

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: April 16, 2020

Object: Jupiter – Io-B

Observer: Unattended

Start - Time UT:	1056	Planetary K-index:	2
Jupiter Altitude (deg):	27.7	Jupiter Azimuth (deg):	170.6
Jupiter CML:	85.76	Jupiter Io Phase:	084.38
Jupiter RA (hr/min):	19:51	Jupiter Dec (hr/min):	-21:06
Hour Angle (hr/min):	-00:36	Polarization	RCP
Sun Altitude (deg):	03.0	Sun Azimuth (deg):	079.8
Sun RA (hr/min):	01:33	Sun Dec (hr/min):	09:40

End – Time UT:	1259		
Jupiter Altitude (deg):	25.0	Jupiter Azimuth (deg):	202.4
Jupiter CML:	159.86	Jupiter Io Phase	101.77
Hour Angle (hr/min):	01:27	Duration (min):	123
Sun Altitude (deg):	26.1	Sun Azimuth (deg):	100.0
Max Frequency MHz	24	Min Frequency MHz	15
J/S Angular Separation	88.9	De:	-1.4

Observatory Configuration

Spectrograph Receiver	Antenna	Polarization	System Loss	Multicoupler	Multicoupler port	Calibrated
FSX-8S	TFD	RCP LCP	-8.35 dB -7.59 dB	#2 RCP #1 LCP	Port 1 +10dB Port 1 +10dB	Twice daily Twice daily
FSX-2	LWA	RCP/LCP manual select		N/A	N/A	N/A
SDRPlay RSP2 #1	TFD	RCP	-8.35 dB	#2 RCP	Port 2 +3dB	Twice daily
SDRPlay RSP2 #2	TFD	LCP	-7.59 dB	#1 LCP	Port 2 +3dB	Twice daily
JOVE II HNRAO #2	Jove dipoles	Linear	-3.66 dB	#3 Linear	Port 4 +3 dB	Offline

Radio JOVE dipoles phased @ 32 degrees for 2020-2021 season

Typinski AN-TFD-24-4 array phased @ 35 degrees for 2020-2021 season

Four LWA antenna array phased @ 35 degrees and orientation for observation: 45 degrees

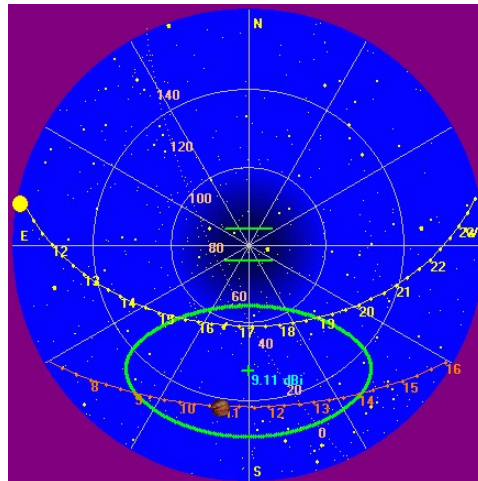
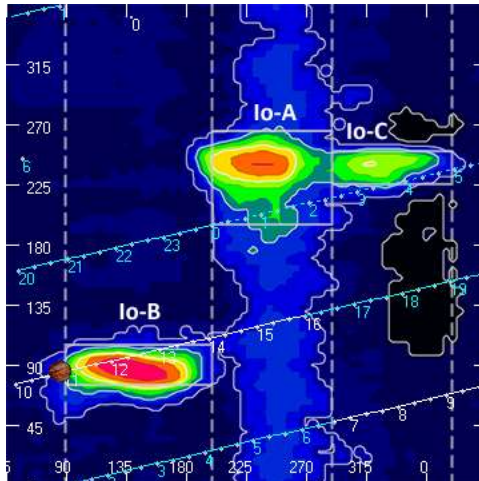
Radio Sky Spectrograph software version 2.9.30

Radio-SkyPipe software version 2.7.33 Radio-Jupiter Pro software version 3.8.2

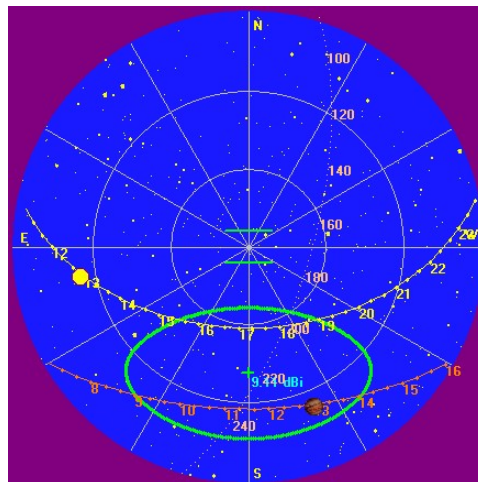
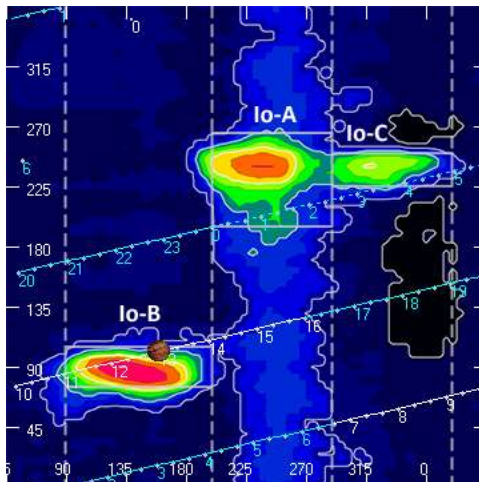
Network Time Server GpsNtp-Pi, Reeve Engineering

All times are synced with a local GPS locked NTP server.

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Beginning of Pass



End of Pass



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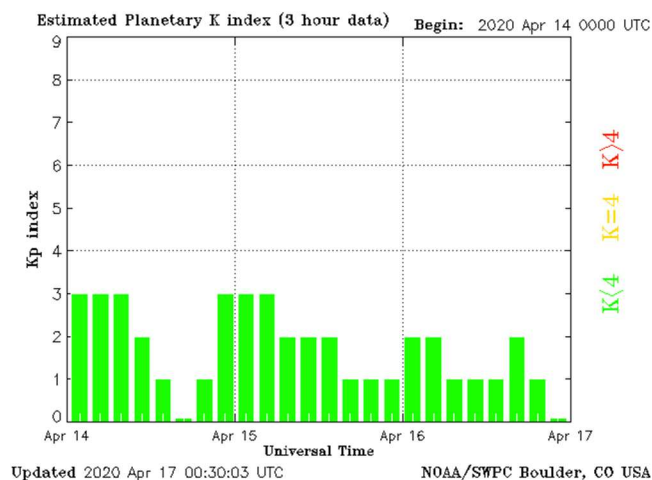


MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360	38	RH	Late	
Io-C	(300-20)	(225-260)	36	RH&LH	Late	Also called "third source"
non-Io-C	300-360	0-360	32	RH&LH	Late	Voyager info

<https://www.radiosky.com/jupmodes.html>

Modulation Lanes Designations*	
L - Burst	S-Burst
L1 – No lanes	S1 – No lanes
L2 - Positive slope	S2 – Positive slope
L3 - Cross hatched	S3 – Cross hatched
L4 – Negative slope	S4 – Negative slope

*Modulation Lanes in the Dynamic Spectra of Jovian L-bursts, J.J. Riihimaa, Astron. & Astrophys. 4, 1970



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Weather at observatory:

Cloudy with a high temperature of 43 degrees and low of 29 degrees F. Approximately 30 degrees F with 79% humidity at time of observations.

