

K4LED

Georgia Amateur Radio Astronomy Observatory

Observation Date: 08-05-2018, 0:00:00 to 23:59:00 UTC

Location: Lat. 34.42322 N, Lon. -84.49413 W (Jasper, GA 30143)

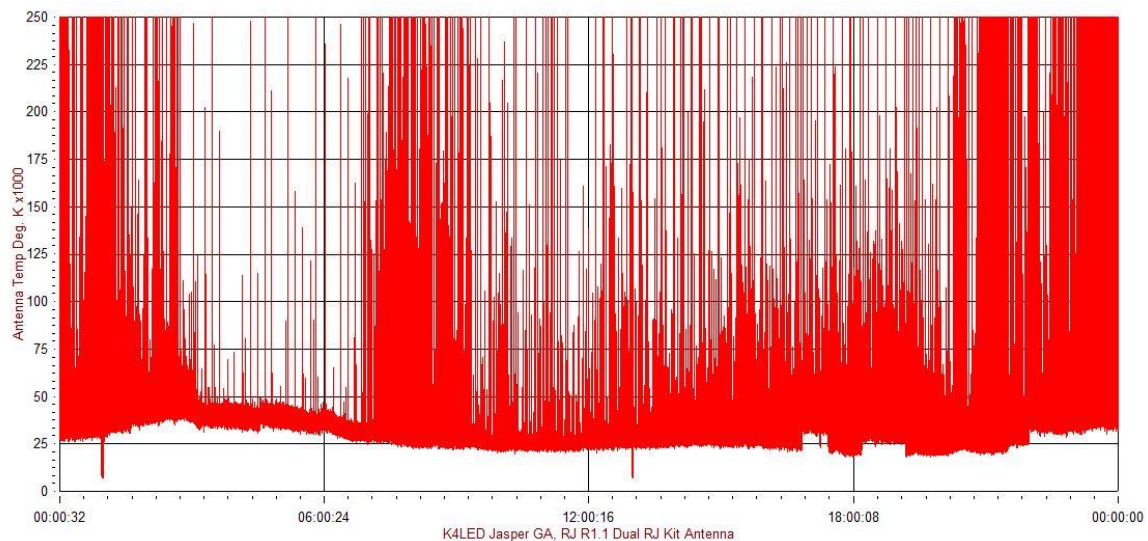
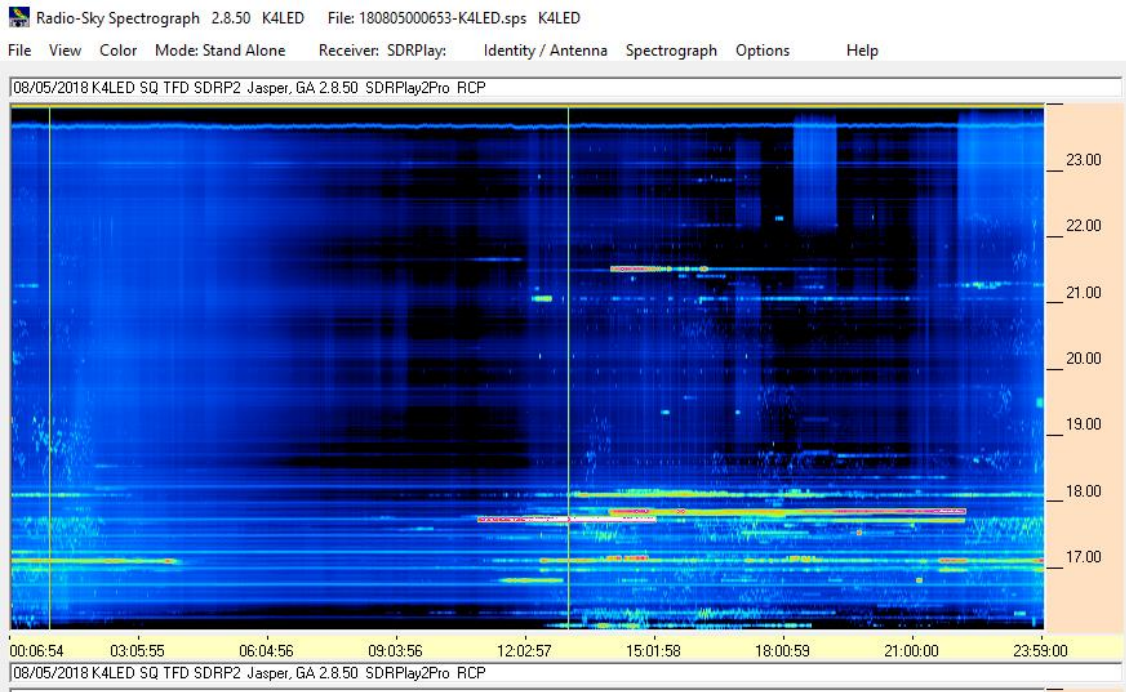
Object: Io-B

