

K4LED

Georgia Amateur Radio Astronomy Observatory

Observation Date: 07-5-2018, 0:00:00 to 23:59:00 UTC

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

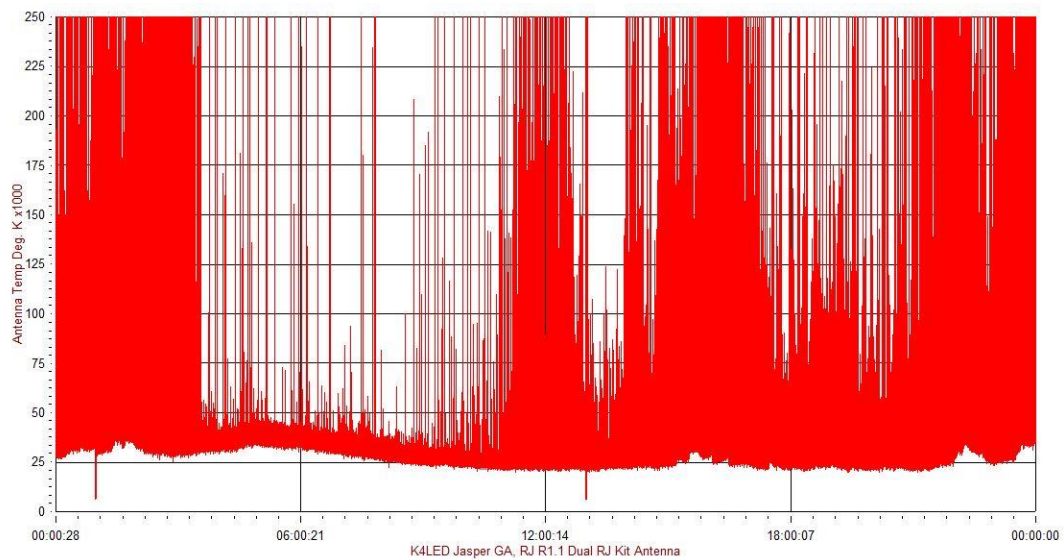
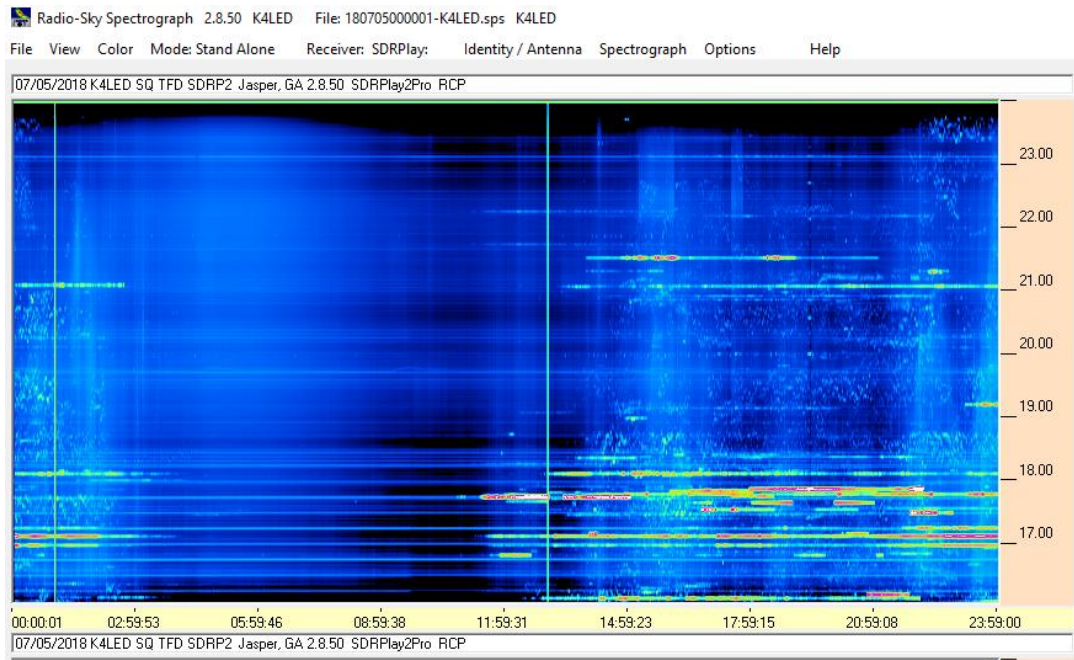
Object: TP, GB, Io-B

