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# IONOSPHERIC DATA IN JAPAN

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## CONTENTS



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

NiCT
NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

# INTRODUCTION

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

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

# A. IONOSPHERE

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

## A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

A Impossible measurement because of the presence of a lower thin layer, for example *Es* ( for *foF2* ).

C Impossible measurement because of any failure in observation.

G Impossible automatic scaling because of too small ionization density of the layer ( for *fEs* ).

N Impossible automatic scaling because of complex echoes.

Blank No digital record because of trouble in the automatic data processing system, but existence of film record.

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

## A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

b. Symbols

(i) Descriptive Letters

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

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

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

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

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

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

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

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

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

**K** Presence of particle *E* layer.

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

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

**N** Conditions are such that the measurement cannot be interpreted.

**O** Measurement refers to the ordinary component.

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

**Q** Range spread present.

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

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

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

**V** Forked trace which may influence the measurement.

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

**X** Measurement refers to the extraordinary component.

**Y** Lacuna phenomena, severe layer tilt.

**Z** Third magneto-electronic component present.

(ii) Qualifying Letters

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

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

**D** Greater than.

**E** Less than.

**I** Missing value has been replaced by an interpolated value.

**J** Ordinary component characteristic deduced from the extraordinary component.

**M** Mode interpretation uncertain.

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

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

**U** Uncertain or doubtful numerical value.

**X** Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

# B. SOLAR RADIO EMISSION

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

## B1. Daily Data at Hiraiso

The three-hourly mean and daily mean values of the solar radio emission intensities are tabulated for 500 MHz measurements. The intensities are expressed by the flux density in $10^{-22}$ $Wm^{-2}$ $Hz^{-1}$ unit.

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

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

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

## B2. Outstanding Occurrences at Hiraiso

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

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

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

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

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

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

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

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

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

**B3. Summary Plots of F10.7 at Hiraiso**

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

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

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

# HOURLY VALUES OF foF2 AT Wakkanai

DEC. 2007

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 32 | 30 | | | 28 | 28 | | | | 58 | 48 | 62 | 57 | 56 | 51 | 56 | 40 | 30 | | 29 | 35 | 28 | 34 | 34 |
| 2 | 34 | 32 | 30 | 29 | 28 | | | 40 | 48 | 53 | 52 | 59 | 43 | 56 | 48 | 49 | 36 | 35 | A | A | A | A | A | 32 |
| 3 | 30 | 32 | 34 | 32 | 30 | 29 | 25 | 37 | | A | 56 | 52 | 54 | 59 | 51 | 51 | 38 | | 28 | 28 | 34 | 30 | 31 | |
| 4 | 34 | | | 31 | 29 | 28 | | 38 | 53 | 47 | 51 | 54 | 52 | 56 | 54 | 50 | 38 | | | 28 | 28 | 29 | 30 | 34 |
| 5 | 34 | 34 | 32 | 34 | 34 | 26 | 23 | 41 | 44 | 56 | 55 | 47 | 66 | 60 | 49 | 46 | 35 | 27 | 25 | | 30 | 34 | 34 | 34 |
| 6 | 34 | 34 | 34 | 32 | 32 | 32 | | 36 | 42 | 30 | 51 | 53 | 52 | 60 | 45 | 49 | 40 | 20 | 31 | 26 | 29 | 30 | 29 | 32 |
| 7 | 32 | 32 | 32 | 34 | 34 | 34 | | 35 | 45 | 48 | 52 | 56 | 57 | | 54 | 45 | 35 | | 16 | | 32 | 35 | 31 | 34 |
| 8 | 34 | 36 | 38 | 38 | 36 | 32 | 26 | 42 | 46 | 41 | | 57 | 46 | 58 | 52 | 46 | 41 | 22 | | 25 | A | 24 | 28 | 34 |
| 9 | 34 | 34 | 34 | 34 | 34 | 34 | 30 | 40 | 44 | | 39 | 54 | 60 | 53 | 51 | 44 | | 28 | | 28 | 30 | 34 | 32 | 34 |
| 10 | 32 | 34 | 34 | 32 | 34 | 41 | 23 | 36 | | 54 | 60 | 59 | 64 | 52 | 58 | | 36 | 26 | | 25 | 36 | 30 | 39 | 30 |
| 11 | 31 | 32 | 32 | 31 | 30 | | | | 55 | 53 | 66 | 60 | 58 | 70 | 64 | 40 | 43 | 22 | 26 | 34 | 37 | 34 | 34 | 34 |
| 12 | 34 | 34 | 38 | 41 | 40 | 44 | 31 | 42 | 54 | 71 | 68 | 67 | 62 | 51 | 62 | 61 | 38 | 34 | A | | 28 | 36 | 34 | 38 |
| 13 | 37 | 35 | 35 | 35 | 32 | 34 | 44 | 43 | 50 | 56 | 58 | 62 | 55 | 57 | 64 | 58 | 43 | | 22 | 23 | 26 | 32 | 40 | 42 |
| 14 | 34 | 41 | 44 | 46 | 45 | 35 | 30 | 38 | 47 | 56 | 68 | 62 | 50 | 56 | 66 | 60 | 32 | | 31 | 30 | 35 | | 34 | 38 |
| 15 | 37 | 32 | 34 | 25 | 26 | 32 | 26 | 40 | | 39 | 58 | 58 | 61 | 53 | 50 | 55 | 39 | | | 36 | 32 | 29 | A | 34 |
| 16 | 34 | 35 | 34 | 32 | 34 | 39 | | 36 | 47 | 46 | 63 | 56 | 60 | 55 | 54 | 56 | 30 | 35 | | 26 | 34 | 34 | 26 | 32 |
| 17 | 35 | 34 | 32 | 32 | 25 | 29 | | 35 | 39 | 46 | 55 | 64 | 64 | 51 | 56 | 55 | 41 | 32 | 34 | 36 | 34 | 34 | 32 | 36 |
| 18 | 34 | 34 | 34 | 34 | 32 | 32 | 25 | 37 | 51 | 50 | 77 | 82 | 62 | 54 | 56 | 58 | 45 | 35 | | 28 | 32 | 17 | 28 | 34 |
| 19 | 32 | 34 | 34 | 37 | 34 | 31 | | 36 | 51 | 48 | 58 | 68 | 57 | 57 | 58 | 58 | 42 | 36 | 29 | 23 | 32 | 25 | 32 | 40 |
| 20 | 54 | 54 | 40 | 37 | 34 | 26 | | 35 | 45 | 46 | 56 | 57 | 42 | 53 | | 53 | 41 | 29 | 26 | 34 | | 30 | 32 | 34 |
| 21 | 32 | 34 | 32 | 24 | 30 | 32 | 23 | 25 | 40 | 53 | 69 | 62 | 58 | 54 | 61 | 60 | 43 | | 28 | 34 | 34 | 34 | 32 | 34 |
| 22 | 32 | 34 | 34 | 34 | 32 | 32 | 23 | 34 | 44 | 60 | 64 | 56 | 54 | 58 | 53 | 44 | 41 | 32 | 26 | 26 | | A | 32 | 32 |
| 23 | 24 | 39 | 28 | 32 | 40 | 36 | 36 | 36 | 42 | 47 | 52 | 60 | 54 | 56 | | 39 | 40 | | 34 | 34 | 36 | 34 | 32 | 34 |
| 24 | 34 | 31 | 28 | 26 | 31 | 35 | 32 | 39 | 52 | 54 | | 54 | 56 | 42 | 31 | 55 | 30 | 28 | 30 | 36 | 32 | 32 | 34 | 34 |
| 25 | 34 | 34 | 36 | 34 | 29 | 28 | 26 | 30 | 42 | 46 | 60 | 53 | | 50 | | 58 | 40 | A | 26 | 28 | 29 | 20 | 31 | 34 |
| 26 | | 34 | 36 | 39 | 31 | 26 | 26 | 34 | 47 | 54 | 55 | 57 | 52 | | 39 | 42 | 40 | | | 31 | 34 | 22 | 34 | 30 |
| 27 | 30 | 39 | 26 | 26 | | | | 26 | 36 | 40 | 55 | 60 | 58 | 62 | 52 | 42 | 34 | 32 | | 28 | 30 | | 28 | 26 |
| 28 | 28 | | | 28 | 26 | 28 | | 30 | 45 | 41 | 54 | | 55 | 50 | 60 | 41 | 36 | | 26 | 29 | 34 | 34 | 28 | 32 |
| 29 | 29 | 25 | 39 | 39 | | | A | 25 | 25 | 32 | 58 | | 54 | 32 | 45 | 45 | A | 26 | A | A | | 39 | 29 | 34 |
| 30 | | 25 | 31 | 39 | 29 | 28 | | 30 | 23 | 42 | A | 66 | 58 | 57 | 40 | 46 | 39 | | A | 29 | 34 | 23 | 30 | 34 |
| 31 | 37 | 36 | 36 | 28 | 29 | 26 | 26 | 30 | 41 | | 45 | 50 | 38 | 50 | 40 | 38 | 38 | 26 | | 23 | 32 | 30 | 28 | 39 |
| | 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 | 28 | 30 | 29 | 27 | 17 | 29 | 27 | 28 | 28 | 29 | 30 | 29 | 28 | 30 | 29 | 19 | 16 | 26 | 26 | 27 | 29 | 30 |
| MED | 34 | 34 | 34 | 33 | 32 | 32 | 26 | 36 | 45 | 48 | 56 | 58 | 56 | 56 | 52 | 50 | 39 | 29 | 27 | 28 | 32 | 30 | 32 | 34 |
| U Q | 34 | 35 | 36 | 37 | 34 | 34 | 30 | 39 | 50 | 54 | 61 | 62 | 60 | 57 | 58 | 56 | 41 | 34 | 30 | 34 | 34 | 34 | 34 | 34 |
| L Q | 32 | 32 | 32 | 31 | 29 | 28 | 24 | 32 | 42 | 44 | 52 | 54 | 52 | 51 | 48 | 44 | 36 | 26 | 26 | 26 | 30 | 28 | 29 | 32 |

# HOURLY VALUES OF fEs AT Wakkanai

DEC.2007

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 32 | 32 | 33 | 32 | G | G | G | | | G | G | G | 40 | G | G | G | 33 | G | | G | G | G | 26 | G |
| 2 | G | G | G | G | G | | | G | G | 41 | 36 | 48 | G | G | G | 27 | G | G | 52 | 60 | 50 | 39 | 40 | 30 |
| 3 | 26 | G | G | 29 | G | G | G | G | 32 | 91 | 35 | G | G | 34 | | G | G | 23 | 28 | G | G | G | G | 36 |
| 4 | 30 | | | G | G | G | G | | 33 | 45 | 34 | 34 | G | G | G | 30 | 11 | G | G | G | G | G | G | G |
| 5 | G | 27 | G | G | G | G | G | G | | 32 | | G | G | G | G | 30 | 11 | G | G | | G | G | G | G |
| 6 | G | G | G | G | G | G | G | G | 30 | 41 | 36 | G | G | G | G | G | 11 | G | G | G | G | G | G | G |
| 7 | G | G | G | G | G | G | G | | 37 | 39 | G | G | G | G | G | G | G | | G | | G | G | G | G |
| 8 | G | G | G | 26 | G | G | G | G | G | 34 | 39 | 39 | 34 | G | G | G | | G | G | G | 33 | 26 | G | G |
| 9 | G | G | G | G | G | G | G | 11 | | 34 | 34 | G | | G | G | G | | G | G | G | G | G | G | G |
| 10 | G | G | G | G | G | G | G | 29 | | G | G | G | G | G | G | | | G | | G | G | 40 | G | G |
| 11 | G | G | G | G | G | | G | | G | 44 | G | G | 46 | 41 | | G | G | G | G | G | G | G | G | G |
| 12 | G | G | G | G | 24 | G | G | | | 34 | 46 | 36 | G | 42 | 40 | 41 | 33 | 38 | 36 | 32 | G | G | 28 | 28 |
| 13 | G | G | 27 | G | G | 26 | G | 11 | 28 | 33 | 34 | 40 | G | G | 40 | 28 | 11 | 26 | 27 | 32 | 32 | 43 | 29 | G |
| 14 | G | G | G | G | G | G | G | 27 | 38 | 38 | 40 | 34 | G | G | G | G | G | G | G | G | G | 34 | G | G |
| 15 | 26 | G | G | G | G | G | G | 24 | 38 | 38 | 37 | G | 34 | G | | G | G | | | G | G | 32 | 43 | 29 |
| 16 | G | G | G | G | G | G | | 30 | 27 | G | G | G | G | G | G | | G | G | | 27 | G | G | G | G |
| 17 | G | G | G | G | G | G | | G | 28 | G | 36 | G | 41 | G | G | G | 27 | 26 | G | G | G | G | G | 22 |
| 18 | G | G | G | G | G | G | G | G | 32 | G | 34 | 41 | 39 | G | G | G | G | 28 | 27 | G | G | G | G | G |
| 19 | G | G | G | G | 22 | G | G | G | 33 | 36 | 39 | 33 | G | 32 | 34 | 29 | G | G | G | G | G | 22 | G | 20 |
| 20 | 39 | G | G | G | G | G | 26 | G | 30 | G | G | G | G | G | G | G | G | G | G | G | | G | G | G |
| 21 | G | G | 29 | 24 | G | G | G | G | 29 | G | | 36 | G | 35 | | G | 11 | 30 | G | G | G | G | G | 23 |
| 22 | G | G | G | G | G | G | 24 | G | G | 37 | 40 | G | G | 45 | G | G | G | G | G | G | 33 | 41 | G | G |
| 23 | G | G | G | G | G | G | G | G | G | 30 | G | 34 | 40 | G | 31 | 34 | G | | 66 | 41 | G | G | G | G |
| 24 | G | G | 26 | G | G | G | G | G | G | G | G | G | G | G | G | G | 11 | G | G | G | G | G | G | G |
| 25 | G | G | G | G | G | G | G | 24 | G | 30 | 41 | 40 | G | 48 | | G | 29 | 40 | G | G | G | 68 | 39 | 34 |
| 26 | 41 | G | G | 26 | G | G | G | G | 29 | 38 | G | G | G | 34 | G | G | G | | | G | G | 33 | G | 32 |
| 27 | G | G | G | G | | G | | G | 34 | 37 | 36 | G | 48 | | G | G | G | G | G | G | G | | 30 | G |
| 28 | G | G | G | G | G | G | G | | | G | G | G | G | G | G | G | 11 | G | G | G | 26 | G | G | 29 |
| 29 | 39 | 26 | G | G | G | G | 30 | 35 | 34 | 34 | 38 | 38 | 41 | G | 34 | 42 | 48 | G | 40 | 70 | 38 | 28 | 28 | 30 |
| 30 | 30 | G | G | G | G | G | 30 | 24 | 32 | 30 | 47 | G | 36 | 32 | G | G | G | 27 | 39 | G | 32 | 47 | 28 | G |
| 31 | G | 29 | 29 | 29 | G | G | G | G | G | | G | G | G | G | G | G | G | G | | G | G | G | G | G |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 31 | 30 | 30 | 31 | 30 | 29 | 27 | 25 | 25 | 30 | 29 | 31 | 30 | 30 | 26 | 29 | 28 | 27 | 25 | 29 | 30 | 30 | 31 | 31 |
| MED | G | G | G | G | G | G | G | G | 29 | 34 | 34 | G | G | G | G | G | G | G | G | G | G | G | G | G |
| U Q | 26 | G | G | G | G | G | G | 24 | 33 | 38 | 38 | 36 | 36 | 32 | G | 27 | 11 | 26 | 27 | G | G | 33 | 28 | 28 |
| L Q | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# HOURLY VALUES OF fmin AT Wakkanai

DEC. 2007

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

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

# HOURLY VALUES OF foF2 AT Kokubunji

DEC. 2007

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

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

# HOURLY VALUES OF fEs AT Kokubunji

DEC. 2007

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | G | G | G | G | 37 | G | G | G | G | 53 | G | G | G | 46 | 47 | G | 34 | | G | G | 24 | 43 | 28 | 29 |
| 2 | 27 | G | | G | G | G | 26 | G | 37 | 42 | G | G | G | G | G | G | G | G | G | 24 | G | G | 56 | 48 |
| 3 | 30 | G | 24 | 26 | 26 | 29 | G | G | 33 | 34 | 38 | G | 50 | 37 | G | G | 34 | 43 | 26 | 25 | G | G | G | G |
| 4 | G | 26 | G | G | G | G | | 39 | G | 35 | 38 | 39 | 53 | 46 | 34 | G | G | G | G | G | G | G | G | G |
| 5 | G | G | G | G | G | | | 28 | 40 | 35 | 43 | 37 | 41 | G | G | 41 | G | G | | G | G | G | G | G |
| 6 | G | G | G | 26 | G | G | | 26 | 31 | G | 40 | 40 | G | G | G | G | 49 | 40 | | G | G | G | G | G |
| 7 | G | G | G | G | G | | G | G | G | 34 | G | G | G | G | G | G | 29 | G | G | G | G | G | G | |
| 8 | G | G | G | G | G | G | | G | | G | 35 | G | 40 | 43 | 34 | 42 | G | G | G | 23 | 36 | 28 | G | G |
| 9 | G | G | G | G | 26 | 24 | 25 | 36 | | 37 | G | 50 | 40 | G | 50 | G | 36 | 29 | G | G | | G | G | G |
| 10 | G | G | G | G | G | | G | G | 31 | 34 | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 11 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 12 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 13 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 14 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 15 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 16 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 17 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 18 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 19 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 20 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 21 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 22 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 23 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 24 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 25 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 26 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | G | G | 23 | | 26 | G | | 43 |
| 27 | 33 | 29 | G | | G | | | 26 | G | G | 53 | 45 | 55 | 37 | G | G | 29 | 27 | | G | 24 | 23 | 28 | G |
| 28 | 32 | 49 | G | G | 25 | G | 25 | 25 | G | G | G | G | | G | G | | G | G | G | G | 23 | | 34 | 33 |
| 29 | G | 25 | 30 | G | | | | 40 | 45 | G | 42 | G | G | 90 | G | 31 | 32 | 11 | | 29 | 36 | 45 | 58 | G |
| 30 | G | 31 | 25 | 32 | 24 | 25 | 26 | 29 | 35 | 36 | G | G | G | G | 40 | G | G | G | G | | | G | 29 | G |
| 31 | 29 | 28 | 26 | G | G | G | | G | 33 | 37 | G | G | G | G | 39 | 37 | 28 | G | G | | G | G | G | G |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 15 | 15 | 14 | 14 | 14 | 10 | 8 | 15 | 13 | 15 | 14 | 14 | 13 | 14 | 14 | 13 | 15 | 14 | 11 | 12 | 13 | 14 | 14 | 14 |
| MED | G | G | G | G | G | G | 13 | 25 | 31 | 34 | 18 | G | G | G | G | G | 28 | G | G | G | G | G | G | G |
| U Q | 29 | 28 | 24 | G | 25 | 24 | 25 | 29 | 36 | 37 | 40 | 39 | 45 | 43 | 39 | 34 | 34 | 27 | G | 23 | 25 | 23 | 29 | 29 |
| L Q | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G |

# HOURLY VALUES OF fmin AT Kokubunji

DEC. 2007

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

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

# HOURLY VALUES OF foF2 AT Yamagawa

DEC. 2007

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 26 | | 25 | | | 26 | 43 | 48 | 50 | 61 | 48 | 50 | 58 | 62 | 60 | 56 | 44 | | 28 | 28 | 28 | 28 | 26 |
| 2 | 28 | 28 | 28 | 28 | 26 | | 26 | 32 | 44 | 50 | 53 | 56 | 58 | 44 | 66 | | 59 | 42 | 32 | 30 | 25 | | A | A |
| 3 | | | A | | 29 | | | 37 | 49 | 56 | 43 | 58 | 50 | 55 | 70 | 59 | 47 | 48 | | 32 | | 26 | | |
| 4 | 25 | 26 | 26 | 30 | | | | 34 | 42 | 56 | 52 | 48 | 56 | 55 | 54 | | | A | 32 | A | | | 26 | 26 |
| 5 | | | | | 26 | | | 29 | 54 | 54 | 58 | 55 | 54 | 69 | 51 | 54 | 52 | 42 | 32 | | 28 | | 28 | 29 |
| 6 | 26 | 29 | 30 | 34 | 28 | | | 30 | 50 | 57 | 58 | 57 | 54 | 47 | 44 | 54 | 50 | 46 | 37 | | 31 | | 26 | 30 |
| 7 | 28 | 26 | 28 | 30 | 28 | | | 32 | 50 | 52 | 53 | 52 | 64 | 54 | 54 | 47 | 60 | 41 | 29 | 26 | | | 26 | |
| 8 | 26 | 28 | 30 | 29 | | | | 32 | 50 | 55 | 58 | 55 | 58 | 61 | 55 | 67 | 56 | 47 | A | 30 | 30 | | | |
| 9 | 25 | 28 | 26 | 32 | 30 | | | 32 | 56 | 60 | 56 | 59 | 58 | 63 | 66 | 52 | 56 | 49 | 30 | 28 | | 26 | | 28 |
| 10 | 28 | 29 | 28 | 29 | 34 | | | 34 | 48 | 56 | 60 | 66 | 78 | 81 | 71 | 45 | 58 | 46 | 37 | 32 | 26 | | 28 | |
| 11 | 28 | 28 | 30 | 34 | 34 | | | 32 | 47 | 54 | 58 | | 62 | 60 | 75 | 74 | 68 | 54 | 48 | 30 | 28 | 28 | 28 | |
| 12 | 26 | 30 | 30 | 30 | 32 | | | 34 | 52 | 55 | 68 | 64 | 69 | 72 | 71 | 64 | 68 | 50 | 40 | 28 | A | 28 | 30 | 28 |
| 13 | | | 28 | 30 | 30 | 31 | 27 | 34 | 48 | 51 | 57 | 60 | 55 | 64 | 66 | 56 | 58 | 48 | 37 | | 31 | | 30 | C |
| 14 | C | C | C | C | C | C | C | C | C | C | 55 | 66 | 72 | 65 | 60 | 62 | 71 | 63 | 43 | | 37 | 25 | 28 | |
| 15 | 26 | | | | | | | 30 | 47 | 59 | 57 | 59 | 62 | 52 | 59 | 60 | 56 | 47 | 34 | 26 | 34 | | | |
| 16 | | 26 | 25 | 25 | 25 | 26 | | 29 | 46 | 54 | 59 | 57 | 63 | 68 | 63 | 57 | 49 | 50 | 42 | | 28 | 26 | 30 | 28 |
| 17 | | | | | | | | 30 | 45 | 50 | 58 | 55 | 59 | 56 | 60 | 60 | 57 | | 37 | | 34 | | | |
| 18 | 26 | 26 | 26 | 32 | 29 | 26 | 25 | 34 | 47 | 58 | 56 | 72 | 68 | 72 | 60 | 52 | 60 | | 43 | 28 | | | 26 | 26 |
| 19 | 28 | 32 | 28 | 28 | 30 | | | 32 | 50 | 55 | 42 | 70 | | | 58 | 53 | 58 | 48 | 41 | 30 | | | | |
| 20 | | 28 | 28 | 28 | 25 | 29 | | 30 | 45 | 52 | 60 | 71 | 64 | 64 | 60 | 71 | 55 | 56 | 35 | | 26 | | | |
| 21 | 28 | 28 | 30 | 29 | 29 | | | 28 | 49 | 48 | 50 | 64 | 68 | 56 | 56 | 55 | 55 | 56 | 25 | 28 | | | 26 | |
| 22 | | | | 26 | 29 | | | | 52 | 56 | 51 | 71 | 61 | 60 | 60 | 65 | 60 | 52 | 30 | 28 | | | | |
| 23 | 29 | 26 | 28 | 30 | 26 | | | 28 | 42 | 51 | 42 | 66 | 68 | 64 | 63 | 57 | 58 | 59 | 35 | | 32 | | | 25 |
| 24 | 26 | 26 | 26 | 26 | | 26 | | 29 | 45 | 50 | 52 | 62 | 57 | 58 | 55 | 50 | 54 | 56 | | | 29 | 36 | | |
| 25 | | | 26 | 26 | 26 | | | 28 | 52 | 51 | 56 | 46 | 56 | 48 | | 66 | 57 | 46 | 45 | | | A | A | A |
| 26 | | | | | 26 | 27 | | 29 | 52 | 52 | 51 | 60 | | 66 | 55 | 54 | 35 | 48 | 35 | | A | | 89 | |
| 27 | | | | 26 | 28 | | | 28 | 48 | 55 | 41 | 67 | 63 | 61 | 60 | 60 | 60 | 42 | 35 | A | 31 | 35 | 28 | |
| 28 | | 25 | 26 | 25 | 26 | 26 | | 30 | | 45 | 52 | 54 | 58 | | 55 | 50 | 45 | 48 | 34 | | 34 | 26 | | |
| 29 | | | | 23 | 34 | | | | 46 | 55 | 52 | 54 | 65 | | | 51 | 54 | 53 | 28 | | A | A | | A |
| 30 | A | A | 26 | 23 | 26 | 28 | | 30 | 41 | 47 | 47 | 60 | | 55 | 48 | 54 | | 42 | 35 | | | 28 | 32 | 26 |
| 31 | A | | | | 26 | 28 | | | | 48 | 52 | 58 | 57 | 54 | 54 | 57 | 48 | 46 | 44 | 26 | 29 | 34 | 34 | |
| | 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 | 18 | 20 | 24 | 24 | 9 | 4 | 27 | 28 | 30 | 31 | 30 | 28 | 28 | 29 | 29 | 29 | 28 | 27 | 15 | 18 | 12 | 17 | 10 |
| MED | 26 | 28 | 28 | 28 | 28 | 27 | 26 | 30 | 48 | 54 | 55 | 59 | 60 | 60 | 60 | 57 | 56 | 48 | 35 | 28 | 30 | 28 | 28 | 27 |
| U Q | 28 | 28 | 29 | 30 | 30 | 28 | 26 | 34 | 50 | 56 | 58 | 66 | 64 | 64 | 64 | 61 | 59 | 52 | 41 | 30 | 32 | 31 | 30 | 28 |
| L Q | 26 | 26 | 26 | 26 | 26 | 26 | 25 | 29 | 45 | 50 | 51 | 55 | 56 | 55 | 55 | 52 | 53 | 46 | 32 | 28 | 28 | 26 | 26 | 26 |

# HOURLY VALUES OF fEs AT Yamagawa

DEC. 2007

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 58 | 40 | 34 | 35 | 26 | G | G | G | 50 | 45 | 40 | G | G | 42 | 39 | 37 | 36 | 34 | 30 | G | G | G | G | G |
| 2 | G | G | G | G | G | G | G | 24 | G | 38 | 44 | 51 | 48 | 40 | 40 | | G | 27 | 27 | G | G | | 32 | 31 |
| 3 | 45 | 45 | 58 | 38 | 28 | G | 30 | G | G | 39 | 42 | 52 | 42 | 42 | 47 | 59 | 47 | 39 | 44 | 29 | 26 | G | G | G |
| 4 | G | G | G | G | | G | 26 | G | G | 34 | G | 42 | 40 | 42 | 76 | 78 | 76 | 79 | 48 | 42 | 32 | 28 | G | G |
| 5 | G | G | G | | G | | | G | 29 | 38 | 39 | 42 | 42 | 38 | G | G | 35 | 28 | G | G | G | | G | G |
| 6 | G | G | G | G | G | | | 23 | G | G | 42 | 40 | 54 | 39 | G | 50 | 40 | G | G | G | G | G | G | G |
| 7 | G | G | G | G | G | | | G | G | G | 36 | G | G | | G | 37 | 32 | 27 | G | G | | G | G | |
| 8 | G | G | G | G | G | | | G | G | G | 41 | G | 41 | 38 | 46 | G | G | 40 | 35 | 32 | 25 | | G | |
| 9 | G | G | G | G | G | G | | G | G | 37 | G | 40 | 42 | 64 | 40 | 34 | 50 | 38 | G | G | G | G | G | G |
| 10 | G | G | G | G | 11 | | | G | G | G | 38 | 47 | 39 | 40 | 39 | 34 | 33 | G | 24 | G | G | | G | G |
| 11 | G | G | G | G | G | | | G | 36 | G | G | | 43 | 49 | 46 | 40 | 31 | 39 | G | G | G | G | G | |
| 12 | G | G | G | G | G | | | 24 | 29 | 35 | 40 | 46 | 50 | G | 38 | 37 | 43 | 31 | 28 | G | 25 | G | G | G |
| 13 | G | G | G | G | G | G | G | G | 30 | 34 | 38 | 43 | N | G | 40 | G | G | G | G | G | G | 27 | G | C |
| 14 | C | C | C | C | C | C | C | C | C | C | 40 | 40 | 38 | G | G | G | G | G | G | | G | G | G | |
| 15 | G | | G | G | G | G | | G | G | G | 43 | 50 | 39 | G | 40 | | 33 | 25 | G | G | G | G | G | |
| 16 | G | G | G | G | G | G | | G | 34 | 38 | 42 | 49 | G | 44 | 46 | 34 | 45 | 31 | 27 | 30 | G | G | 23 | G |
| 17 | | | G | G | G | G | G | G | 40 | 36 | 40 | 42 | 40 | 56 | 37 | G | 34 | 48 | 33 | 27 | G | G | G | G |
| 18 | G | G | G | G | G | G | G | G | G | 48 | G | 46 | 51 | 44 | G | G | 44 | | 35 | G | | G | G | G |
| 19 | G | G | G | G | G | | | G | G | 36 | G | 38 | 48 | G | G | 46 | 35 | 25 | G | G | G | G | G | G |
| 20 | G | G | G | G | 29 | 26 | G | G | | 36 | 37 | 37 | G | 39 | G | G | 32 | G | 11 | | G | G | G | G |
| 21 | G | G | G | G | G | | | G | | 34 | G | G | 40 | 58 | 49 | 45 | 35 | 29 | 29 | G | | G | G | G |
| 22 | 28 | G | G | G | G | G | | G | 28 | G | G | G | 43 | G | | G | N | G | G | G | G | G | | G |
| 23 | G | G | G | 24 | G | | | G | G | G | G | 38 | G | 38 | 40 | | 34 | G | 29 | 40 | G | | 34 | 28 |
| 24 | 25 | G | G | G | G | G | G | G | G | G | G | 41 | 38 | 44 | 56 | 34 | 36 | 34 | 34 | | G | G | G | |
| 25 | G | G | G | G | G | | | G | G | 37 | 46 | 55 | 41 | 49 | 62 | 40 | 33 | G | 28 | 26 | 29 | 34 | 41 | 32 |
| 26 | 26 | | | | G | G | | G | | | 41 | 39 | | 38 | G | 35 | G | G | G | 36 | 67 | 51 | 33 | G |
| 27 | G | 25 | G | G | G | G | | G | | 40 | 46 | 40 | 40 | 40 | | G | G | | G | 42 | 28 | 29 | G | G |
| 28 | G | G | 33 | 26 | G | G | 33 | 32 | 28 | 34 | G | G | 44 | 42 | 40 | 39 | G | | G | 27 | G | G | | |
| 29 | | G | G | 36 | 40 | 38 | | 24 | 34 | 42 | 72 | 59 | 97 | 82 | 91 | 49 | 43 | 28 | 26 | 51 | 50 | 34 | 38 | 33 |
| 30 | 34 | 32 | 26 | 28 | G | G | | 24 | 29 | 36 | 37 | 52 | 54 | 37 | 40 | 34 | 32 | G | G | G | 28 | G | 30 | G |
| 31 | 39 | G | G | 28 | G | G | G | | | 38 | 44 | 43 | 44 | 37 | 46 | G | 46 | 34 | 26 | G | G | G | G | G |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 28 | 27 | 29 | 28 | 29 | 19 | 11 | 29 | 25 | 29 | 31 | 30 | 29 | 30 | 29 | 28 | 30 | 28 | 31 | 28 | 28 | 26 | 29 | 23 |
| MED | G | G | G | G | G | G | G | G | G | 36 | 39 | 42 | 41 | 40 | 40 | 34 | 34 | 28 | 24 | G | G | G | G | G |
| U Q | 13 | G | G | 12 | G | G | 26 | G | 29 | 38 | 42 | 47 | 46 | 44 | 46 | 40 | 43 | 34 | 29 | 29 | 25 | G | 12 | G |
| L Q | G | G | G | G | G | G | G | G | G | G | G | 38 | 38 | 37 | G | G | 31 | G | G | G | G | G | G | G |