Observer: Larry E. Dodd

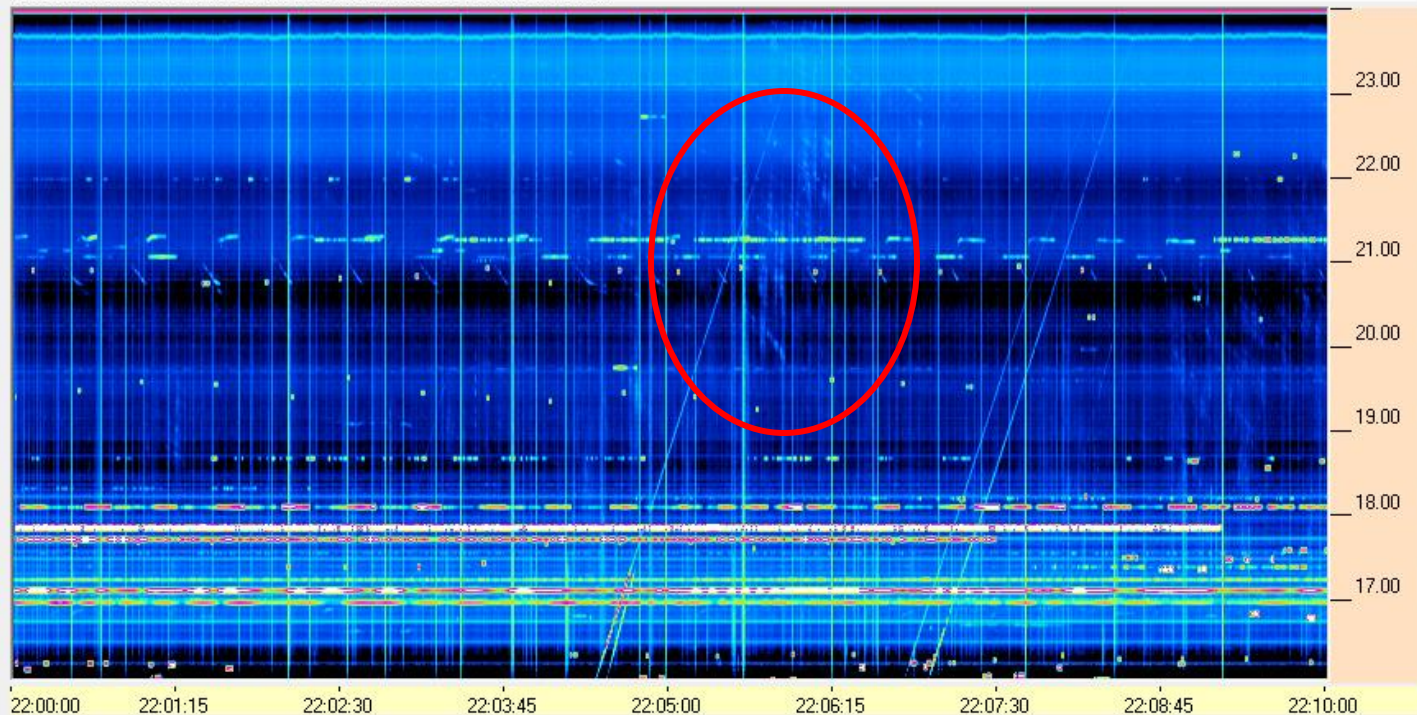
Receivers: Flagg FSX11, SDRPlay2PRO, Flagg RJ1.1