Observer: Larry E. Dodd

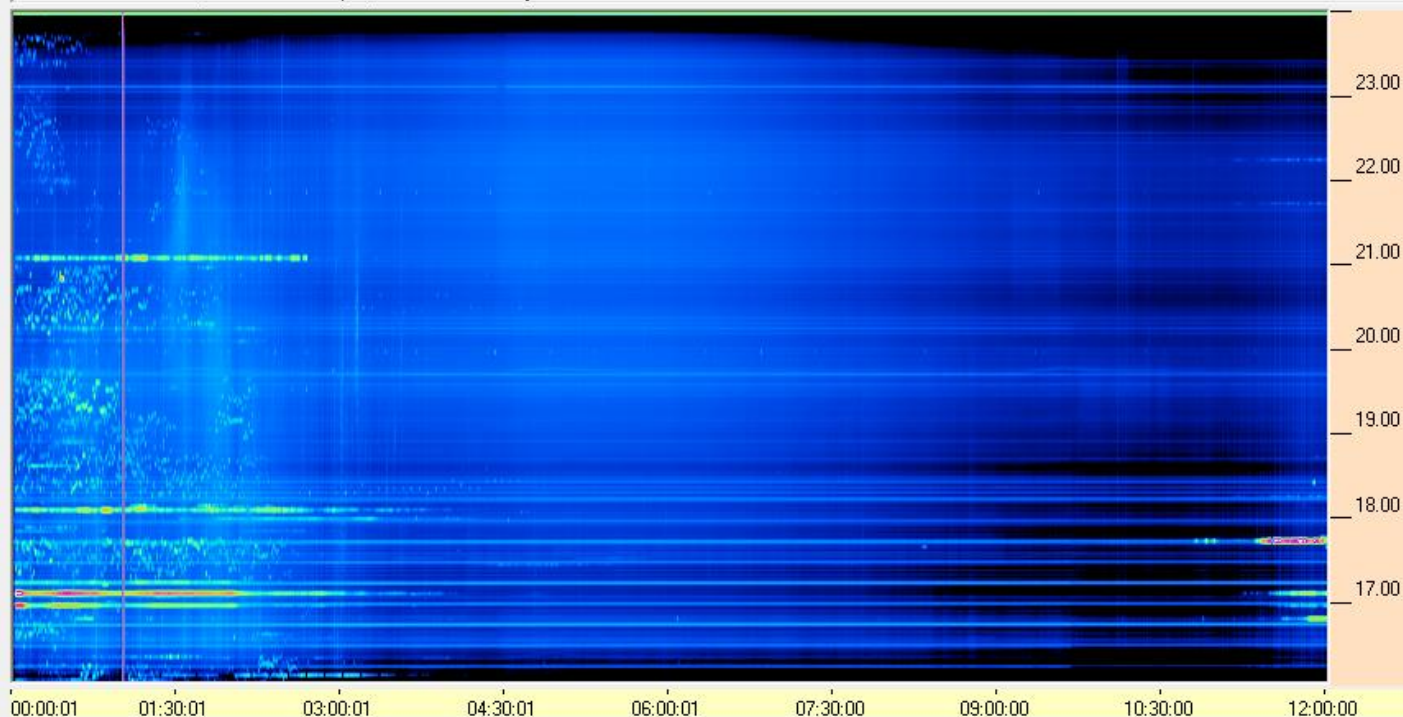
Receivers: FSX11, SDRPlay2PRO, RJ1.1

Software: SkypipeII 2.7.34, Spectrograph 2.8.50

Antennas: Radio Jove Dual Dipole Kit, Typinski Square TFD

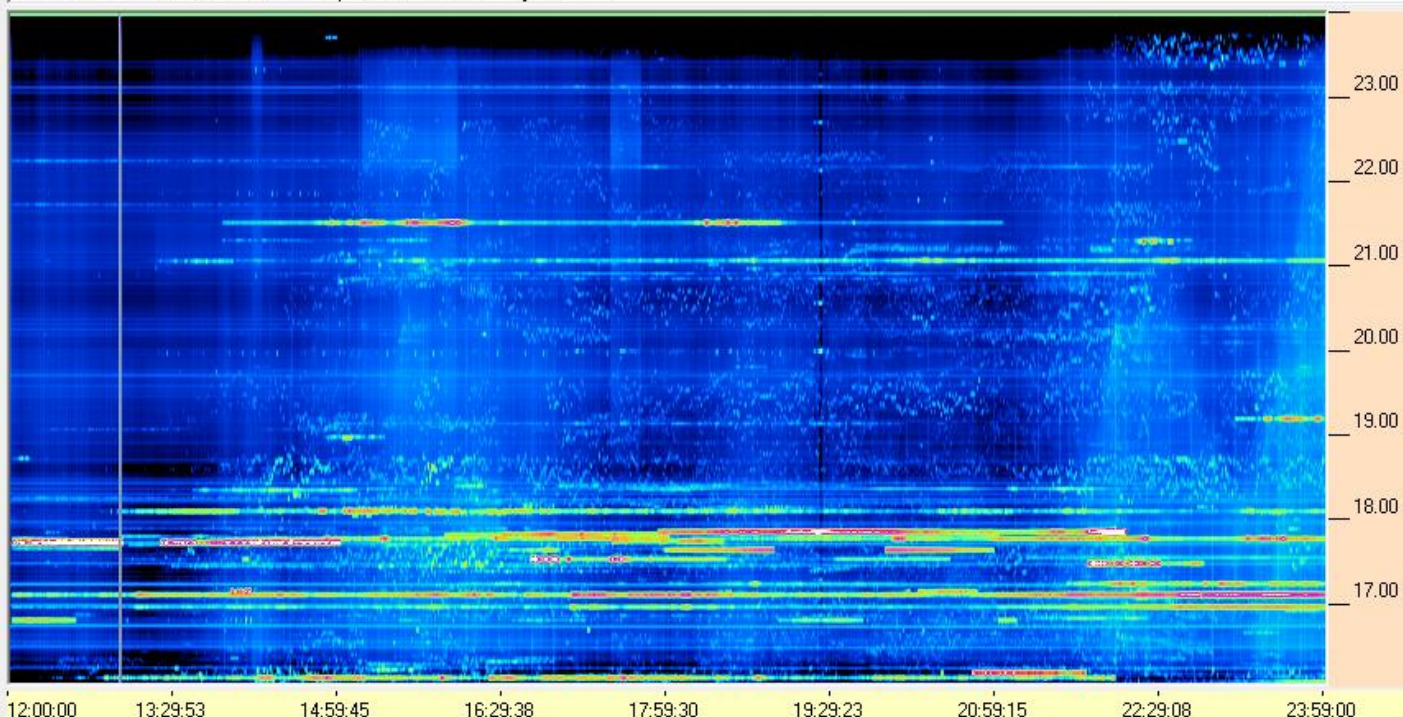


07/05/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP



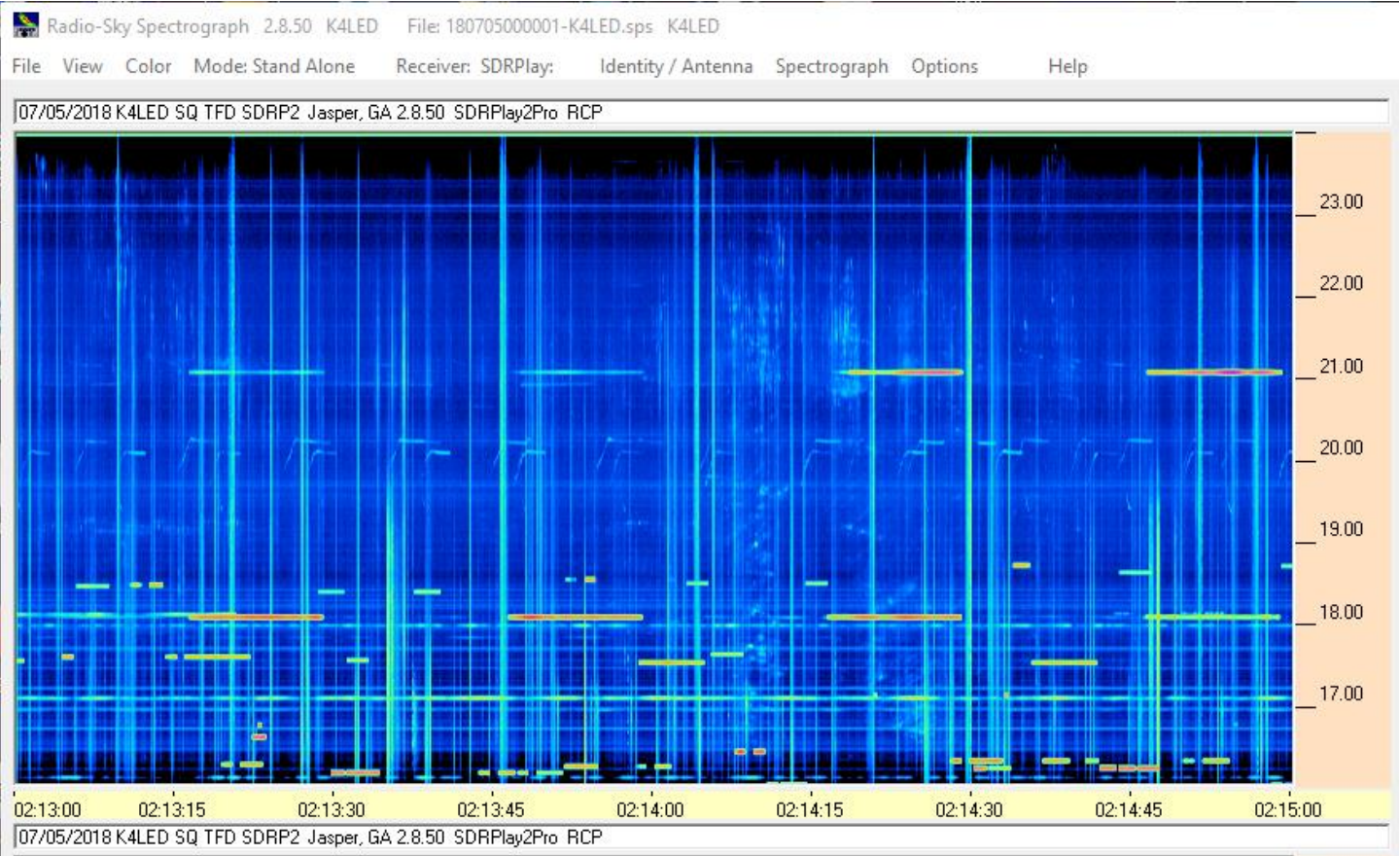
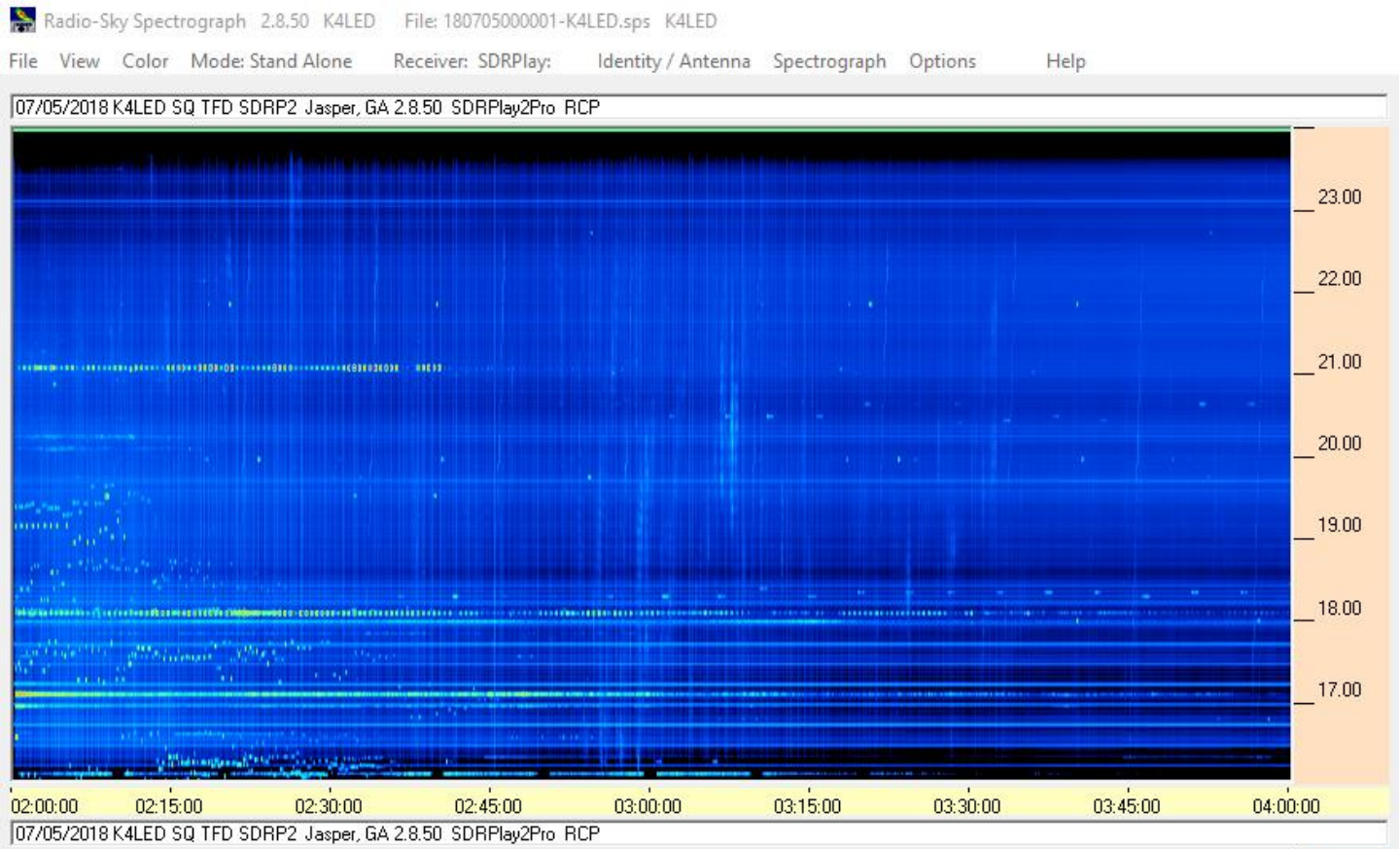
07/05/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

