**First observations of daytime** **range spread F** **at middle latitude during the afternoon hours**

**Lehui Wei1, Chunhua Jiang1\*, Ting Lan2, Wenxuan Wang1, Hua Sheng3, Ercha A3, Wengeng Huang3, Jing Liu4, Guobin Yang1, Yaogai, Hu1, Zhengyu Zhao1**

1 School of Electronic Information, Wuhan University, 430072, Wuhan, Hubei, China.

2 School of Computer, Huanggang Normal University, 438000, Huanggang, Hubei, China.

3 National Space Science Center, Chinese Academy of Sciences, Beijing, China.

4 Institute of Earthquake Forecasting, China Earthquake Administration, Beijing, China.

Corresponding author: Chunhua Jiang ([chuajiang@whu.edu.cn)](mailto:email@address.edu))

**Contents of this file**

Tables S1

**Additional Supporting Information (Files uploaded separately)**

**puer.zip and qujing.zip**

The file of 20161223.zip includes ionograms (\*.amp) at ZHY station.

**Introduction**

This supporting information provides the ionograms and airglow data used in this study. It is noted that the recorded time of the data is Beijing Time (UT+8h), the local time is UT+7h.

The files of \*.amp in 20161223.zip are corresponding to ionograms data.

The file format of \*.amp was shown in Table S1, readers could read them instructed by Tables S1.

Table S1.File format of \*.amp recorded by ionosonde

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Bytes | Description | Unit | Range | Type |
| 1-4 | Start frequency | MHz | 0-20 | float |
| 5-8 | Step frequency | KHz | 0-1000 | float |
| 9-12 | Stop frequency | MHz | 0-20 | float |
| 13-16 | Sounding times of each frequency | time | 1-128 | float |
| 17-20 | Total Range number of echoes | one | 1-700 | float |
| 21-24 | Range resolution | km | 3.84, 3.84\*n,n=1,2.. | float |
| 25-28 | Number of frequency | one | 1-1000 | float |
| 29-32 | Echo starting position | one | 1-20 | float |
| 33-36 | Type of sounding code | - | 1:complementary code; otherwise: m sequence | float |
| 37-40 | Code order | one | 1-20 | float |
| 41-44 | Pulse width | one | 1-20 | float |
| 45-48 | Pulse repetition period | second | 1-1000 | float |
| 49-52 | Start year | year | 0-2999 | float |
| 53-56 | Start month | month | 1-12 | float |
| 57-60 | Start day | day | 1-31 | float |
| 61-64 | Start hour | hour | 0-24 | float |
| 65-68 | Start minute | minute | 0-59 | float |
| 69-72 | Start second | second | 0-59 | float |
| 73-76 | Stop year | year | 0-2999 | float |
| 77-80 | Stop month | month | 1-12 | float |
| 81-84 | Stop day | day | 1-31 | float |
| 85-88 | Stop hour | hour | 0-24 | float |
| 89-92 | Stop minute | minute | 0-59 | float |
| 93-96 | Stop second | second | 0-59 | float |
| 97-100 | Latitude of station | degree | 0-90 | float |
| 101-104 | Latitude of station | minute | 0-59 | float |
| 105-108 | Latitude of station | second | 0-59 | float |
| 109-112 | North and south latitude | - | 0:north; 1:south | float |
| 113-116 | Longitude of station | degree | 0-180 | float |
| 117-120 | Longitude of station | minute | 0-59 | float |
| 121-124 | Longitude of station | second | 0-59 | float |
| 125-128 | East and west longitude | - | 0: east; 1: west. | float |
| 129-132 | Code width | one | 1-100 | float |
| 133-136 | Mode of sounding | - | 0: sweep frequency sounding; 1: fixed frequency sounding; 2: hop frequency sounding. | float |
| 137-140 | Display Range number of echoes | one | 1-700, indicates number of echoes to be displayed on ionogram. | float |
| 141-144 | Type of sounding | - | 0: vertical sounding; 1: backscatter sounding; 2: oblique sounding. | float |
| 145-500\*4 | Reserved | - | - | - |
| 500\*4+1-end | data | - | - | float |