Status of observatory equipment:

All equipment functioning normally. Radio JOVE telescope offline due to RFI. Strong RFI in all spectrographs from local heat pump. All antennas functional. RFI prevented any Radio JOVE/SkyPipe data. Local heat pump generated strong RFI visible in all spectrographs. The regular pulsations seen were caused by the heat pump cycling on and off.

This Io-B storm was one of the stronger storms observed in the past year with strong L-bursts and modulation lanes, both L2 and L3 throughout the entire observation. Scintillation was evident throughout the storm. No N-events were observed.

L-bursts ranged from slightly above GB to as much as 6+ dB above GB as observed from this location.

Emissions followed a positive drift with positive slope modulation lanes. All emissions became much stronger in the time period from 1200 UT until the very end of the storm. At times, emissions spanned 8 MHz.

Nothing else of note.

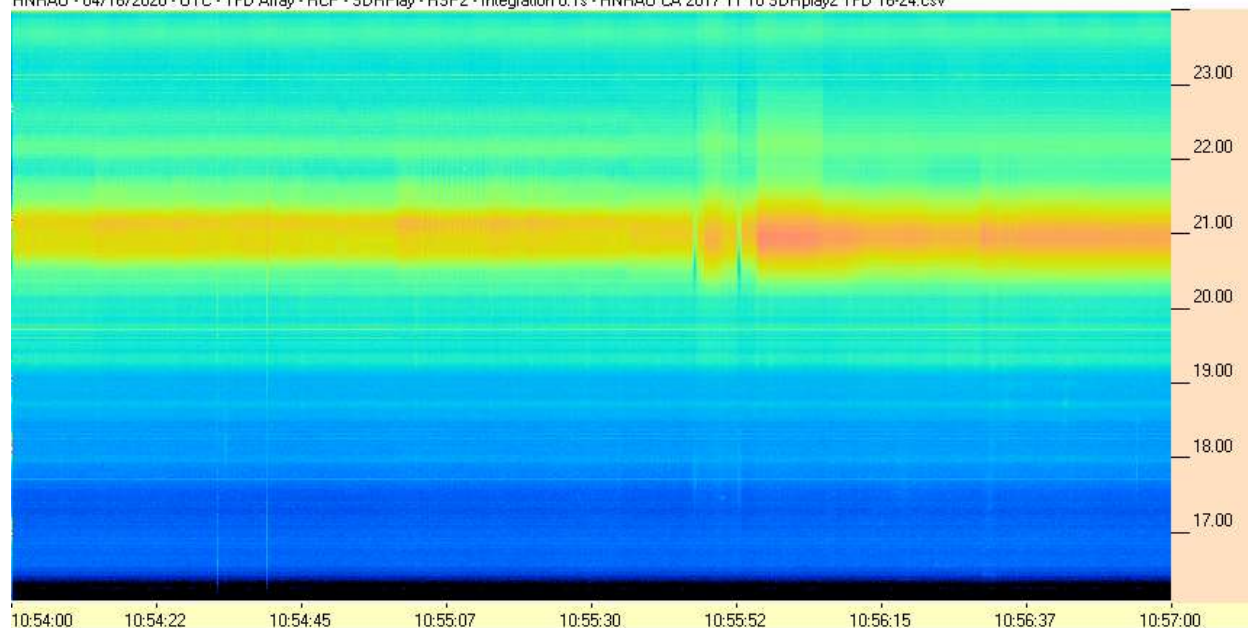
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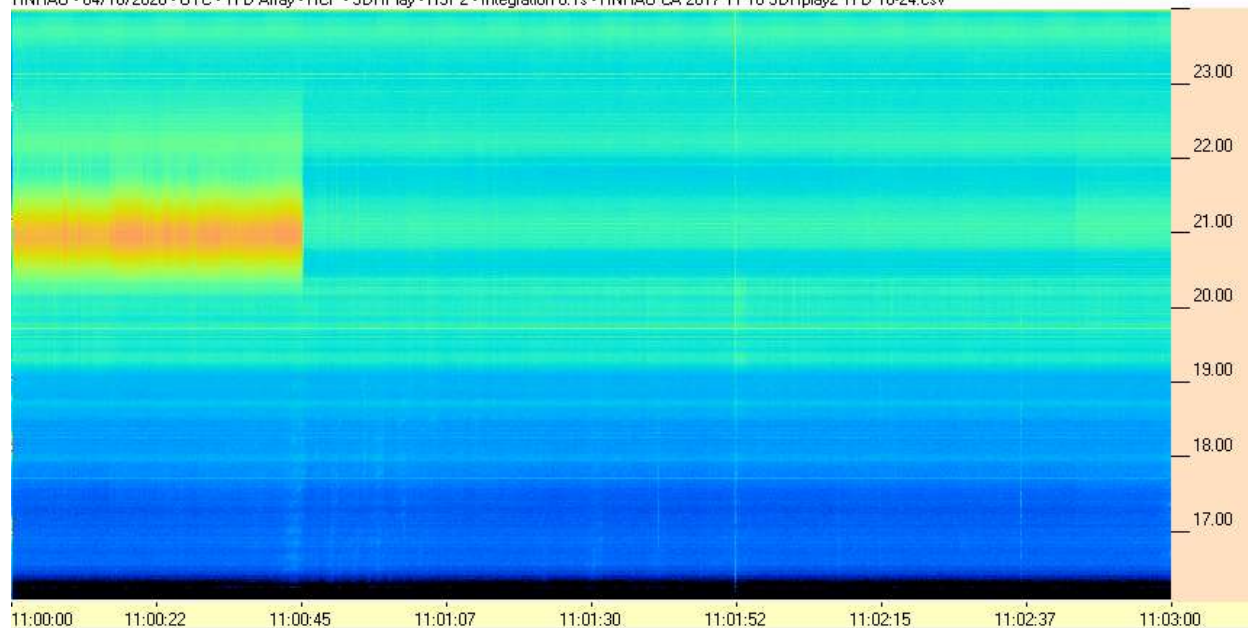


SDRPlay RSP2 / TFD Array

HNRAO - 04/16/2020 - UTC - TFD Array - RCP - SDRPlay - RSP2 - Integration 0.1s - HNRAO CA 2017 11 10 SDRplay2 TFD 16-24.csv