# HOURLY VALUES OF fmin AT Yamagawa

DEC. 2007

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

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

# HOURLY VALUES OF foF2 AT Okinawa

DEC. 2007

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A | | | | | | | 40 | 44 | 50 | 61 | 58 | 53 | 58 | 67 | 70 | 66 | 65 | A | | 32 | 29 | | |
| 2 | | | | | 29 | | | 35 | 42 | 52 | 62 | 57 | 58 | A | 66 | 61 | 58 | 47 | A | A | A | | A | |
| 3 | | | A | A | | | A | 34 | 44 | 52 | 61 | 59 | 52 | 51 | 73 | 81 | 67 | 60 | 54 | 44 | A | | | |
| 4 | | | | | | | | 32 | 45 | 46 | 55 | 56 | 61 | 58 | 54 | 60 | 58 | 50 | 40 | | 34 | | | |
| 5 | | | | 25 | | | | 34 | 51 | 55 | 58 | 56 | 62 | 58 | 62 | 60 | 48 | 56 | 37 | 34 | 28 | 23 | | |
| 6 | | 26 | 30 | 32 | | | | 30 | 48 | 56 | 68 | 66 | 46 | 57 | 54 | 69 | 55 | | 47 | 42 | | 34 | | 29 |
| 7 | 30 | 30 | 28 | 30 | 30 | | | 32 | 47 | 58 | 65 | 62 | 55 | 72 | 55 | 55 | 45 | 60 | A | 34 | | | A | |
| 8 | | | | 30 | | | | 32 | 48 | 55 | 54 | 68 | 70 | 87 | 97 | 82 | | 66 | 53 | 41 | 31 | A | | 30 |
| 9 | | | 31 | 30 | 30 | | | 32 | 48 | 52 | 58 | 57 | 65 | 62 | 66 | 73 | 61 | 52 | 45 | 29 | | | 26 | |
| 10 | 29 | 32 | 28 | 29 | 42 | | | 32 | 47 | 48 | 69 | 82 | 96 | 127 | 111 | 88 | 67 | 73 | 59 | A | 42 | 34 | 28 | |
| 11 | | | 30 | 38 | | | | 30 | | 56 | 67 | 71 | 63 | 61 | 78 | 95 | 88 | 88 | 77 | 40 | 29 | 30 | 30 | |
| 12 | | 26 | 29 | 30 | | | | 32 | 52 | 58 | 61 | 64 | 73 | 88 | 91 | 75 | 78 | 77 | A | 43 | | 32 | 36 | |
| 13 | | | | | 29 | 29 | | 32 | 50 | 54 | 61 | 57 | 69 | 68 | 77 | 66 | 58 | 58 | 62 | 37 | 31 | | 34 | |
| 14 | | | | 29 | 30 | | | 32 | 55 | 57 | 57 | 66 | 70 | 96 | 66 | 74 | 90 | 71 | 71 | 49 | 38 | A | | |
| 15 | | | | | 26 | 28 | 28 | 28 | 47 | 58 | 60 | 66 | 67 | 74 | 80 | 68 | 79 | 66 | 46 | 42 | 41 | | | |
| 16 | | | | | 25 | 32 | | 28 | 44 | 68 | 57 | 60 | 66 | 67 | 72 | 64 | 55 | 54 | 50 | 42 | | | | |
| 17 | | | | | | | | 29 | | 52 | 57 | 62 | 58 | 61 | 62 | 79 | 75 | 45 | 56 | 41 | 32 | | | |
| 18 | | 29 | | 31 | 30 | | | 31 | 54 | 58 | 68 | 62 | 69 | 84 | 73 | 57 | 57 | 67 | 71 | 29 | 28 | | 28 | |
| 19 | | 30 | 32 | | 37 | | | 31 | 50 | 64 | 65 | 73 | 74 | 70 | 80 | 64 | 64 | 48 | | 37 | | | | |
| 20 | | | | | | | | 25 | 42 | 50 | 60 | | 62 | 72 | 81 | 77 | 76 | 51 | 54 | 30 | 30 | | | |
| 21 | | | | | | | | | 45 | 60 | 54 | 60 | 81 | 67 | 55 | 56 | 60 | 60 | 53 | | | | | |
| 22 | | | | 28 | 39 | | | | 51 | 67 | 68 | 67 | 64 | 86 | 71 | 76 | 84 | 63 | 45 | 28 | 30 | | | |
| 23 | 26 | 28 | 29 | 29 | | | | 28 | 43 | 52 | 67 | 74 | 69 | 86 | 66 | 87 | | 96 | 48 | | | | | |
| 24 | | | | | | | | 28 | 50 | 51 | 62 | 59 | 72 | 66 | 83 | 77 | 68 | 57 | 41 | | | 31 | 32 | 32 |
| 25 | | | 29 | | | | | | 48 | 59 | 56 | 60 | | A | 66 | 70 | 62 | | 48 | | 29 | | 30 | |
| 26 | | | | | | | | 28 | 46 | | 57 | 46 | 63 | 62 | 76 | 75 | 78 | 48 | 29 | A | A | | | |
| 27 | A | | | | | | | | 46 | 54 | 62 | 56 | 60 | 65 | 78 | 86 | 57 | 62 | 41 | 32 | 29 | 26 | | |
| 28 | | | | | 25 | 32 | | | 52 | 47 | 47 | 70 | 57 | 80 | 77 | 62 | 58 | 52 | 51 | 28 | 26 | | | A |
| 29 | | | | | | | | | 43 | 56 | 65 | | 70 | 88 | 110 | 102 | 87 | 71 | 44 | A | A | | | A |
| 30 | A | | | A | | | | | 49 | 47 | 55 | 57 | 52 | 61 | 77 | 74 | 67 | 46 | 47 | 41 | | | 29 | |
| 31 | A | | | | | | | | 43 | 57 | 57 | 58 | 60 | 53 | 72 | 67 | 76 | 66 | 51 | 45 | | 30 | 42 | |
| | 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 | 7 | 9 | 12 | 12 | 4 | 1 | 23 | 29 | 30 | 31 | 29 | 30 | 29 | 31 | 31 | 29 | 29 | 26 | 21 | 16 | 9 | 10 | 3 |
| MED | 29 | 29 | 29 | 30 | 30 | 30 | 28 | 32 | 47 | 55 | 61 | 60 | 64 | 67 | 73 | 73 | 66 | 60 | 49 | 40 | 30 | 30 | 30 | 30 |
| U Q | 30 | 30 | 30 | 30 | 33 | 32 | 14 | 32 | 50 | 58 | 65 | 66 | 70 | 85 | 80 | 79 | 77 | 66 | 54 | 42 | 33 | 33 | 34 | 32 |
| L Q | 26 | 26 | 28 | 29 | 27 | 28 | 14 | 28 | 44 | 52 | 57 | 57 | 58 | 61 | 66 | 64 | 58 | 51 | 45 | 31 | 29 | 27 | 28 | 29 |

# HOURLY VALUES OF fEs AT Okinawa

## DEC. 2007

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

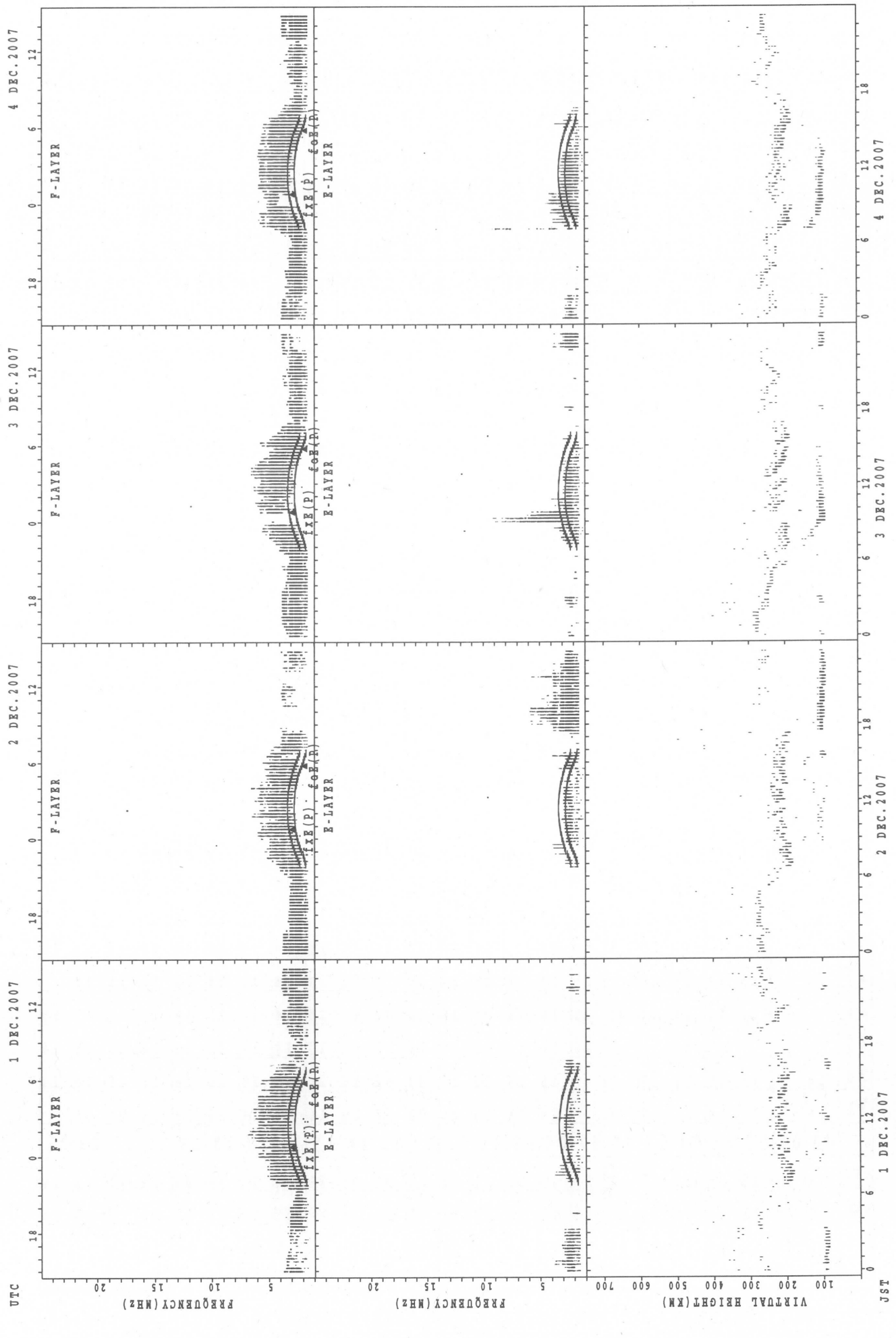
| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 52 | | | | 26 | 28 | G | G | 45 | | G | G | G | G | 40 | 38 | 33 | 36 | 35 | G | G | G | G | |
| 2 | G | 29 | 27 | G | 29 | G | 30 | 29 | G | 34 | G | 45 | 48 | 80 | 57 | 44 | 74 | 43 | 61 | 38 | 37 | 27 | 30 | |
| 3 | | | 30 | 56 | 32 | | 31 | 11 | G | 40 | G | 42 | 38 | 40 | 37 | 47 | 49 | 48 | 29 | 27 | 30 | 28 | | G |
| 4 | G | | G | G | | | | G | G | G | G | 38 | 39 | 50 | 50 | 36 | G | 26 | 25 | 41 | 29 | | | |
| 5 | G | G | G | G | | | | G | G | 38 | 37 | 46 | G | 44 | G | G | G | G | G | 25 | G | G | G | G |
| 6 | G | G | G | G | | | | | 32 | G | 42 | 46 | 44 | 40 | G | 47 | 38 | 31 | G | G | | G | G | G |
| 7 | G | G | G | G | G | | | G | G | G | G | 44 | G | 39 | G | G | 36 | 32 | 32 | G | | | 25 | G |
| 8 | | G | G | G | G | G | | G | G | G | 37 | G | G | 42 | 38 | 56 | 76 | 56 | 33 | 25 | G | 30 | | G |
| 9 | | | G | G | G | G | | G | 32 | 37 | G | 40 | G | G | G | G | 34 | 29 | G | G | | | G | G |
| 10 | G | G | G | G | 11 | | | G | G | G | G | 44 | G | G | 38 | 50 | 57 | 35 | 29 | 32 | 26 | G | G | G |
| 11 | | G | G | G | | | | G | 44 | G | G | G | G | G | 43 | 50 | 74 | 45 | 29 | 32 | G | G | G | G |
| 12 | | G | G | G | G | | | G | 29 | G | 38 | 39 | 58 | 45 | G | 58 | 52 | 34 | 40 | G | | G | G | G |
| 13 | | | G | G | G | G | | G | G | 34 | G | G | G | G | G | G | G | 28 | G | G | G | | G | |
| 14 | G | | G | G | G | | | G | G | G | G | 56 | G | G | G | G | G | G | 20 | 11 | 29 | 36 | 28 | G |
| 15 | G | | | | G | G | G | G | 29 | 40 | 36 | G | 57 | 65 | G | 39 | G | G | G | G | G | | | |
| 16 | | G | G | G | G | G | | G | G | 38 | 40 | 50 | G | 58 | G | 40 | G | 27 | 28 | | | 34 | | |
| 17 | | | G | G | G | G | G | G | 38 | 40 | 36 | G | G | G | 37 | 45 | 36 | 58 | 33 | 27 | G | G | | G |
| 18 | | G | | G | G | G | | G | G | G | G | G | G | G | G | G | G | 36 | G | | G | G | G | |
| 19 | G | G | G | | G | | | G | 29 | G | G | G | G | G | G | 38 | 73 | 33 | G | G | | | | |
| 20 | | | G | | G | | | 25 | | 37 | G | | G | | G | G | G | 28 | 24 | G | G | G | G | |
| 21 | G | | | G | G | G | | G | | 34 | 38 | 44 | 43 | 47 | 41 | 40 | G | G | G | 28 | 29 | 28 | 28 | 26 |
| 22 | G | G | 27 | G | G | | | G | 31 | G | G | G | 46 | G | | G | 48 | G | G | G | G | | G | G |
| 23 | G | G | G | G | | | | G | G | G | 38 | 43 | 45 | G | G | G | | G | 26 | G | G | | | |
| 24 | | | G | G | G | 25 | G | G | 29 | 35 | G | 39 | 48 | G | G | 40 | G | 38 | 35 | | | G | G | G |
| 25 | G | G | G | | G | G | | G | 30 | 35 | 41 | 48 | 52 | 58 | 74 | 67 | 59 | 54 | 40 | 41 | 32 | | G | 34 |
| 26 | | | | | | G | | G | 28 | | 40 | 51 | 40 | 39 | 42 | 40 | 36 | 59 | 52 | 58 | 94 | 27 | 26 | 30 |
| 27 | 29 | | 29 | 29 | 30 | G | | 24 | 32 | 38 | 43 | G | G | G | G | G | G | 32 | 34 | G | 30 | G | G | |
| 28 | | | G | G | G | 28 | G | G | 41 | G | G | G | 40 | 41 | 39 | 38 | 35 | G | 24 | G | G | | | 29 |
| 29 | | | | G | G | | | 23 | 33 | 43 | 43 | 74 | 60 | 51 | 69 | 82 | 64 | 48 | 32 | 48 | 38 | 34 | 33 | 50 |
| 30 | 29 | | G | 33 | 26 | G | | | 30 | 43 | 48 | G | 38 | G | G | G | G | 39 | 40 | | G | 26 | G | 35 |
| 31 | 30 | | G | G | | G | G | | 32 | 36 | 48 | G | 50 | 38 | 39 | 43 | 50 | 45 | 49 | 43 | 38 | G | G | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 17 | 14 | 25 | 25 | 24 | 17 | 8 | 28 | 29 | 29 | 31 | 30 | 31 | 30 | 30 | 31 | 30 | 31 | 31 | 27 | 24 | 21 | 22 | 19 |
| MED | G | G | G | G | G | G | G | G | 29 | 34 | G | 39 | 38 | 38 | G | 39 | 36 | 33 | 29 | 11 | G | G | G | G |
| U Q | 15 | G | G | G | 6 | G | 15 | G | 32 | 38 | 40 | 45 | 46 | 45 | 40 | 47 | 52 | 45 | 35 | 32 | 30 | 28 | 25 | 29 |
| L Q | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | G | 26 | G | G | G | G | G | G |

# HOURLY VALUES OF fmin AT Okinawa

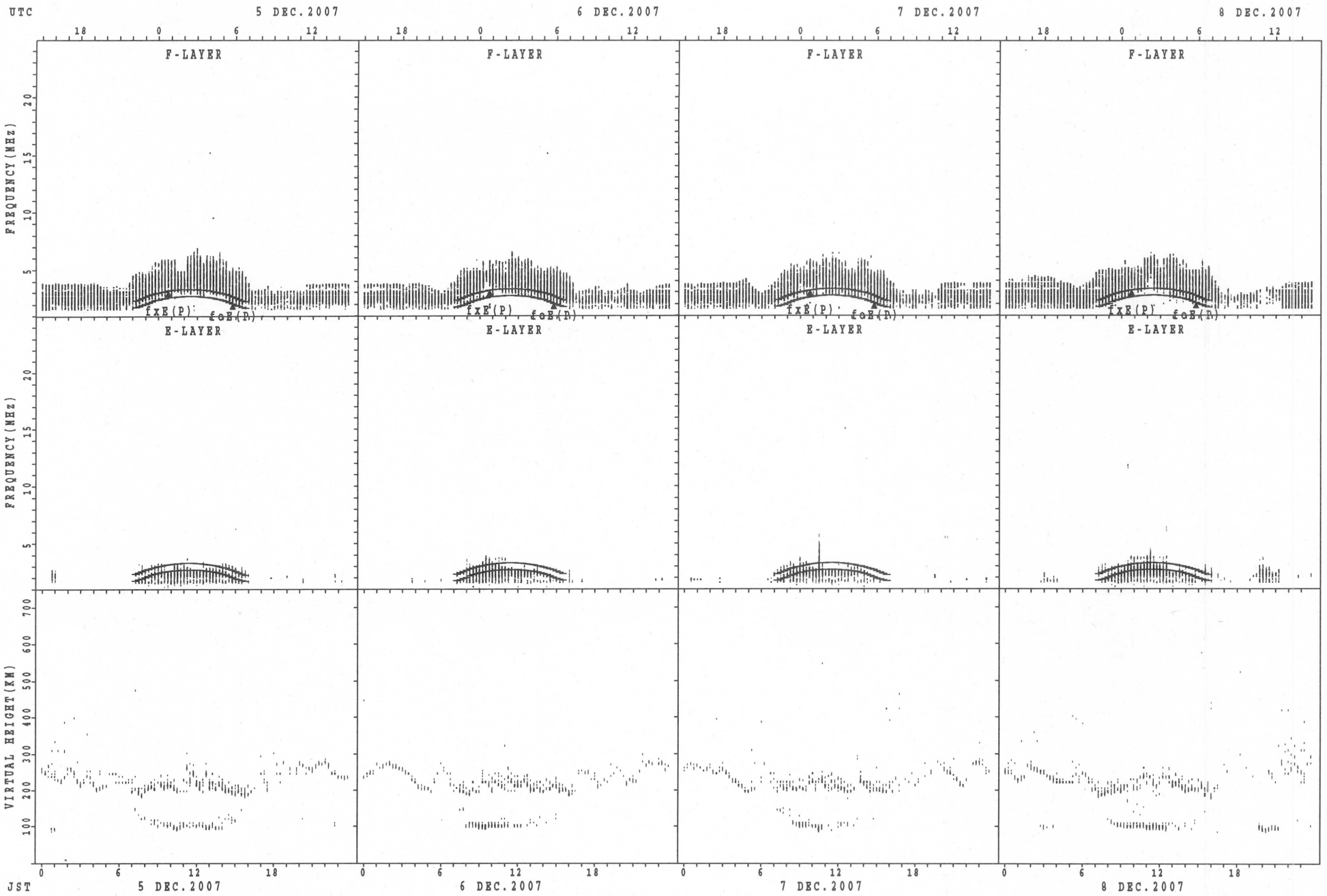
DEC. 2007

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

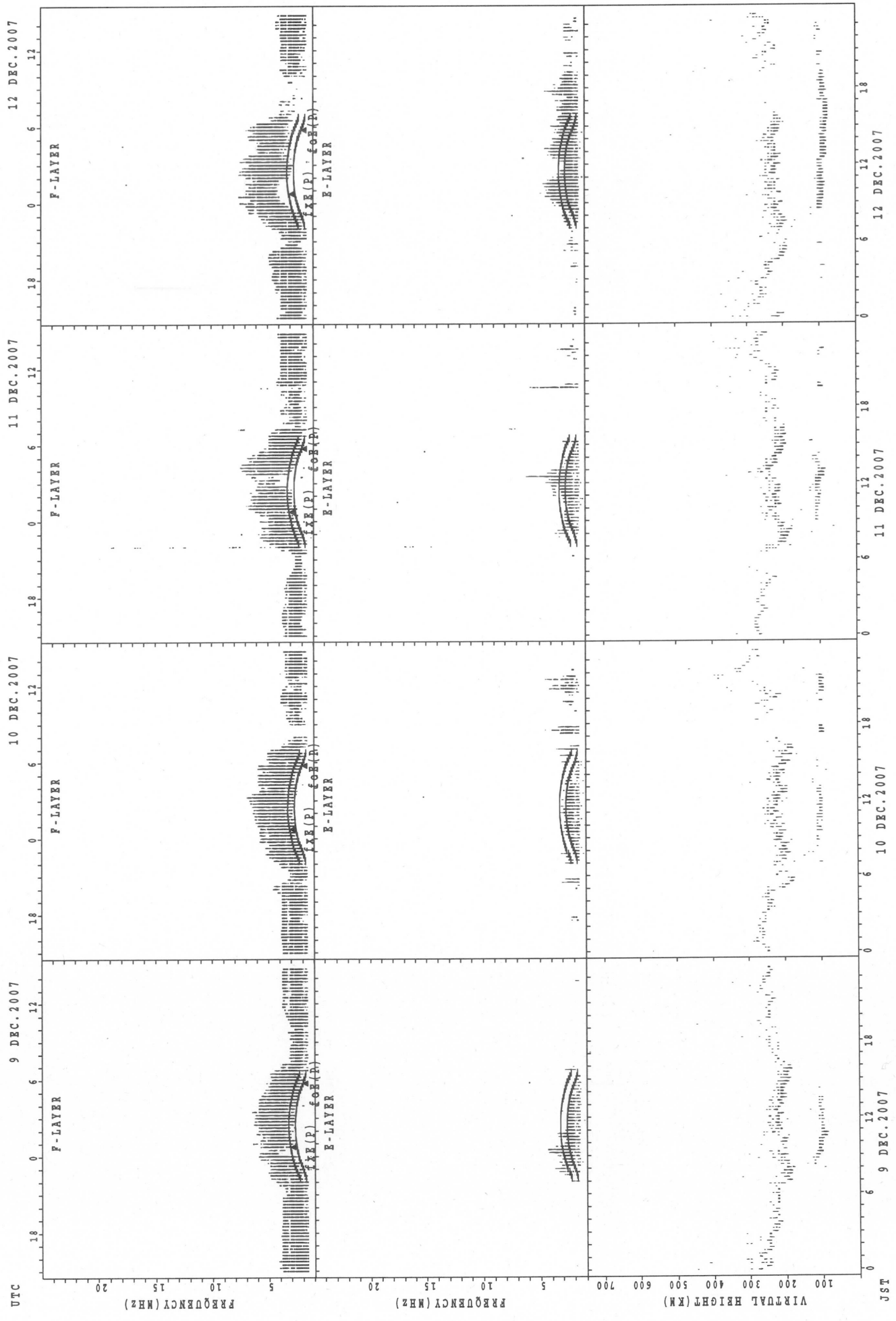
| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15 | | | | 16 | 15 | 14 | 14 | 14 | 15 | 15 | 15 | 41 | 28 | 21 | 17 | 14 | 15 | 14 | 15 | 15 | 14 | 18 | |
| 2 | 14 | 16 | 17 | 15 | 15 | 14 | 15 | 14 | 14 | 15 | 20 | 21 | 21 | 21 | 22 | 17 | 15 | 14 | 14 | 14 | 14 | 15 | 15 | |
| 3 | | | 16 | 14 | 14 | | 14 | 14 | 14 | 14 | 17 | 28 | 15 | 22 | 20 | 14 | 14 | 14 | 14 | 15 | 14 | 15 | | 15 |
| 4 | 21 | | 18 | 14 | | | | 15 | 22 | 27 | 20 | 22 | 23 | 28 | 23 | 16 | 15 | 14 | 15 | 15 | 14 | | | |
| 5 | 16 | 14 | 15 | 14 | | | | 15 | 14 | 14 | 17 | 22 | 21 | 18 | 16 | 18 | 14 | 20 | 15 | 16 | 16 | 17 | 20 | 15 |
| 6 | 15 | 14 | 14 | 14 | | | | 15 | 14 | 18 | 15 | 20 | 21 | 22 | 20 | 17 | 15 | 14 | 20 | 15 | | 15 | 17 | 15 |
| 7 | 17 | 15 | 15 | 15 | 16 | | | 15 | 22 | 15 | 18 | 23 | 21 | 22 | 15 | 30 | 16 | 15 | 14 | 20 | | | 15 | 15 |
| 8 | | 15 | 15 | 15 | 15 | 15 | | 15 | 14 | 14 | 15 | 18 | 20 | 21 | 18 | 16 | 15 | 14 | 15 | 15 | 16 | 15 | | 15 |
| 9 | | | 15 | 14 | 14 | 15 | | 15 | 14 | 14 | 17 | 16 | 21 | 20 | 20 | 15 | 17 | 18 | 18 | 15 | | | 15 | 15 |
| 10 | 15 | 15 | 14 | 14 | 15 | | | 14 | 14 | 16 | 16 | 17 | 21 | 21 | 18 | 16 | 14 | 14 | 18 | 15 | 14 | 15 | 16 | 15 |
| 11 | | 16 | 15 | 15 | | | | 15 | 14 | 14 | 18 | 17 | 20 | 22 | 23 | 17 | 15 | 14 | 15 | 14 | 16 | 16 | 16 | 15 |
| 12 | | 14 | 14 | 14 | 15 | | | 15 | 15 | 15 | 17 | 18 | 22 | 24 | 21 | 17 | 15 | 14 | 14 | 28 | | 16 | 15 | 16 |
| 13 | | | 18 | 16 | 15 | 15 | | 15 | 23 | 15 | 17 | 18 | 20 | 21 | 18 | 16 | 14 | 23 | 15 | 15 | 17 | | 15 | |
| 14 | 15 | | 20 | 15 | 20 | | | 15 | 21 | 14 | 15 | 16 | 21 | 21 | 18 | 14 | 27 | 21 | 15 | 17 | 15 | 17 | 16 | 18 |
| 15 | 15 | | | | 15 | 15 | 15 | 14 | 23 | 15 | 15 | 20 | 23 | 20 | 17 | 16 | 15 | 21 | 23 | 14 | 15 | | | |
| 16 | | 16 | 16 | 15 | 14 | 20 | | 17 | 14 | 15 | 21 | 22 | 21 | 22 | 16 | 14 | 24 | 14 | 15 | 14 | | 15 | | |
| 17 | | | 16 | 15 | 14 | 15 | 15 | 15 | 14 | 14 | 18 | 20 | 22 | 29 | 20 | 18 | 14 | 14 | 14 | 15 | 20 | 21 | | 16 |
| 18 | | 15 | | 15 | 15 | 15 | | 15 | 22 | 15 | 15 | 17 | 21 | 21 | 29 | 29 | 24 | 15 | 14 | 15 | 15 | 20 | 17 | |
| 19 | 15 | 15 | 15 | | 14 | | | 15 | 17 | 15 | 15 | 20 | 23 | 23 | 18 | 14 | 14 | 14 | 18 | 15 | | | | |
| 20 | | | 15 | | 15 | | | 14 | 17 | 14 | 18 | | 36 | 21 | 17 | 15 | 28 | 14 | 18 | 14 | 15 | 20 | 15 | |
| 21 | 17 | | | 15 | 15 | 15 | | 15 | 16 | 14 | 18 | 15 | 20 | 18 | 21 | 15 | 15 | 20 | 14 | 17 | 14 | 15 | 14 | 15 |
| 22 | 15 | 17 | 14 | 18 | 27 | | | 18 | 17 | 14 | 17 | 15 | 22 | 20 | 17 | 16 | 15 | 20 | 15 | 20 | 15 | | 16 | 15 |
| 23 | 16 | 15 | 15 | 16 | | | | 15 | 24 | 16 | 27 | 21 | 17 | 26 | 21 | 17 | | 27 | 16 | 17 | 21 | | | |
| 24 | | | 14 | 16 | 16 | 15 | 15 | 16 | 22 | 15 | 16 | 15 | 17 | 20 | 39 | 14 | 14 | 14 | 14 | | | 18 | 14 | 16 |
| 25 | 16 | 15 | 15 | | 14 | 15 | | 17 | 15 | 15 | 18 | 21 | 21 | 20 | 18 | 15 | 15 | 17 | 15 | 14 | 14 | | 18 | 15 |
| 26 | | | | | | 15 | | 14 | 15 | | 16 | 16 | 16 | 21 | 17 | 16 | 14 | 14 | 14 | 14 | 15 | 16 | 15 | 15 |
| 27 | 15 | | 15 | 14 | 14 | 17 | | 15 | 14 | 14 | 16 | 24 | 44 | 23 | 30 | 34 | 14 | 14 | 14 | 15 | 14 | 15 | 18 | |
| 28 | | | 14 | 16 | 15 | 14 | 15 | 15 | 14 | 14 | 15 | 16 | 16 | 32 | 17 | 14 | 14 | 16 | 15 | 18 | 15 | | | 15 |
| 29 | | | | 15 | 15 | | | 16 | 14 | 14 | 15 | 17 | 20 | 22 | 18 | 17 | 14 | 14 | 15 | 15 | 14 | 15 | 15 | 14 |
| 30 | 16 | | 15 | 15 | 15 | 15 | | | 15 | 16 | 23 | 17 | 32 | 42 | 16 | 20 | 28 | 15 | 15 | 14 | 18 | 15 | 14 | 15 |
| 31 | 14 | | 17 | 14 | | 17 | 16 | | 14 | 14 | 29 | 28 | 24 | 22 | 20 | 14 | 15 | 14 | 14 | 15 | 15 | 20 | 16 | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 17 | 14 | 25 | 25 | 24 | 17 | 8 | 29 | 31 | 30 | 31 | 30 | 31 | 31 | 31 | 31 | 30 | 31 | 31 | 30 | 24 | 21 | 22 | 19 |
| MED | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 18 | 21 | 22 | 18 | 16 | 15 | 14 | 15 | 15 | 15 | 15 | 16 | 15 |
| U Q | 16 | 16 | 16 | 15 | 15 | 15 | 15 | 15 | 21 | 15 | 18 | 21 | 23 | 23 | 21 | 17 | 15 | 18 | 15 | 16 | 16 | 17 | 17 | 15 |
| L Q | 15 | 15 | 14 | 14 | 14 | 15 | 14 | 14 | 14 | 14 | 15 | 16 | 20 | 21 | 17 | 15 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 |


SUMMARY PLOTS AT Wakkanai
UTC
1 DEC.2007
2 DEC.2007
3 DEC.2007
4 DEC.2007
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