Software: SkypipeII 2.7.34, Spectrograph 2.8.50

Antennas: Radio Jove Dual Dipole Kit, Typinski Square TFD

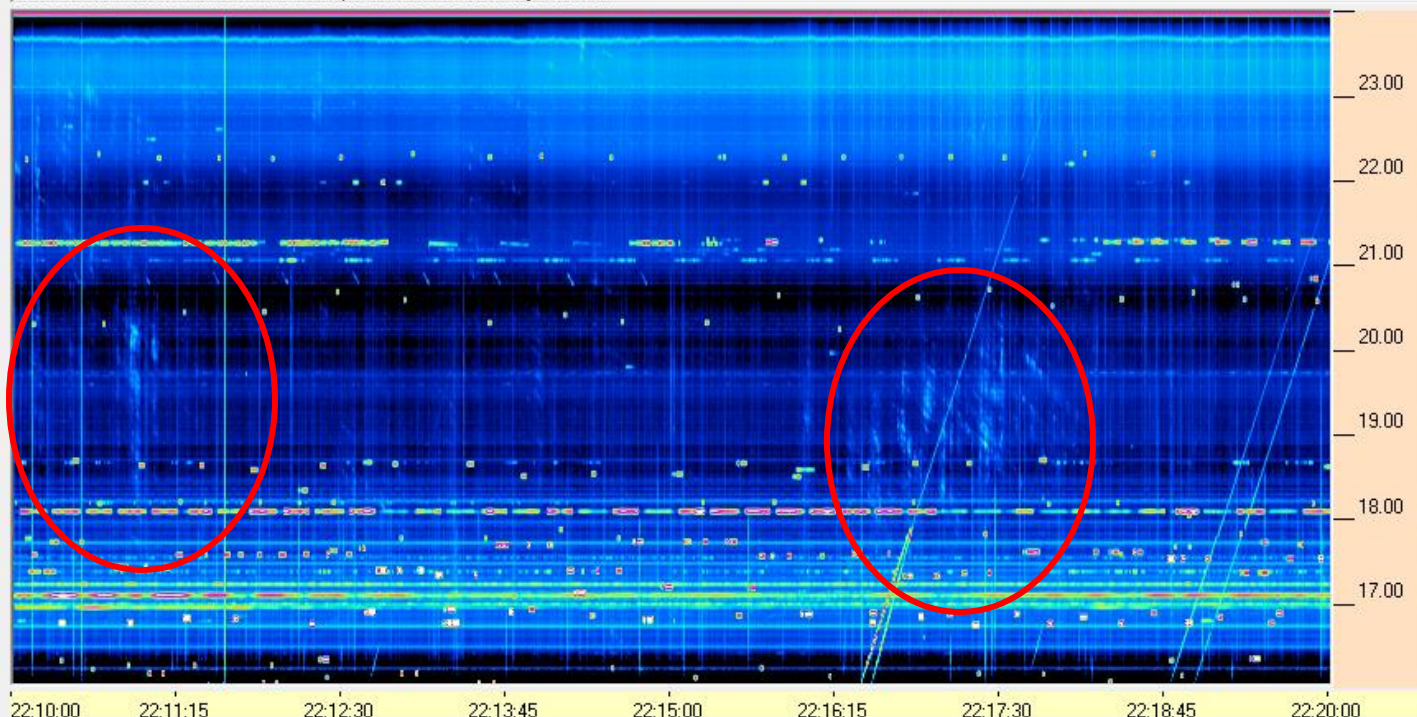