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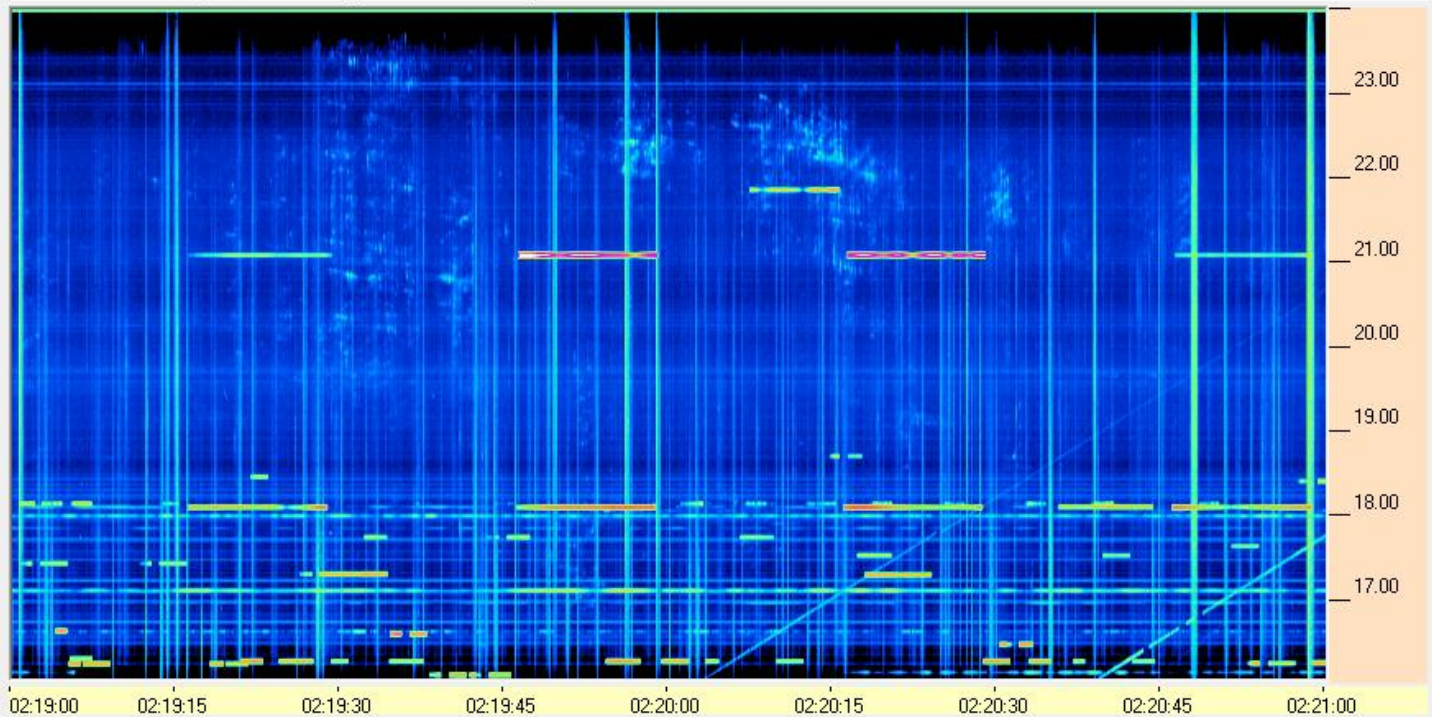