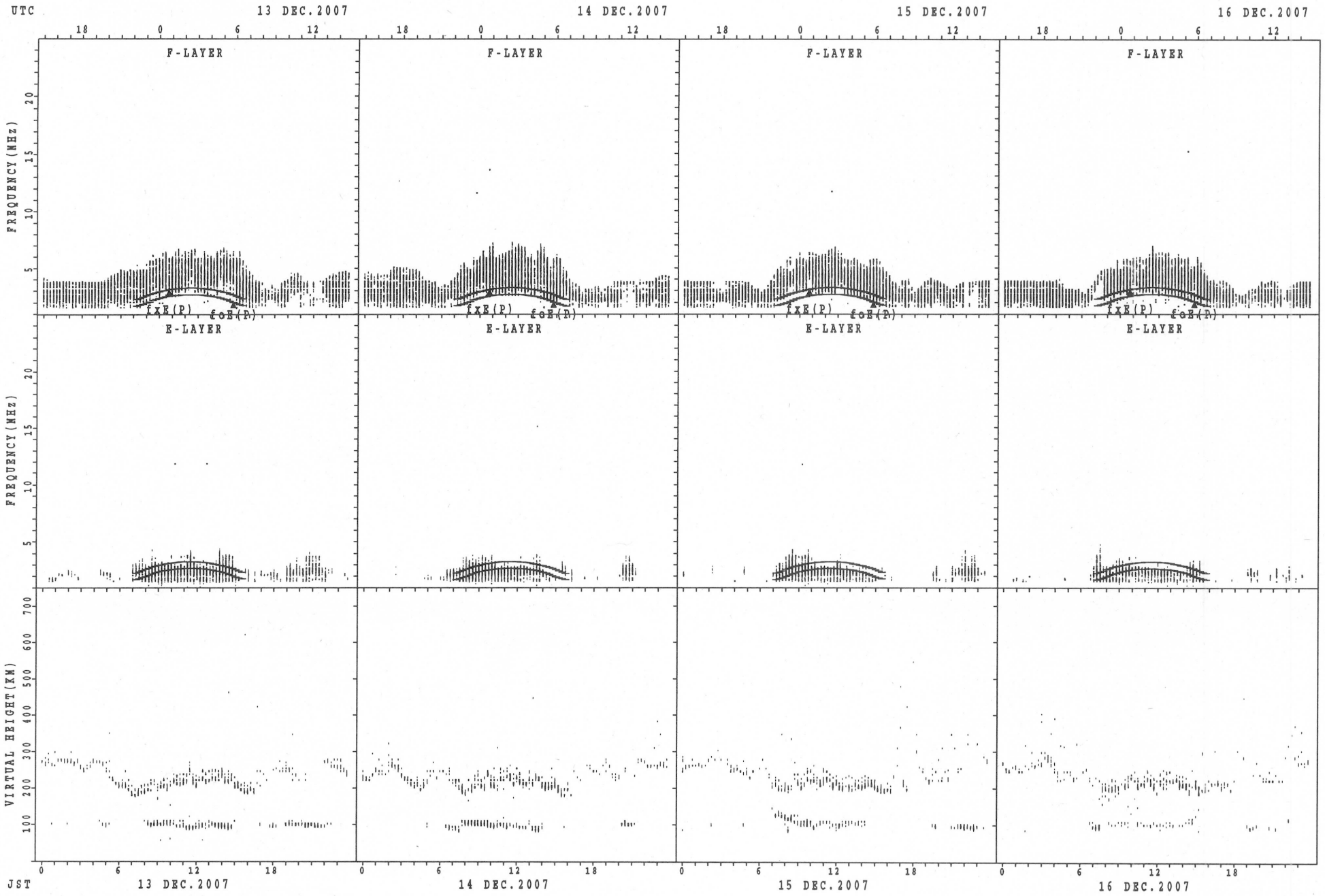
## SUMMARY PLOTS AT Wakkanai




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

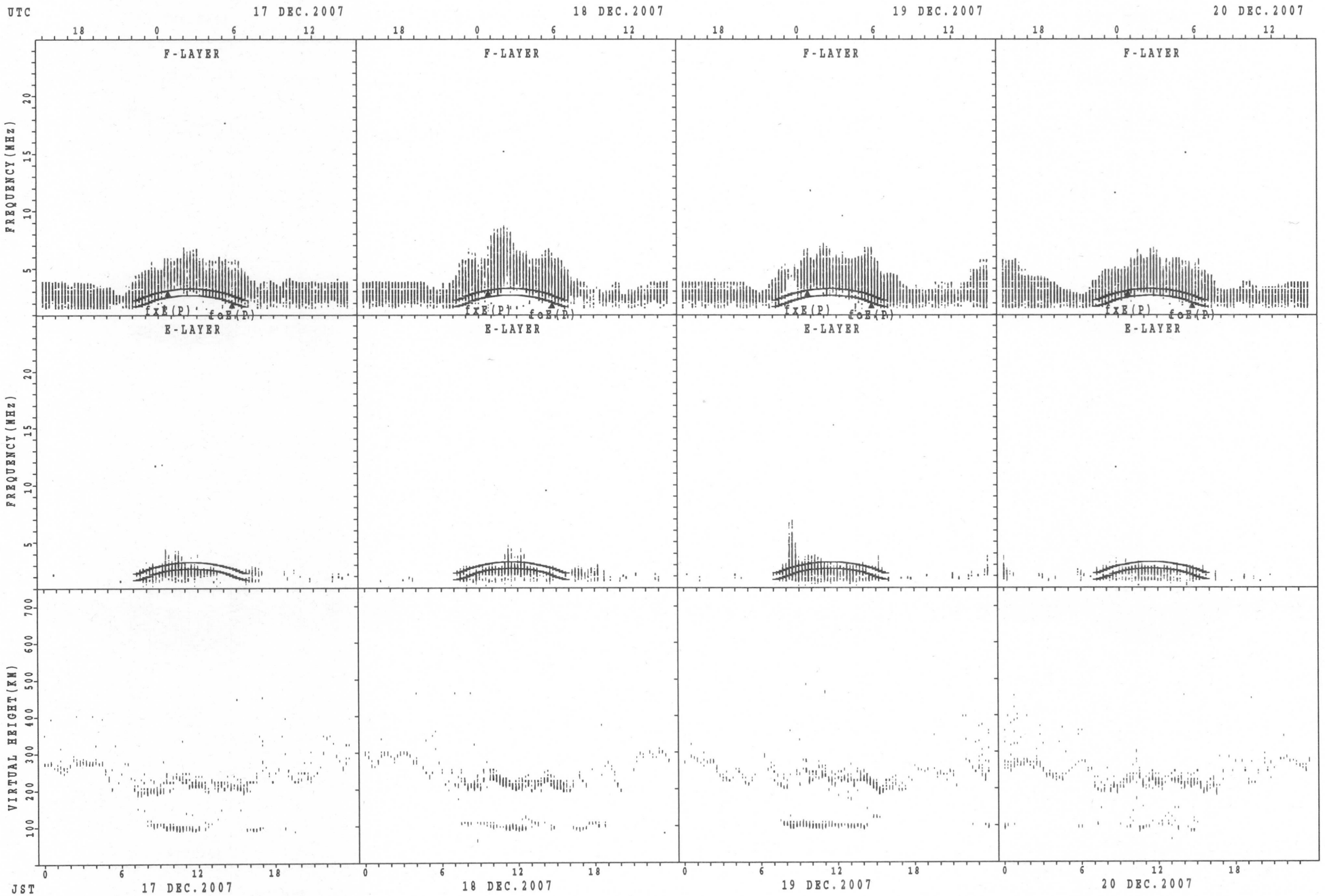

SUMMARY PLOTS AT Wakkanai
UTC
9 DEC.2007
10 DEC.2007
11 DEC.2007
12 DEC.2007
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Wakkanai