08/05/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP



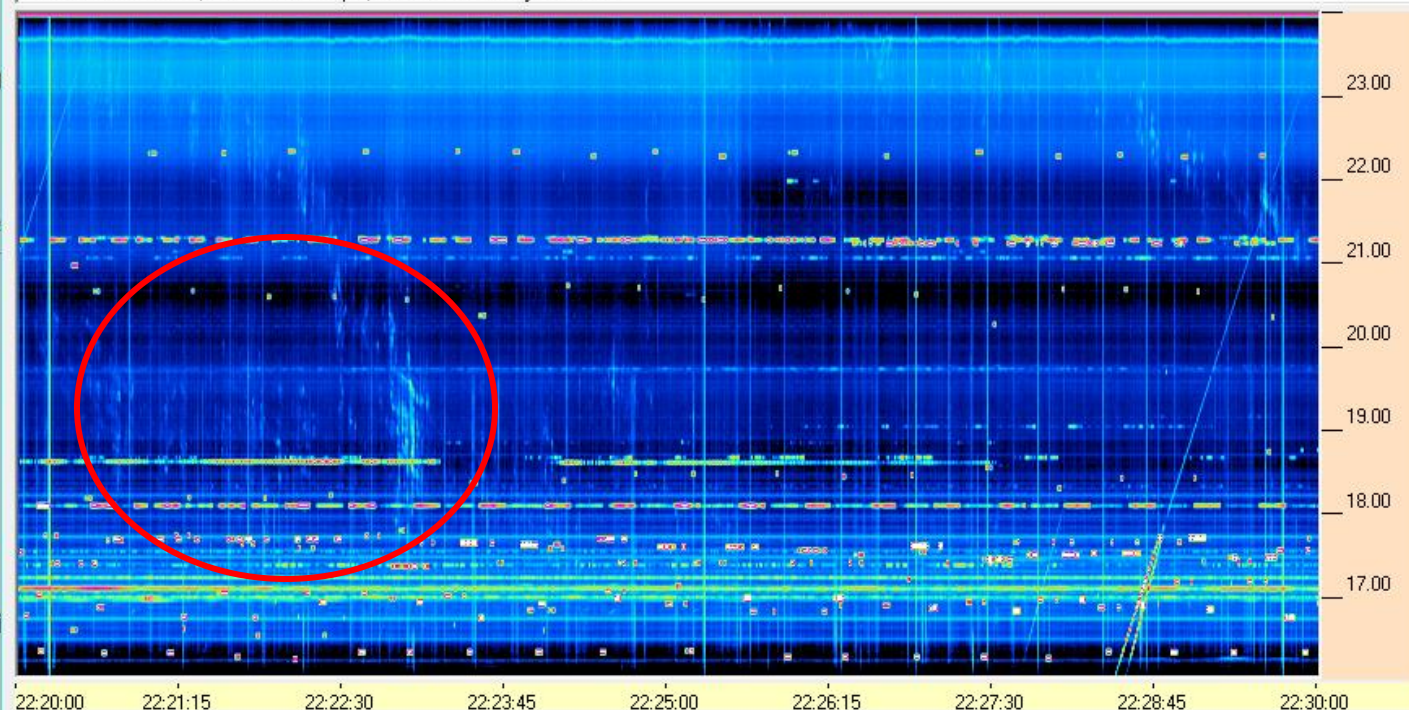
08/05/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