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Io-B

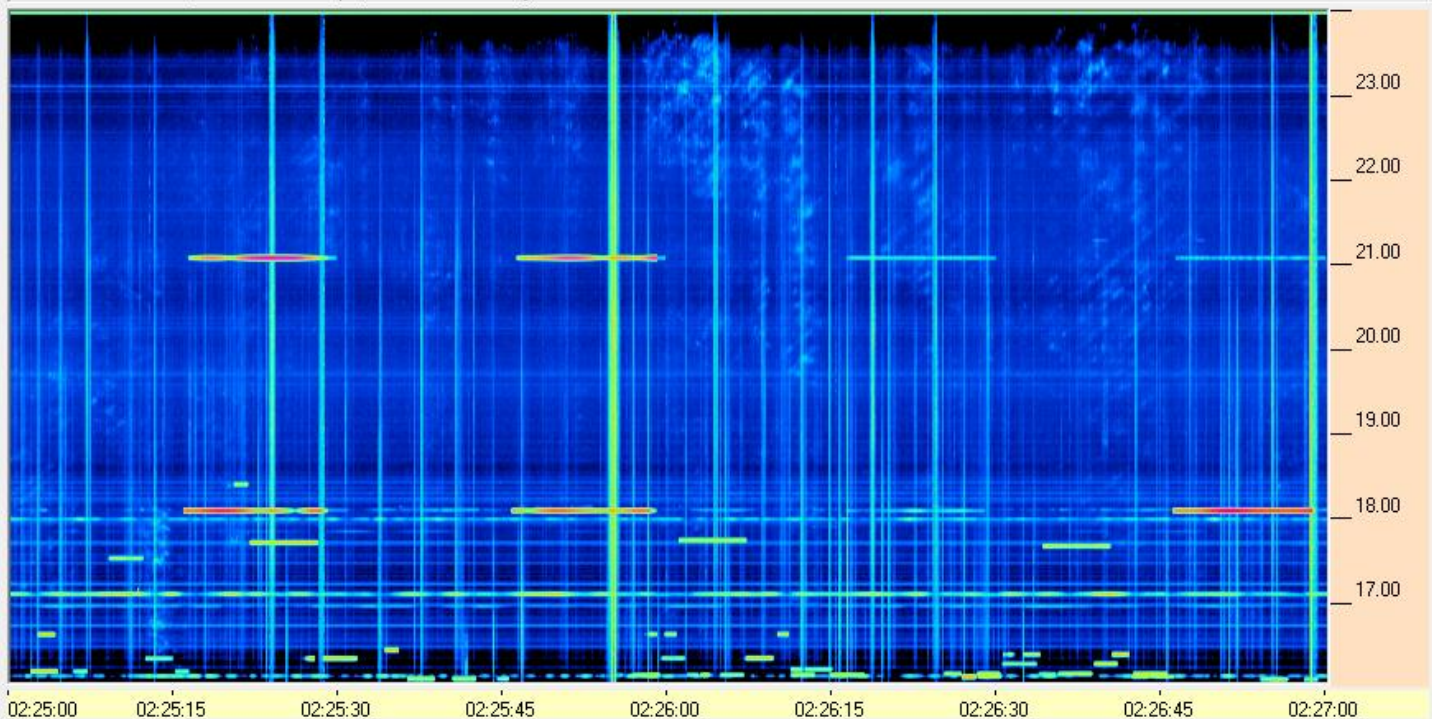


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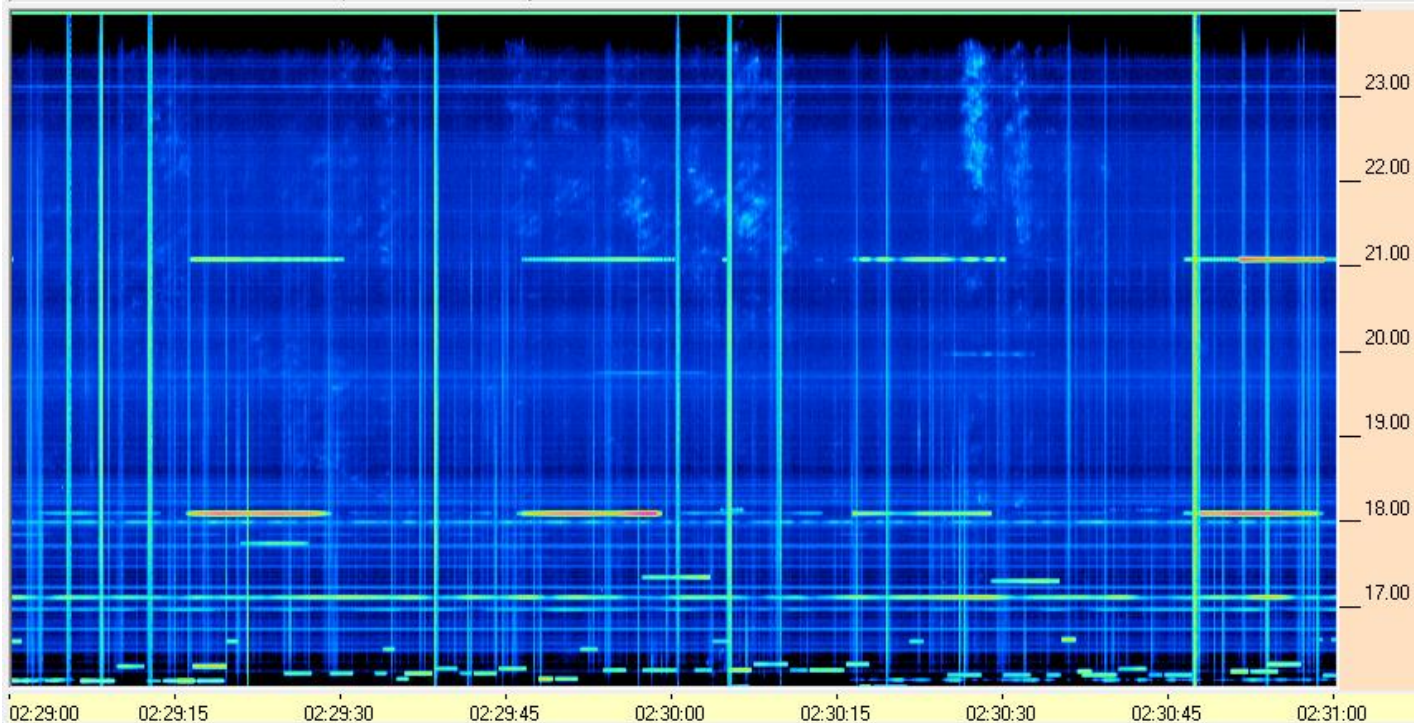
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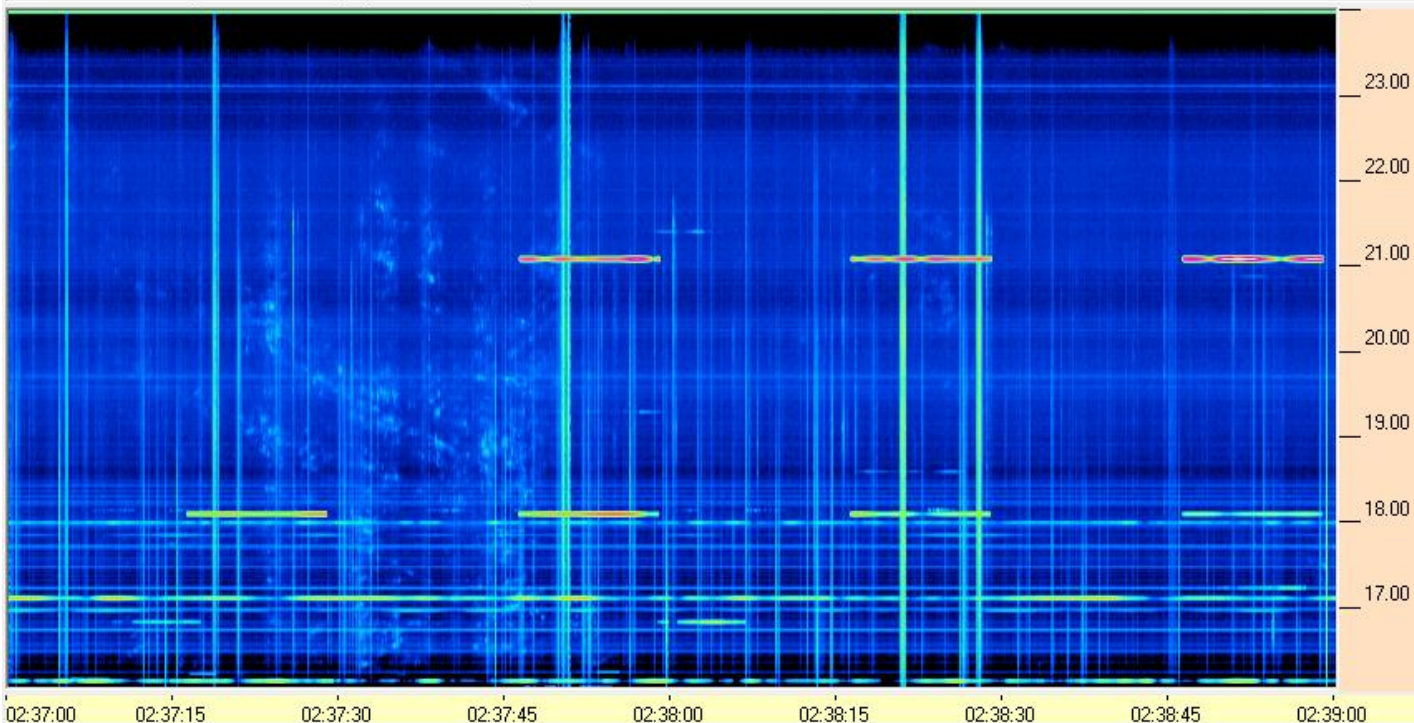
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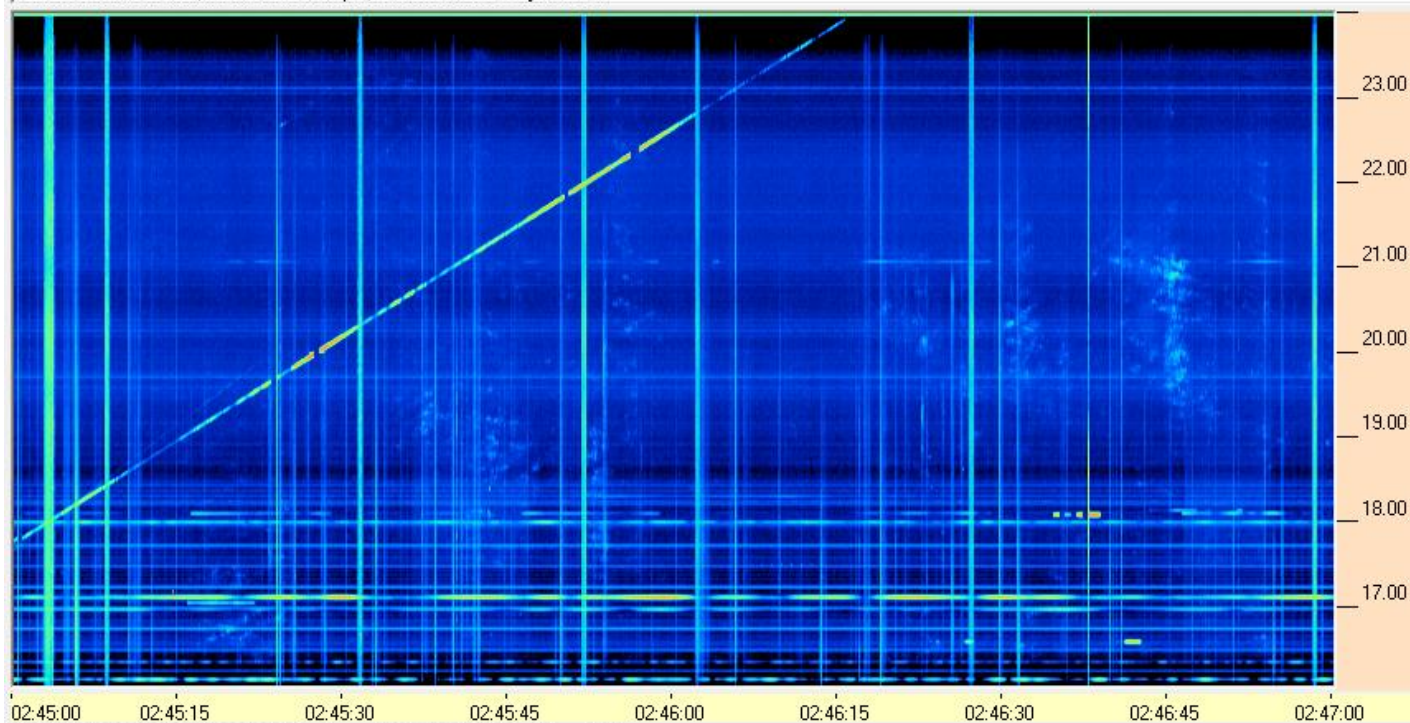