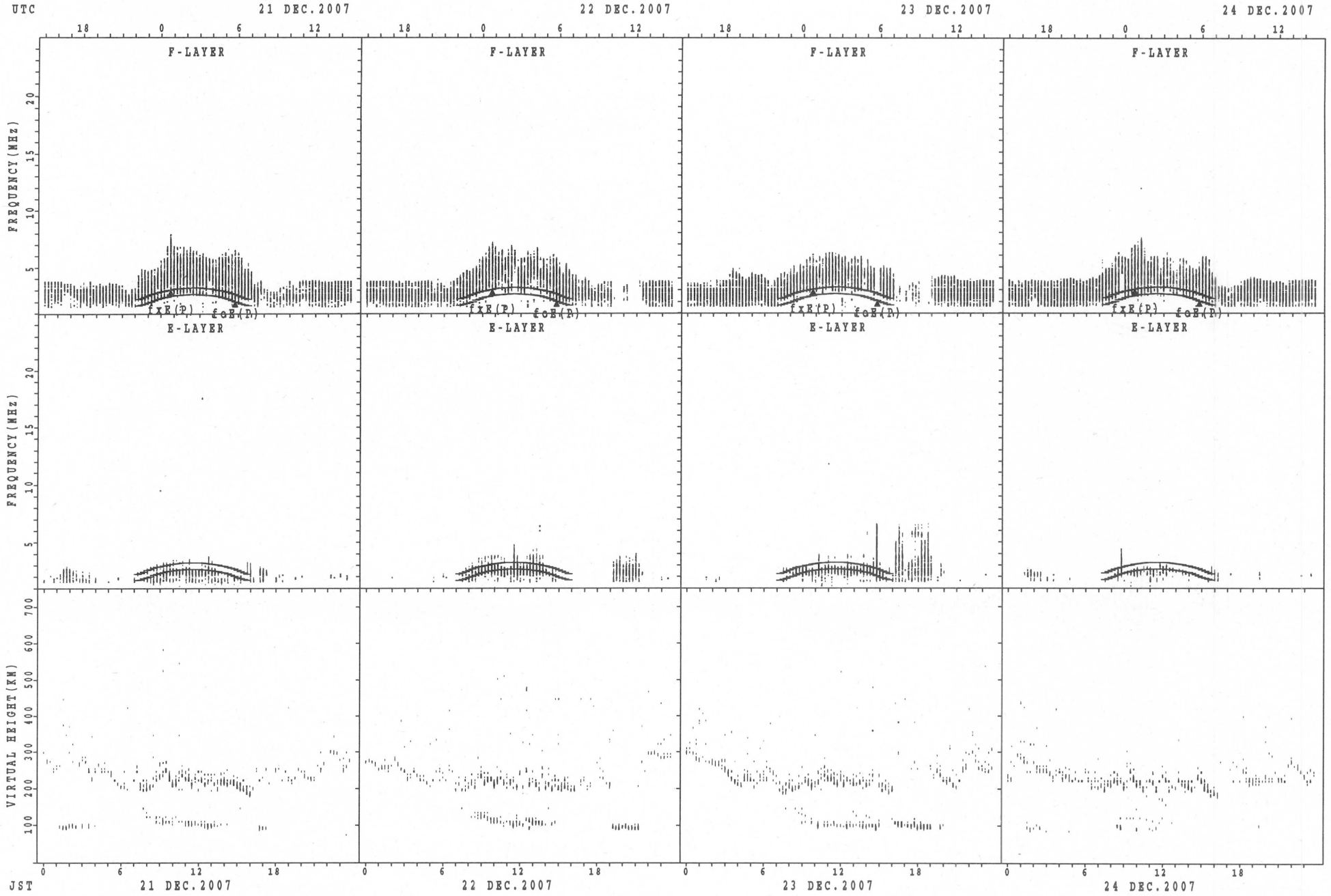

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

# SUMMARY PLOTS AT Wakkanai



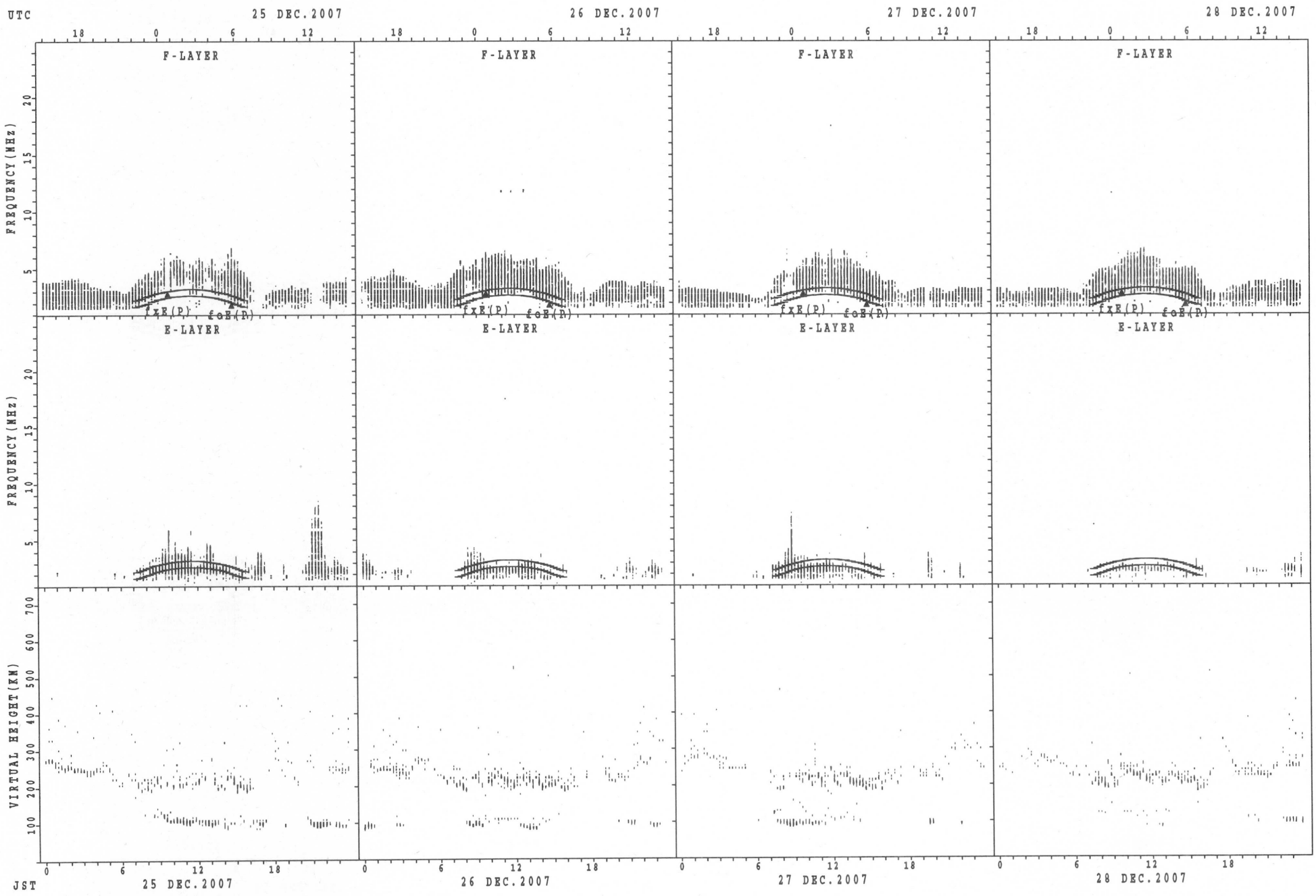

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Wakkanai



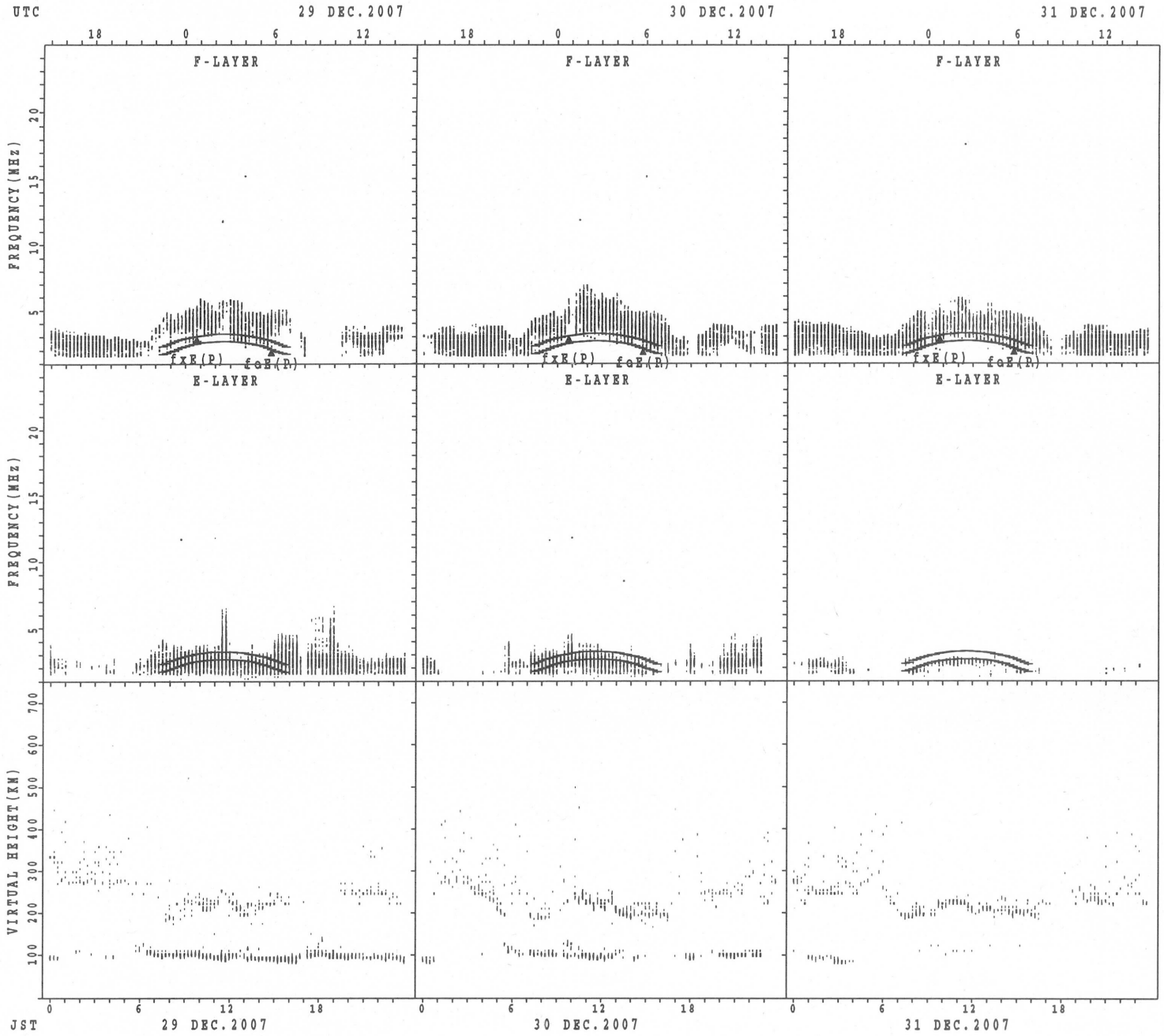

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Wakkanai



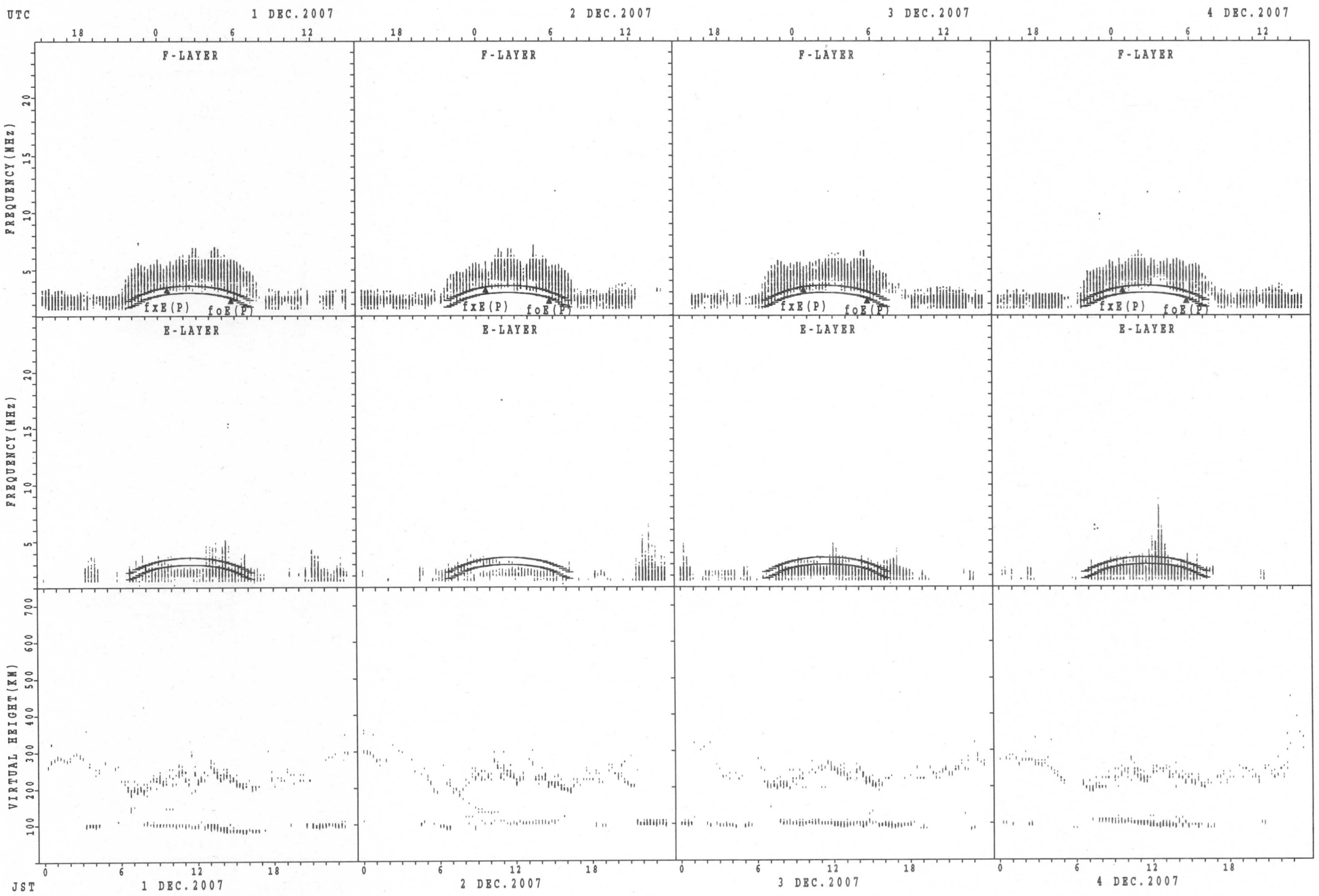

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



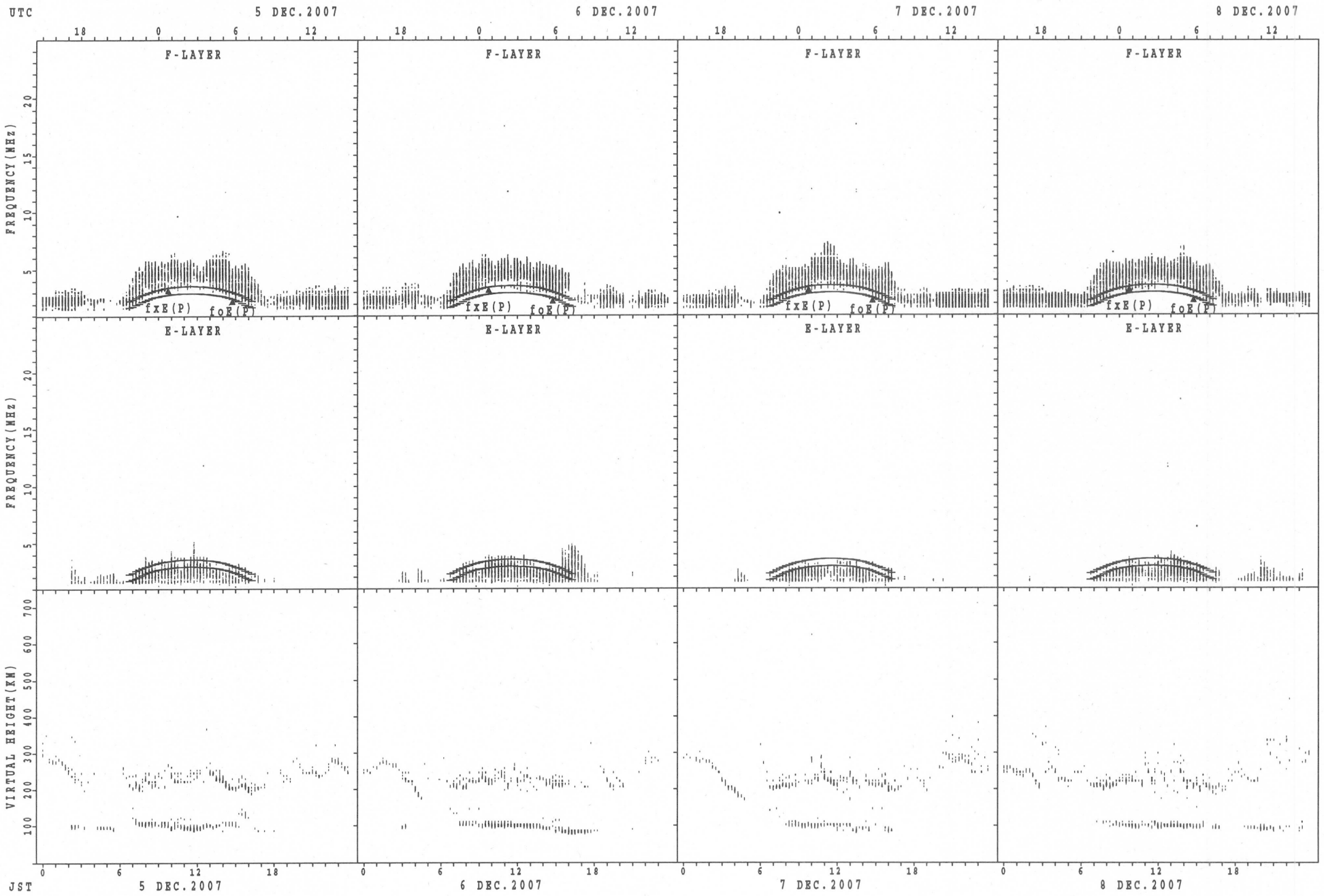

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

# SUMMARY PLOTS AT Kokubunji



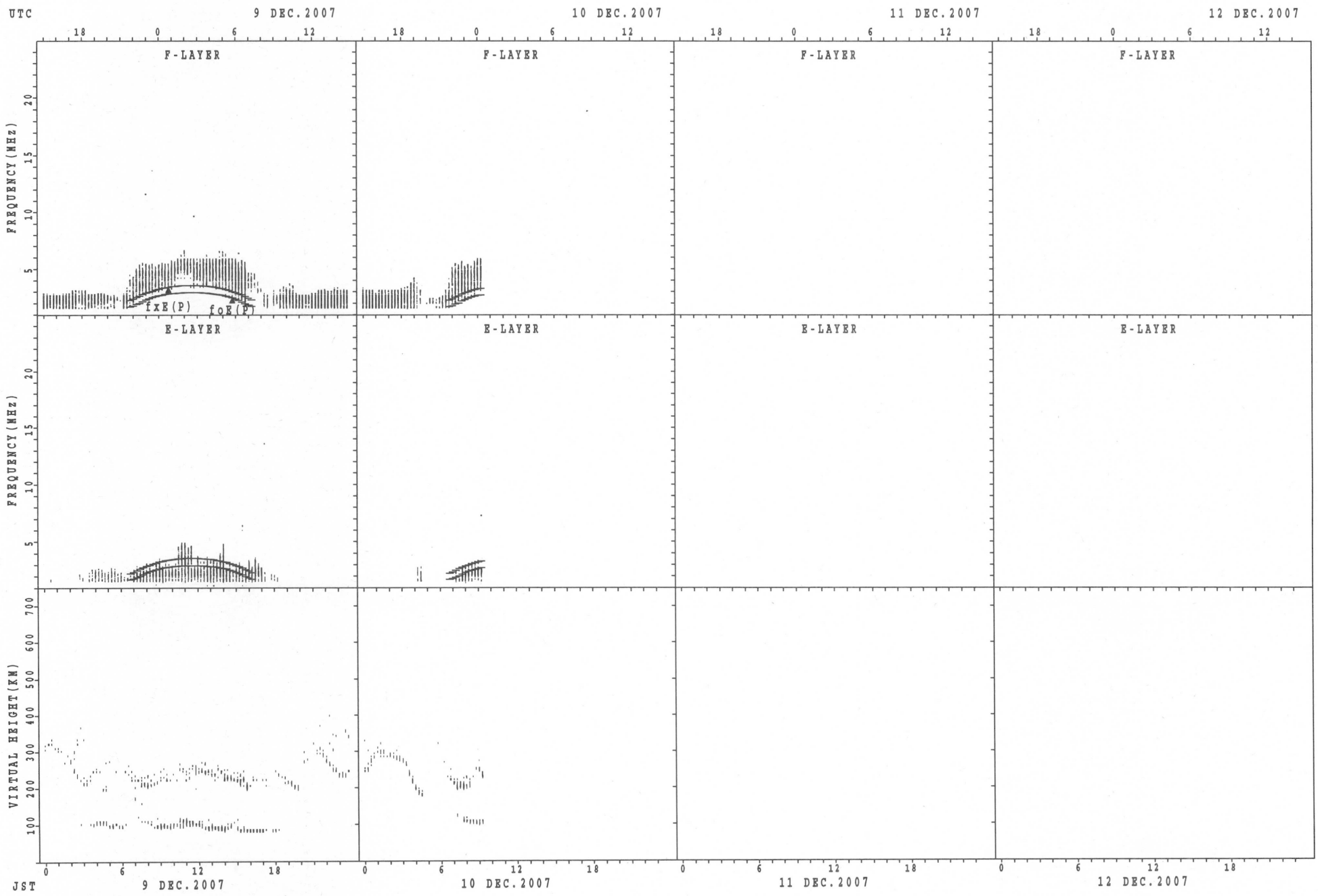

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



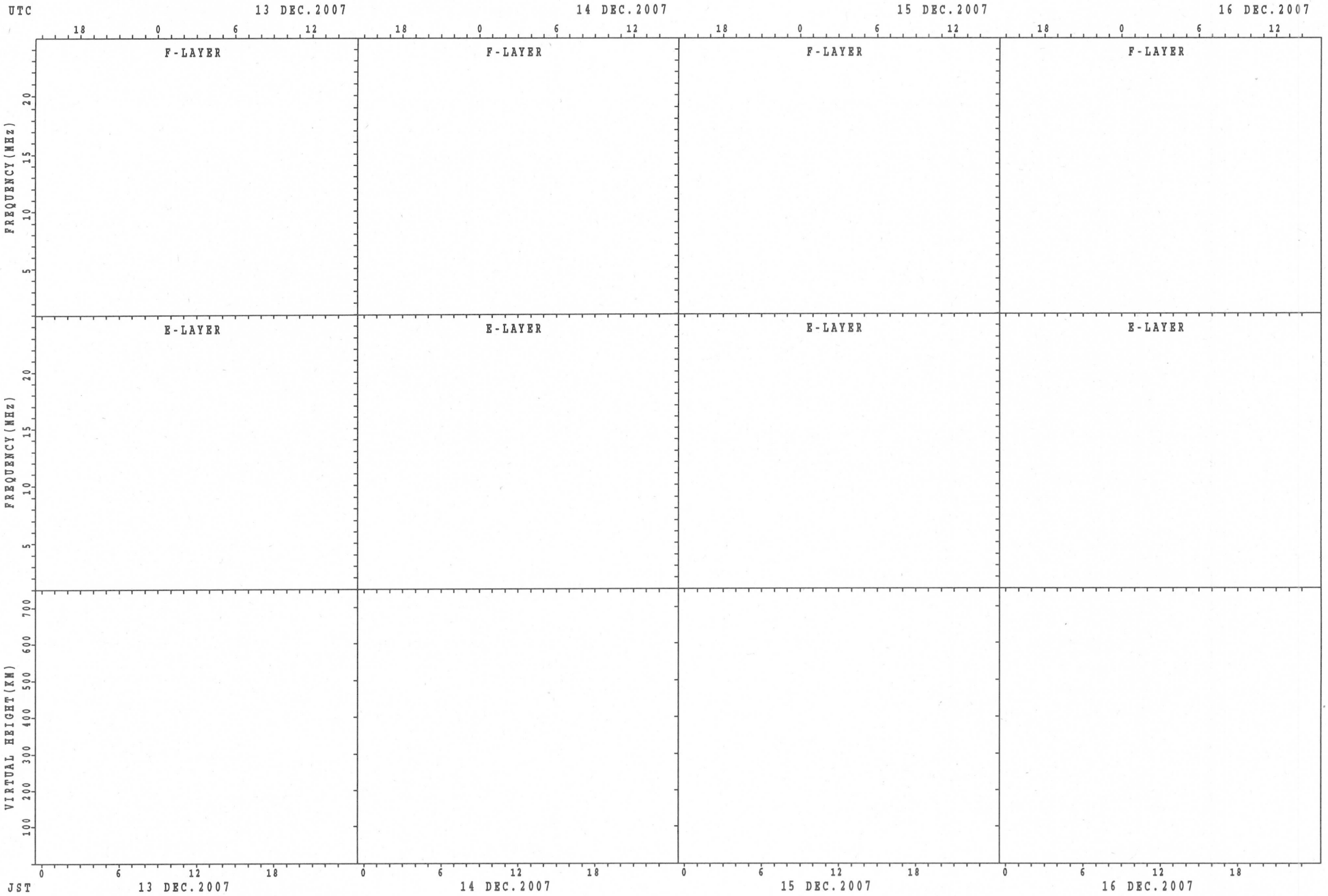

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



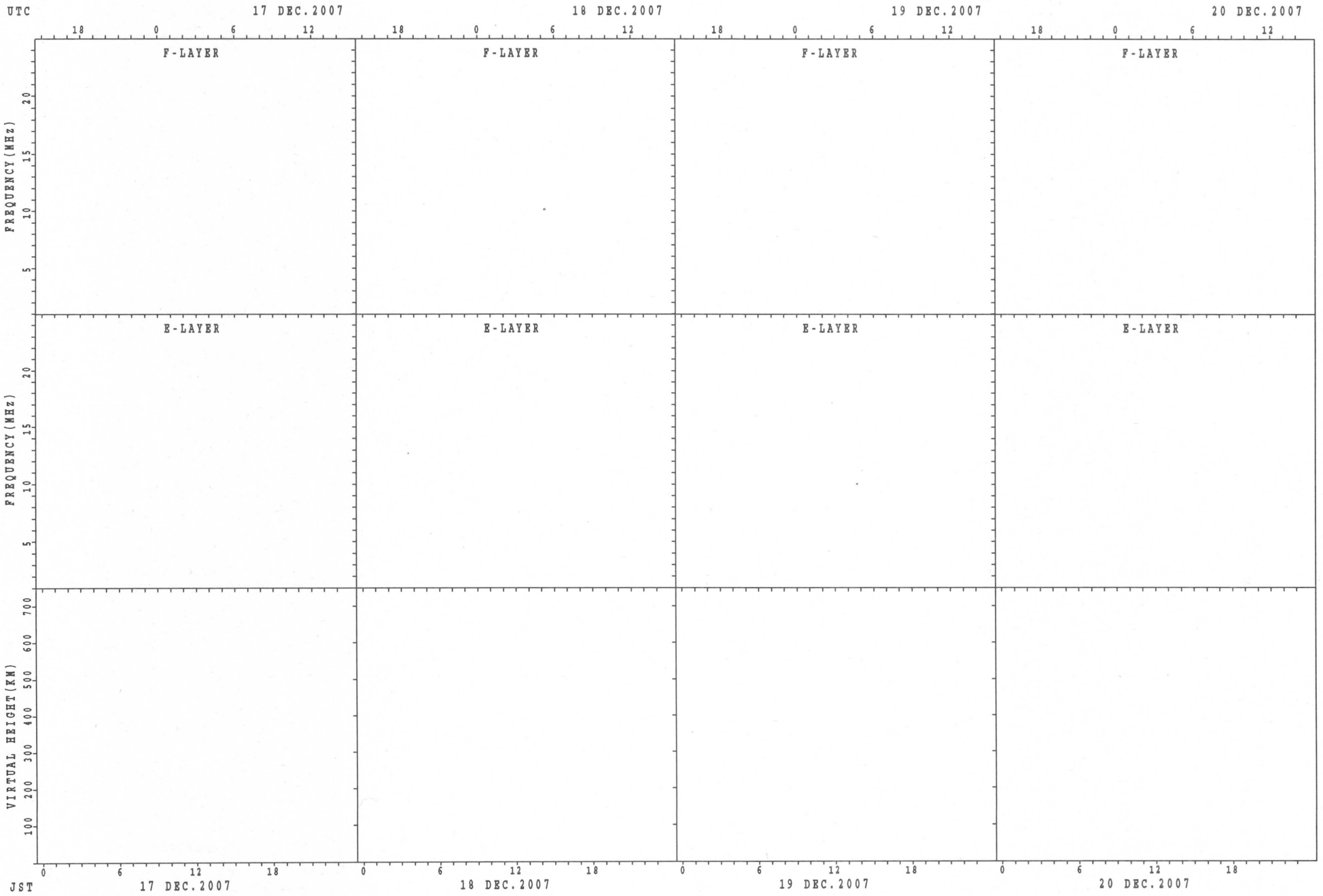

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

# SUMMARY PLOTS AT Kokubunji



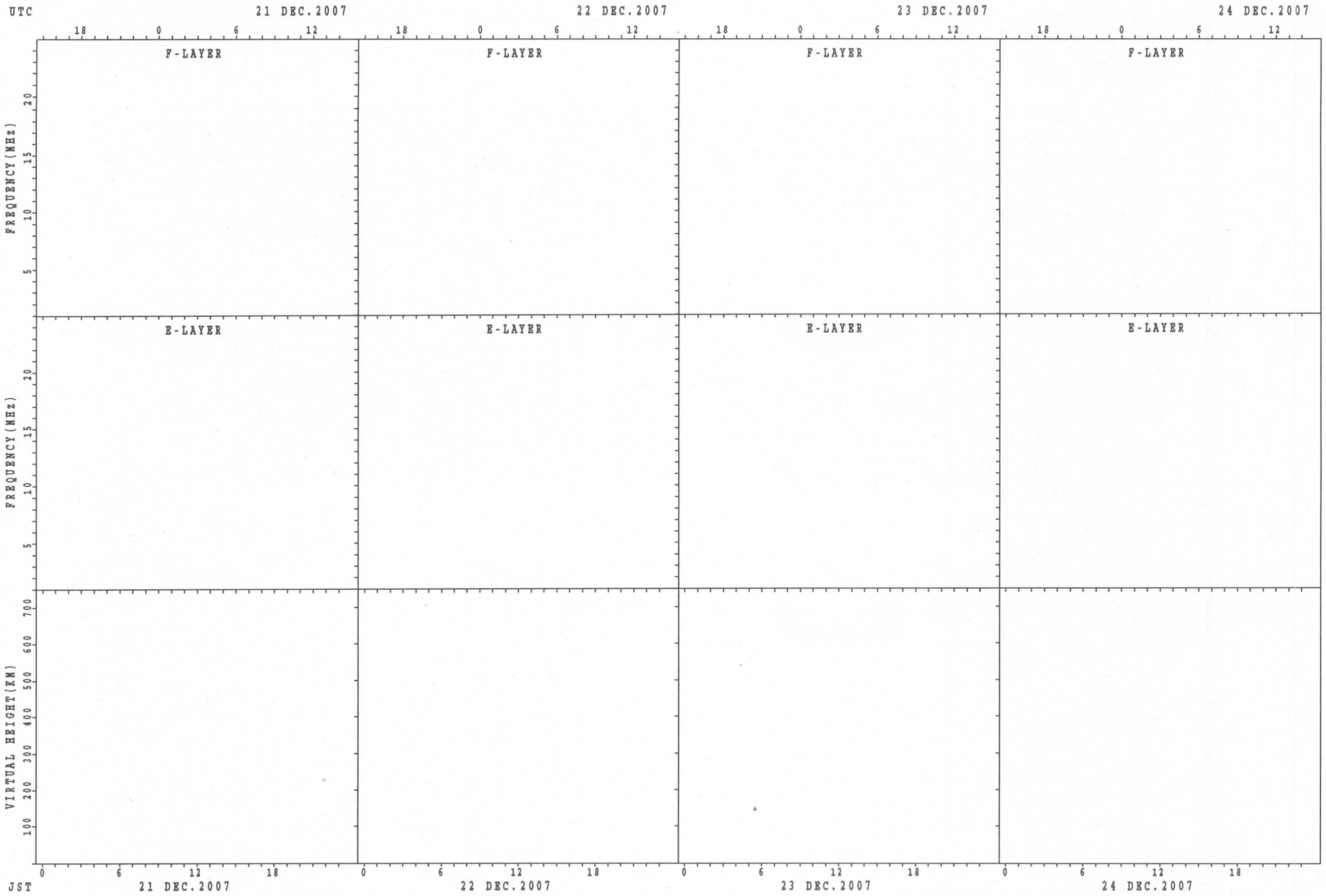

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

# SUMMARY PLOTS AT Kokubunji



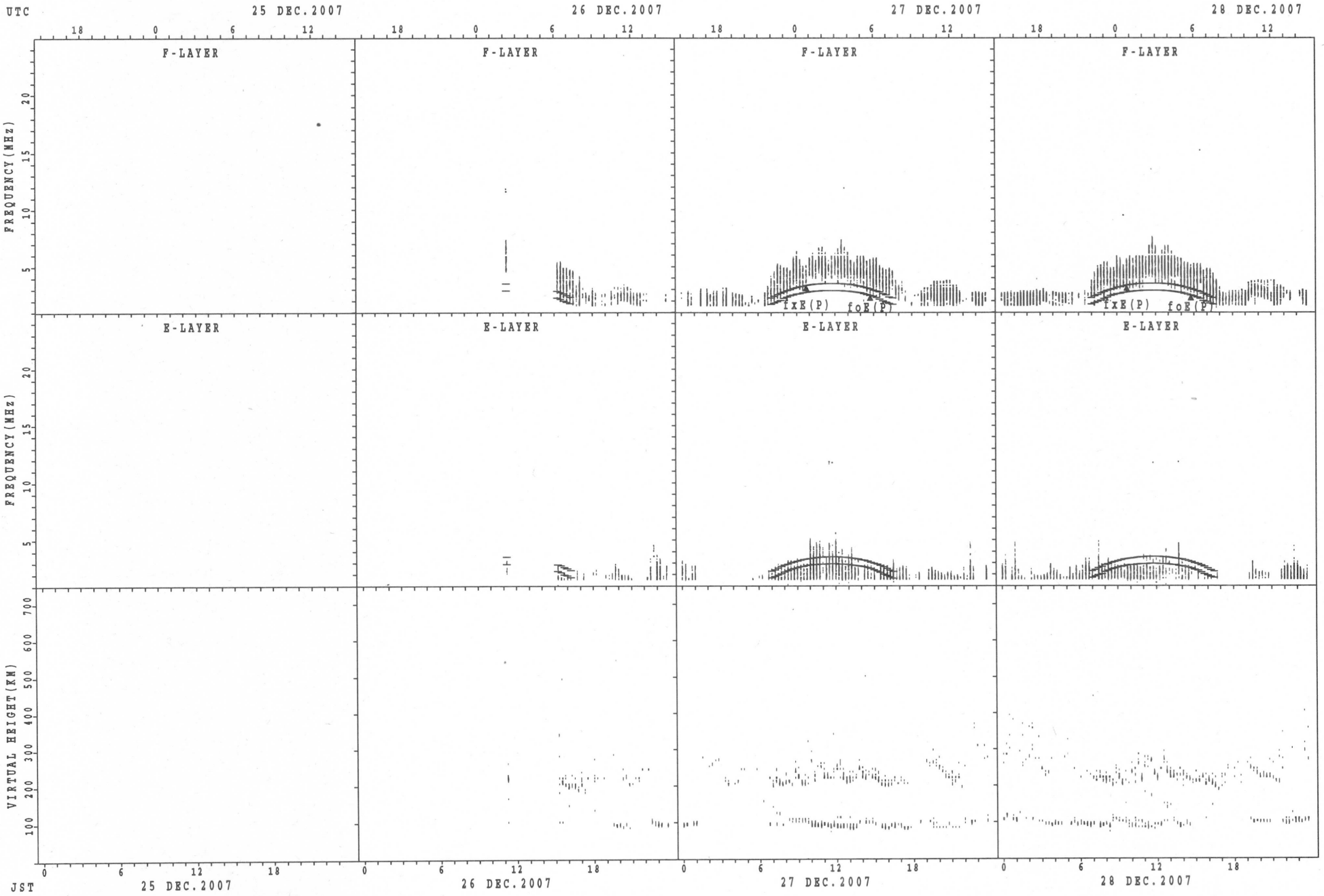