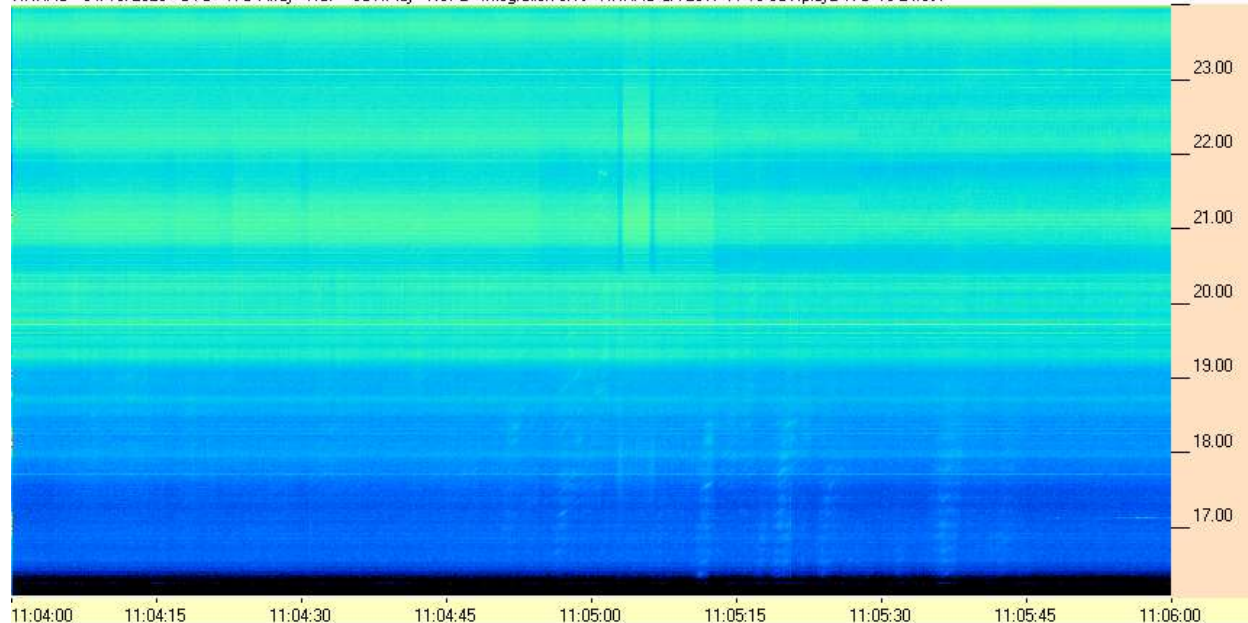
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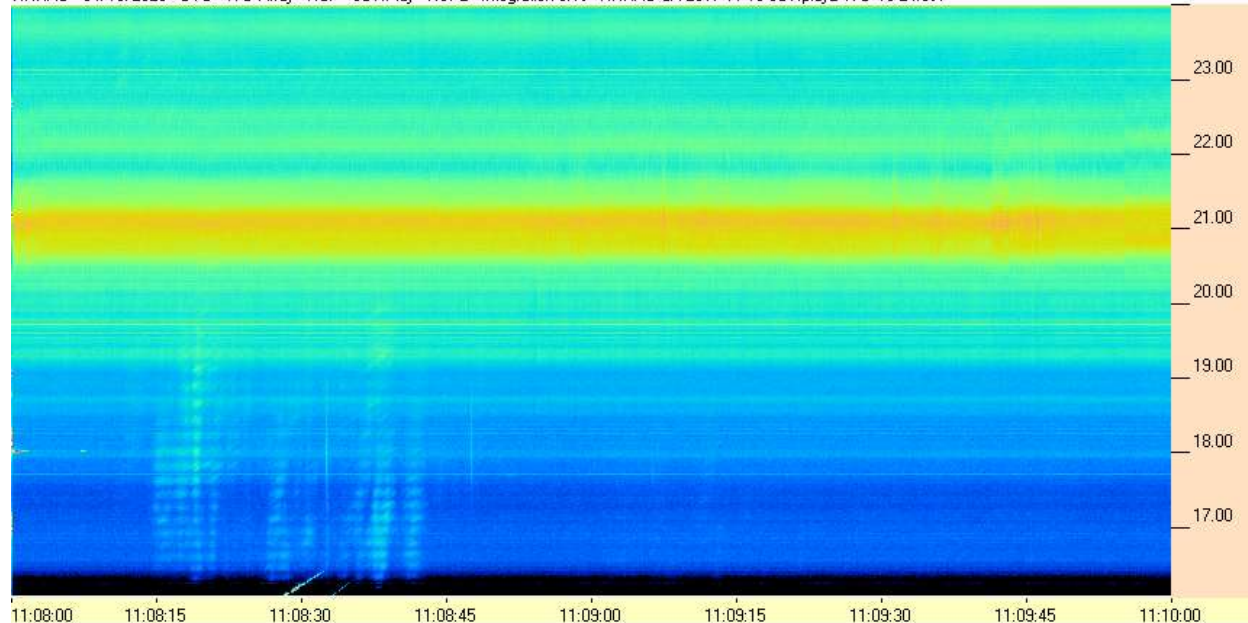
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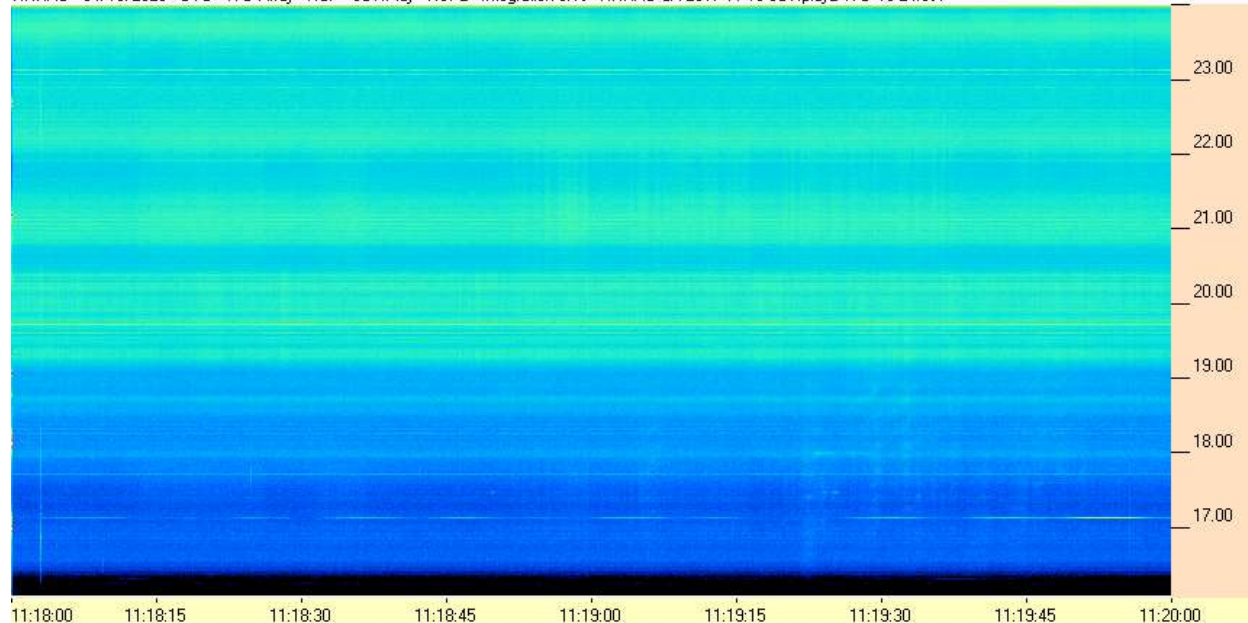
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