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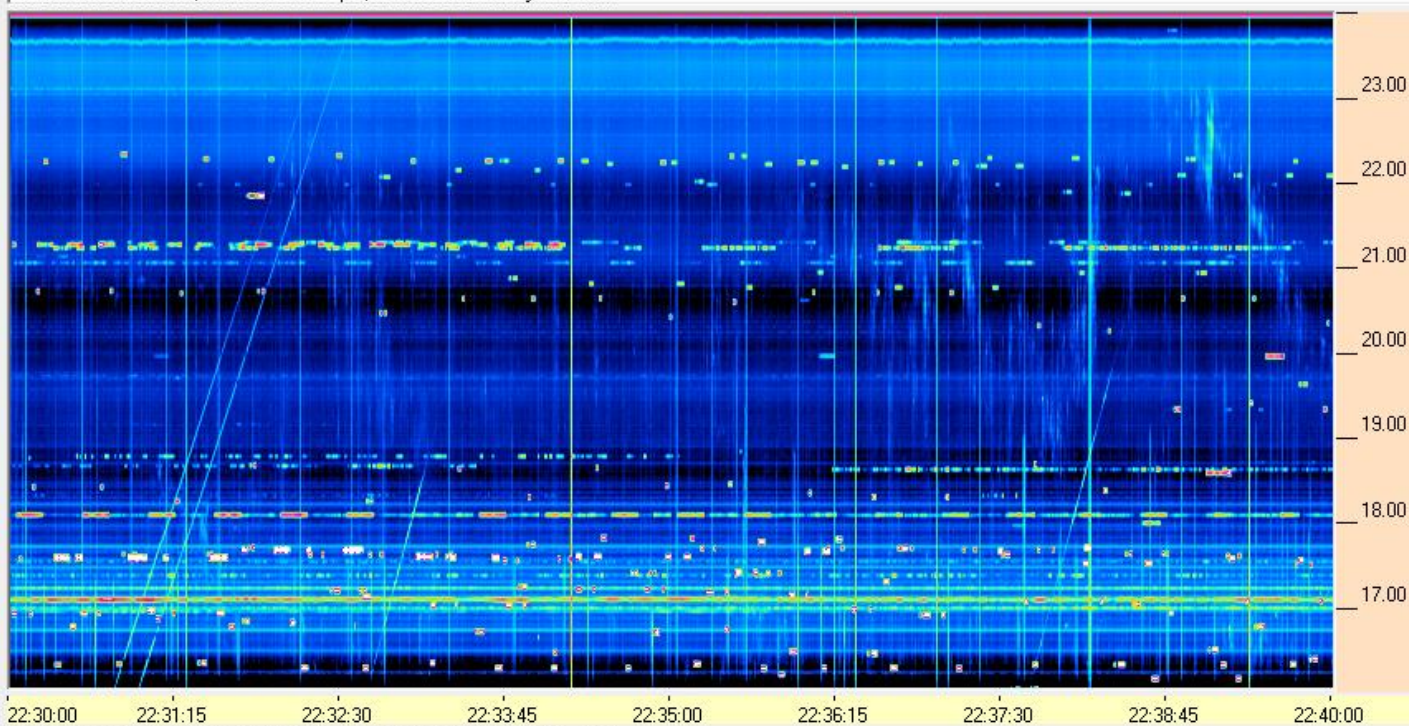
08/05/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

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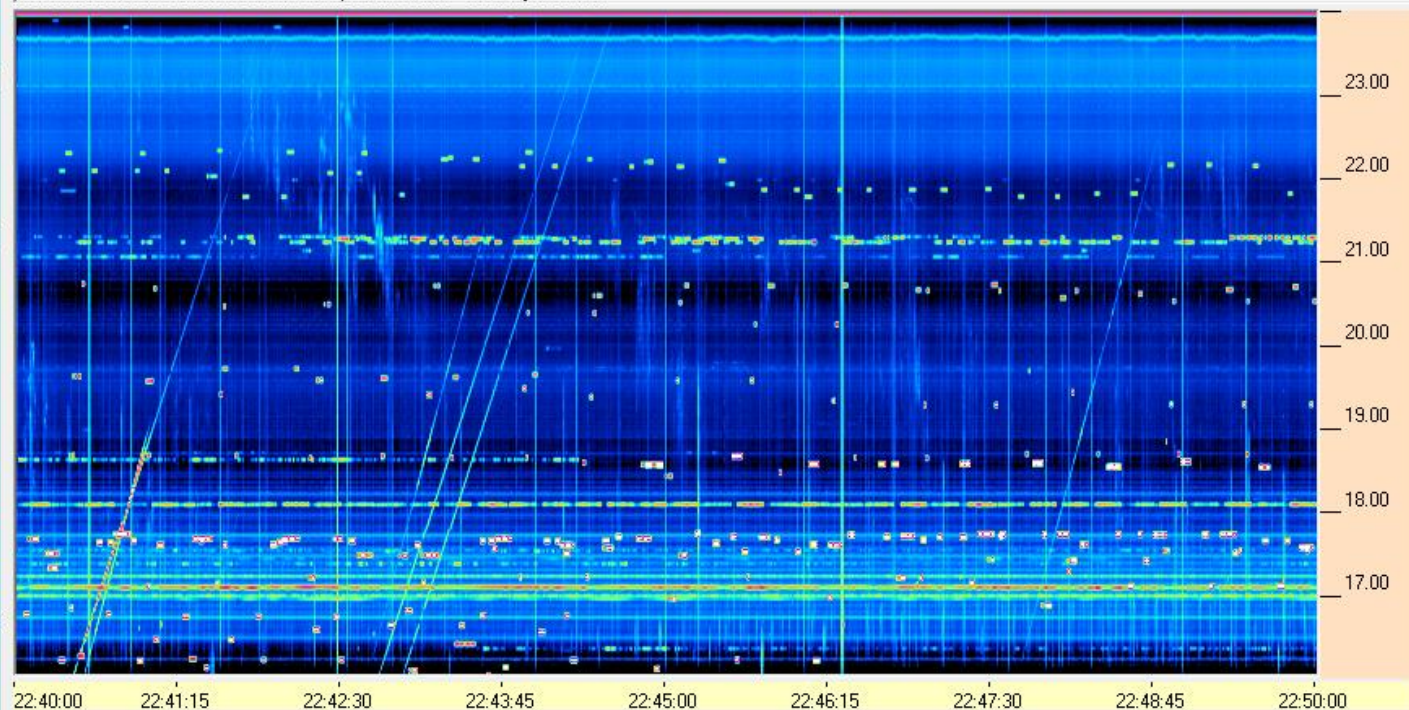
08/05/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