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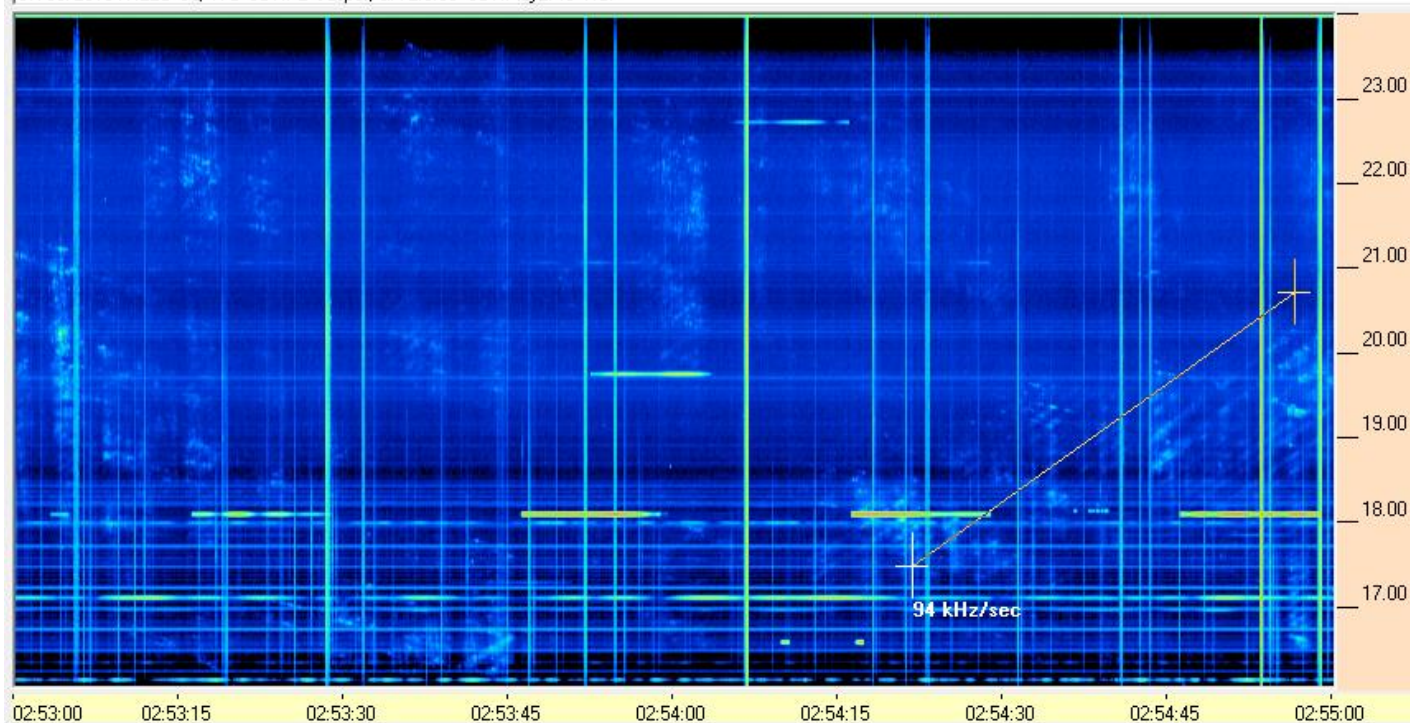
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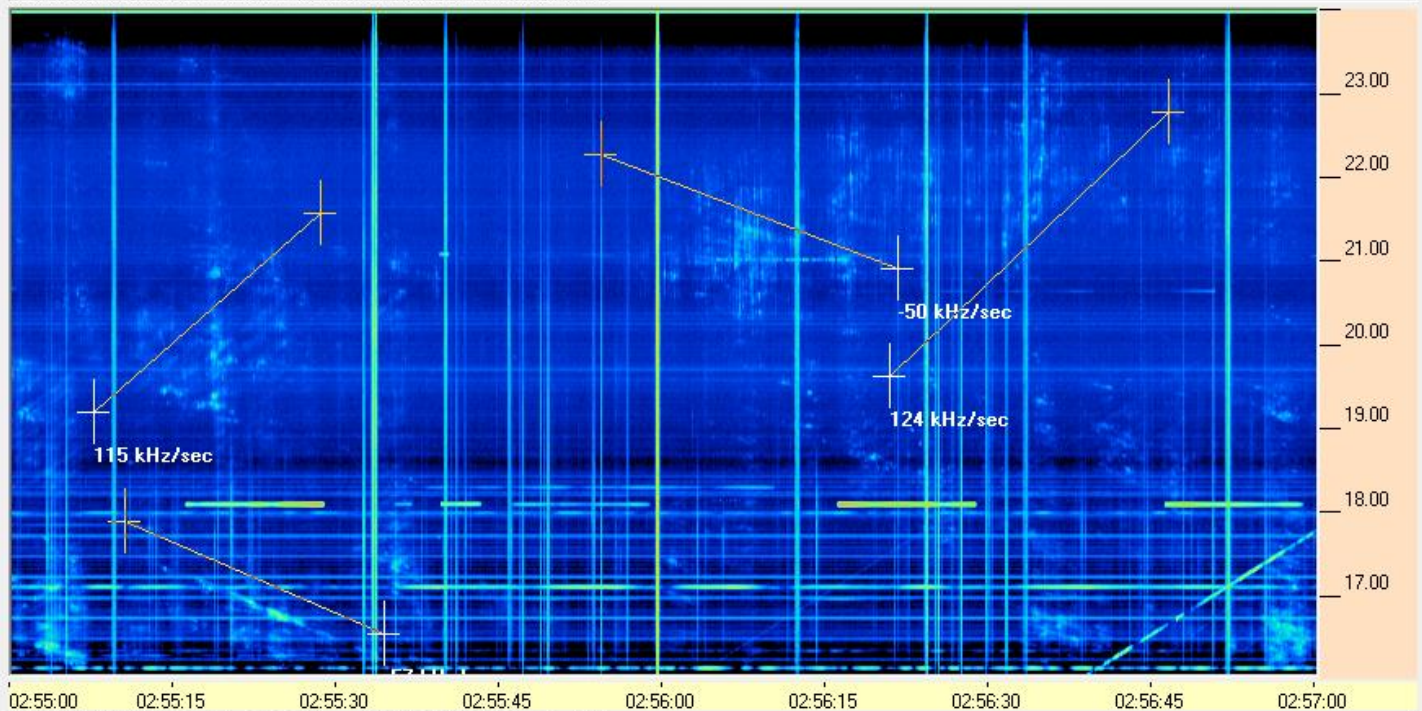
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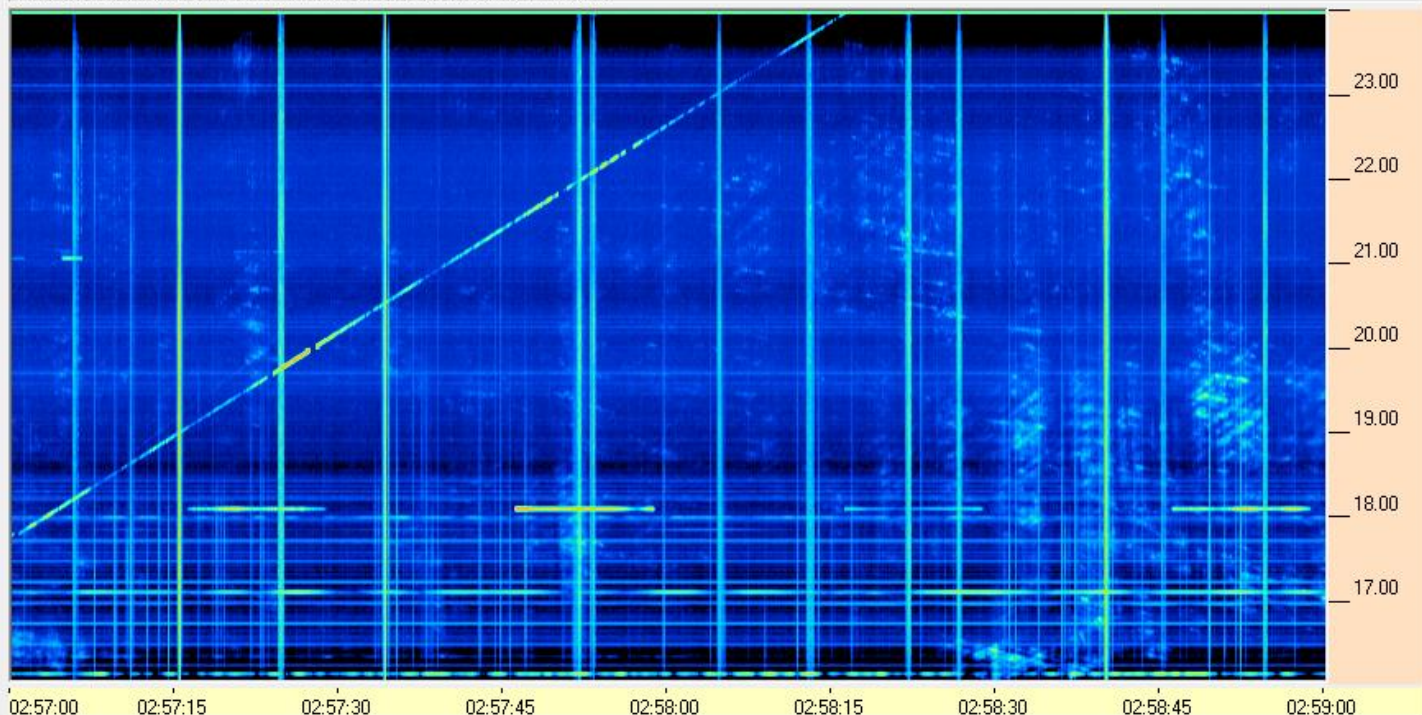
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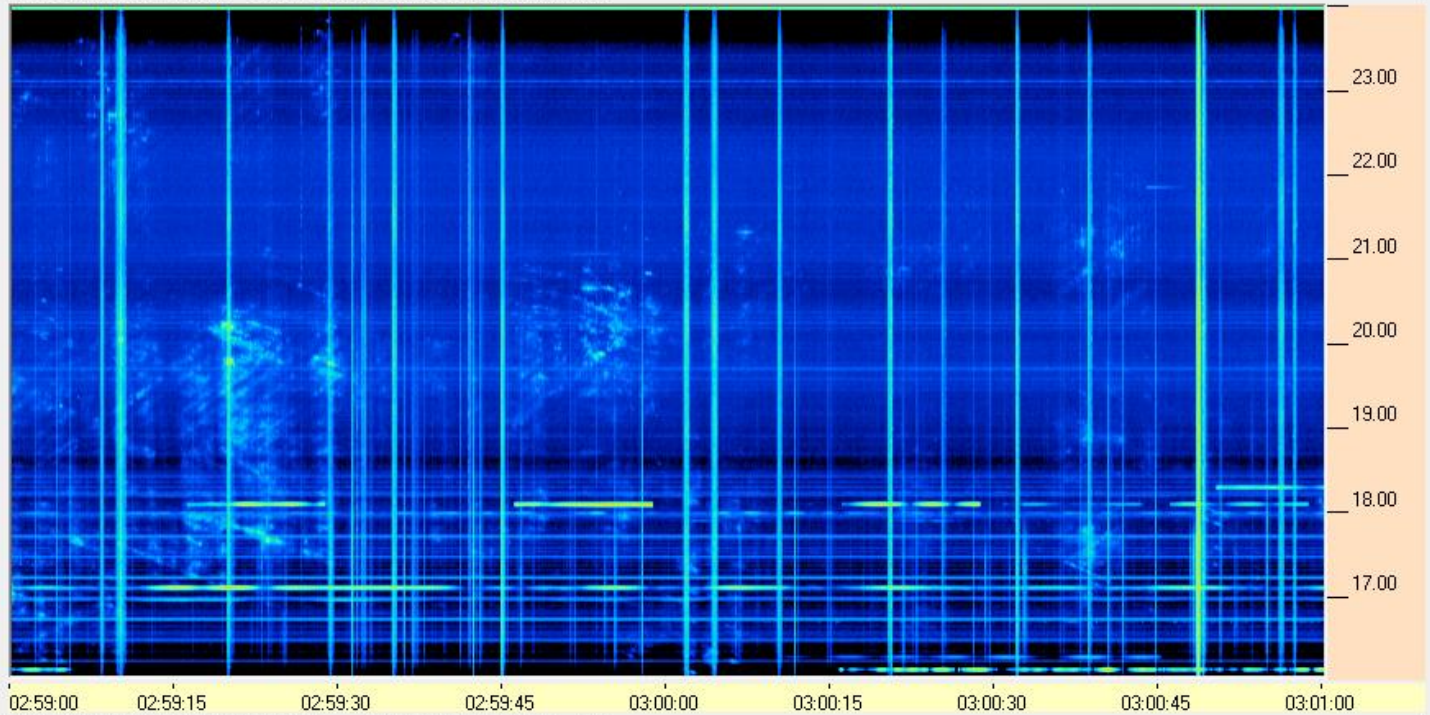
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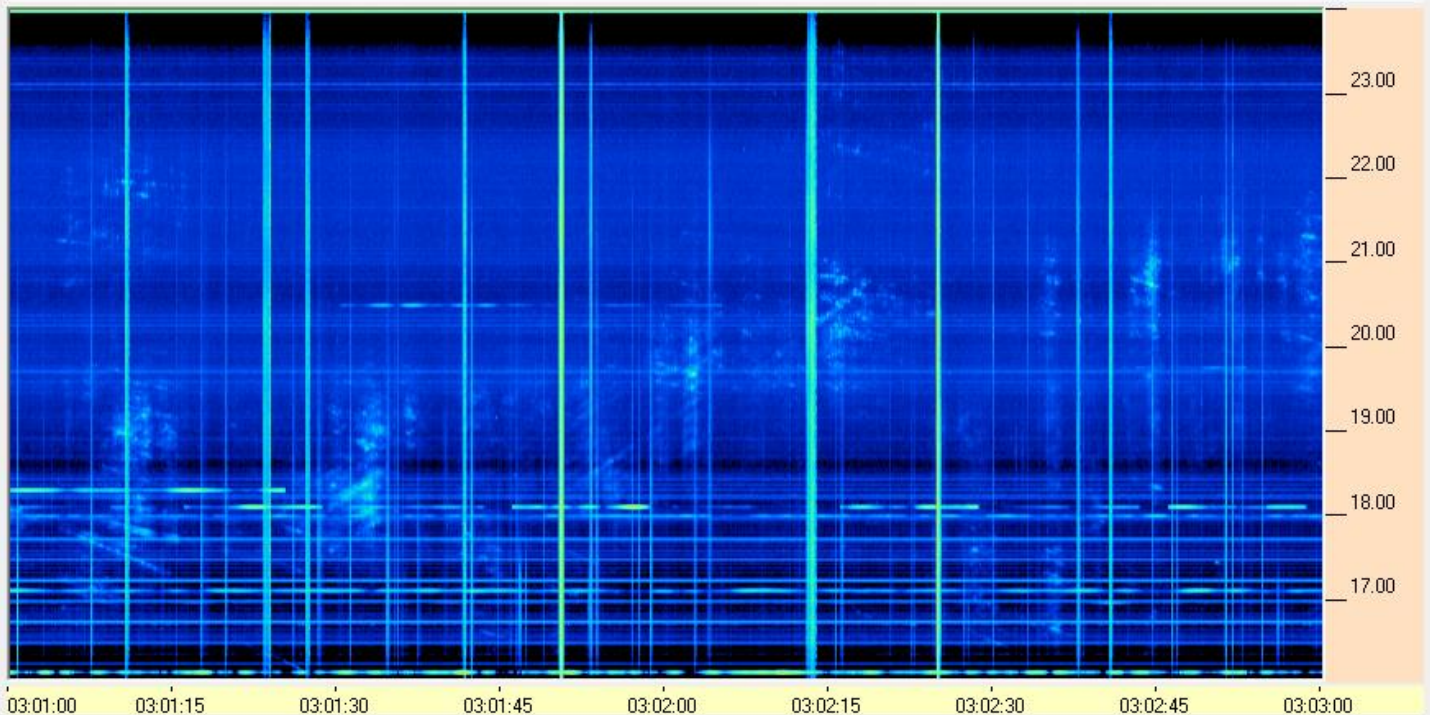