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

# SUMMARY PLOTS AT Kokubunji



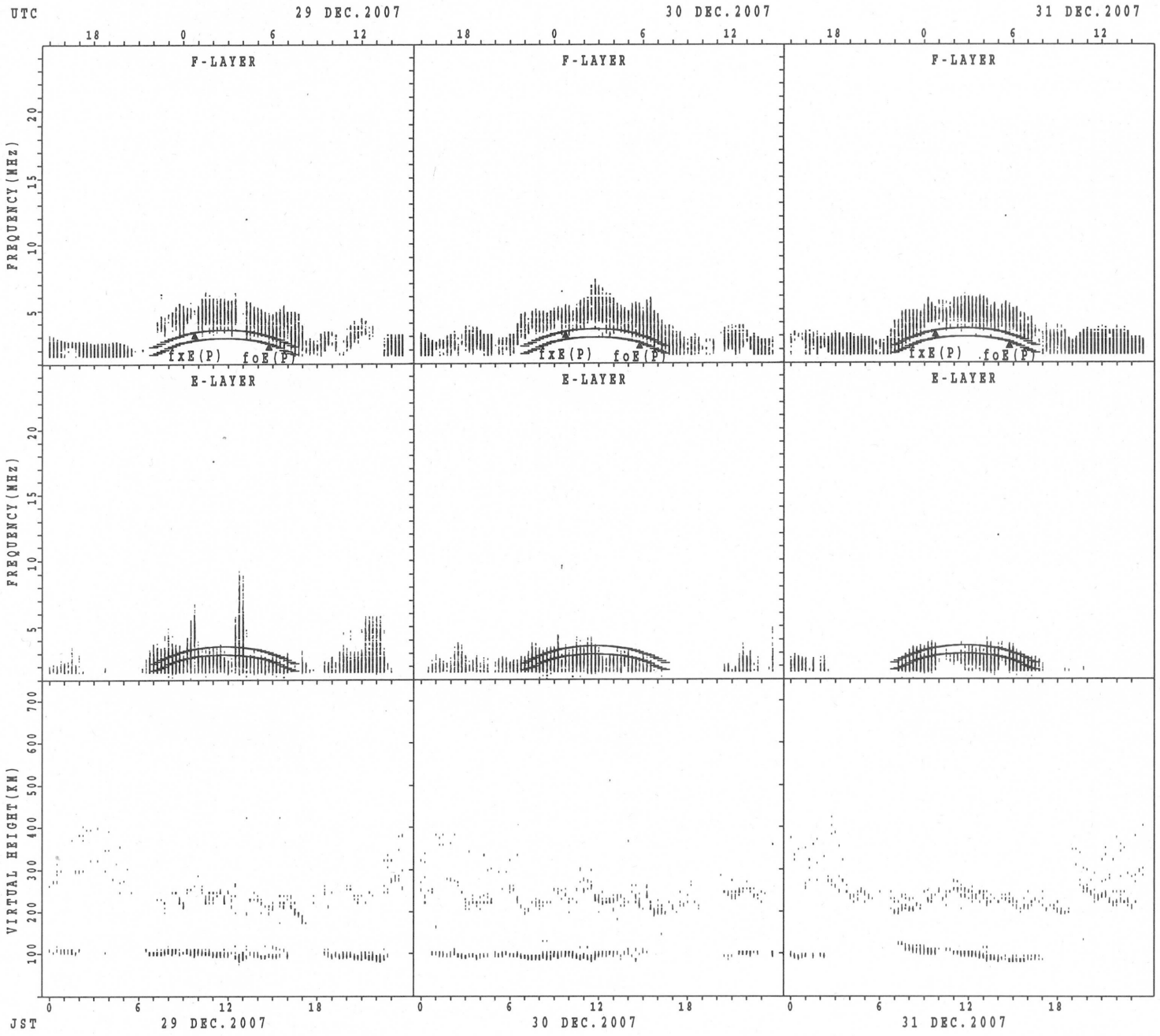

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



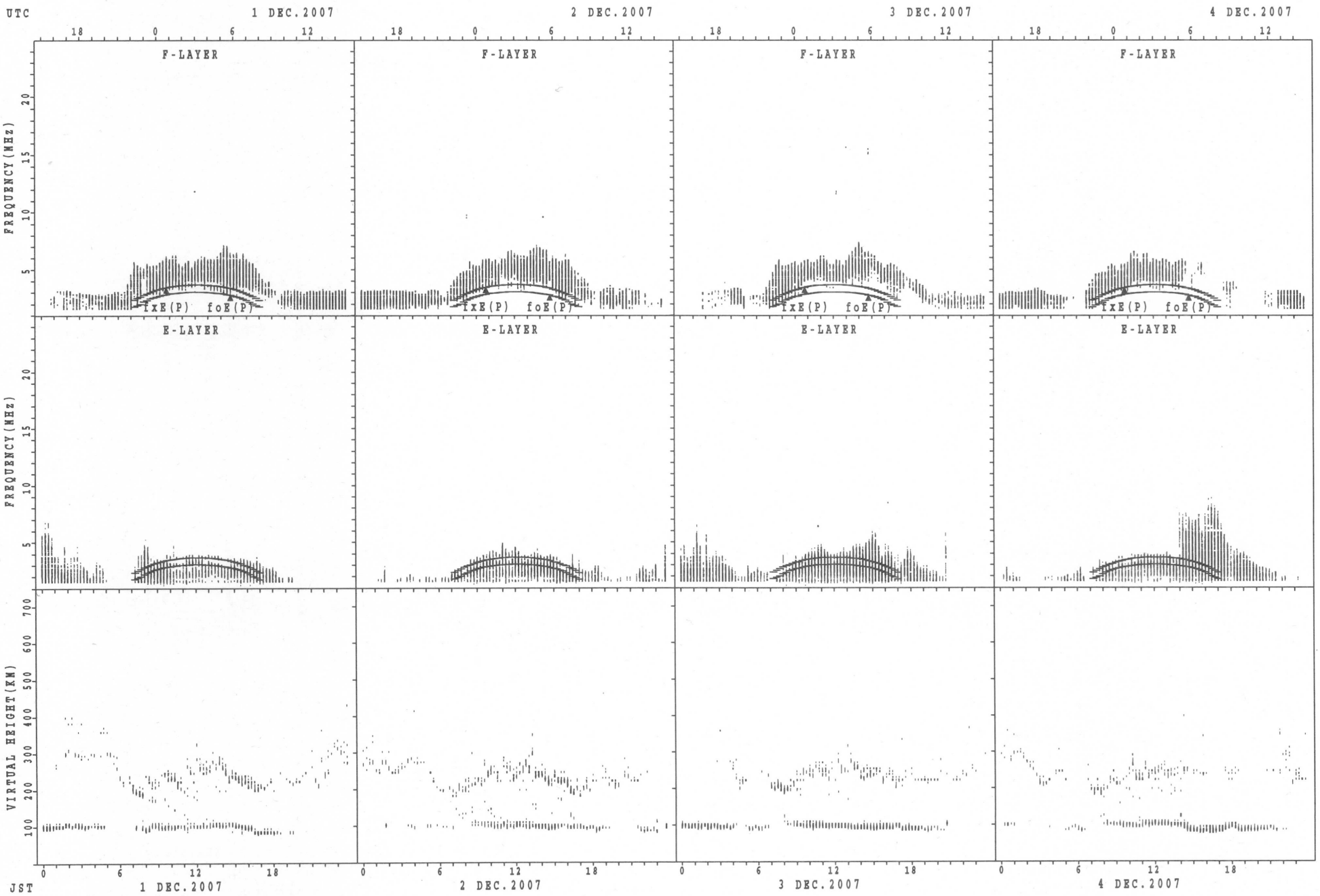

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Kokubunji



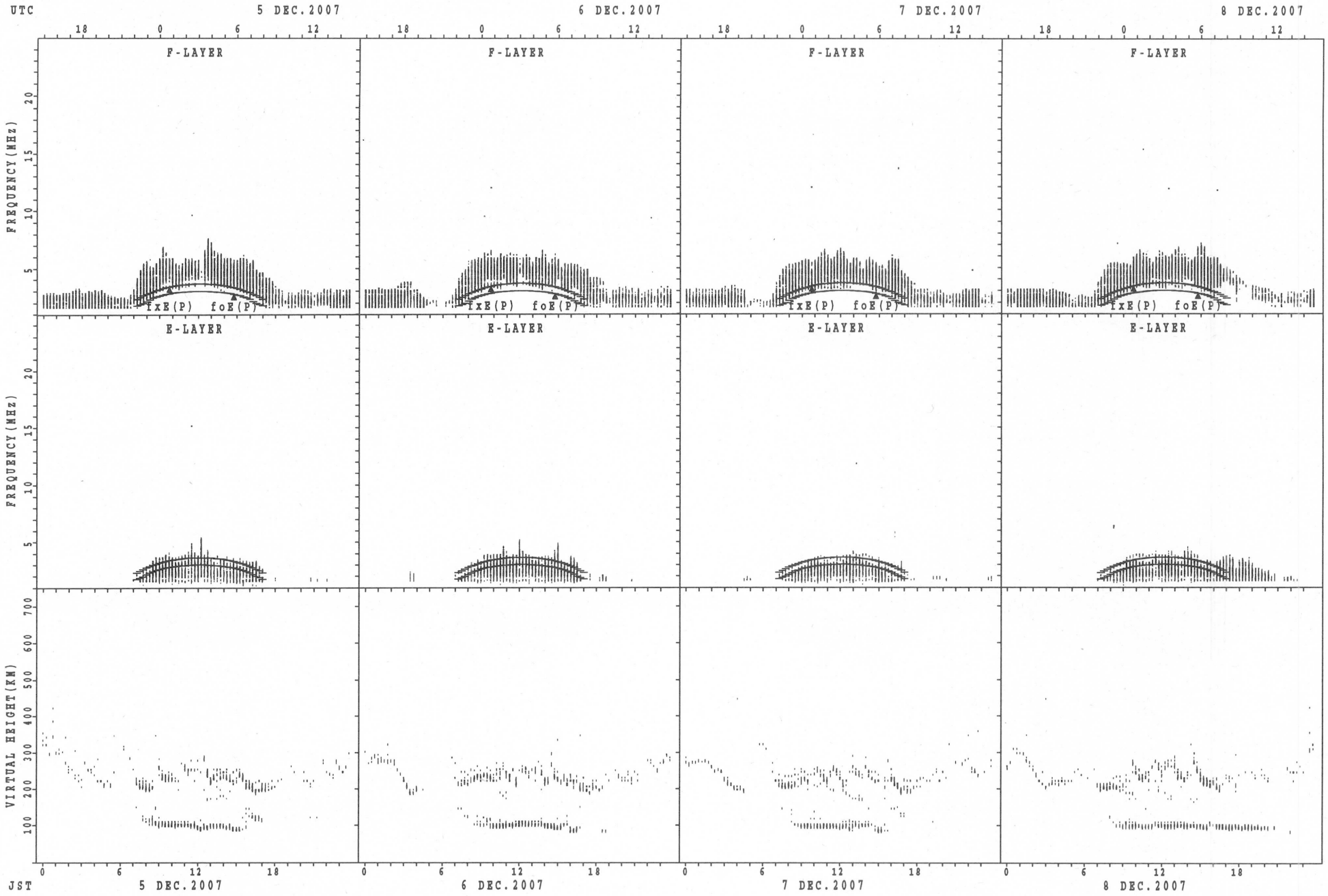

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Yamagawa



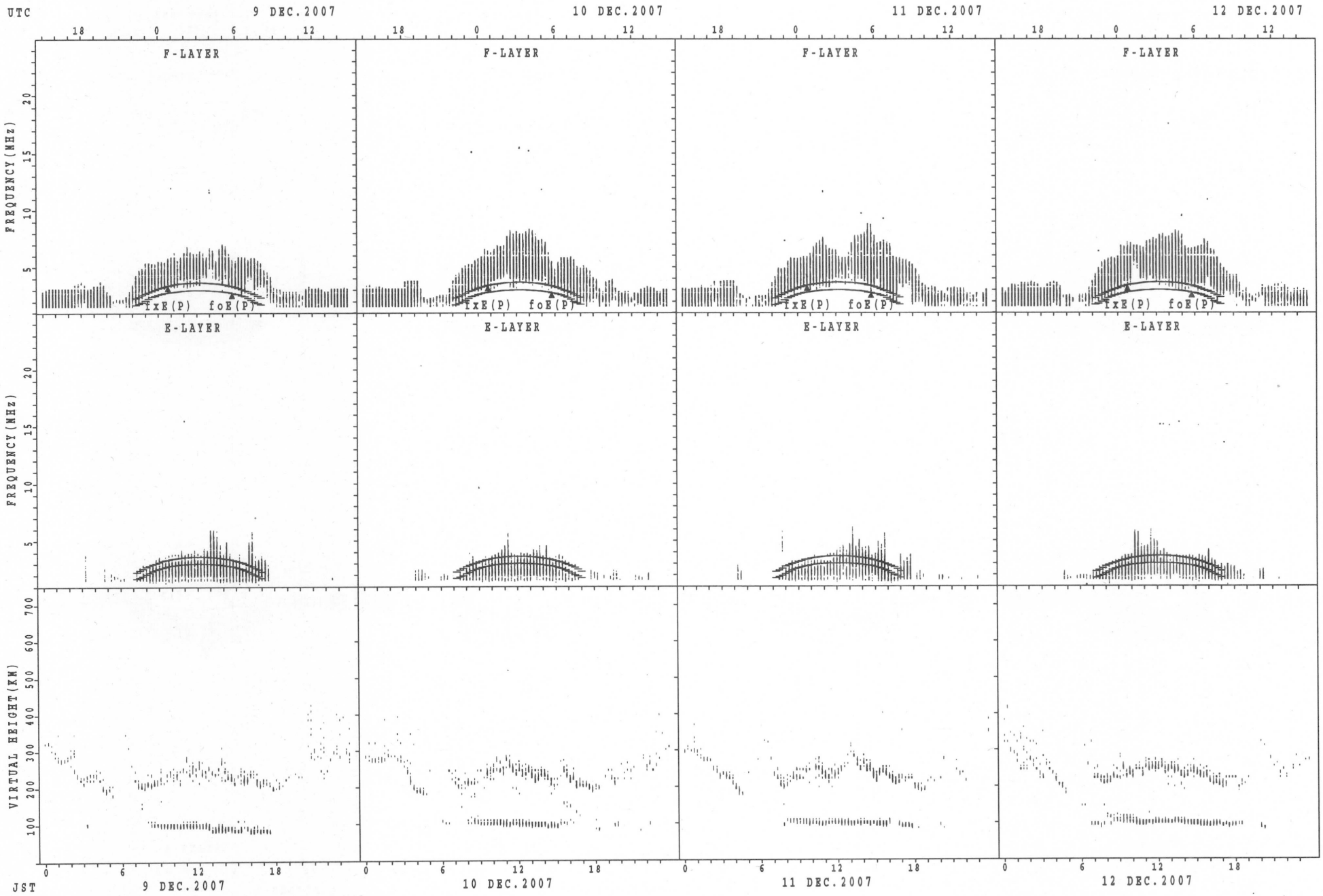

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Yamagawa



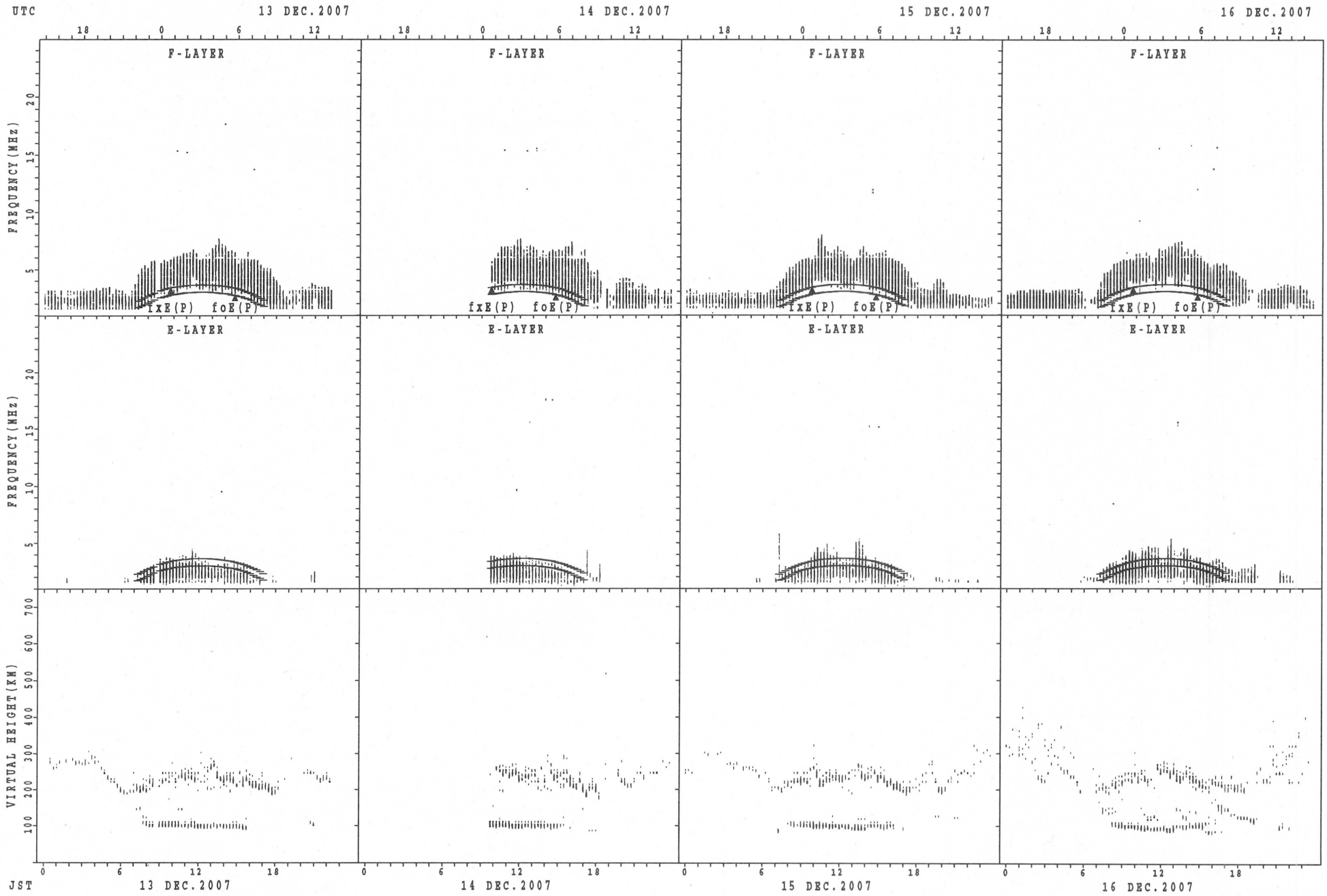

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Yamagawa

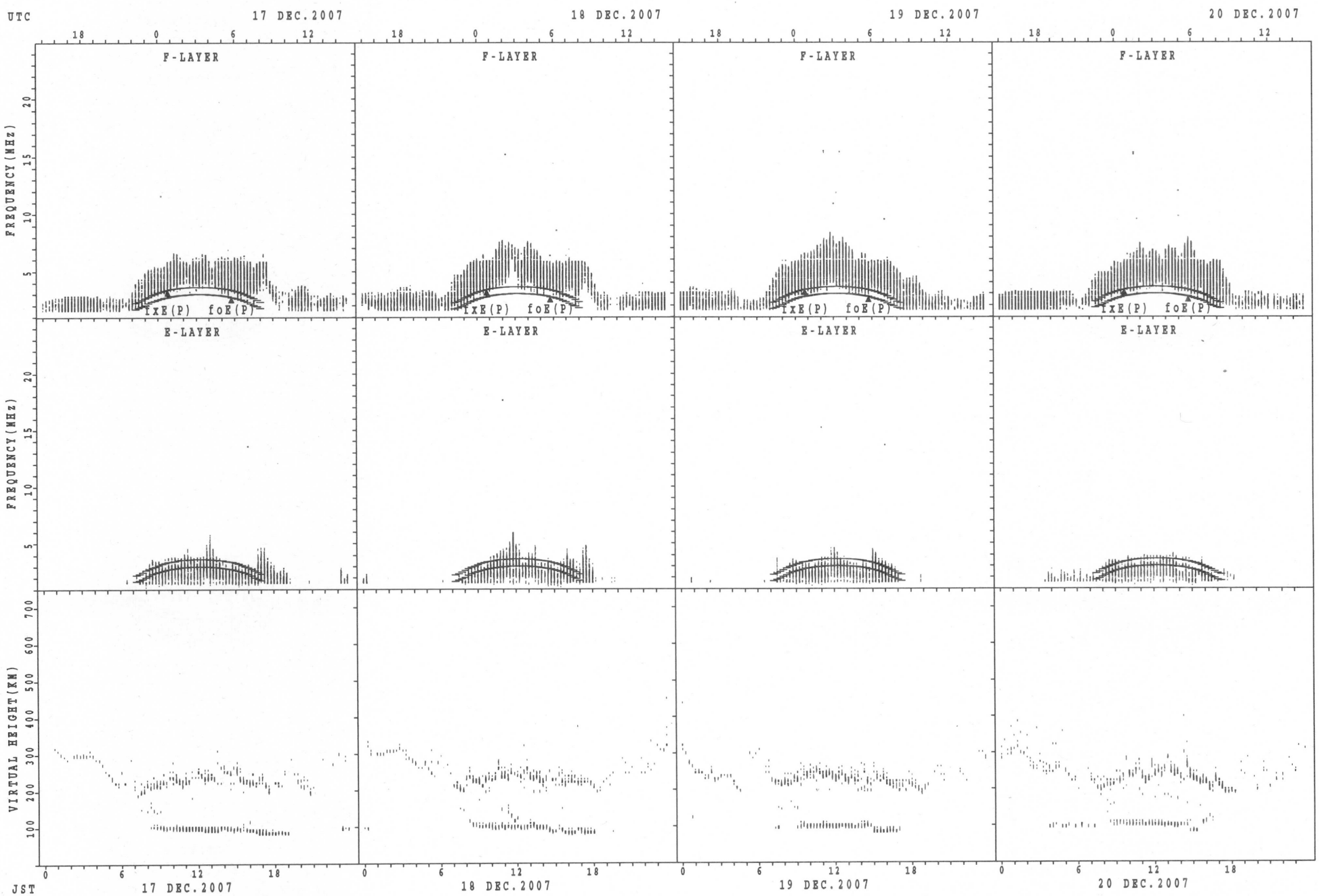



fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

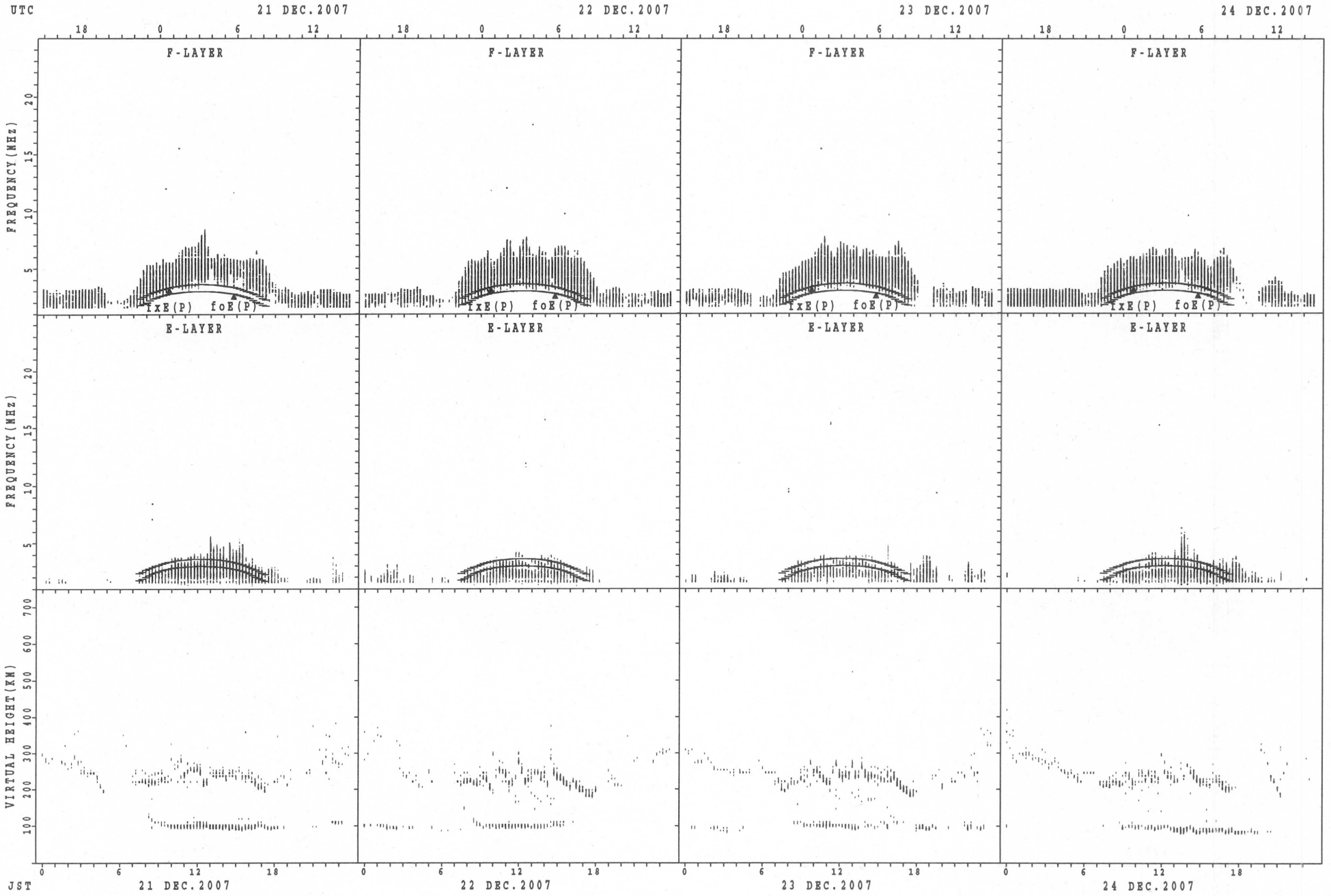
## SUMMARY PLOTS AT Yamagawa




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

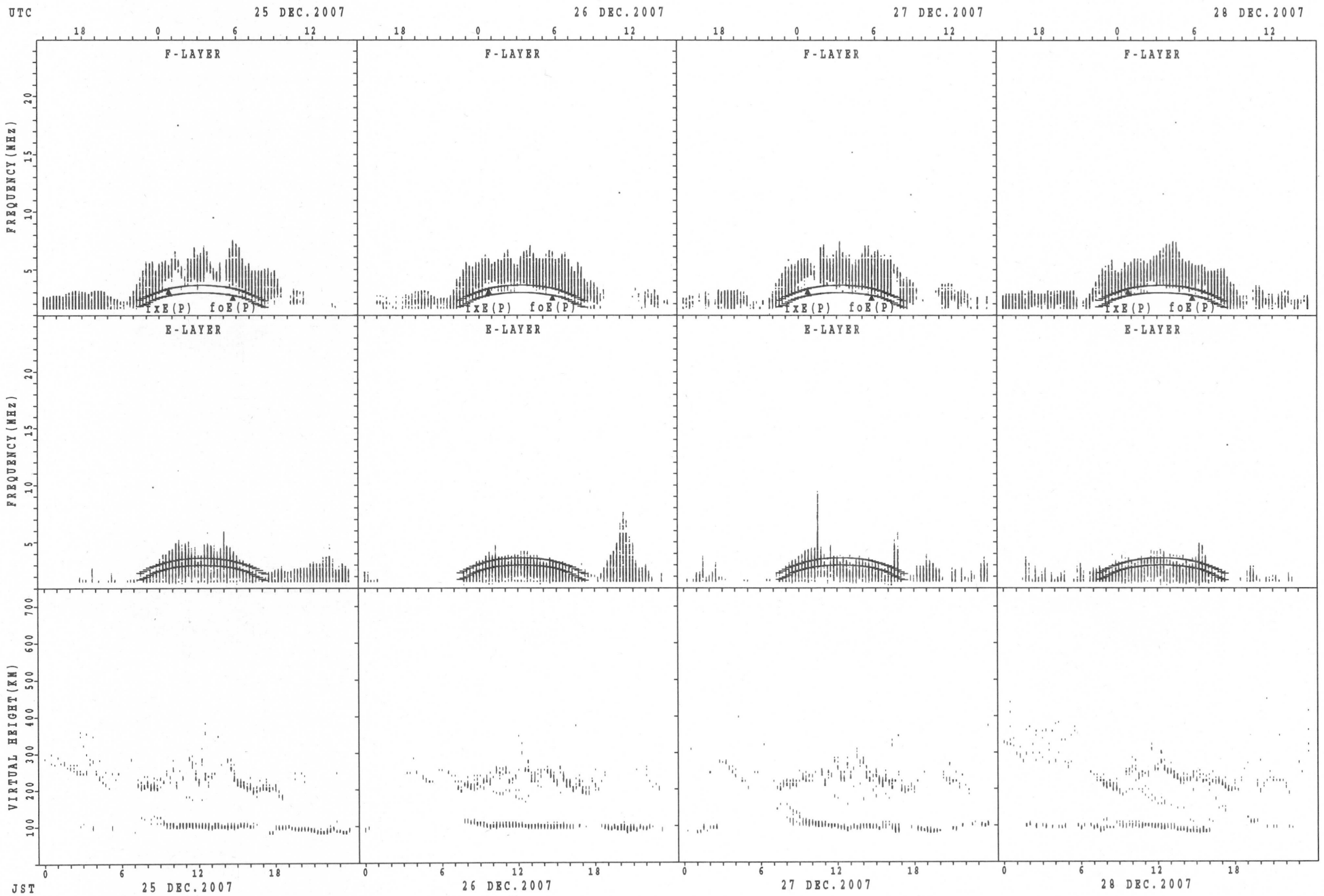

SUMMARY PLOTS AT Yamagawa
UTC
17 DEC.2007
18 DEC.2007
19 DEC.2007
20 DEC.2007
F-LAYER
fxE(P) foE(P)
FREQUENCY(MHz)
E-LAYER
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