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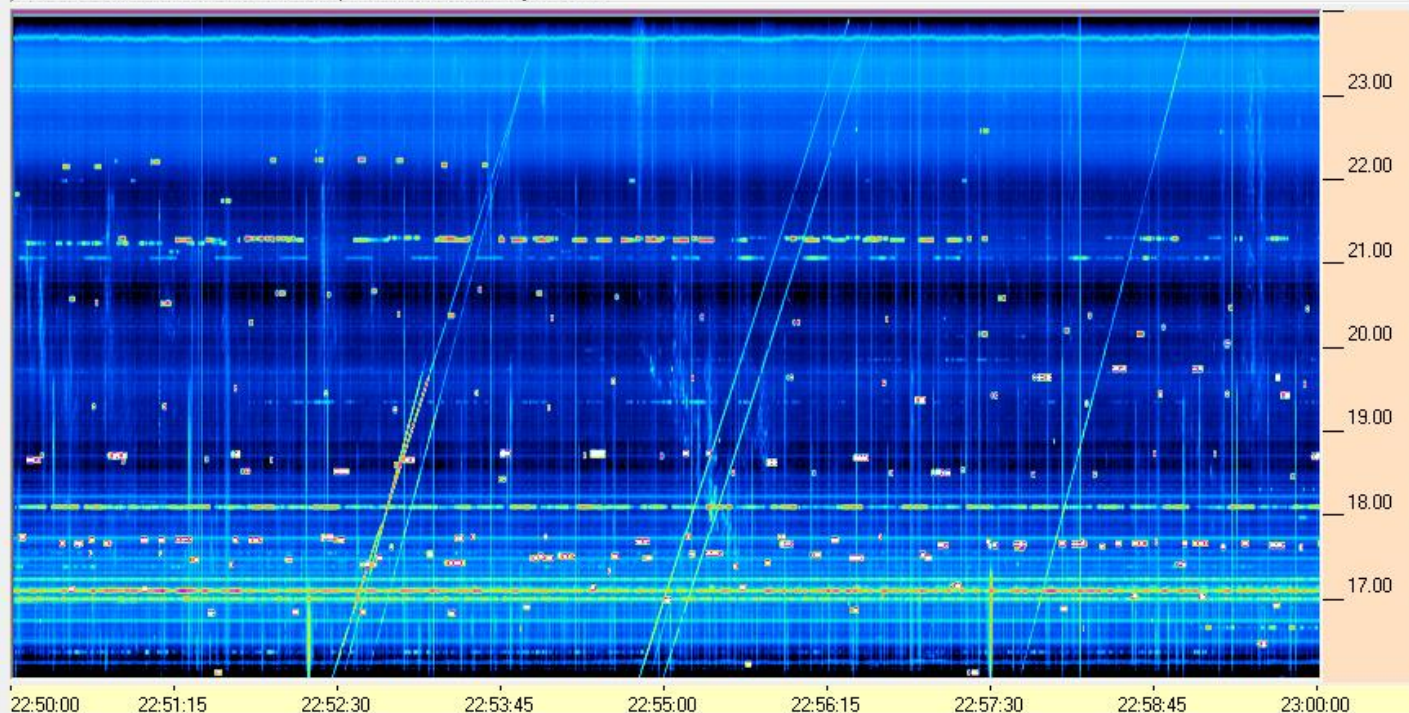
08/05/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