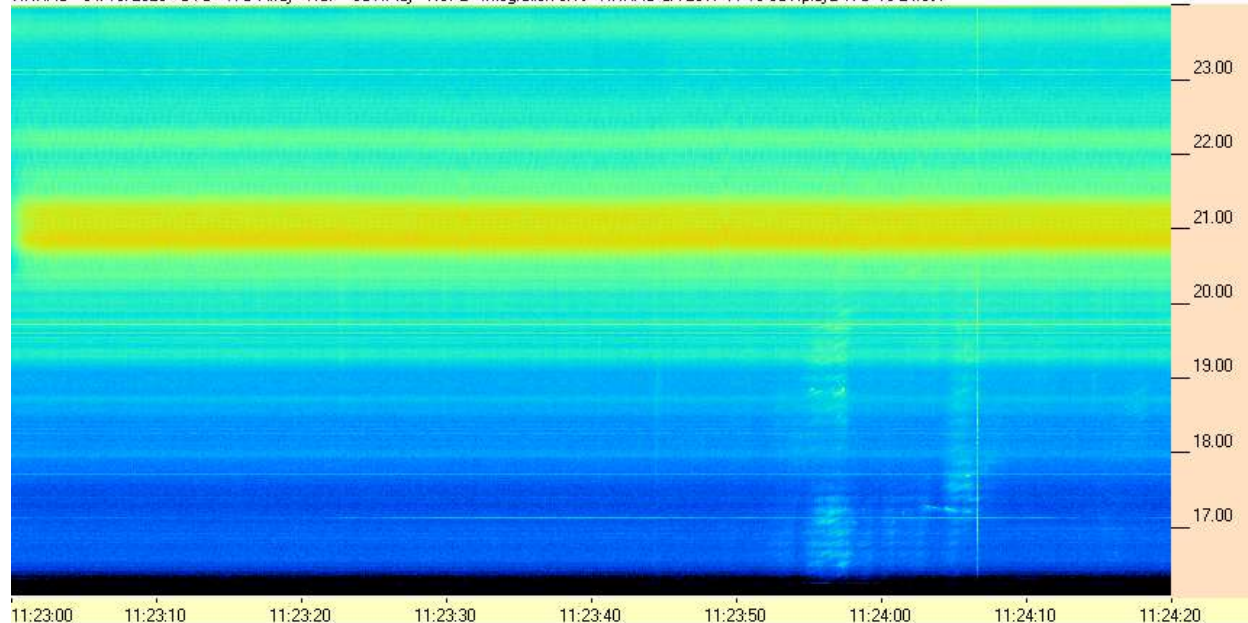
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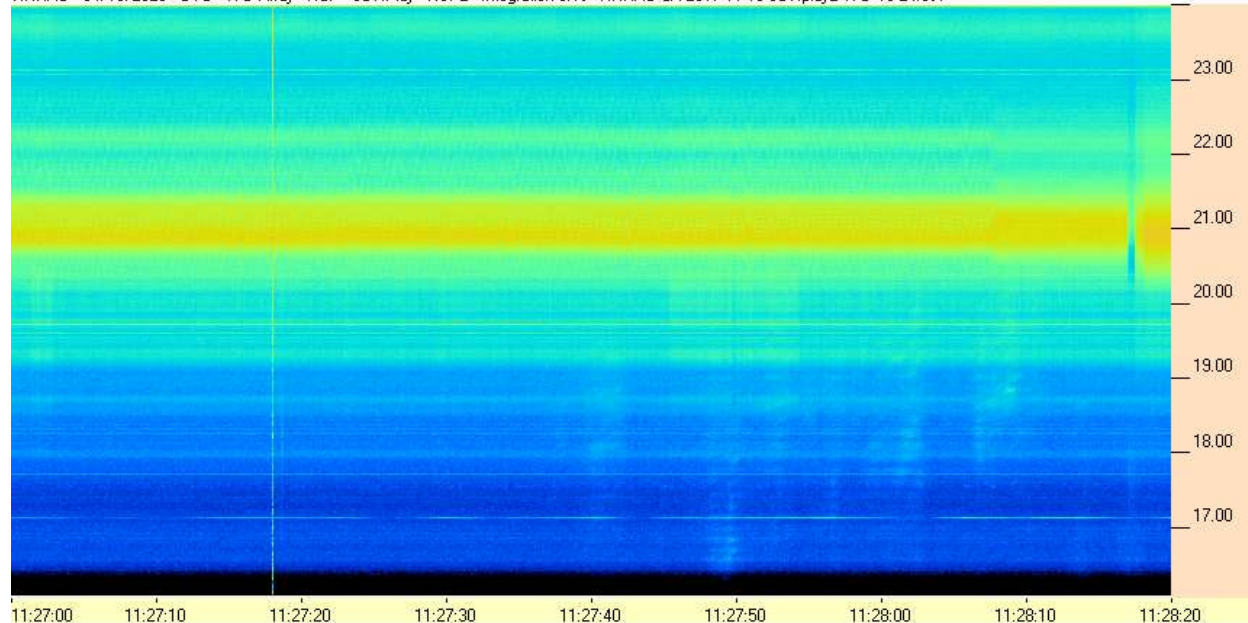
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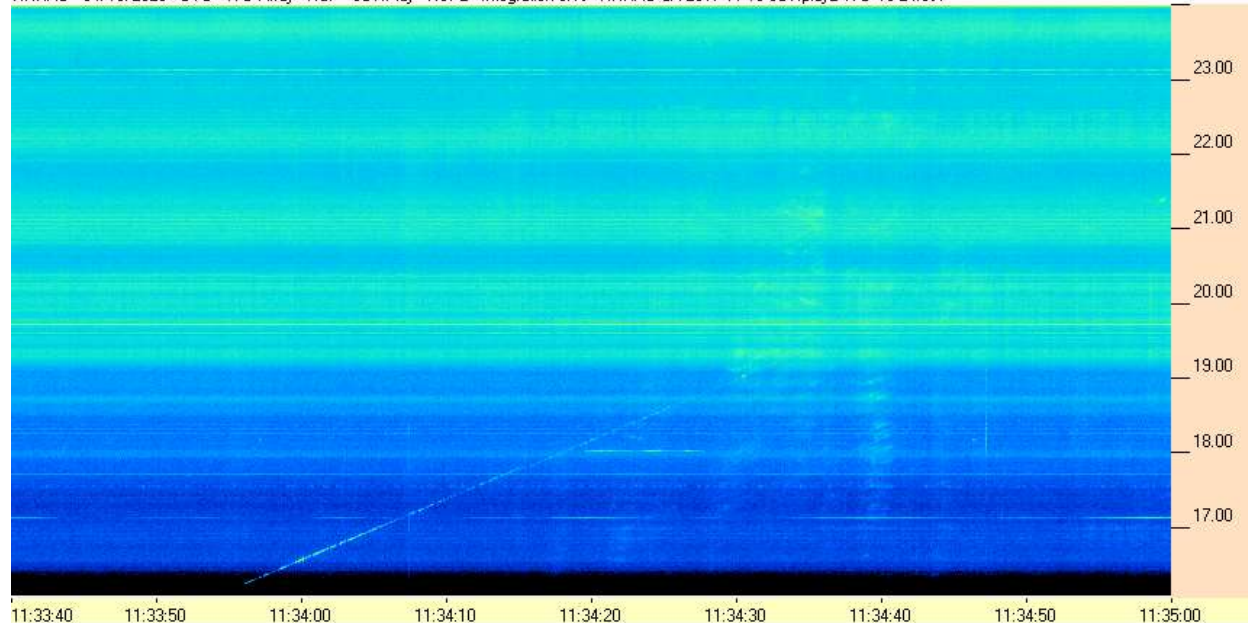