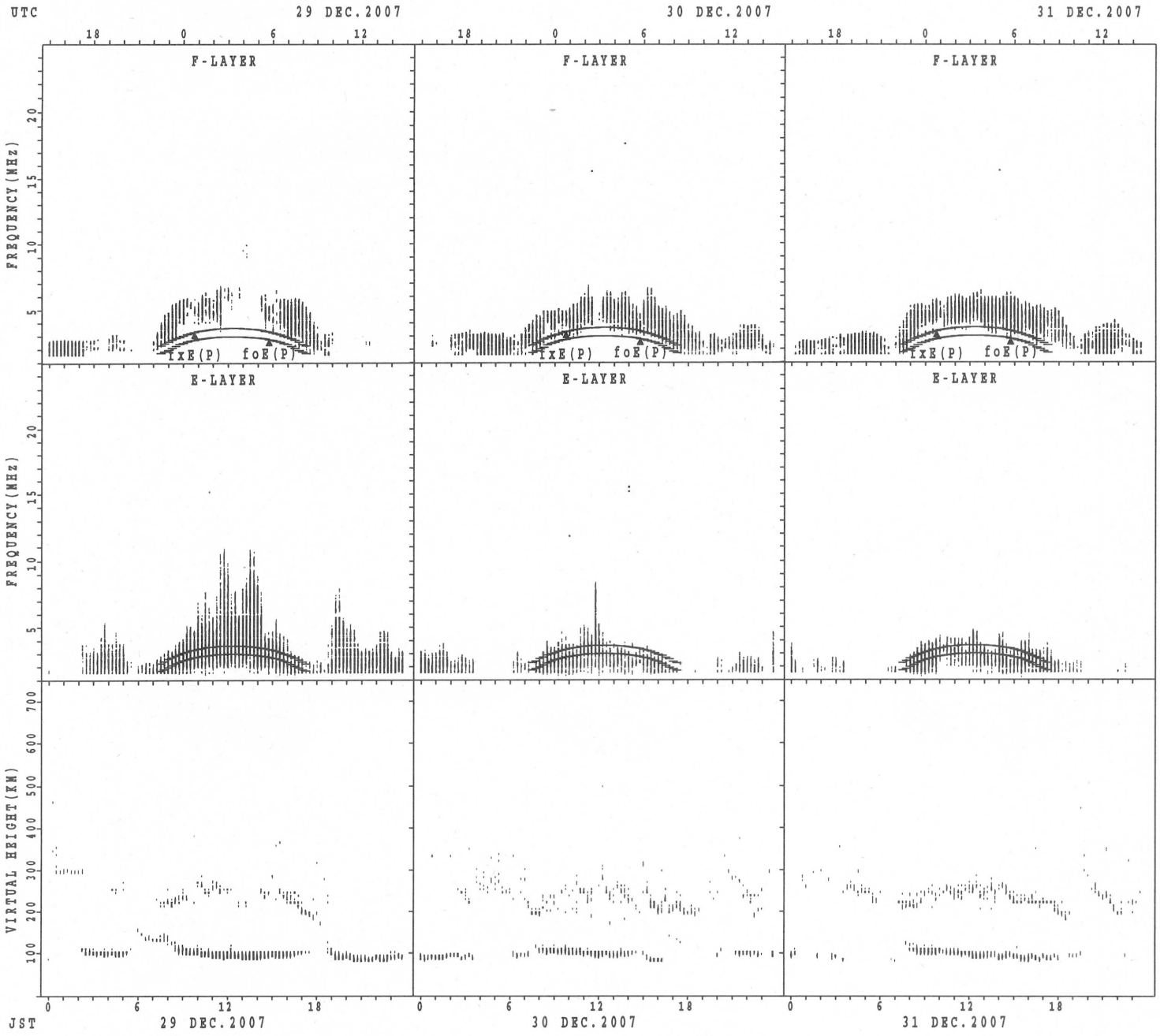

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



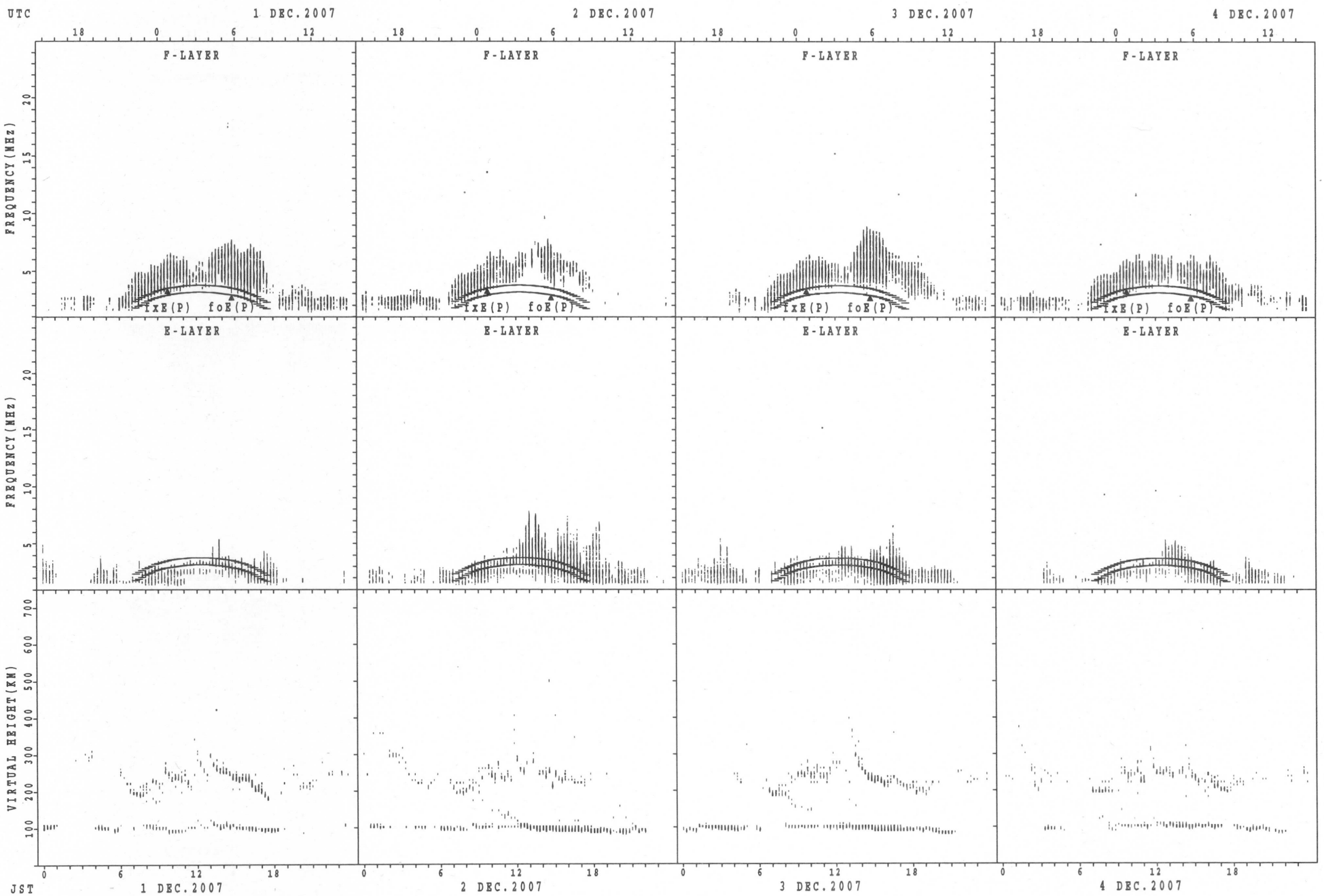

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



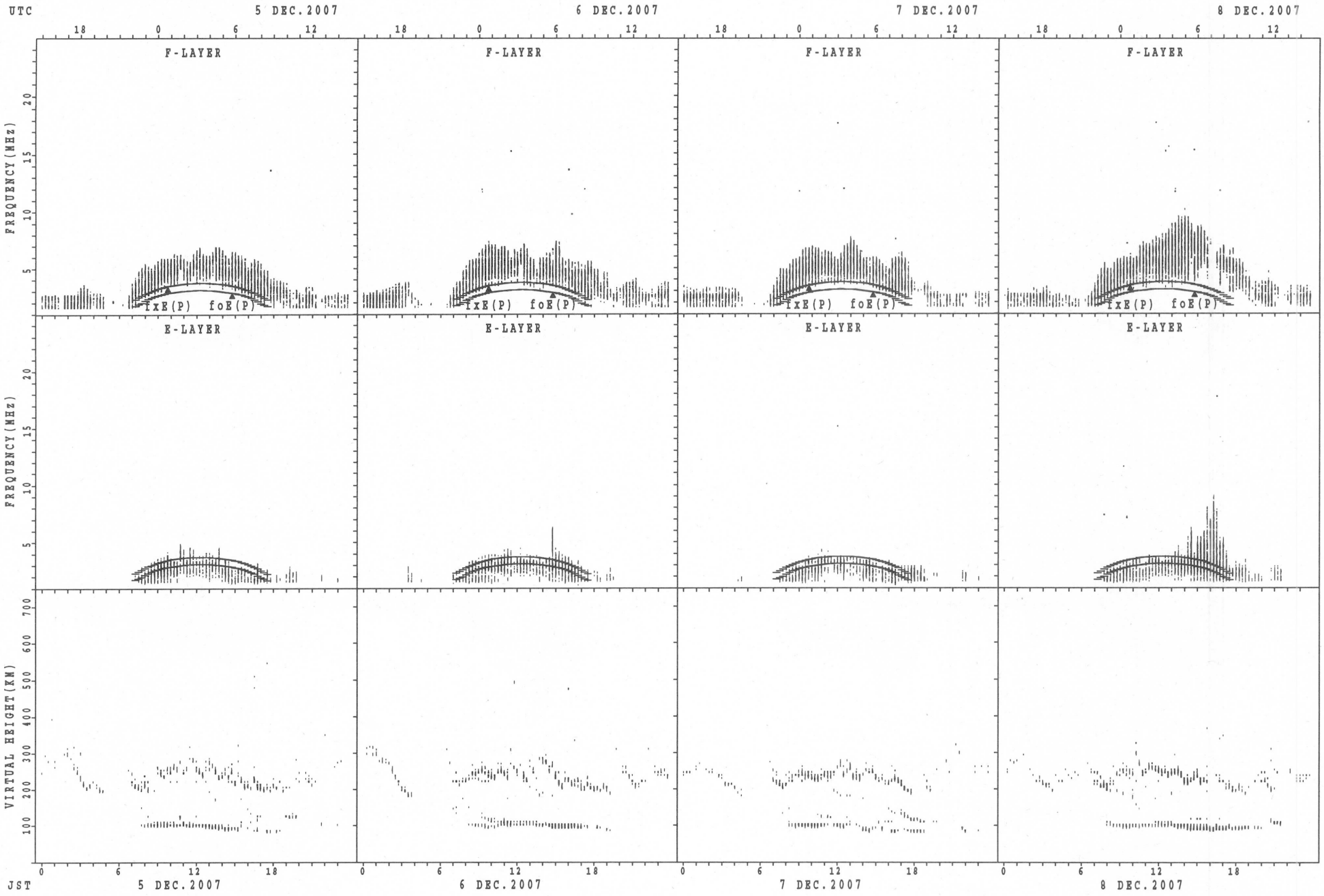

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



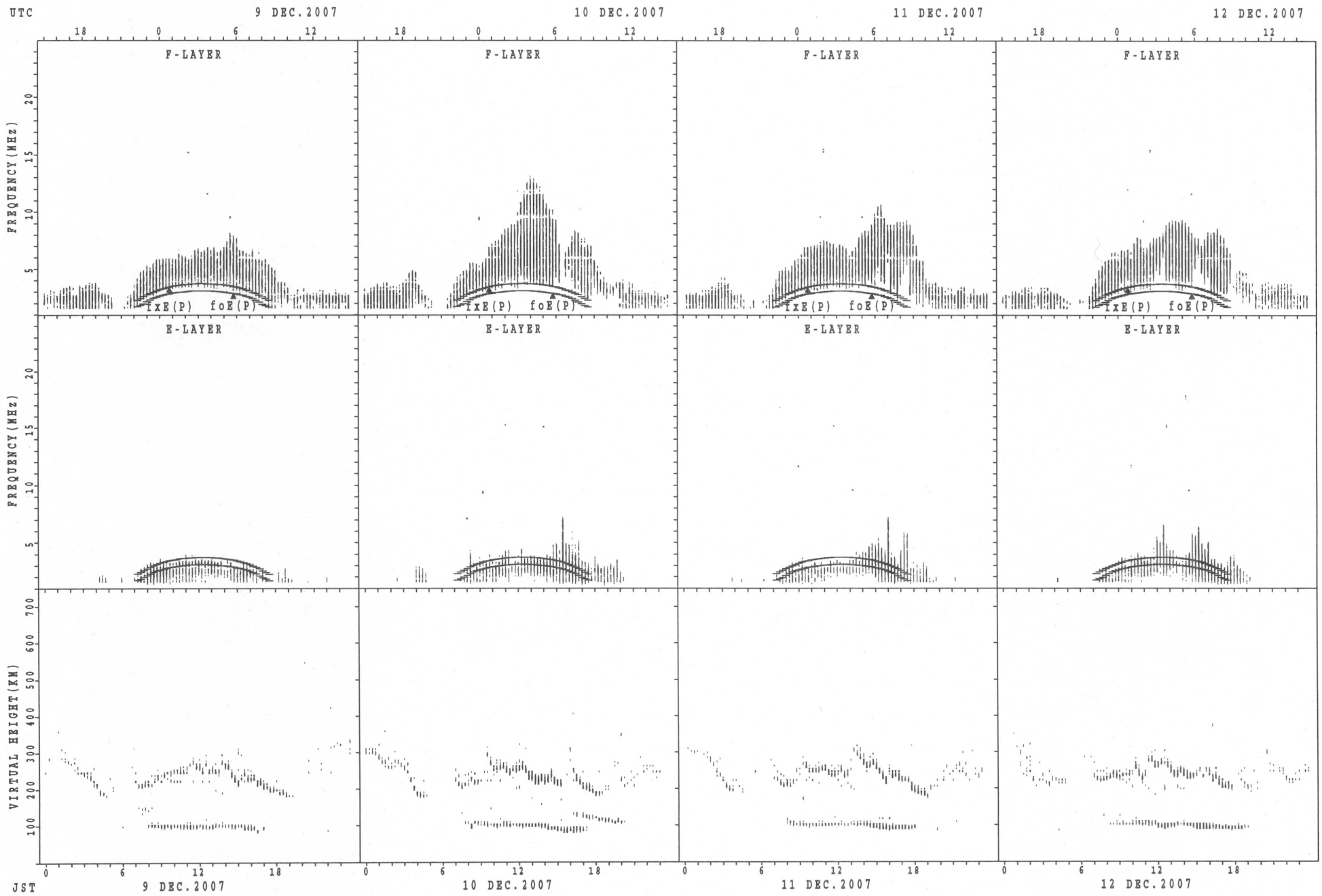

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Okinawa



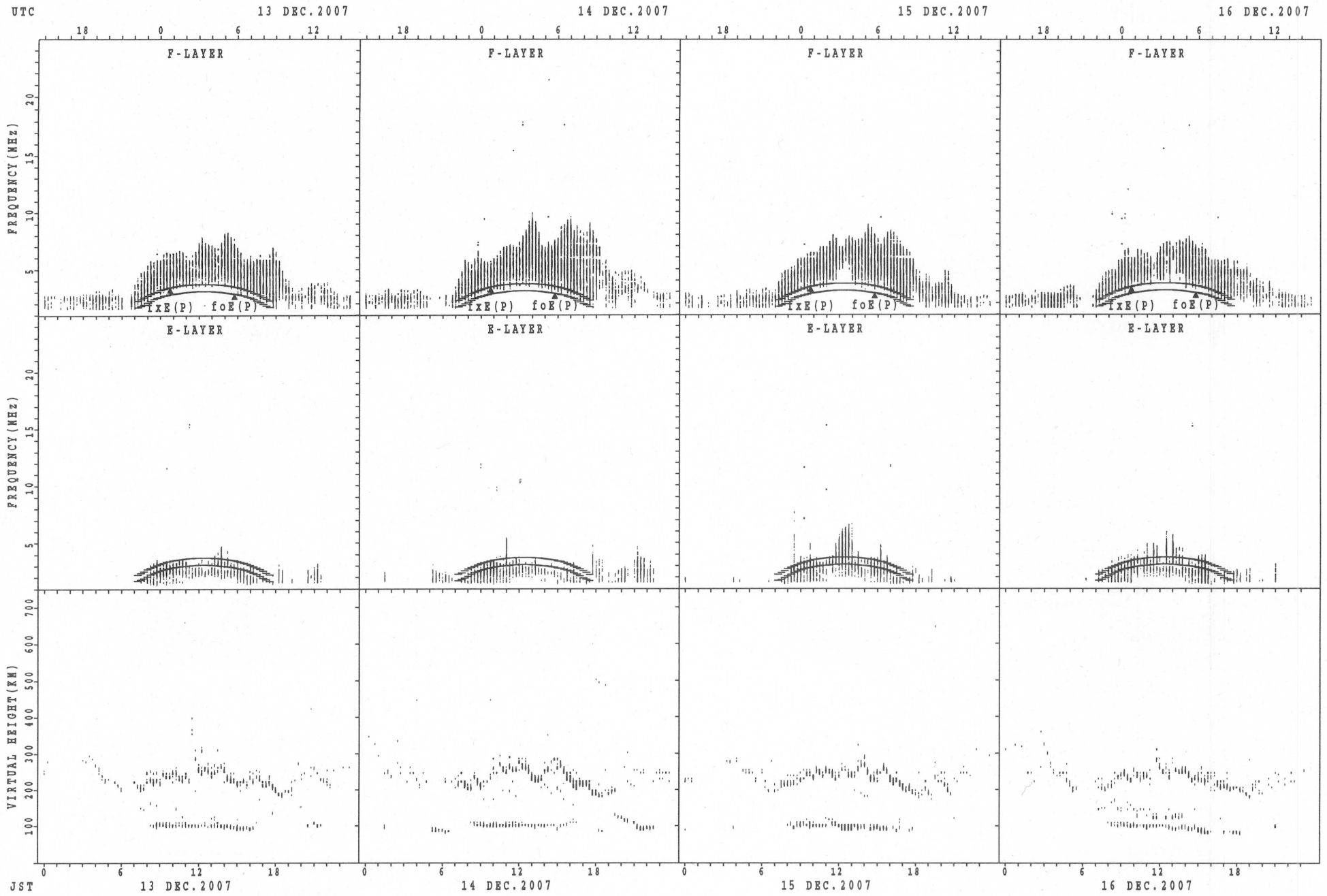

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



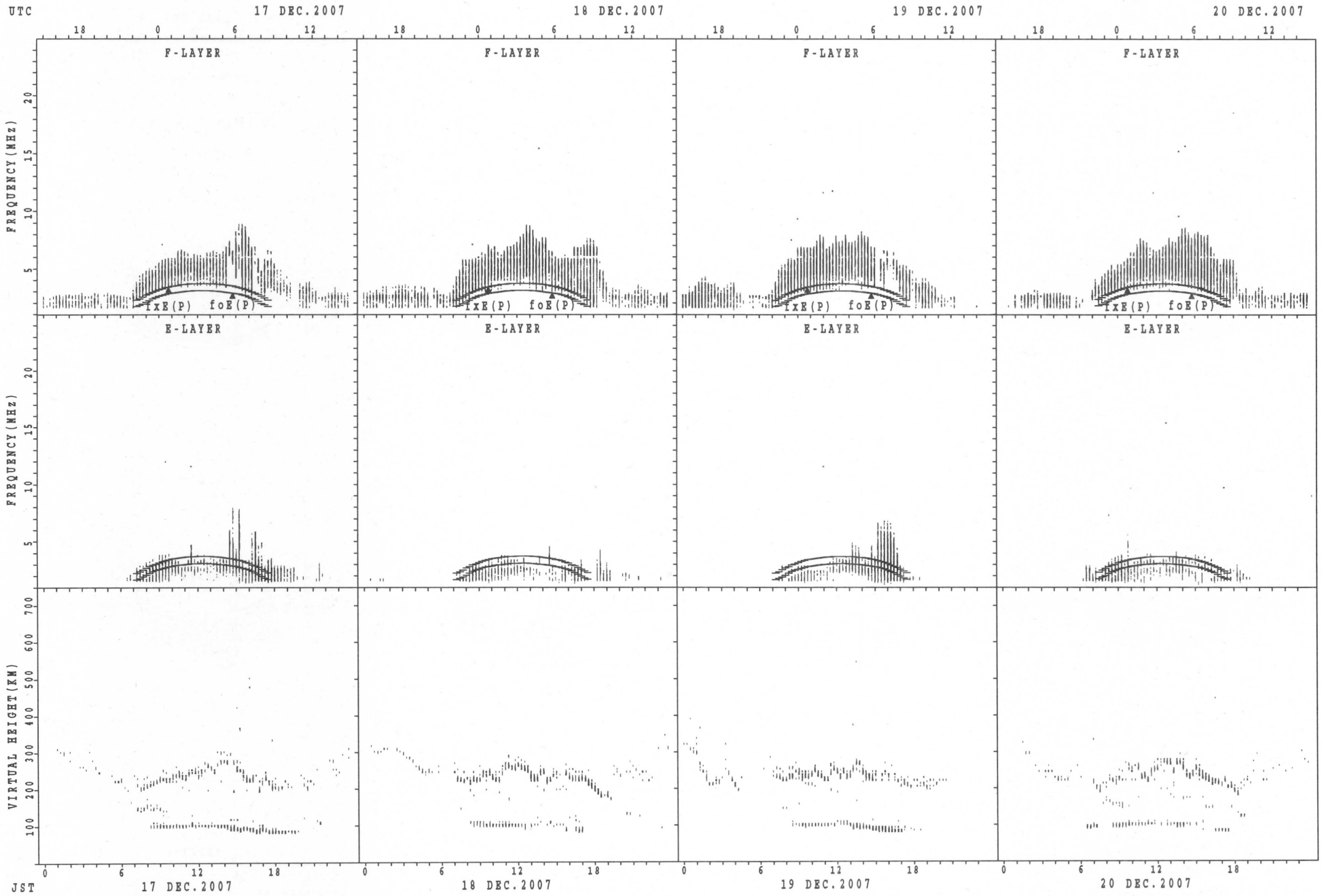

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Okinawa



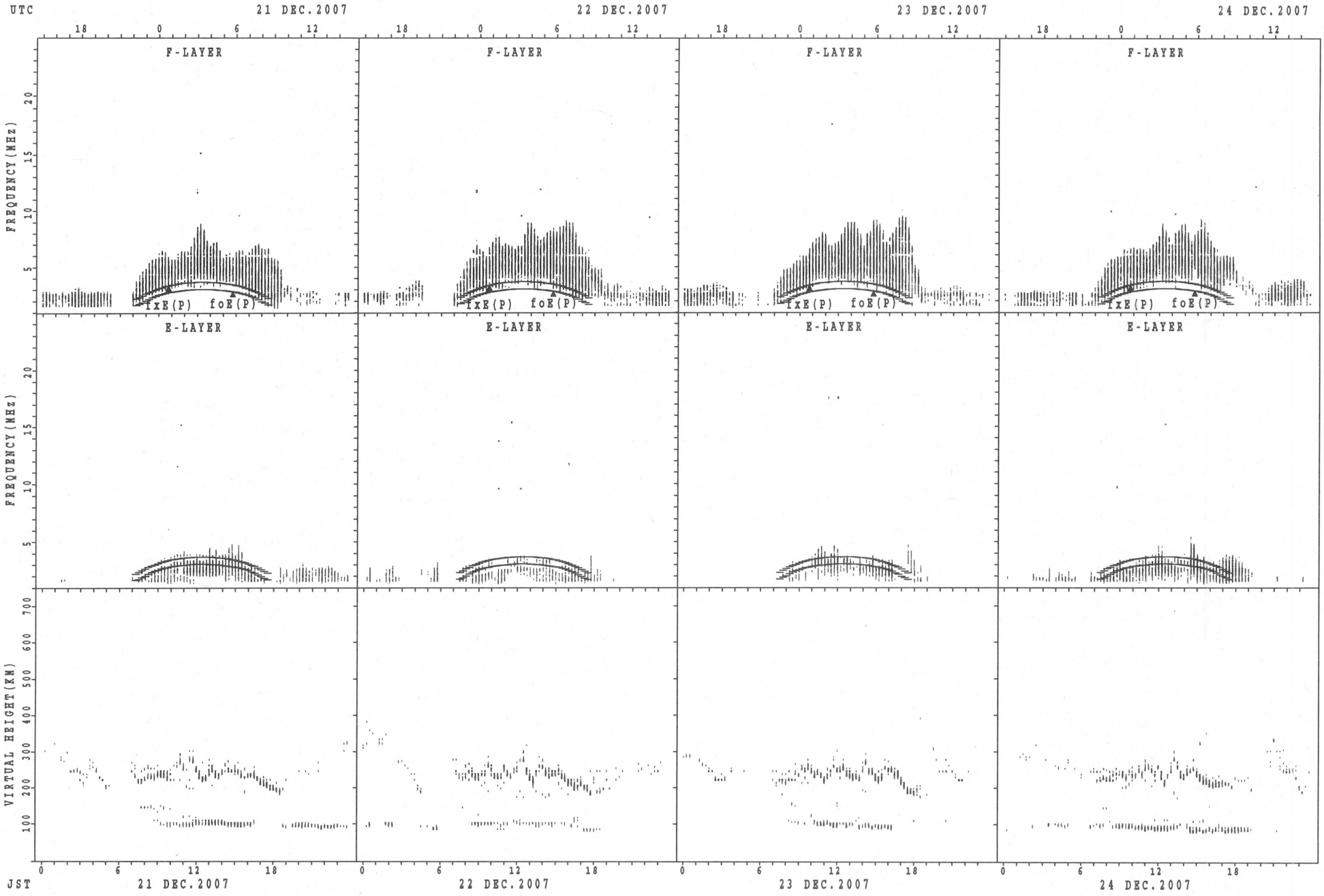

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Okinawa



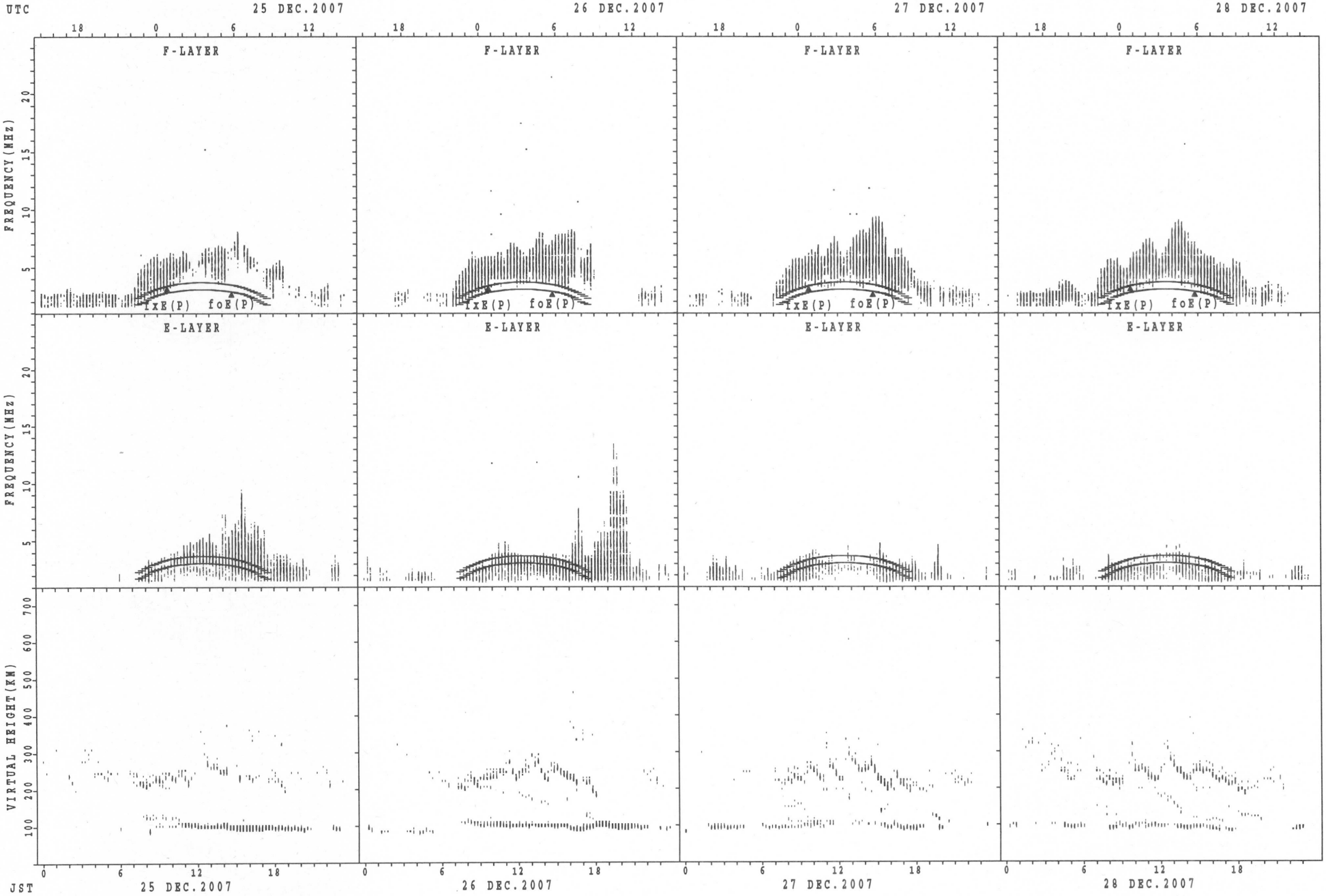

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

## SUMMARY PLOTS AT Okinawa



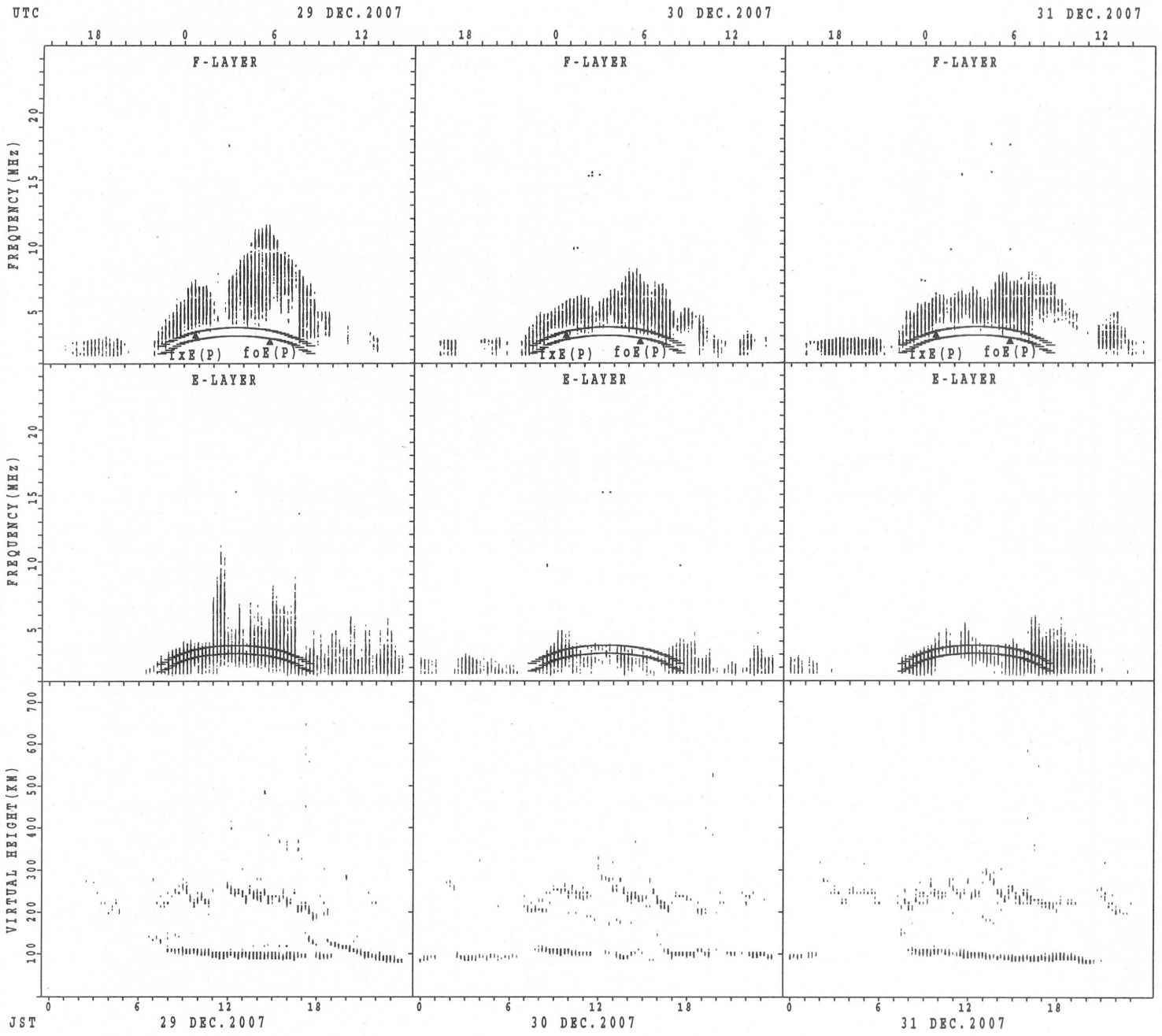

fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa




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

## SUMMARY PLOTS AT Okinawa




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

# MONTHLY MEDIANS OF h'F AND h'Es

DEC.2007 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNT | | | | | | | | | | 4 | 10 | 17 | 13 | 6 | 5 | 4 | | | | | | | | |
| MED | | | | | | | | | | 239 | 239 | 238 | 232 | 242 | 240 | 232 | | | | | | | | |
| U Q | | | | | | | | | | 250 | 258 | 248 | 235 | 248 | 250 | 243 | | | | | | | | |
| L Q | | | | | | | | | | 224 | 214 | 227 | 226 | 228 | 223 | 231 | | | | | | | | |

## h'Es

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNT | 8 | 4 | 5 | 6 | 2 | 1 | 4 | 7 | 17 | 21 | 18 | 12 | 10 | 9 | 5 | 8 | 5 | 8 | 8 | 6 | 7 | 12 | 9 | 10 |
| MED | 94 | 97 | 97 | 97 | 94 | 99 | 116 | 103 | 107 | 113 | 103 | 101 | 97 | 99 | 93 | 114 | 89 | 100 | 99 | 100 | 103 | 97 | 97 | 94 |
| U Q | 97 | 99 | 102 | 97 | 97 | 49 | 139 | 155 | 128 | 130 | 113 | 104 | 105 | 105 | 101 | 132 | 92 | 103 | 117 | 103 | 105 | 102 | 102 | 97 |
| L Q | 90 | 96 | 90 | 91 | 91 | 49 | 107 | 101 | 105 | 102 | 99 | 99 | 95 | 90 | 87 | 99 | 80 | 87 | 96 | 97 | 95 | 95 | 95 | 91 |

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

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNT | | | | | | | | | | 2 | 2 | 3 | 2 | 5 | 3 | | | | | | | | | |
| MED | | | | | | | | | | 234 | 263 | 232 | 260 | 242 | 238 | | | | | | | | | |
| U Q | | | | | | | | | | 238 | 264 | 272 | 264 | 263 | 244 | | | | | | | | | |
| L Q | | | | | | | | | | 230 | 262 | 230 | 256 | 232 | 232 | | | | | | | | | |

## h'Es

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNT | 5 | 6 | 4 | 3 | 5 | 3 | 4 | 8 | 8 | 10 | 7 | 5 | 6 | 6 | 6 | 4 | 8 | 4 | 2 | 4 | 6 | 4 | 6 | 4 |
| MED | 103 | 104 | 102 | 97 | 95 | 97 | 97 | 139 | 107 | 106 | 103 | 105 | 99 | 99 | 97 | 134 | 91 | 88 | 118 | 97 | 95 | 92 | 100 | 101 |
| U Q | 110 | 111 | 108 | 97 | 104 | 101 | 98 | 163 | 127 | 113 | 107 | 110 | 103 | 103 | 105 | 158 | 95 | 92 | 137 | 97 | 105 | 96 | 103 | 105 |
| L Q | 97 | 97 | 99 | 95 | 93 | 95 | 97 | 100 | 105 | 101 | 97 | 99 | 97 | 97 | 89 | 100 | 87 | 86 | 99 | 93 | 93 | 90 | 97 | 97 |

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

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNT | | | | | | | | | | | 10 | 12 | | | 16 | 11 | 5 | 1 | | | | | | |
| MED | | | | | | | | | | | 256 | 238 | | | 251 | 238 | 224 | 216 | | | | | | |
| U Q | | | | | | | | | | | 264 | 248 | | | 256 | 250 | 249 | 108 | | | | | | |
| L Q | | | | | | | | | | | 246 | 230 | | | 237 | 228 | 223 | 108 | | | | | | |

## 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 | 7 | 4 | 4 | 7 | 4 | 2 | 3 | 6 | 11 | 20 | 21 | 24 | 24 | 24 | 21 | 18 | 23 | 18 | 16 | 11 | 9 | 6 | 7 | 4 |
| MED | 103 | 97 | 106 | 95 | 99 | 99 | 93 | 98 | 117 | 131 | 107 | 103 | 104 | 101 | 103 | 95 | 97 | 95 | 95 | 95 | 95 | 95 | 95 | 93 |
| U Q | 105 | 102 | 108 | 103 | 103 | 103 | 95 | 135 | 155 | 150 | 119 | 109 | 107 | 106 | 128 | 97 | 131 | 105 | 97 | 105 | 96 | 97 | 95 | 95 |
| L Q | 91 | 90 | 101 | 93 | 97 | 95 | 91 | 97 | 111 | 110 | 105 | 103 | 100 | 97 | 97 | 87 | 89 | 89 | 89 | 89 | 90 | 91 | 89 | 90 |

# MONTHLY MEDIANS OF h'F AND h'Es

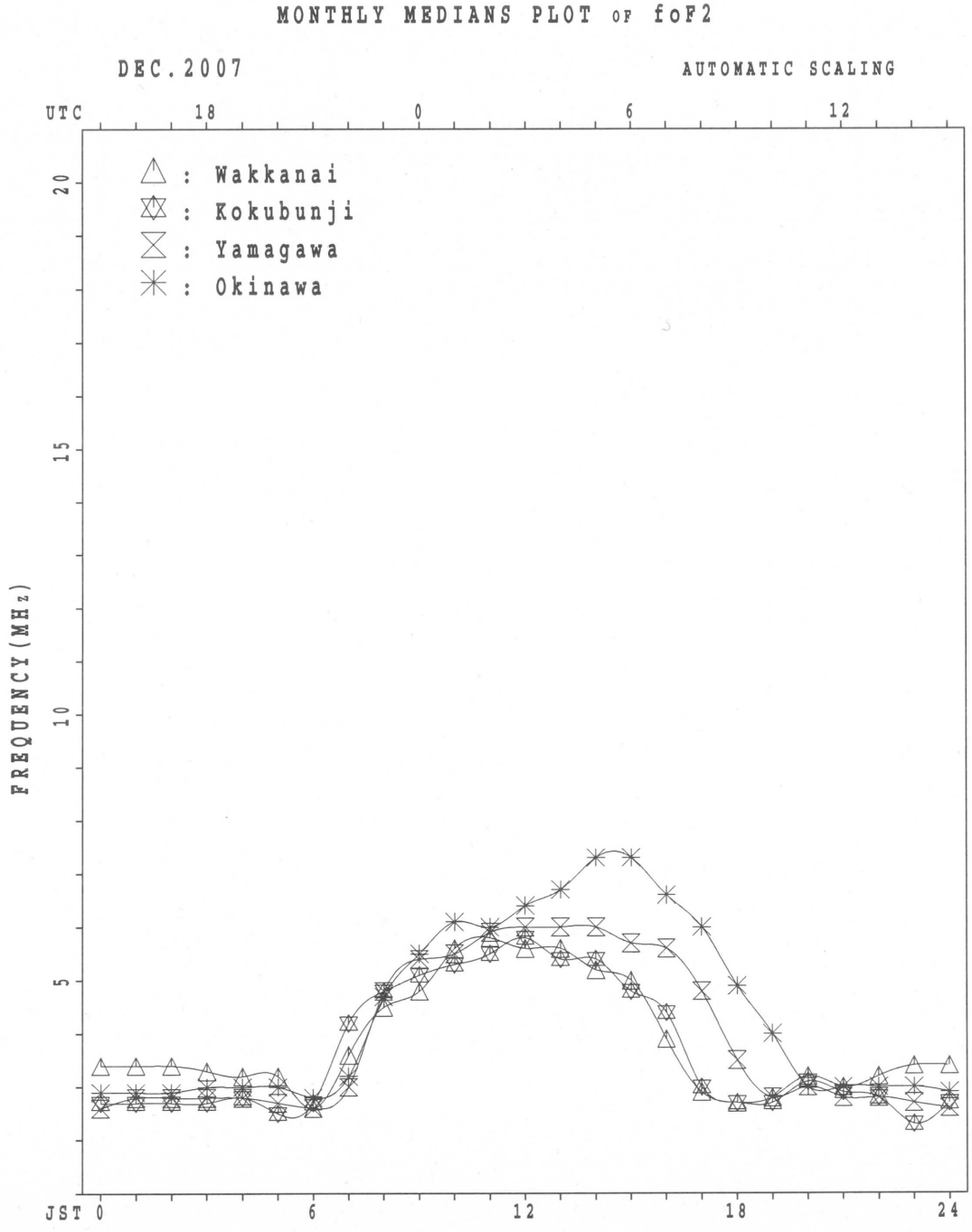
DEC.2007 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNT | | | | | | | | | | 7 | 21 | | | | | 26 | 16 | 12 | 3 | | | | | |
| MED | | | | | | | | | | 254 | 248 | | | | | 240 | 231 | 226 | 224 | | | | | |
| U Q | | | | | | | | | | 256 | 259 | | | | | 256 | 244 | 229 | 232 | | | | | |
| L Q | | | | | | | | | | 238 | 243 | | | | | 224 | 223 | 218 | 206 | | | | | |

## h'Es

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CNT | 4 | 1 | 4 | 3 | 5 | 3 | 2 | 4 | 17 | 16 | 15 | 17 | 16 | 16 | 14 | 20 | 18 | 24 | 22 | 13 | 11 | 9 | 6 | 6 |
| MED | 92 | 109 | 103 | 97 | 97 | 103 | 98 | 97 | 145 | 134 | 111 | 105 | 105 | 103 | 103 | 97 | 95 | 95 | 97 | 97 | 97 | 105 | 95 | 95 |
| U Q | 103 | 54 | 105 | 99 | 105 | 103 | 101 | 118 | 157 | 151 | 113 | 109 | 112 | 118 | 105 | 100 | 99 | 100 | 107 | 122 | 111 | 109 | 97 | 95 |
| L Q | 88 | 54 | 99 | 89 | 96 | 97 | 95 | 96 | 123 | 109 | 107 | 103 | 101 | 102 | 97 | 93 | 93 | 92 | 95 | 94 | 91 | 96 | 93 | 93 |


MONTHLY MEDIANS PLOT OF foF2
DEC.2007
AUTOMATIC SCALING
UTC
18
0
6
12
△ : Wakkanai
⛛ : Kokubunji
⧖ : Yamagawa
✳ : Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

# IONOSPHERIC DATA STATION Kokubunji

DEC. 2007 foI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

DEC. 2007 foI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

DEC. 2007 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 29 | 27 | 27 | 26 | 26 | 22 | 24 | 47 | 49 | 55 | 53 | 60 | 66 | 57 | 61 | 54 | 45 | 27 | 29 | 29 | 29 | A | 26 | 28 |
| 2 | 28 | 28 | 27 | 26 | 26 | 26 | 20 | 42 | 43 | 51 | 46 | 65 | 60 | 51 | H 57 | 50 | 46 | 30 | 30 | 27 | 32 | 32 | 23 | 27 |
| 3 | 23 | 24 | 25 | 28 | 25 | 21 | 22 | 43 | 51 | 50 | 48 | 54 | 61 | 56 | 58 | 53 | 42 | 34 | 26 | 26 | 29 | 30 | 28 | 27 |
| 4 | 26 | 27 | 27 | F | F | 22 | 21 | 43 | 46 | 52 | 51 | 61 | 54 | 52 | 55 | 50 | 42 | 32 | 26 | 28 | 31 | 28 | F | 27 |
| 5 | F | F | 27 | 27 | 19 | 19 | 19 | 39 | 54 | 51 | 59 | 54 | 50 | 58 | 62 | 49 | 48 | 29 | 25 | 28 | 30 | 31 | 30 | 31 |
| 6 | 32 | 30 | 30 | 31 | 34 | 23 | 21 | 42 | 48 | 52 | 52 | 59 | 58 | 52 | 50 | 49 | 43 | 36 | 25 | 33 | 29 | 26 | 27 | 26 |
| 7 | 26 | 27 | 27 | 29 | 30 | 18 | 19 | 40 | 48 | 46 | 56 | 66 | 56 | 54 | H 48 | 44 | 51 | 27 | H 25 | 28 | 24 | F | F | F |
| 8 | 27 | 29 | 30 | 28 | F | 24 | 22 | 41 | 53 | 51 | 52 | 56 | 55 | 51 | 65 | 50 | 48 | 31 | 22 | 29 | 23 | F | F | 24 |
| 9 | 24 | 24 | 24 | 28 | 23 | F | 19 | 39 | 50 | 50 | 52 | 62 | 58 | 57 | 61 | 55 | 42 | 30 | 26 | 30 | 22 | 26 | F | 28 |
| 10 | 27 | 26 | 28 | 28 | 36 | 17 | 22 | 48 | 48 | 57 | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 11 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 12 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 13 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 14 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 15 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 16 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 17 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 18 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 19 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 20 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 21 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 22 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 23 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 24 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 25 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 26 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | 44 | 38 | 29 | 23 | 30 | 27 | 25 | A |
| 27 | 24 | 25 | 27 | C | 24 | 18 | 18 | 37 | 45 | 59 | 53 | 64 | 58 | 58 | 55 | 53 | 43 | 35 | 20 | 26 | 32 | 32 | 23 | 22 |
| 28 | F | F | F | 25 | 23 | 22 | 20 | 36 | 49 | 55 | 58 | 56 | 64 | 64 | 52 | 48 | 44 | 29 | 26 | 28 | 35 | 38 | 26 | F |
| 29 | F | F | F | F | F | F | 20 | A | 43 | 50 | 49 | 55 | 53 | 52 | 48 | 42 | 44 | 36 | 24 | 29 | 30 | 38 | 26 | F |
| 30 | F | F | F | F | F | F | 26 | 41 | 45 | 47 | 49 | 55 | 63 | 55 | 45 | 47 | 42 | 34 | 23 | 22 | 28 | 34 | 31 | F |
| 31 | F | F | F | F | F | F | 20 | 36 | 45 | 49 | 52 | 54 | 55 | 56 | 48 | 44 | 39 | 36 | 34 | 23 | 30 | 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 | 10 | 10 | 11 | 10 | 10 | 11 | 15 | 14 | 15 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 11 | 10 | 9 |
| MED | 26 | 27 | 27 | 28 | 26 | 22 | 20 | 41 | 48 | 51 | 52 | 58 | 58 | 56 | 55 | 50 | 44 | 32 | 26 | 28 | 30 | 31 | 26 | 27 |
| U Q | 28 | 28 | 28 | 28 | 30 | 23 | 22 | 43 | 50 | 55 | 53 | 62 | 61 | 57 | 61 | 53 | 46 | 36 | 29 | 29 | 31 | 34 | 28 | 28 |
| L Q | 24 | 25 | 27 | 26 | 23 | 18 | 19 | 39 | 45 | 50 | 49 | 55 | 55 | 52 | 48 | 47 | 42 | 29 | 24 | 26 | 28 | 27 | 25 | 25 |

DEC. 2007 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

DEC. 2007 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | L | | L | U L 400 | U L 392 | U L 420 | E A | | | | | | | | | |
| 2 | | | | | | | | | | E A | E A | L | L | L | L | | | | | | | | | |
| 3 | | | | | | | | | | | L | L | U L 412 | L | L | | | | | | | | | |
| 4 | | | | | | | | | | L | L | U L 396 | U L 416 | L | L | | | | | | | | | |
| 5 | | | | | | | | | | | E A | L | L | U L 372 | L | | | | | | | | | |
| 6 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 7 | | | | | | | | | | L | U L 408 | U L 408 | L | U L 404 | | | | | | | | | | |
| 8 | | | | | | | | | | L | L | U L 420 | U L 420 | L | L 336 | | | | | | | | | |
| 9 | | | | | | | | | | L | L | E A | U L 408 | L | L | | | | | | | | | |
| 10 | | | | | | | | | | U L 400 | C | C | C | C | C | C | C | | | | | | | |
| 11 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 12 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 13 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 14 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 15 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 16 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 17 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 18 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 19 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 20 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 21 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 22 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 23 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 24 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 25 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 26 | | | | | | | | C | C | C | C | C | C | C | C | C | | | | | | | | |
| 27 | | | | | | | | | | L | U L 408 | E A | E A | | C | | | | | | | | | |
| 28 | | | | | | | | | | L | U L 388 | U L 400 | 368 | E A | L | | | | | | | | | |
| 29 | | | | | | | | A | | E A | U L 392 | L | L | E A | L | | | | | | | | | |
| 30 | | | | | | | | | | | L | L 384 | U L 412 | L | L | L | | | | | | | | |
| 31 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | | 1 | 4 | 6 | 7 | 3 | 1 | | | | | | | | | |
| MED | | | | | | | | | | U L 400 | U L 400 | U L 400 | U L 412 | U L 404 | L 336 | | | | | | | | | |
| U Q | | | | | | | | | | | U L 408 | U L 408 | U L 416 | U L 420 | | | | | | | | | | |
| L Q | | | | | | | | | | | U L 390 | L 396 | 392 | U L 372 | | | | | | | | | | |

DEC. 2007 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

DEC. 2007 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | B | U R 236 | 260 | | A | R | R | A | A | U R 236 | A | | | | | | |
| 2 | | | | | | | | B | 236 | | A | A | R | R | R | 256 | U A 212 | B | | | | | | |
| 3 | | | | | | | | B | | A | A | A | A | A | A | U R 284 | U A 232 | A | | | | | | |
| 4 | | | | | | | | B | 244 | | A | A | A | A | A | U R 276 | 228 | B | | | | | | |
| 5 | | | | | | | | 160 | | A | A | A | A | A | A | 256 | 224 | B | | | | | | |
| 6 | | | | | | | | B | U A 232 | 268 | | A | A | U R 328 | A | U R 268 | 232 | B | | | | | | |
| 7 | | | | | | | | B | 224 | | A | A | 328 | R | R | R | U R 240 | B | | | | | | |
| 8 | | | | | | | | B | | 244 | U A 272 | A | R | A | A | U R 280 | 232 | | | | | | | |
| 9 | | | | | | | | 184 | 240 | 276 | 292 | | A | A | A | A | U R 232 | B | | | | | | |
| 10 | | | | | | | | B | A | A | C | C | C | C | C | C | C | C | | | | | | |
| 11 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 12 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 13 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 14 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 15 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 16 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 17 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 18 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 19 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 20 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 21 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 22 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 23 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 24 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 25 | | | | | | | | C | C | C | C | C | C | C | C | C | C | C | | | | | | |
| 26 | | | | | | | | C | C | C | C | C | C | C | C | C | C | B | | | | | | |
| 27 | | | | | | | | B | 208 | | A | A | A | A | A | C | 224 | B | | | | | | |
| 28 | | | | | | | | B | U A 200 | | A | U R 296 | U R 316 | R | 272 | 260 | C | 196 | | | | | | |
| 29 | | | | | | | | B | | A | U A 260 | A | 304 | U R 300 | A | R | U R 236 | A | | | | | | |
| 30 | | | | | | | | B | | A | A | A | A | R | R | U R 264 | 232 | B | | | | | | |
| 31 | | | | | | | | B | | A | A | A | R | U R 308 | R | 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 | | | | | | | | 2 | 9 | 5 | 2 | 3 | 3 | 1 | 8 | 12 | 1 | | | | | | | |
| MED | | | | | | | | 172 | 236 | 268 | 294 | 316 | U R 308 | 272 | U R 266 | 232 | 196 | | | | | | | |
| U Q | | | | | | | | | 242 | 274 | | 328 | U R 328 | | U R 278 | U R 234 | | | | | | | | |
| L Q | | | | | | | | | 216 | 260 | | 304 | U R 300 | | 258 | 226 | | | | | | | | |

DEC. 2007 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

**DEC. 2007** foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19 | E B 15 | 19 | 20 | J A 36 | E B 15 | J A 24 | 20 | G 23 | 33 | 32 | G 26 | G 23 | J A 42 | J A 42 | G 22 | J A 28 | J A 20 | J A 21 | E B 15 | J A 17 | J A 45 | J A 30 | J A 25 |
| 2 | J A 24 | E B 16 | 19 | E B 14 | E B 15 | 20 | J A 21 | E B 15 | 31 | 37 | 36 | G 21 | G 25 | G 26 | 30 | 25 | E B 15 | E B 15 | J A 20 | J A 22 | 20 | 18 | J A 58 | J A 50 |
| 3 | J A 29 | J A 21 | J A 20 | J A 21 | J A 22 | J A 25 | 19 | 20 | J A 32 | 30 | 30 | 32 | J A 45 | J A 32 | G 20 | 28 | J A 30 | J A 42 | J A 21 | J A 20 | 20 | E B 15 | E B 15 | J A 19 |
| 4 | E B 15 | J A 20 | 19 | 19 | E B 15 | 21 | J A 19 | 20 | G 19 | 31 | 34 | J A 34 | J A 48 | J A 42 | G 21 | G 18 | E B 17 | J A 23 | E B 14 | E B 15 | E B 15 | 20 | E B 15 | E B 15 |
| 5 | E B 16 | 19 | J A 24 | J A 20 | J A 18 | J A 19 | J A 17 | 20 | J A 34 | 30 | J A 38 | 34 | J A 38 | 31 | 29 | 26 | 20 | J A 18 | 22 | 18 | E B 16 | E B 15 | E B 15 | E B 15 |
| 6 | E B 16 | E B 16 | E B 15 | J A 20 | E B 15 | J A 20 | 20 | 20 | 27 | 30 | J A 37 | J A 38 | G 30 | J A 33 | G 25 | J A 24 | J A 44 | J A 35 | J A 19 | E B 14 | E B 15 | J A 20 | E B 14 | E B 15 |
| 7 | E B 14 | E B 14 | E B 15 | E B 16 | E B 15 | E B 15 | E B 15 | 21 | 26 | 31 | 34 | G 28 | G 28 | G 27 | G 24 | G | J A 22 | 20 | 19 | E B 15 | E B 15 | 19 | E B 16 | E B 15 |
| 8 | E B 15 | E B 15 | 20 | E B 15 | 18 | E B 15 | E B 15 | 19 | G | 34 | J A 32 | G 24 | 34 | J A 38 | G 26 | 26 | E B 16 | J A 18 | E B 16 | J A 17 | J A 36 | J A 21 | J A 18 | J A 20 |
| 9 | E B 16 | 20 | E B 15 | J A 20 | J A 23 | J A 22 | J A 20 | 22 | 26 | 31 | 32 | J A 45 | J A 36 | 34 | J A 45 | G 22 | J A 30 | J A 25 | J A 18 | E B 15 | E B 14 | E B 14 | E B 15 | 20 |
| 10 | E B 15 | E B 15 | E B 16 | E B 15 | E B 15 | E B 14 | E B 14 | E B 16 | J A 28 | 30 | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 11 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 12 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 13 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 14 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 15 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 16 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 17 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 18 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 19 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 20 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 21 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 22 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 23 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 24 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 25 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 26 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | 20 | E B 14 | J A 18 | 20 | J A 20 | 19 | 19 | J A 41 |
| 27 | J A 30 | J A 23 | E B 14 | C | E B 14 | E B 14 | 20 | 20 | 26 | 30 | J A 47 | J A 39 | J A 48 | J A 37 | E C 36 | 25 | J A 24 | J A 21 | E B 15 | 20 | 22 | 22 | J A 23 | J A 22 |
| 28 | J A 39 | J A 45 | E B 14 | 19 | J A 22 | 19 | J A 28 | 24 | 24 | G 26 | J A 32 | G 26 | G 24 | 34 | 32 | E B 22 | E B 13 | E B 15 | E B 16 | E B 14 | J A 18 | 20 | J A 34 | J A 39 |
| 29 | J A 22 | J A 21 | J A 30 | E B 16 | 20 | E B 15 | 19 | J A 37 | J A 42 | 33 | J A 38 | J A 34 | G 22 | J A 85 | 21 | G 22 | J A 26 | E B 14 | E B 14 | J A 22 | J A 44 | J A 60 | J A 63 | 20 |
| 30 | E B 16 | J A 22 | J A 22 | J A 28 | J A 22 | J A 20 | J A 21 | 28 | J A 30 | J A 31 | 32 | J A 32 | G 25 | G 26 | G 22 | G | 20 | E B 14 | E B 16 | E B 14 | E B 14 | J A 21 | J A 31 | E B 15 |
| 31 | J A 29 | J A 22 | J A 22 | E B 15 | E B 15 | E B 14 | E B 15 | E B 16 | 27 | J A 32 | 36 | G 29 | G 28 | G 28 | J A 34 | J A 32 | J A 23 | J A 20 | J A 18 | E B 14 | E B 14 | E B 15 | E B 15 | E B 14 |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 15 | 15 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| MED | E B 16 | 20 | 19 | 19 | 18 | 19 | 19 | 20 | 27 | 31 | 34 | 32 | G 29 | 34 | 27 | G | J A 22 | J A 20 | 18 | E B 15 | 17 | 20 | 18 | 20 |
| U Q | J A 29 | J A 22 | J A 22 | J A 20 | J A 22 | J A 20 | J A 21 | 22 | J A 31 | 33 | J A 37 | J A 34 | J A 38 | J A 38 | J A 34 | 26 | J A 28 | J A 23 | J A 20 | J A 20 | J A 20 | J A 21 | J A 31 | J A 25 |
| L Q | E B 15 | E B 15 | E B 15 | E B 15 | E B 15 | E B 15 | E B 15 | E B 19 | G 24 | 30 | 32 | G 26 | G 25 | G 28 | G 22 | G 22 | E B 17 | E B 15 | E B 16 | E B 14 | E B 15 | E B 15 | E B 15 | E B 15 |