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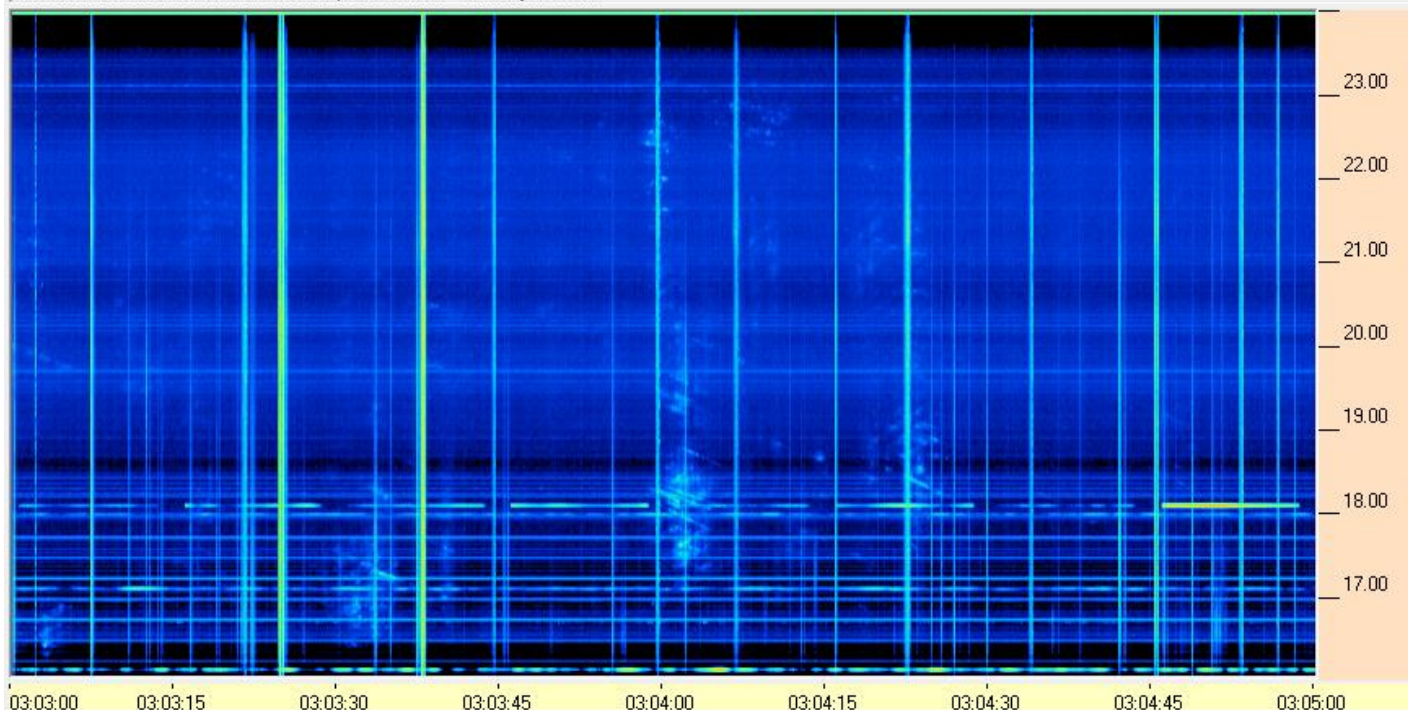
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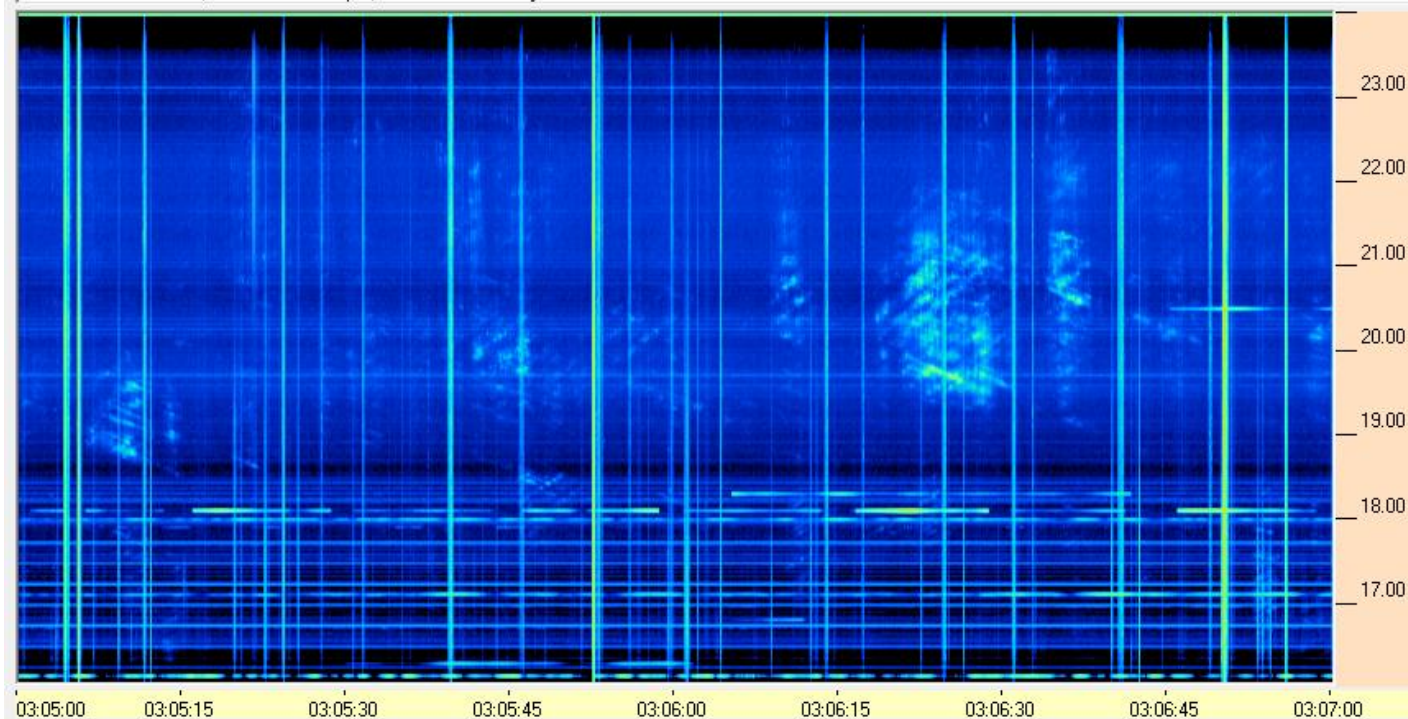
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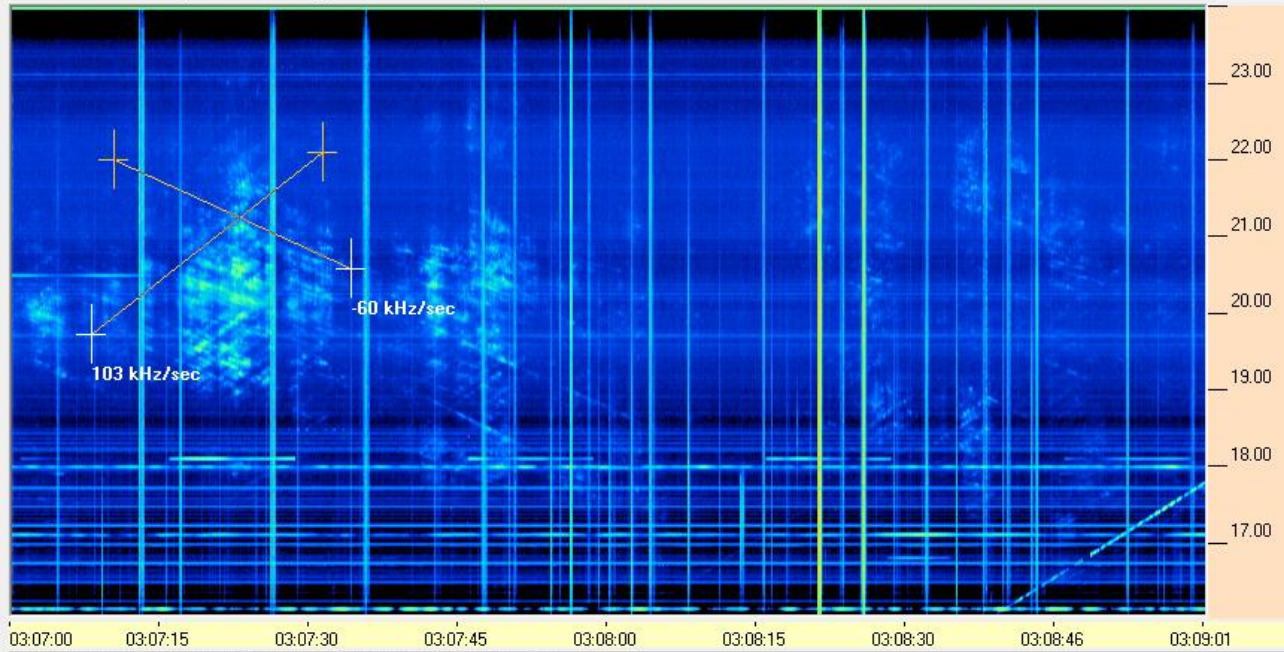
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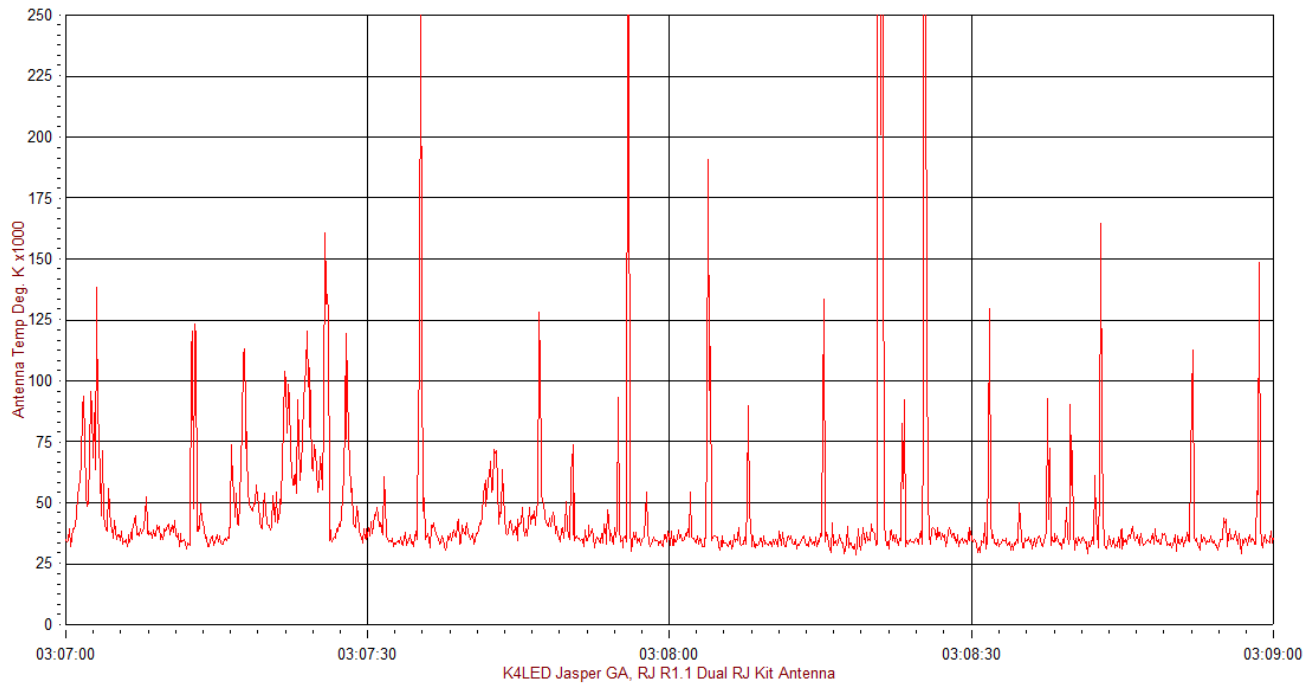