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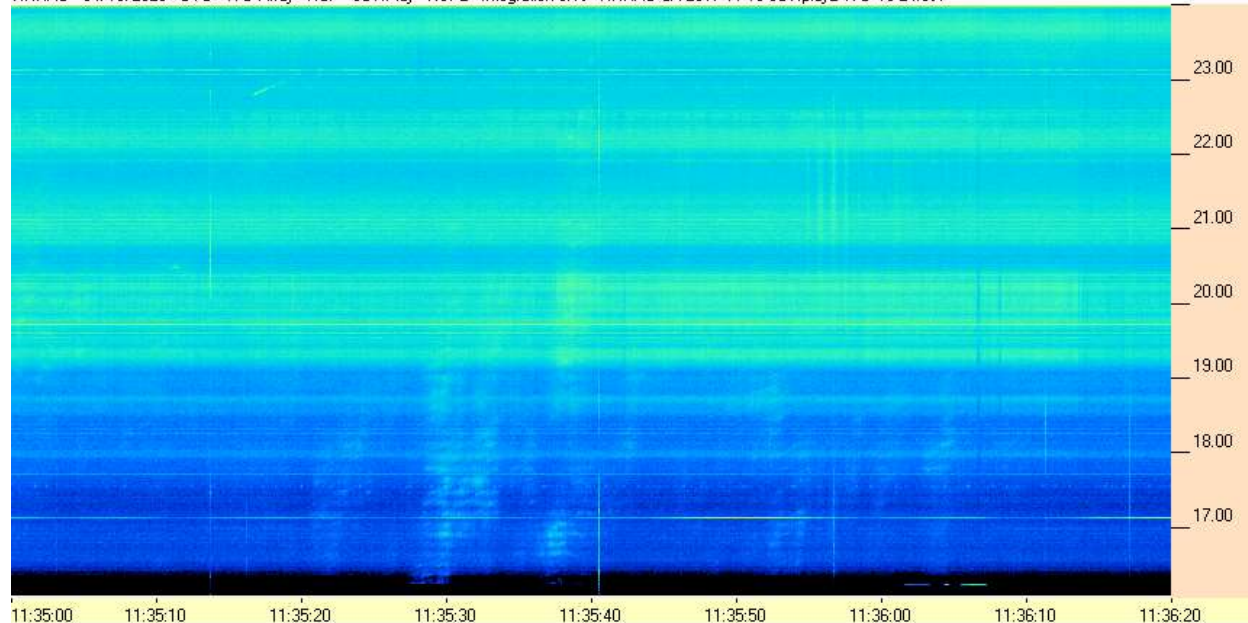
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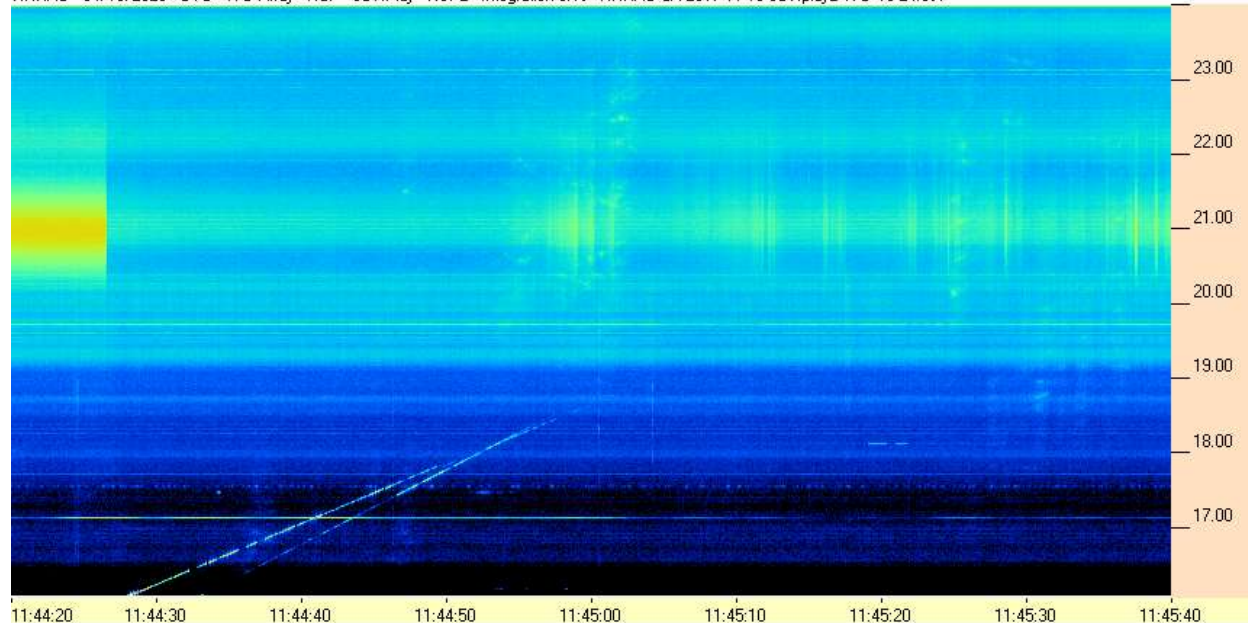
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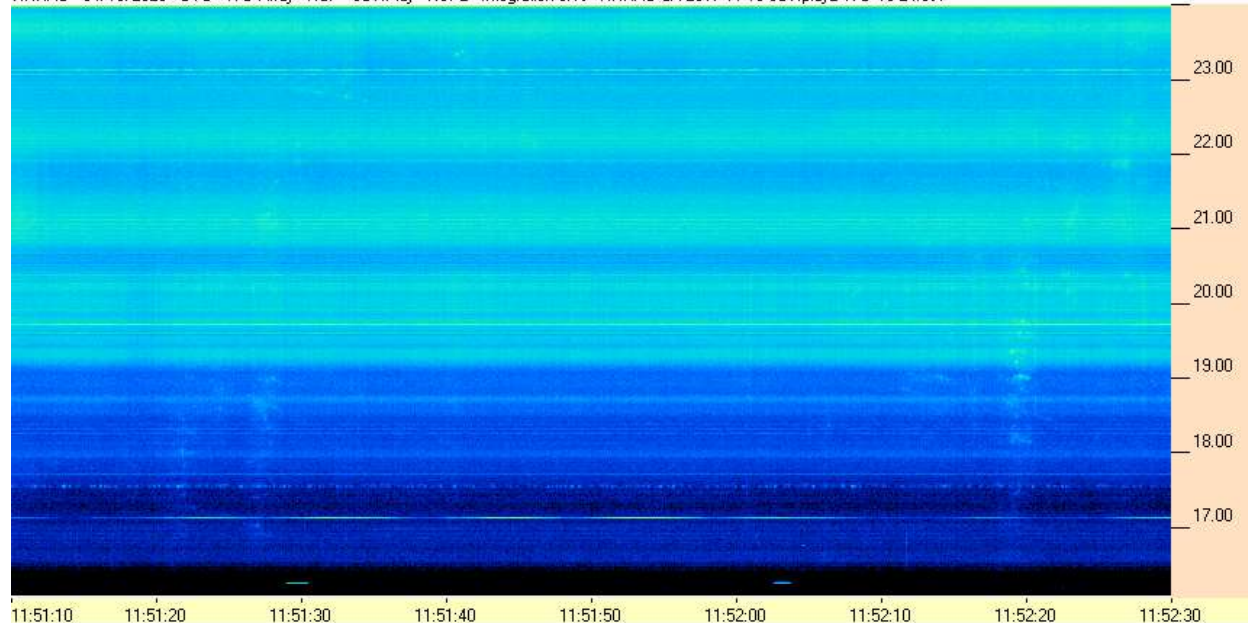