**DEC. 2007** foEs (0.1MHz)

# IONOSPHERIC DATA STATION Kokubunji

DEC. 2007 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

DEC. 2007 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

DEC. 2007 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

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

DEC. 2007 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

**DEC. 2007** M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 330 | 319 | 303 | 318 | 362 | 346 | 355 | 395 | 391 | 401 | 377 | 392 | 394 | 350 | 356 | 383 | 381 | 394 | 376 | 347 | 362 | A | 342 | 310 |
| 2 | 305 | 318 | 334 | 332 | 353 | 365 | 318 | 402 | 393 | 384 | 368 | 342 | 402 | 348 | H 356 | 391 | 394 | 378 | 362 | 334 | 340 | 377 | 382 | 343 |
| 3 | 346 | 310 | 309 | 351 | 350 | 347 | 342 | 386 | 405 | 373 | 367 | 368 | 360 | 392 | 357 | 397 | 388 | 368 | 376 | 368 | 349 | 337 | 328 | 326 |
| 4 | 318 | 317 | 319 | F | F | 387 | 350 | 387 | 401 | 376 | 379 | 401 | 382 | 370 | 387 | 386 | 387 | 355 | 360 | 346 | 369 | 337 | F | 349 |
| 5 | F | F | 339 | 376 | 373 | 372 | 347 | 368 | 384 | 372 | 377 | 351 | 388 | 369 | 380 | 388 | 410 | 368 | 314 | 358 | 331 | 339 | 331 | 314 |
| 6 | 334 | 337 | 321 | 348 | 386 | 355 | 333 | 381 | 373 | 370 | 395 | 371 | 381 | 384 | 369 | 386 | 382 | 341 | 346 | 353 | 378 | 335 | 321 | 315 |
| 7 | 310 | 322 | 317 | 367 | 399 | 323 | 331 | 395 | 393 | 372 | 349 | 381 | 413 | 377 | H 345 | 375 | 402 | 386 | H 332 | 395 | 351 | F | F | F |
| 8 | 330 | 348 | 320 | 334 | F | 358 | 336 | 380 | 389 | 389 | 396 | 361 | 358 | 375 | 396 | 384 | 381 | 381 | 368 | 381 | 364 | F | F | 332 |
| 9 | 307 | 313 | 328 | 373 | 345 | F | 345 | 387 | 398 | 367 | 377 | 389 | 346 | 367 | 372 | 387 | 404 | 391 | 352 | 360 | 313 | 302 | F | 371 |
| 10 | 327 | 306 | 307 | 325 | 406 | 369 | 329 | 384 | 379 | 366 | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 11 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 12 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 13 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 14 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 15 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 16 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 17 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 18 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 19 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 20 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 21 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 22 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 23 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 24 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 25 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 26 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | 401 | 383 | 387 | 334 | 365 | 356 | 340 | A |
| 27 | 314 | 322 | 324 | C | 391 | 329 | 376 | 399 | 408 | 386 | 356 | 391 | 380 | 400 | 387 | 386 | 390 | 370 | 337 | 321 | 328 | 375 | 373 | 303 |
| 28 | F | F | F | 329 | 349 | 328 | 405 | 381 | 397 | 409 | 381 | 360 | 380 | 370 | 376 | 378 | 385 | 363 | 362 | 337 | 357 | 352 | 324 | F |
| 29 | F | F | F | F | F | F | 449 | A | 369 | 390 | 363 | 383 | 363 | 381 | 390 | 390 | 368 | 411 | 334 | 375 | 334 | 383 | 380 | F |
| 30 | F | F | F | F | F | F | 331 | 393 | 389 | 377 | 386 | 369 | 374 | 377 | 363 | 345 | 403 | 371 | 360 | 350 | 335 | 356 | 348 | F |
| 31 | F | F | F | F | F | F | 351 | 374 | 391 | 350 | 372 | 356 | 380 | 389 | 374 | 391 | 385 | 368 | 387 | 287 | 347 | 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 | 10 | 10 | 11 | 10 | 10 | 11 | 15 | 14 | 15 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 11 | 10 | 9 |
| MED | 322 | 318 | 320 | 341 | 368 | 355 | 345 | 386 | 391 | 376 | 377 | 370 | 380 | 376 | 373 | 386 | 388 | 371 | 360 | 350 | 349 | 352 | 341 | 326 |
| U Q | 330 | 322 | 328 | 367 | 391 | 369 | 355 | 395 | 398 | 389 | 381 | 389 | 388 | 384 | 387 | 390 | 402 | 386 | 376 | 368 | 364 | 375 | 373 | 346 |
| L Q | 310 | 313 | 309 | 329 | 350 | 329 | 331 | 381 | 384 | 370 | 367 | 360 | 363 | 369 | 357 | 383 | 382 | 368 | 337 | 334 | 334 | 337 | 328 | 312 |

**DEC. 2007** M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

DEC.2007 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | L | | L | U L 396 | U L 411 | U L 382 | E A | | | | | | | | | |
| 2 | | | | | | | | | | E A | E A | L | L | L | L | | | | | | | | | |
| 3 | | | | | | | | | | | L | L | U L 393 | L | L | | | | | | | | | |
| 4 | | | | | | | | | | L | L | U L 388 | U L 390 | L | L | | | | | | | | | |
| 5 | | | | | | | | | | | E A | L | L | U L 413 | L | | | | | | | | | |
| 6 | | | | | | | | | | | L | L | L | L | L | | | | | | | | | |
| 7 | | | | | | | | | | L | U L 389 | U L 389 | L | U L 402 | | | | | | | | | | |
| 8 | | | | | | | | | | L | L | U L 395 | U L 384 | L | L 443 | | | | | | | | | |
| 9 | | | | | | | | | | L | L | E A | U L 416 | L | L | | | | | | | | | |
| 10 | | | | | | | | | | U L 374 | C | C | C | C | C | C | C | | | | | | | |
| 11 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 12 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 13 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 14 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 15 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 16 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 17 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 18 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 19 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 20 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 21 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 22 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 23 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 24 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 25 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 26 | | | | | | | | C | C | C | C | C | C | C | C | C | | | | | | | | |
| 27 | | | | | | | | | | L | U L 380 | E A | E A | | C | | | | | | | | | |
| 28 | | | | | | | | | | L | U L 399 | U L 436 | 438 | E A | L | | | | | | | | | |
| 29 | | | | | | | | A | | E A | U L 382 | L | L | E A | L | | | | | | | | | |
| 30 | | | | | | | | | | | L | L 405 | U L 409 | L | L | L | | | | | | | | |
| 31 | | | | | | | | | | L | L | L | L | L | L | | | | | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | | 1 | 4 | 6 | 7 | 3 | 1 | | | | | | | | | |
| MED | | | | | | | | | | U L 374 | U L 386 | U L 396 | U L 409 | U L 402 | L 443 | | | | | | | | | |
| U Q | | | | | | | | | | | U L 394 | L 405 | 416 | U L 413 | | | | | | | | | | |
| L Q | | | | | | | | | | | U L 381 | U L 389 | U L 390 | U L 382 | | | | | | | | | | |

DEC.2007 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | 220 | | 242 | 228 | 222 | 268 | 236 | | | | | | | | | |
| 2 | | | | | | | | | | 240 | 220 | 252 | 224 | 260 | 236 | | | | | | | | | |
| 3 | | | | | | | | | | | 246 | 256 | 256 | 228 | 254 | | | | | | | | | |
| 4 | | | | | | | | | | 234 | 248 | 224 | 242 | 246 | 230 | | | | | | | | | |
| 5 | | | | | | | | | | | 236 | 248 | 240 | 246 | 240 | | | | | | | | | |
| 6 | | | | | | | | | | | 232 | 242 | 226 | 218 | 236 | | | | | | | | | |
| 7 | | | | | | | | | | 240 | 280 | 236 | 216 | 242 | | | | | | | | | | |
| 8 | | | | | | | | | | 232 | 222 | 260 | 262 | 250 | 226 | | | | | | | | | |
| 9 | | | | | | | | | | 248 | 252 | 226 | 248 | 244 | 234 | | | | | | | | | |
| 10 | | | | | | | | | | 252 | C | C | C | C | C | C | C | | | | | | | |
| 11 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 12 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 13 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 14 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 15 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 16 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 17 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 18 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 19 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 20 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 21 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 22 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 23 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 24 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 25 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 26 | | | | | | | | C | C | C | C | C | C | C | C | C | | | | | | | | |
| 27 | | | | | | | | | | 228 | 274 | 226 | 242 | | 232 | | | | | | | | | |
| 28 | | | | | | | | | | 228 | 238 | 258 | 222 | 232 | 232 | | | | | | | | | |
| 29 | | | | | | | | A | | 212 | 266 | 236 | 250 | 240 | 232 | | | | | | | | | |
| 30 | | | | | | | | | | | 226 | 250 | 230 | 230 | 238 | 224 | | | | | | | | |
| 31 | | | | | | | | | | 262 | 250 | 252 | 240 | 238 | 238 | | | | | | | | | |
| | 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 | 10 | 14 | 14 | 14 | 13 | 13 | 1 | | | | | | | | |
| MED | | | | | | | | | 220 | 237 | 244 | 245 | 240 | 242 | 236 | 224 | | | | | | | | |
| U Q | | | | | | | | | | 248 | 252 | 252 | 248 | 248 | 238 | | | | | | | | | |
| L Q | | | | | | | | | | 228 | 232 | 228 | 224 | 231 | 232 | | | | | | | | | |

DEC. 2007 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

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DEC. 2007 h'F (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 248 | E B 256 | E B 272 | E B 274 | 230 | E B 256 | 214 | 196 | 180 | 218 | 212 | 188 | 192 | 200 | A | 208 | 194 | 186 | 206 | 216 | 212 | A | E B 250 | E B 274 |
| 2 | E B 282 | E B 266 | E B 260 | E B 266 | 242 | 214 | E A 280 | 192 | 204 | A | A | 214 | 198 | 208 | 210 | 204 | 196 | 194 | 214 | 224 | 222 | 204 | 226 | E A 252 |
| 3 | 218 | E B 304 | E B 284 | 232 | 218 | E A 240 | E A 252 | 200 | 204 | 204 | 188 | 204 | 208 | 200 | 220 | 212 | 202 | 212 | 202 | 212 | 218 | 232 | 238 | 246 |
| 4 | E B 254 | E B 252 | E B 256 | E B 256 | 236 | 208 | 218 | 194 | 196 | 186 | 212 | H 182 | 202 | 196 | 190 | H 194 | 198 | 198 | 208 | 218 | 220 | 222 | E B 224 | 220 |
| 5 | E B 280 | E B 256 | 242 | 210 | 236 | E A 248 | E B 288 | 206 | 216 | 202 | A | 208 | 206 | 182 | 214 | 200 | 198 | 186 | 234 | 214 | 244 | 232 | 232 | E B 260 |
| 6 | 238 | 244 | E B 254 | 222 | 202 | 210 | E B 268 | 206 | 206 | 214 | 212 | 200 | 204 | 186 | 196 | H 184 | 206 | E A 266 | 224 | 216 | 208 | E B 248 | E B 248 | E B 264 |
| 7 | E B 280 | E B 278 | E B 270 | 224 | 198 | E B 320 | E B 278 | 206 | 206 | 190 | 208 | 208 | 192 | H 170 | 192 | 208 | 200 | 192 | 242 | 200 | E B 234 | E B 270 | E B 272 | E B 228 |
| 8 | 240 | 234 | 244 | 198 | E B 242 | 206 | 210 | 204 | 214 | 204 | 188 | 200 | 200 | 202 | 180 | 212 | 200 | 194 | 216 | 218 | E A 248 | E B 266 | 248 | E B 274 |
| 9 | E B 288 | E B 288 | E B 256 | 212 | 226 | 214 | E A 266 | 204 | 206 | 204 | 202 | A | 184 | 206 | 208 | 206 | 194 | 202 | 206 | 208 | 214 | E B 296 | E B 270 | 222 |
| 10 | 234 | E B 282 | E B 278 | E B 268 | 202 | 190 | E B 248 | 210 | 192 | 192 | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 11 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 12 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 13 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 14 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 15 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 16 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 17 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 18 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 19 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 20 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 21 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 22 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 23 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 24 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 25 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 26 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | 198 | 210 | 216 | E B 244 | 230 | 200 | 214 | A |
| 27 | E A 298 | E A 290 | E B 250 | C | 204 | 226 | E B 252 | 204 | 208 | A | 232 | A | A | 212 | C | 216 | 200 | 204 | 222 | E B 262 | 238 | 208 | 196 | E B 286 |
| 28 | 218 | E B 268 | E B 262 | 232 | 230 | E B 268 | 210 | 214 | 212 | 212 | 206 | H 192 | 182 | 230 | 200 | 212 | 212 | 196 | 218 | E B 252 | 212 | 210 | E B 280 | E A 298 |
| 29 | E B 260 | E B 298 | E B 284 | E B 304 | E B 292 | E B 260 | 186 | A | 246 | A | 214 | 192 | 208 | A | 198 | 208 | 208 | 188 | 208 | 206 | 242 | 206 | 210 | E B 254 |
| 30 | E B 244 | E A 308 | E A 258 | 200 | 196 | 208 | 242 | 206 | 206 | 194 | 200 | 200 | 194 | 202 | 182 | 180 | 200 | 208 | 210 | 206 | E B 258 | 224 | 226 | 214 |
| 31 | E B 264 | 248 | E B 272 | E B 254 | 228 | 218 | 228 | 198 | 208 | 204 | 206 | 206 | 192 | 202 | 200 | 212 | H 192 | 212 | 204 | E B 288 | 240 | 222 | E B 212 | 208 |
| | 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 | 15 | 15 | 14 | 15 | 15 | 15 | 14 | 15 | 12 | 12 | 12 | 13 | 13 | 12 | 14 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 14 |
| MED | E B 254 | E B 268 | E B U 260 | 216 | 223 | 212 | E 248 | 204 | 206 | 204 | 207 | 200 | 198 | 202 | 199 | 208 | 200 | 197 | 214 | 212 | 224 | 215 | 222 | E 253 |
| U Q | E B 280 | E 290 | E B 272 | E B 266 | 236 | E B 256 | E B 268 | 206 | 212 | 208 | 212 | 207 | 205 | 207 | 209 | 212 | 202 | 210 | 222 | E B 244 | 242 | E B 248 | E B 250 | E B 274 |
| L Q | 238 | 252 | 254 | 212 | 202 | 208 | 214 | 198 | 204 | 193 | 201 | 192 | 192 | 191 | 191 | 200 | 196 | 192 | 206 | 208 | 214 | 208 | 214 | 222 |

DEC. 2007 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

DEC. 2007 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | B | 126 | 122 | 120 | 114 | 112 | A | A | 110 | A | | | | | | | |
| 2 | | | | | | | | B | 120 | 118 | 120 | 120 | 120 | 120 | 120 | 124 | B | | | | | | | |
| 3 | | | | | | | | B | A | A | A | A | A | A | 120 | 124 | A | | | | | | | |
| 4 | | | | | | | | B | 114 | 116 | 116 | A | A | A | 116 | 114 | B | | | | | | | |
| 5 | | | | | | | | 122 | A | 124 | A | A | A | A | 110 | 112 | B | | | | | | | |
| 6 | | | | | | | | B | 124 | 122 | A | A | 124 | A | 114 | 112 | B | | | | | | | |
| 7 | | | | | | | | B | 114 | 120 | 116 | 114 | 116 | 122 | 112 | 112 | B | | | | | | | |
| 8 | | | | | | | | B | 118 | 118 | A | 116 | A | A | 118 | 118 | | | | | | | | |
| 9 | | | | | | | | E B 142 | 120 | 120 | 116 | 116 | A | A | A | 110 | B | | | | | | | |
| 10 | | | | | | | | B | 122 | A | C | C | C | C | C | C | C | | | | | | | |
| 11 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 12 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 13 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 14 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 15 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 16 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 17 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 18 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 19 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 20 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 21 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 22 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 23 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 24 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 25 | | | | | | | | C | C | C | C | C | C | C | C | C | C | | | | | | | |
| 26 | | | | | | | | C | C | C | C | C | C | C | C | C | B | | | | | | | |
| 27 | | | | | | | | B | 116 | 116 | A | A | A | A | C | 114 | B | | | | | | | |
| 28 | | | | | | | | B | 118 | 120 | 114 | 112 | 116 | 118 | 114 | C | E B 140 | | | | | | | |
| 29 | | | | | | | | B | A | 118 | A | 118 | 118 | A | 116 | 114 | A | | | | | | | |
| 30 | | | | | | | | B | A | A | A | A | 114 | 120 | 118 | 114 | B | | | | | | | |
| 31 | | | | | | | | B | 122 | A | A | 120 | 120 | 120 | 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 | | | | | | | | 2 | 11 | 11 | 6 | 8 | 8 | 5 | 10 | 12 | 1 | | | | | | | |
| MED | | | | | | | | 132 | 120 | 120 | 116 | 116 | 117 | 120 | 116 | 114 | E B 140 | | | | | | | |
| U Q | | | | | | | | | 122 | 122 | 120 | 119 | 120 | 121 | 118 | 116 | | | | | | | | |
| L Q | | | | | | | | | 116 | 118 | 116 | 114 | 115 | 119 | 114 | 112 | | | | | | | | |

DEC. 2007 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

# IONOSPHERIC DATA STATION Kokubunji

DEC.2007 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 88 | B | 106 | 106 | 102 | B | 126 | 150 | 106 | 172 | 136 | 104 | 100 | 100 | 94 | 88 | 88 | 88 | 90 | B | 108 | 98 | 98 | 102 |
| 2 | 104 | B | 90 | B | B | 104 | 100 | B | 160 | 132 | 130 | 106 | 106 | 104 | 142 | 136 | B | B | 98 | 96 | 96 | 96 | 102 | 102 |
| 3 | 102 | 104 | 100 | 100 | 98 | 98 | 98 | 150 | 104 | 106 | 104 | 104 | 100 | 98 | 98 | 124 | 100 | 96 | 94 | 90 | 90 | B | B | 90 |
| 4 | B | 100 | 100 | 98 | B | 98 | 92 | 142 | 102 | 114 | 116 | 104 | 98 | 98 | 104 | 94 | B | 98 | B | B | B | 100 | B | B |
| 5 | B | 92 | 104 | 102 | 100 | 98 | 98 | 146 | 106 | 112 | 100 | 114 | 108 | 102 | 142 | 148 | 126 | 94 | 90 | 118 | B | B | B | B |
| 6 | B | B | B | 94 | B | 96 | 150 | 136 | 138 | 138 | 106 | 106 | 102 | 102 | 98 | 92 | 84 | 84 | 84 | B | B | 88 | B | B |
| 7 | B | B | B | B | B | B | B | 142 | 158 | 116 | 118 | 104 | 100 | 104 | 96 | G | 92 | 90 | 92 | B | B | 134 | B | B |
| 8 | B | B | 100 | B | 100 | B | B | 112 | G | 136 | 102 | 108 | 106 | 102 | 104 | 152 | B | 110 | B | 98 | 96 | 92 | 94 | 92 |
| 9 | B | 90 | B | 102 | 104 | 100 | 98 | 166 | 164 | 158 | 152 | 118 | 104 | 98 | 94 | 94 | 88 | 88 | 88 | B | B | B | B | 106 |
| 10 | B | B | B | B | B | B | B | B | 118 | 106 | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 11 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 12 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 13 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 14 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 15 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 16 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 17 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 18 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 19 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 20 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 21 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 22 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 23 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 24 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 25 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| 26 | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | 152 | B | 136 | 100 | 98 | 96 | 96 | 102 |
| 27 | 98 | 98 | B | C | B | B | 152 | 134 | 142 | 130 | 98 | 98 | 96 | 94 | C | 158 | 92 | 92 | B | 108 | 98 | 94 | 96 | 102 |
| 28 | 112 | 110 | B | 102 | 96 | 96 | 100 | 96 | 122 | 106 | 104 | 102 | 94 | 144 | 132 | B | B | B | B | B | 104 | 102 | 102 | 106 |
| 29 | 110 | 110 | 110 | B | 102 | B | 122 | 106 | 106 | 120 | 104 | 102 | 98 | 98 | 100 | 100 | 102 | B | B | 100 | 100 | 98 | 92 | 92 |
| 30 | B | 104 | 100 | 94 | 92 | 92 | 102 | 98 | 92 | 98 | 102 | 94 | 100 | 104 | 102 | G | 142 | B | B | B | B | 90 | 104 | B |
| 31 | 100 | 96 | 100 | B | B | B | B | B | 116 | 106 | 104 | 104 | 102 | 98 | 94 | 90 | 88 | 90 | 96 | B | B | B | B | B |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | 7 | 9 | 9 | 8 | 8 | 8 | 11 | 12 | 14 | 15 | 14 | 14 | 14 | 14 | 13 | 11 | 11 | 10 | 9 | 7 | 8 | 11 | 8 | 9 |
| MED | 102 | 100 | 100 | 101 | 100 | 98 | 100 | 139 | 117 | 116 | 104 | 104 | 100 | 101 | 100 | 100 | 92 | 91 | 92 | 100 | 98 | 96 | 97 | 102 |
| U Q | 110 | 107 | 105 | 102 | 102 | 99 | 126 | 148 | 142 | 136 | 118 | 106 | 104 | 104 | 118 | 148 | 126 | 96 | 97 | 108 | 102 | 100 | 102 | 104 |
| L Q | 98 | 94 | 100 | 96 | 97 | 96 | 98 | 109 | 106 | 106 | 102 | 102 | 98 | 98 | 95 | 92 | 88 | 88 | 89 | 96 | 96 | 92 | 95 | 92 |

# IONOSPHERIC DATA STATION Kokubunji

**DEC. 2007 TYPES OF Es** 135°E MEAN TIME (G.M.T. + 9 H)

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

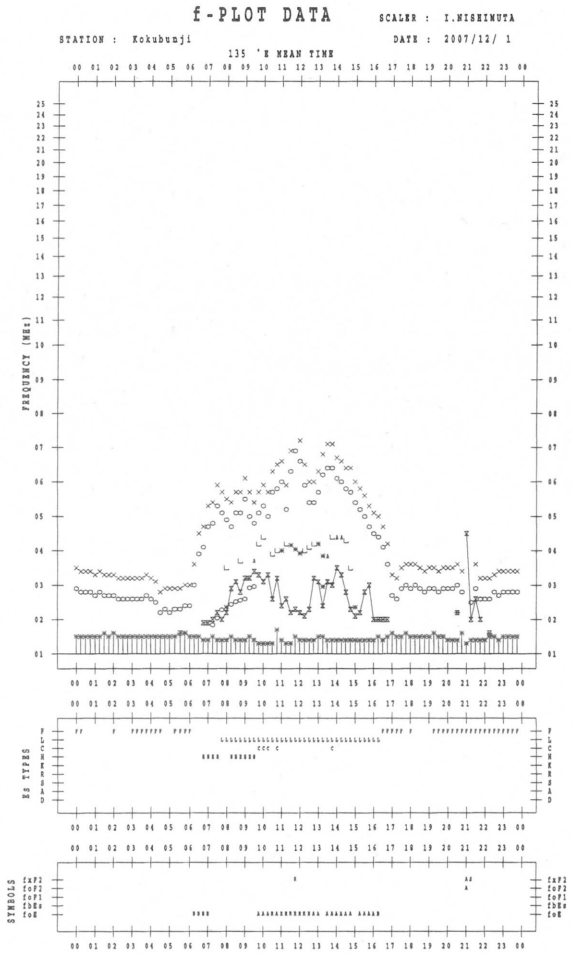
| D \ H | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F2 | | F1 | F1 | F2 | | F1 | H2 | L2 | HL22 | CL12 | L2 | L2 | L2 | L2 | L2 | L1 | F2 | F1 | | F1 | F5 | F5 | F2 |
| 2 | F2 | | F1 | | | F2 | F3 | | H1 | CL11 | CL22 | L1 | L2 | L1 | HL11 | CL22 | | | F2 | F2 | F1 | F1 | F4 | F3 |
| 3 | F3 | F1 | F1 | F1 | F1 | F3 | F2 | H2 | L2 | L2 | L1 | L2 | L1 | L1 | L2 | CL22 | L2 | F3 | F3 | F3 | F2 | | | F2 |
| 4 | | F2 | F1 | F1 | | F1 | F1 | HL21 | L2 | CL22 | CL12 | L2 | L2 | L2 | L2 | L2 | | F1 | | | | F2 | | |
| 5 | | F1 | F1 | F2 | F2 | F2 | F2 | HL21 | L3 | CL22 | L3 | CL12 | L3 | L2 | HL12 | H2 | H2 | F2 | F1 | F2 | | | | |
| 6 | | | | F2 | | F1 | F1 | H2 | CL32 | HL22 | L2 | L2 | L1 | L2 | L2 | L2 | L3 | F4 | F2 | | | F2 | | |
| 7 | | | | | | | | H2 | H2 | CL22 | CL12 | L2 | L2 | L2 | L2 | | L3 | F2 | F1 | | | F1 | | |
| 8 | | | F1 | | F1 | | | C2 | | CL12 | L1 | L2 | L2 | L2 | L2 | HL22 | | F1 | | F3 | F4 | F2 | F2 | F2 |
| 9 | | F1 | | F1 | F2 | F2 | F2 | H3 | HL22 | HL12 | HL12 | CL22 | L2 | L3 | L2 | L2 | L3 | F3 | F2 | | | | | F1 |
| 10 | | | | | | | | | C2 | L2 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | | | | | H2 | | F2 | F2 | F3 | F2 | F2 | F3 |
| 27 | F3 | F4 | | | | | F1 | HL22 | H2 | CL22 | L3 | L3 | L2 | L2 | | H2 | L2 | F2 | | F1 | F2 | F2 | F2 | F1 |
| 28 | F2 | F2 | | F1 | F4 | F2 | F5 | L2 | CL22 | L2 | L2 | L2 | L2 | HL12 | HL11 | | | | | | F2 | F2 | F2 | F3 |
| 29 | F2 | F2 | F2 | | F1 | | F1 | L6 | L4 | CL22 | L2 | L2 | L2 | L3 | L3 | L2 | L2 | | | F3 | F3 | F2 | F4 | F2 |
| 30 | | F2 | F2 | F2 | F2 | F2 | F2 | L3 | L2 | L3 | L2 | L3 | L2 | L2 | L2 | | H2 | | | | | F2 | F3 | |
| 31 | F2 | F2 | F2 | | | | | | C2 | L2 | L2 | L1 | L2 | L2 | L2 | L2 | L2 | F2 | F2 | | | | | |
| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| CNT | | | | | | | | | | | | | | | | | | | | | | | | |
| MED | | | | | | | | | | | | | | | | | | | | | | | | |
| U Q | | | | | | | | | | | | | | | | | | | | | | | | |
| L Q | | | | | | | | | | | | | | | | | | | | | | | | |

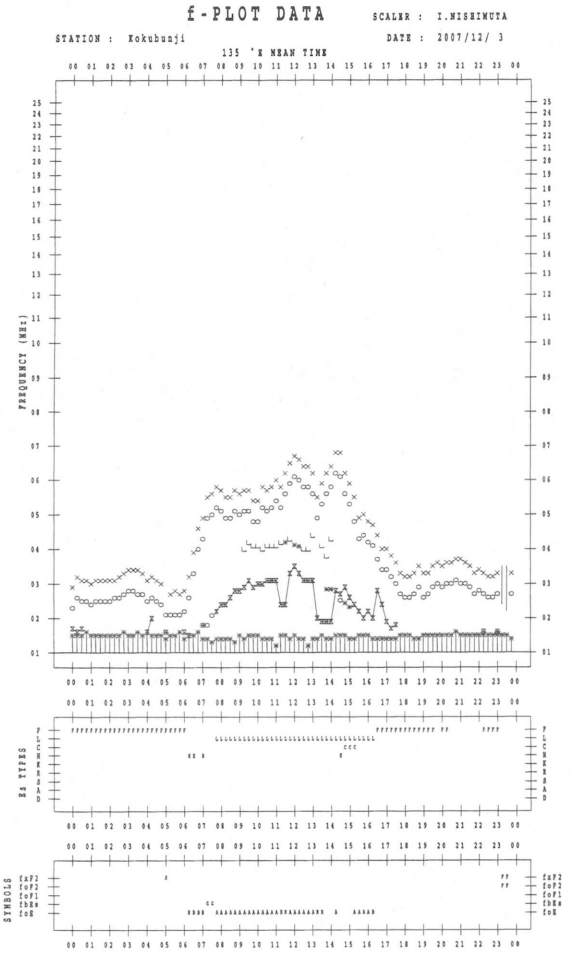
**DEC. 2007 TYPES OF Es**

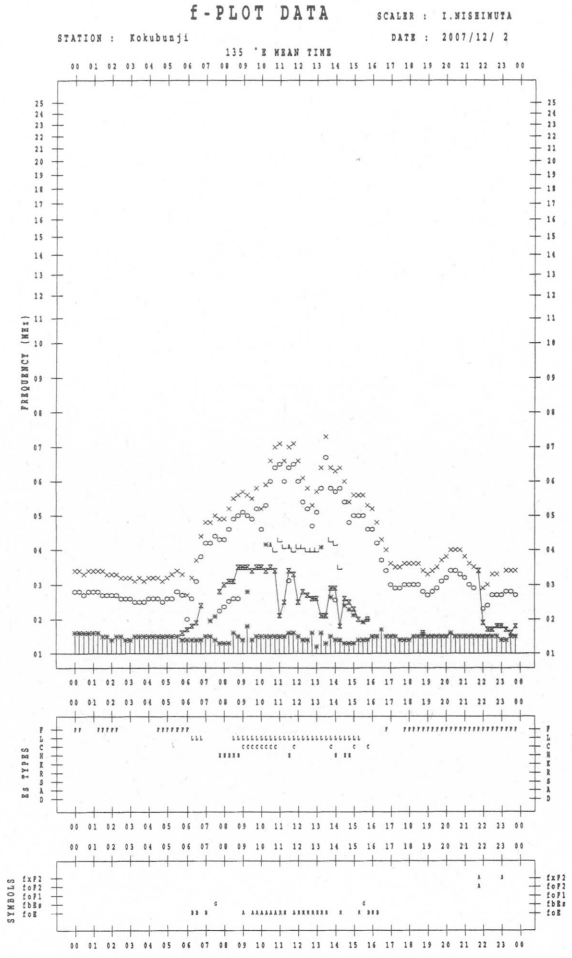
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