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Station YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
Eglin AFB 2018 Aug05 217 223000 RSF 1 713 100 03+ 79

foF2 5.100
foF1 3.61
foF1p N/A
foE 2.58
foEp 2.66
fxI 5.70
foEs 3.20
fmin 1.00

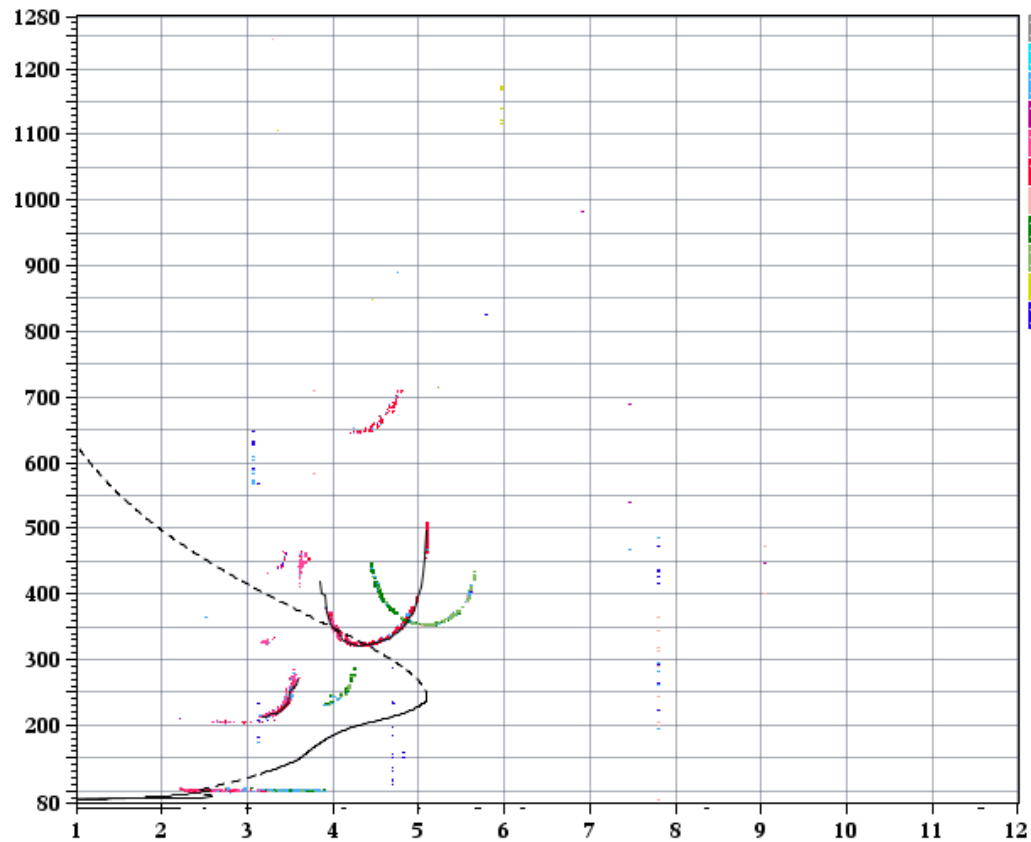
MUF(D) 16.10
M(D) 3.16
D N/A

h`F 212.5
h`F2 320.0
h`E 86.4
h`Es 95.0

hmF2 240.9
hmF1 149.6
hmE 91.3
yF2 71.8
yF1 43.5
yE 4.2
B0 152.2
B1 1.02

C-level 11

Auto:
Artist5
500200



D 100 200 400 600 800 1000 1500 3000 [km]
MUF 5.7 5.8 6.0 6.4 6.9 7.8 10.1 16.1 [MHz]
39015669.tmp / 440fx512h 25 kHz 2.5 km / DPS-4D EG931 084 / 30.5 N 273.5 E