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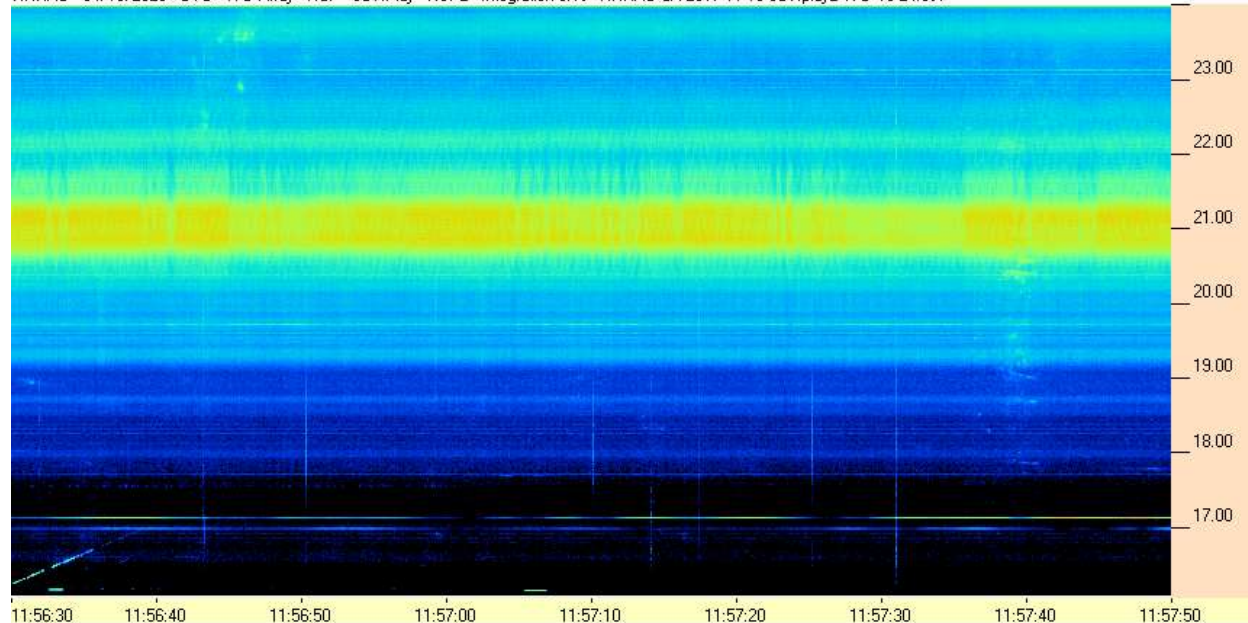
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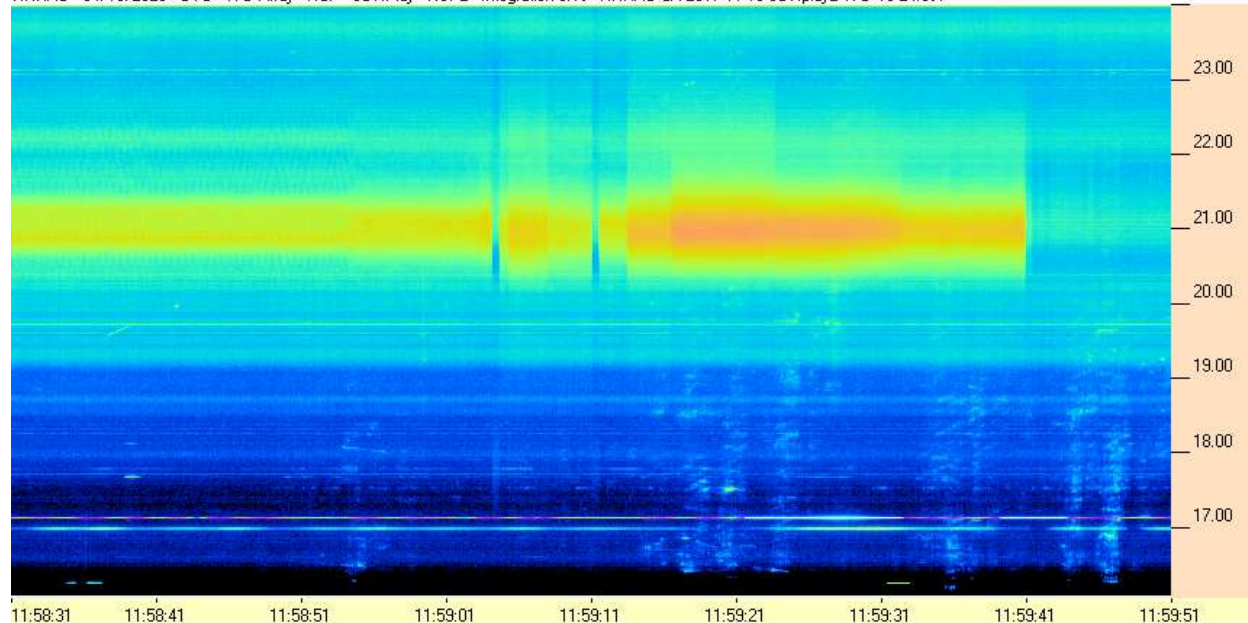
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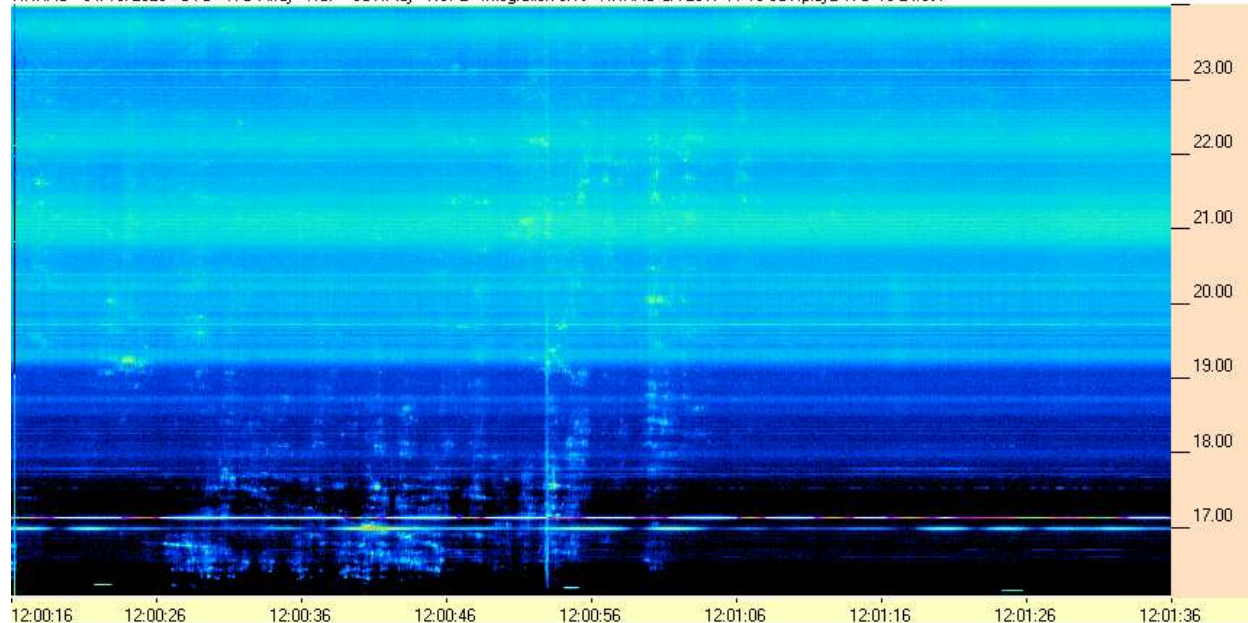