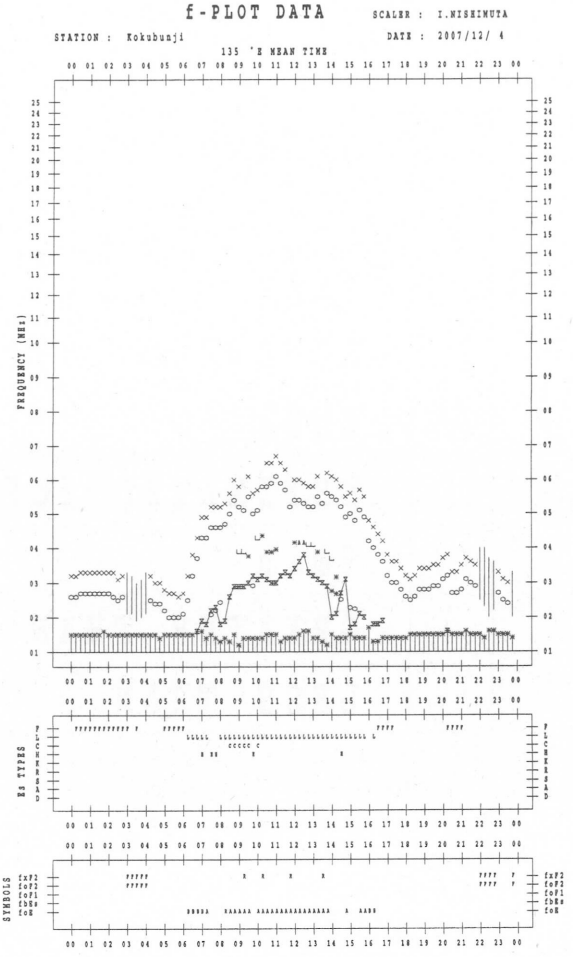
# f-PLOTS OF IONOSPHERIC DATA

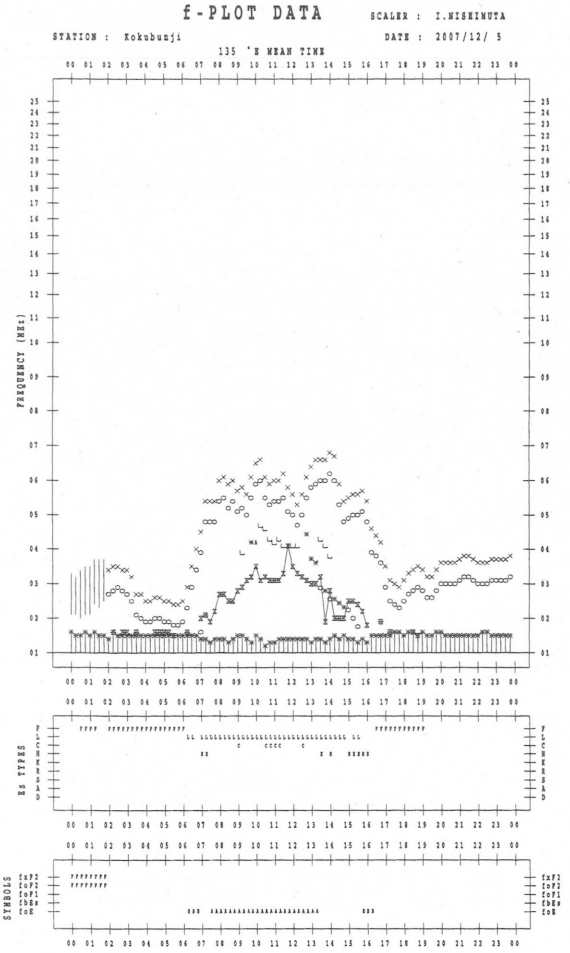
| KEY OF f-PLOT | |
|---|---|
|  | SPREAD |
|  | foF2, foF1, foE |
|  | fxF2 |
|  | DOUBTFUL foF2, foF1, foE |
|  | fbEs |
|  | ESTIMATED foF1 |
|  | fmin |
|  | GREATER THAN |
|  | LESS THAN |

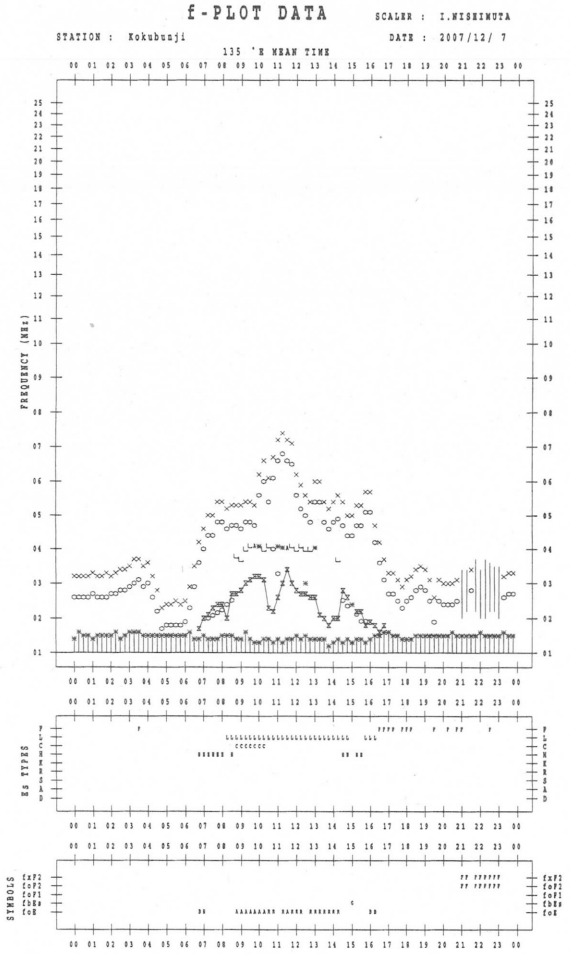

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

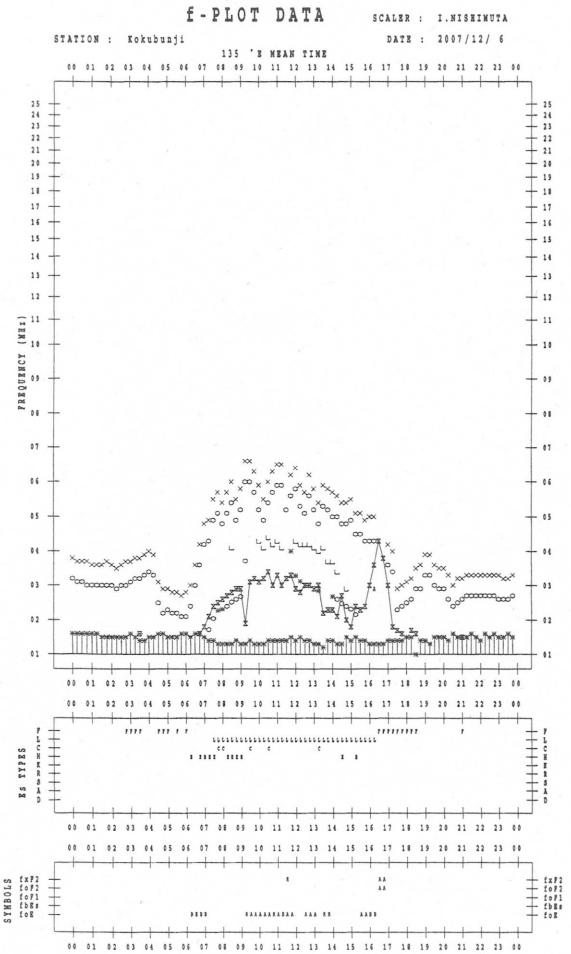

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

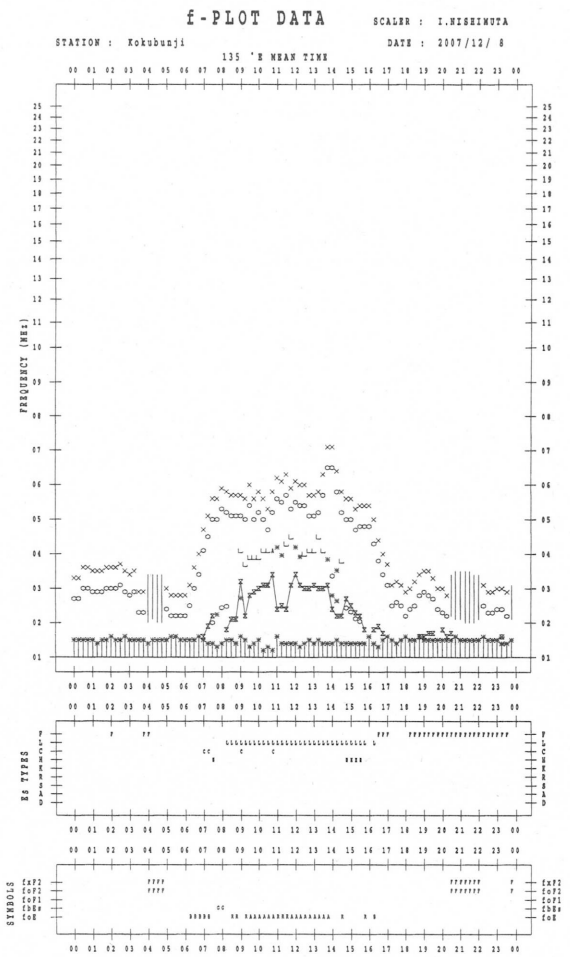

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

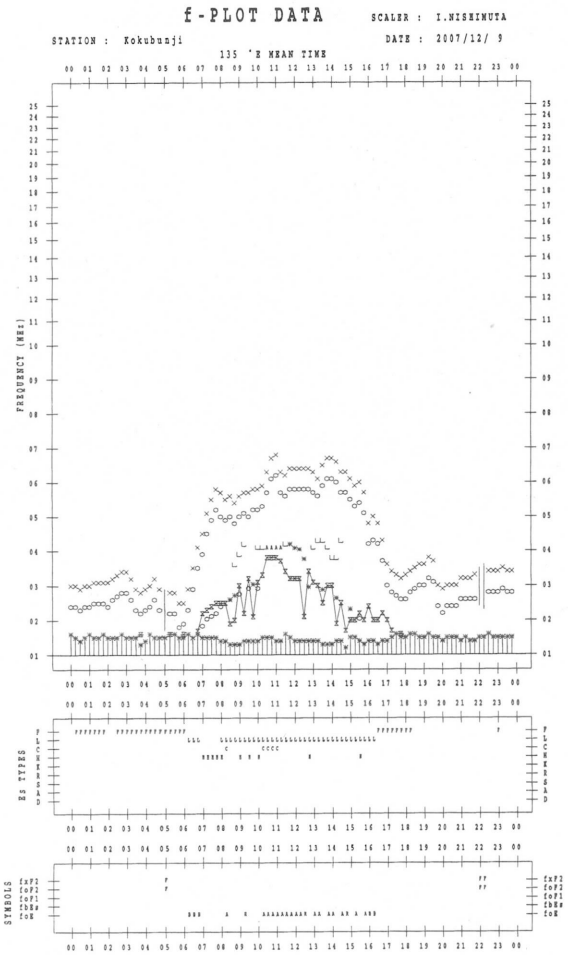

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

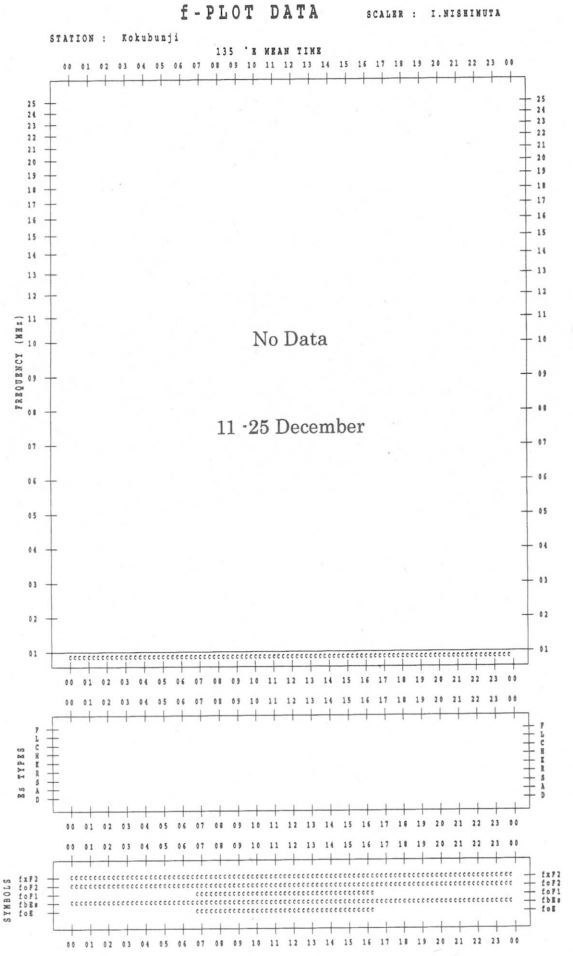

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 5
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

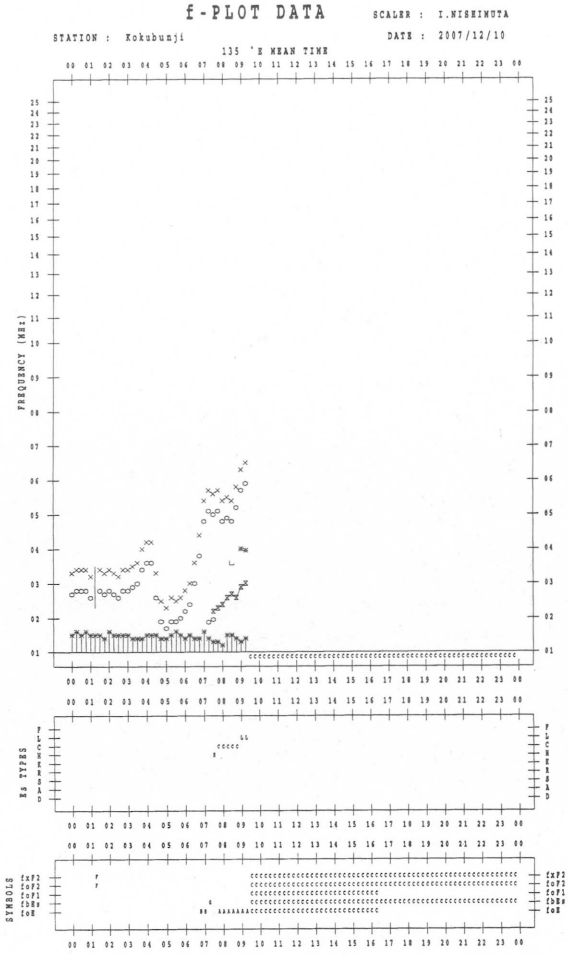

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 7
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

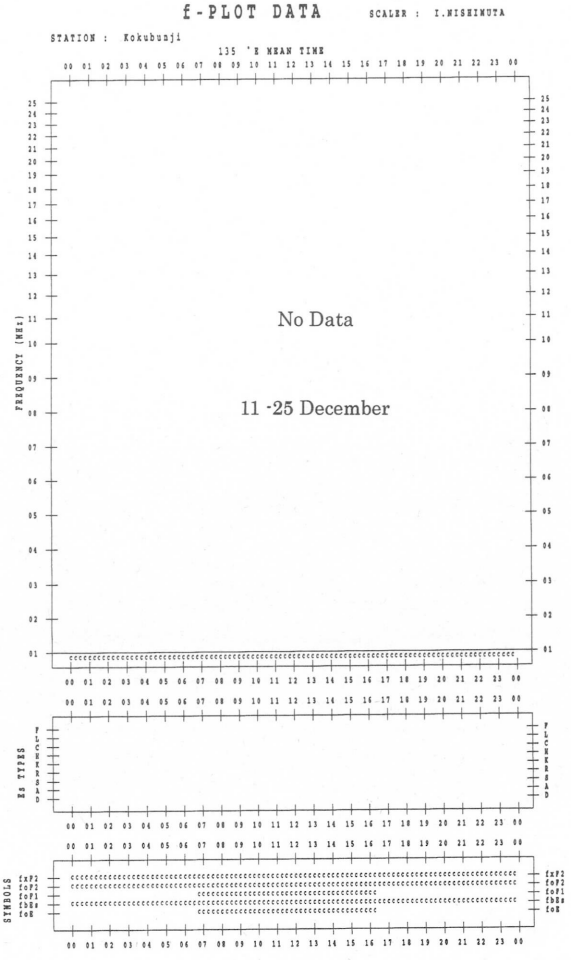

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 6
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 8
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
135 °E MEAN TIME
No Data
11 -25 December
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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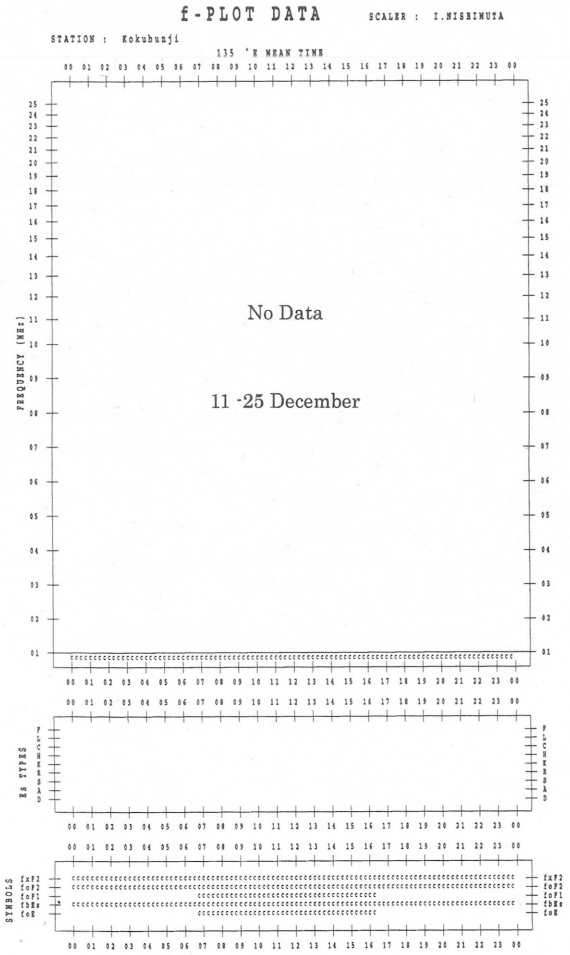
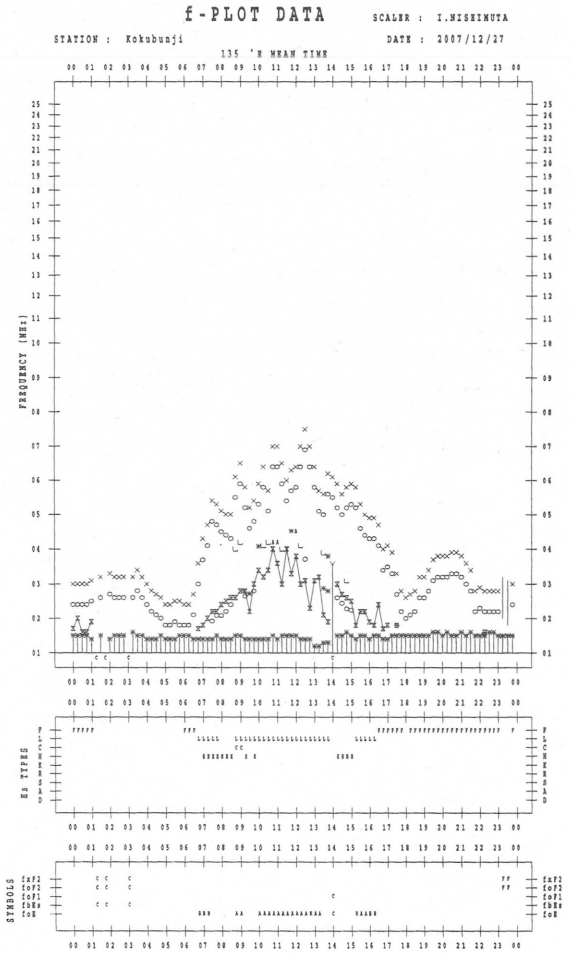
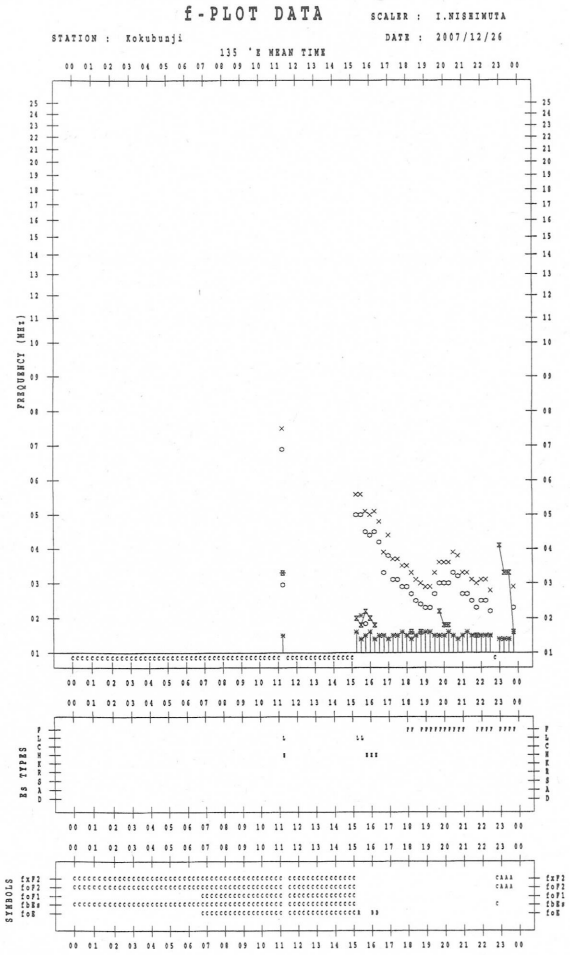
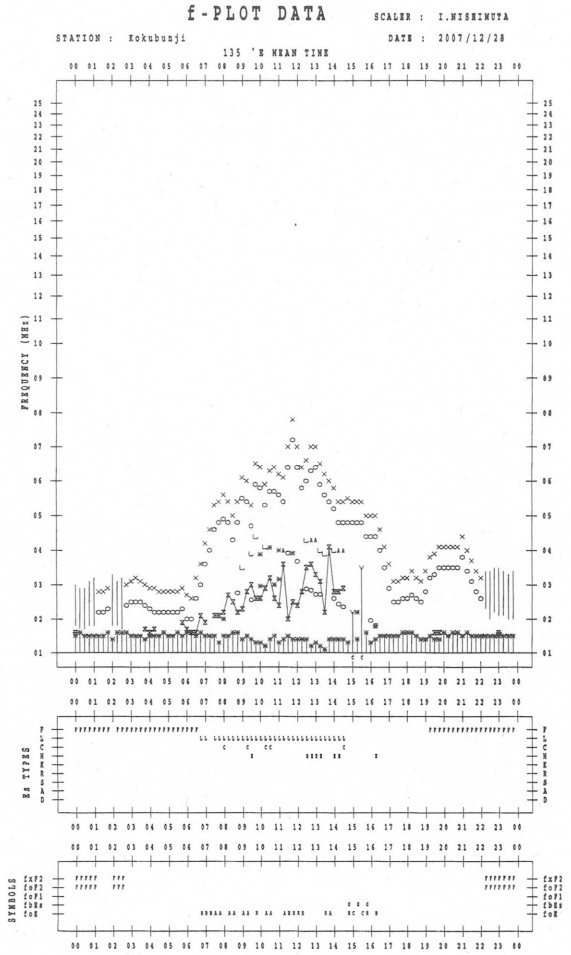
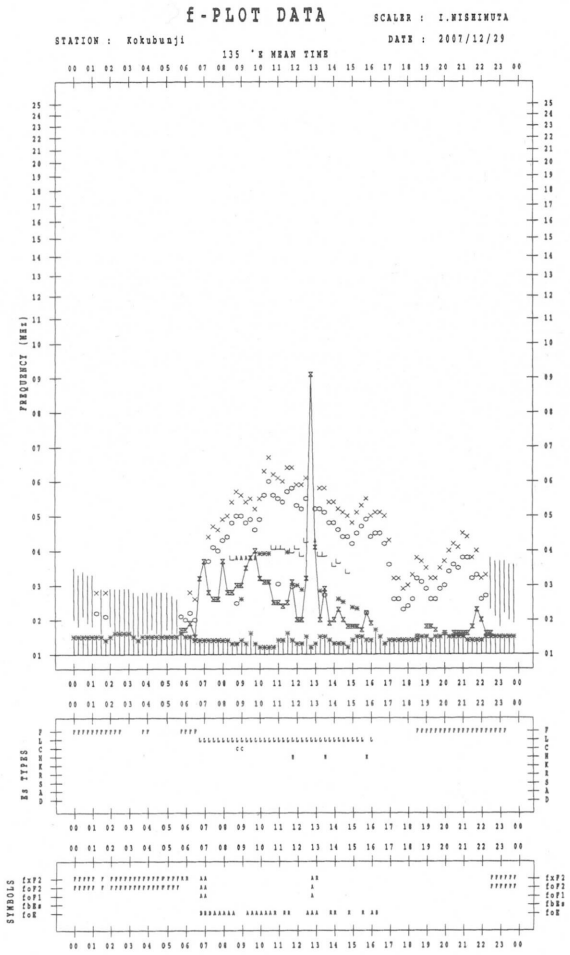
STATION : Kokubunji
135 °E MEAN TIME
No Data
11 -25 December
FREQUENCY (MHz)
Es TYPES
SYMBOLS

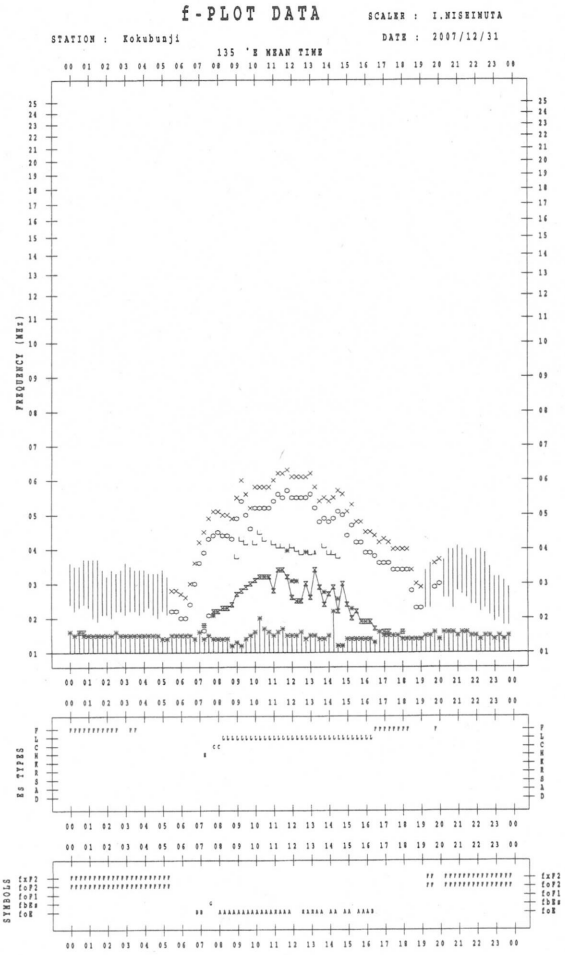

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
135 °E MEAN TIME
No Data
11 -25 December
FREQUENCY (MHz)
Es TYPES
SYMBOLS

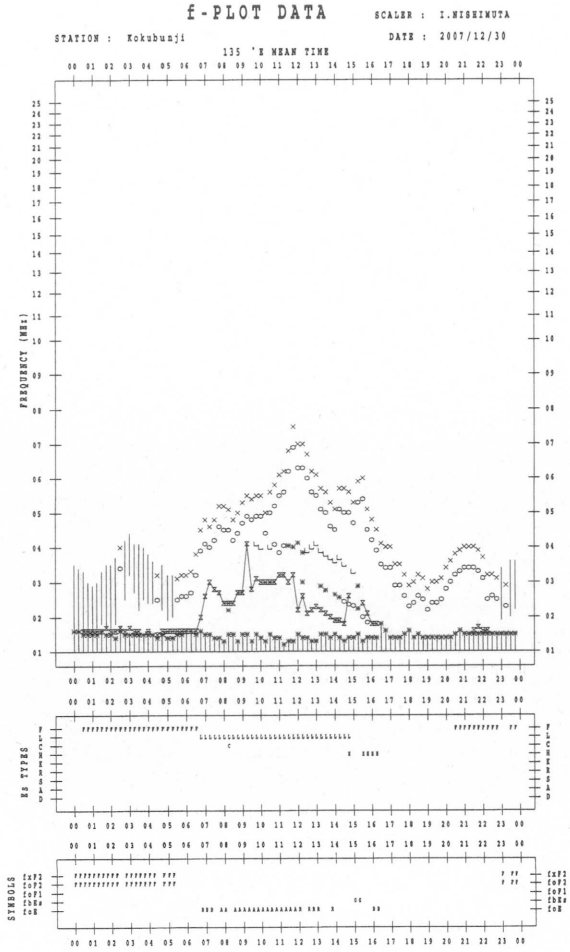

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2007/12/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

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

Since 10th November 2004, offering of 500MHz observational data has been finished due to deterioration of the observational environment.

B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso December 2007

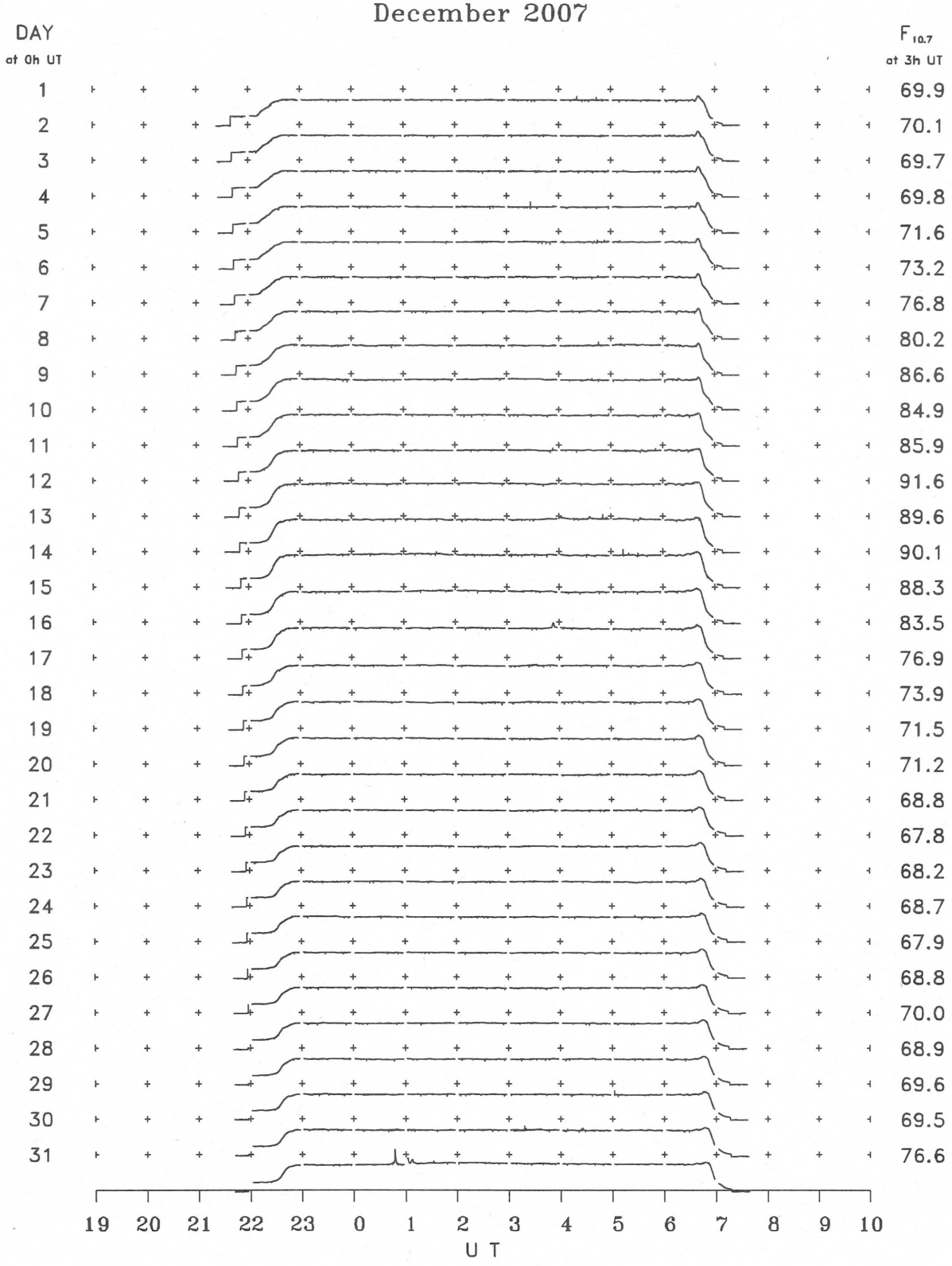
Single-frequency observations
Normal observing period: 2135 - 0730 U.T. (sunrise to sunset)

| DEC. 2007 | FREQ. (MHz) | TYPE | START TIME (U.T.) | TIME OF MAXIMUM (U.T.) | DUR. (MIN.) | FLUX DENSITY ($10^{-22}$ W $m^{-2}$ $Hz^{-1}$) PEAK | FLUX DENSITY ($10^{-22}$ W $m^{-2}$ $Hz^{-1}$) MEAN | POLARIZATION REMARKS |
|---|---|---|---|---|---|---|---|---|
| 13 | 2800 | 1 S | 0434.0 | 0436.0 | 4.0 | 10 | - | |
| 16 | 2800 | 1 S | 0350.0 | 0353.0 | 7.0 | 15 | - | |
| 31 | 2800 | 7 F | 0041.0 | 0048.0 | 10.0 | 35 | - | |
| 31 | 2800 | 7 F | 0100.0 | 0103.0 | 12.0 | 25 | - | |

# B. Solar Radio Emission

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

### December 2007




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

IONOSPHERIC DATA IN JAPAN FOR DECEMBER 2007
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☎(042)(327)7540(直通)

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2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184-8795 JAPAN