ShowIonogram v 1.0

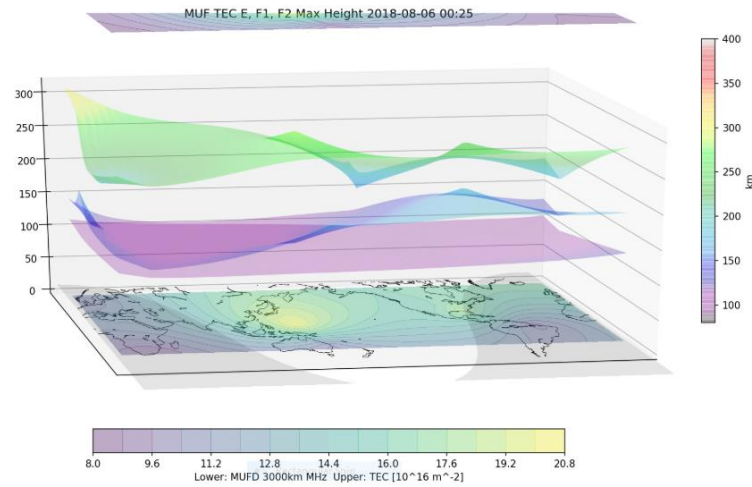
References for Interpreting the Ionogram:

http://www.sws.bom.gov.au/IPSHosted/INAG/uag_23a/UAG_23A_indexed.pdf

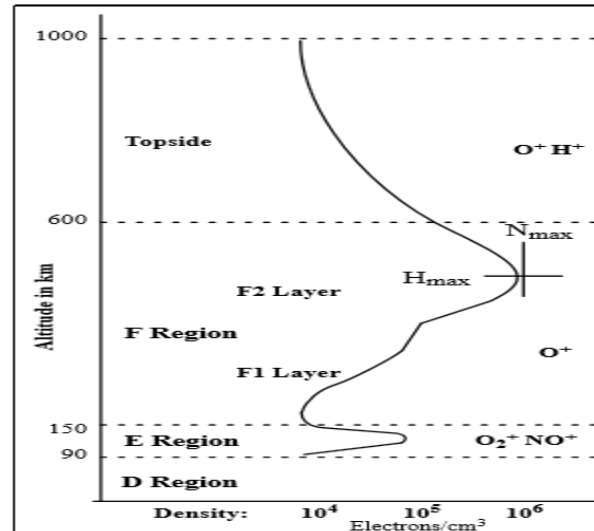
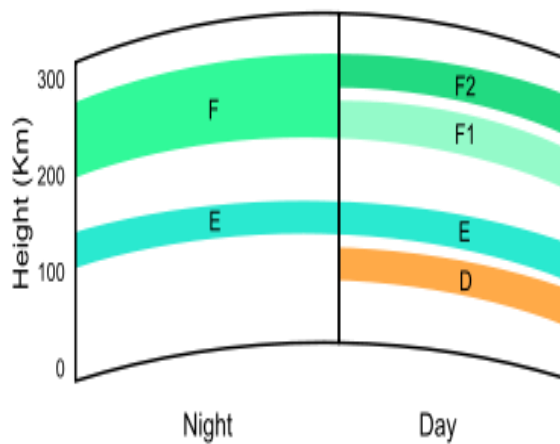
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.404.5517&rep=rep1&type=pdf>

<https://www.hfunderground.com/wiki/index.php/Ionosonde>

Ionosphere Layers, MUF, Total Electron Content



Data Global Ionospheric Radio Observatory (GIRO) Principal Investigator Prof. B. W. Reinisch UMass Lowell



The **critical frequency** is the limiting frequency at or below which a radio wave is reflected by an ionospheric layer at vertical **incidence**. If the transmitted frequency is higher than the **plasma frequency** of the ionosphere, then the electrons cannot respond fast enough, and they are not able to re-radiate the signal. It is calculated as shown below:

$$f_{\text{critical}} = 9 \times \sqrt{N}$$

where N = electron density per m^3 and f_{critical} is in Hz.

The Maximum Usable Frequency (MUF) is defined as the upper frequency limit that can be used for transmission between two points at a specified time.

$$f_{\text{muf}} = \frac{f_{\text{critical}}}{\sin \alpha}$$

where α = **angle of attack**, the angle of the wave relative to the **horizon**, and $\sin$ is the **sine** function.

Reference: <https://en.wikipedia.org/wiki/Ionosphere>