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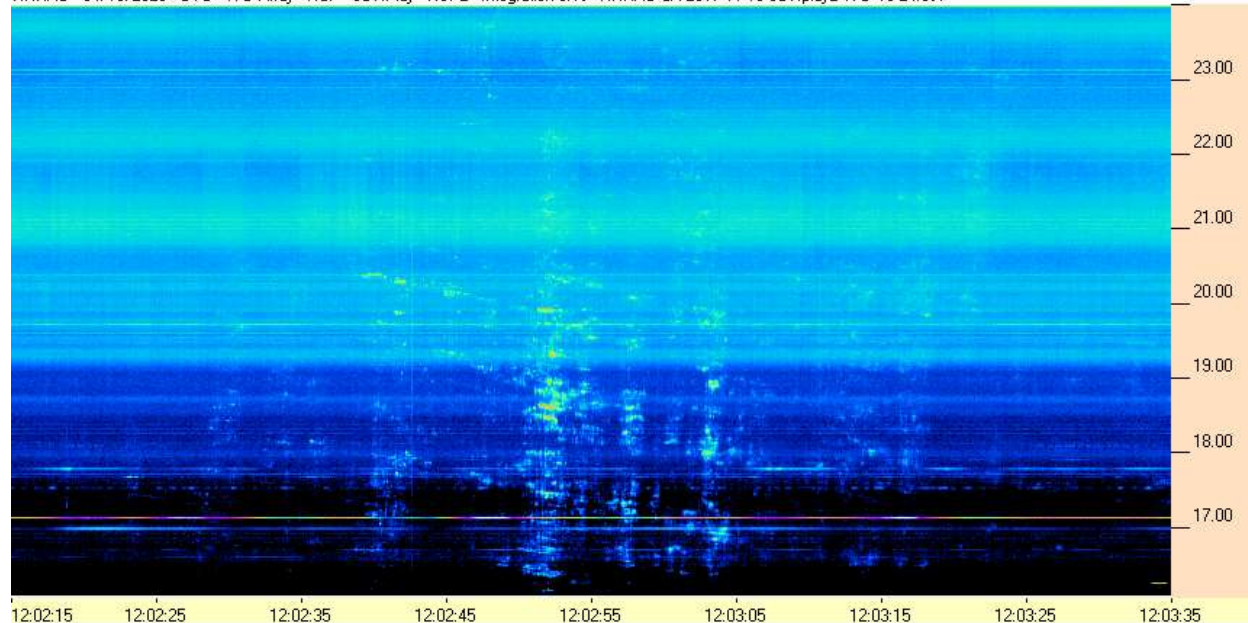
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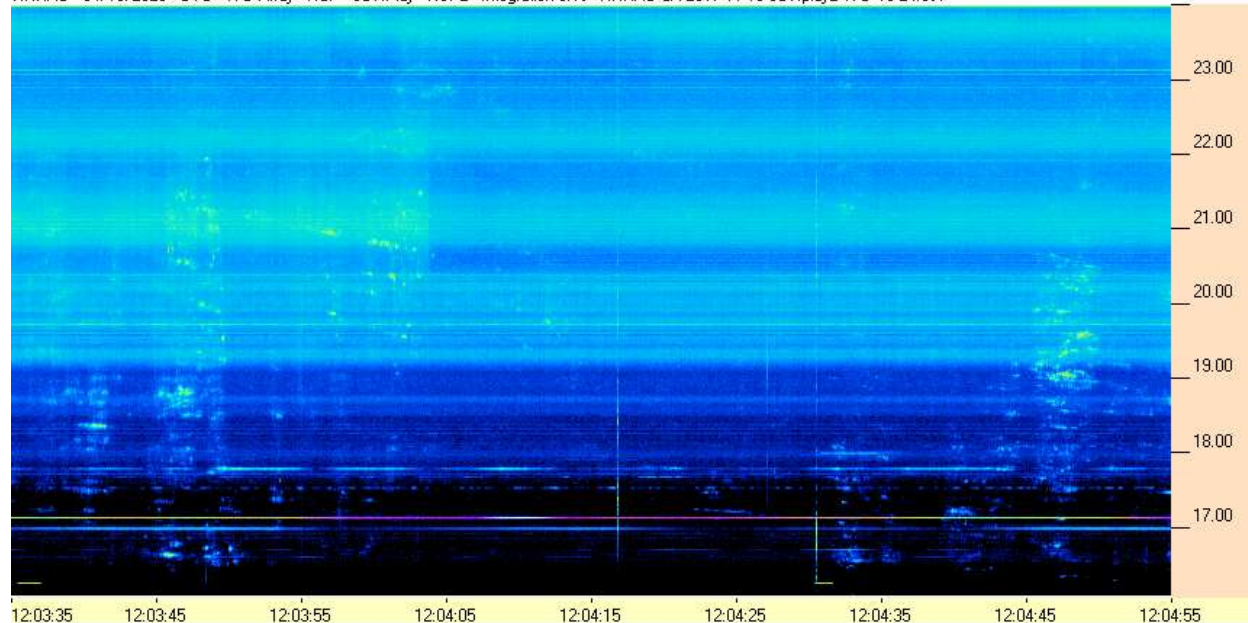
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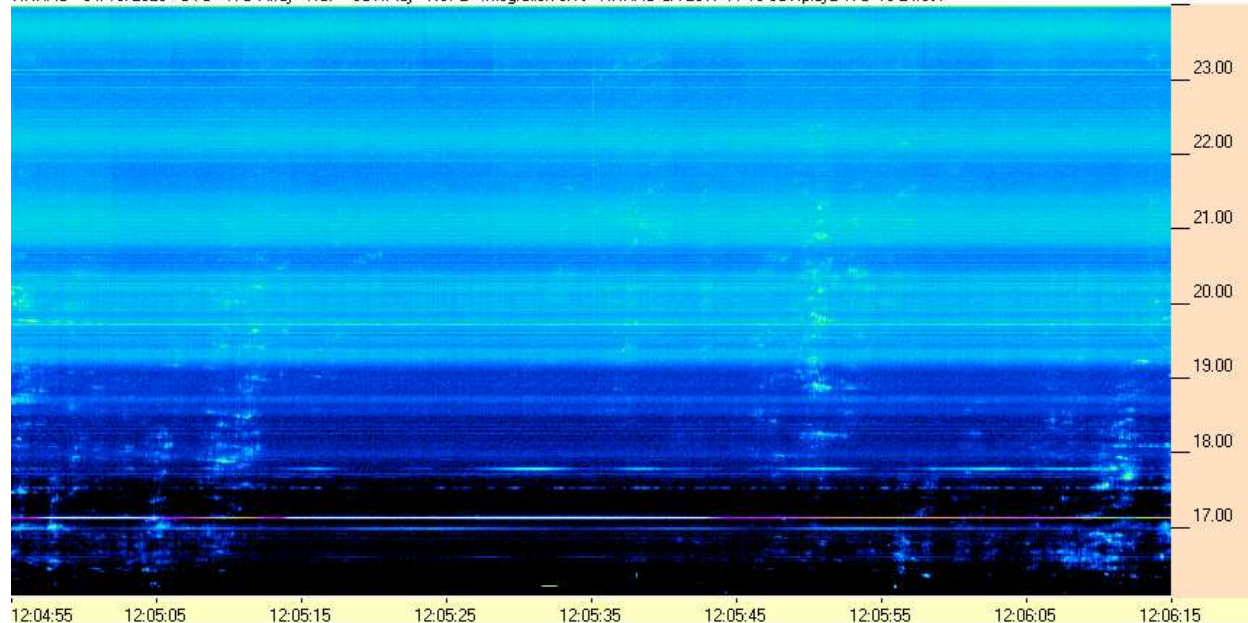