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Station YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
Eglin AFB 2018 Jul05 186 030000 RSF 1 713 100 03+ 79

foF2 4.125
foF1 N/A
foF1p N/A
foE N/A
foEp 0.38
fxI 4.78
foEs N/A
fmin 2.55

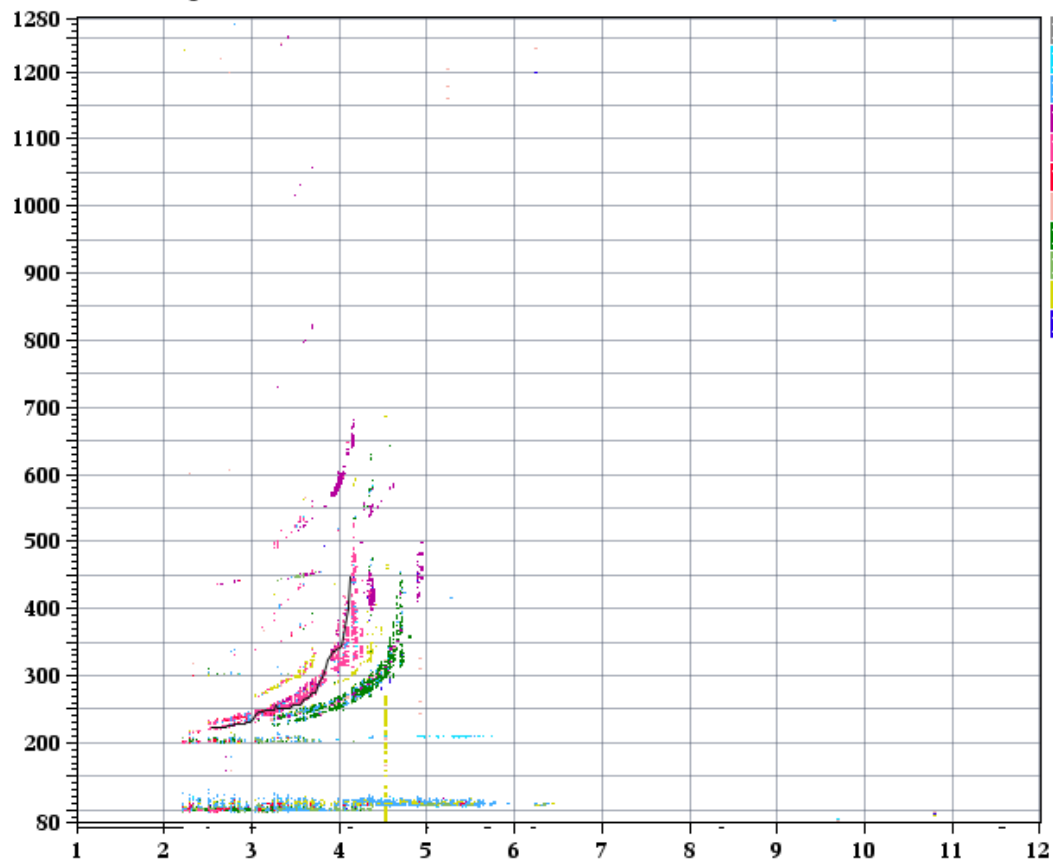
MUF(D) 14.28
M(D) 3.46
D N/A

h'F 222.5
h'F2 222.5
h'E N/A
h'Es N/A

hmF2 N/A
hmF1 N/A
hmE 110.0
yF2 N/A
yF1 N/A
yE 20.0
B0 N/A
B1 N/A

C-level 33

Auto:
Artist5
500200



D 100 200 400 600 800 1000 1500 3000 [km]
MUF 4.7 4.8 5.0 5.3 5.9 6.6 8.7 14.3 [MHz]
34528989.tmp / 440fx512h 25 kHz 2.5 km / DPS-4D EG931 084 / 30.5 N 273.5 E

ShowIonogram v 1.0

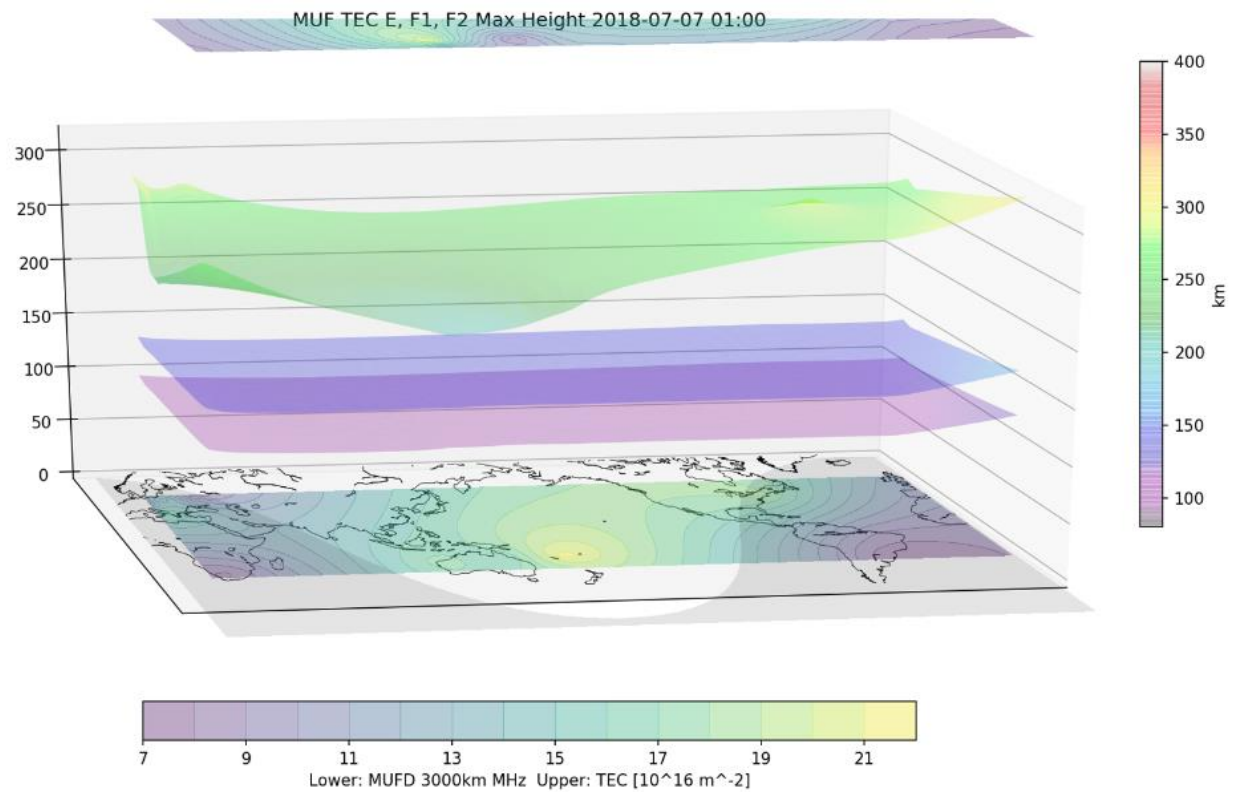
References for Interpreting the Ionogram:

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

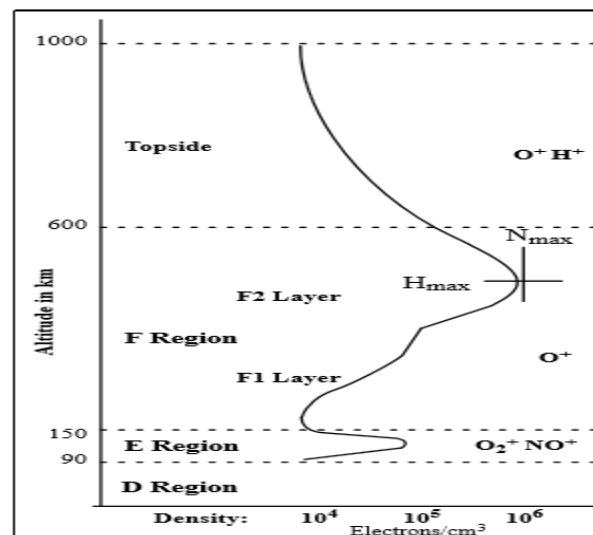
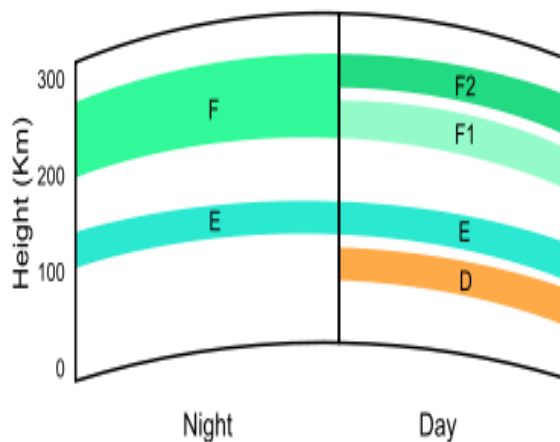
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.404.5517&rep=rep1&type=pdf>

<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:

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

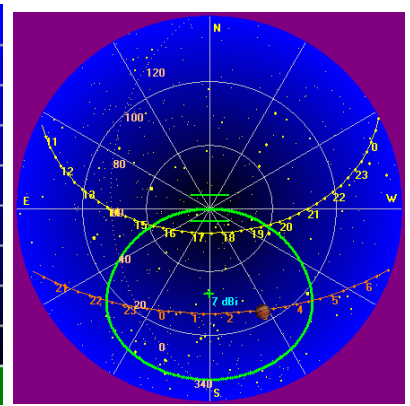
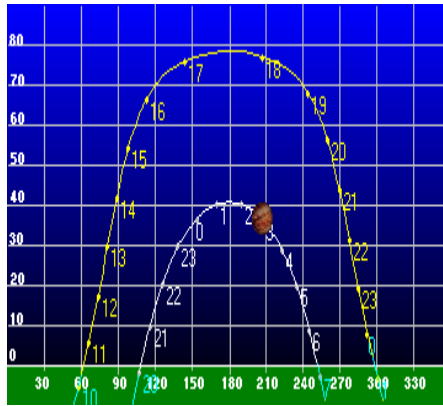
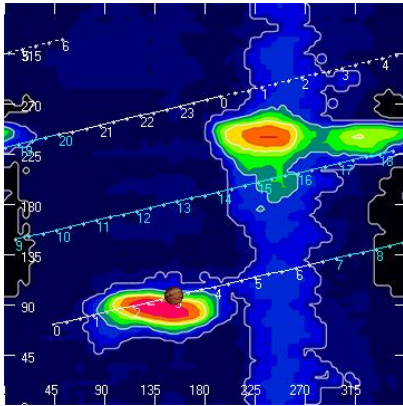
where N = electron density per m^3 and f_{critical} is in Hz.

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>



Radio-Jupiter Pro 3.8.2 (GMT)

File Options Display Tools Window Help

YYYY MM DD
Date 2018 07 05 cal

HH MM SS
Time 03 00 00 GMT

update

Using Fixed Time

Lat: 34:25:23.5
Long: 84:29:38.8 W

Jupiter

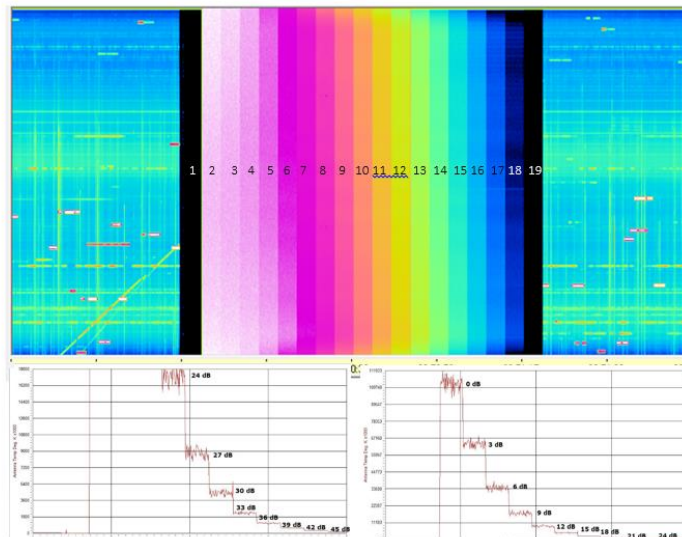
ALT: 36.4
AZ: 207.4
HA: 01:30
Rise: 20:12
Set: 06:49
RA: 14:44
DEC: -14:45
CMIH: 152.75
Io SGC: 097.90

Sun

ALT: -21.9
AZ: 321.7
HA: 09:26
Rise: 10:27
Set: 00:43
RA: 06:49
DEC: 22:58

LMST: 16:14:17

AUTOMATED CALIBRATION COLOR BAR TEST PATTERN AND DATA ACTUAL MEASURED DATA



STEP	TEMPERATURE	ATTENUATION
1	>1 kK	101 dB
2	104.0 MK	0 dB
3	66.9 MK	3 dB
4	36.3 MK	6 dB
5	19.1 MK	9 dB
6	9.6 MK	12 dB
7	4.5 MK	15 dB
8	2.3 MK	18 dB
9	1.2 MK	21 dB
10	602.0 kK	24 dB
11	296.6 kK	27 dB
12	133.0 kK	30 dB
13	92.2 kK	33 dB
14	51.6 kK	36 dB
15	32.0 kK	39 dB
16	22.6 kK	42 dB
17	17.9 kK	45 dB
18	12.0 kK	48 dB
19	>1 kK	101 dB