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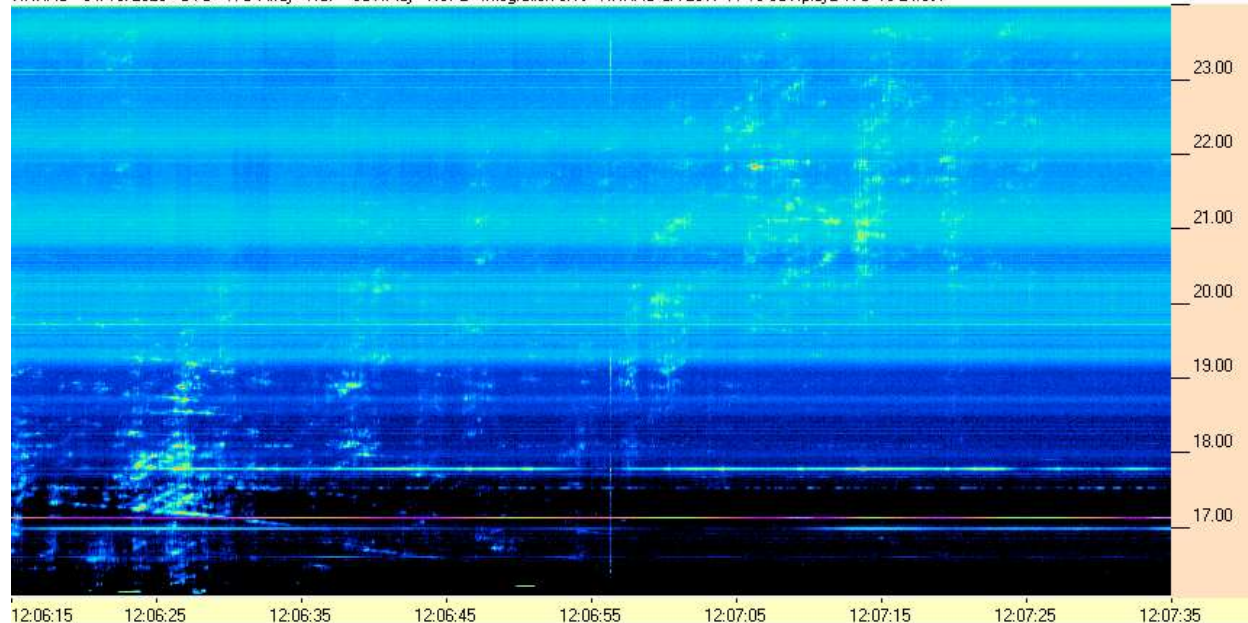
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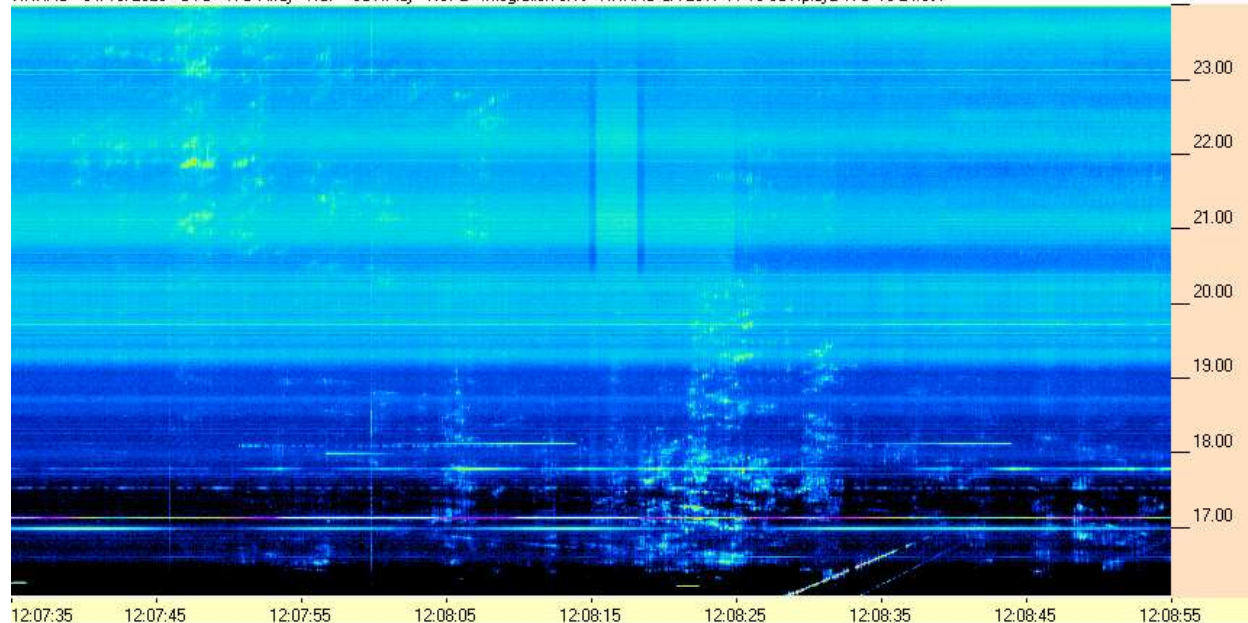
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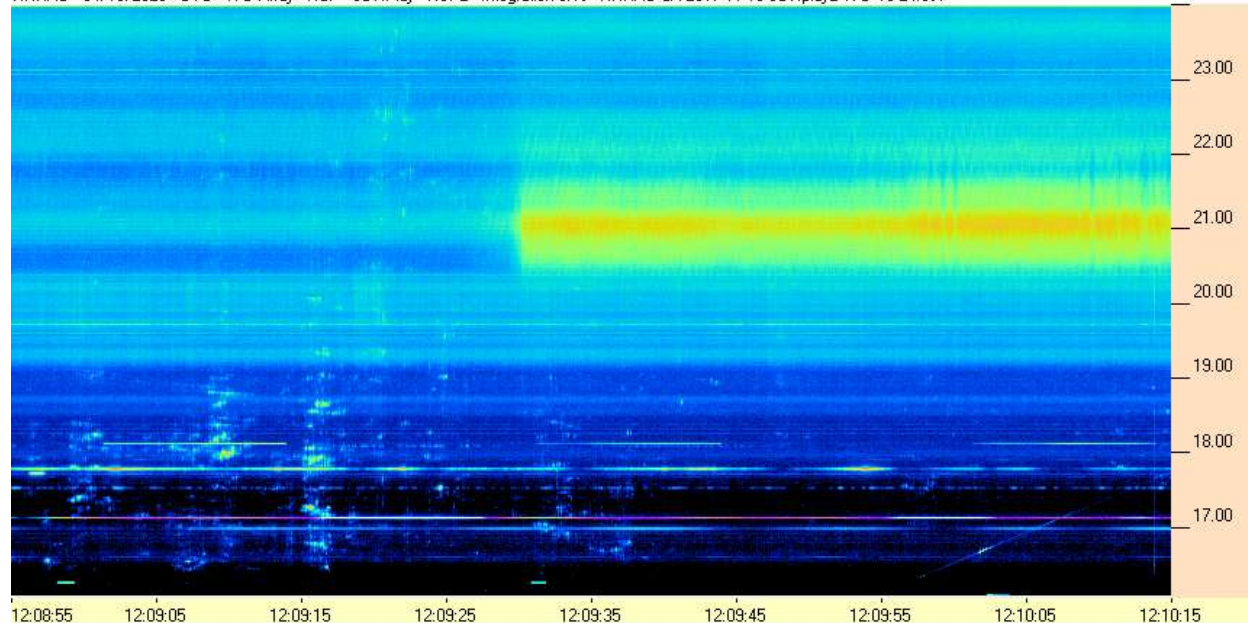
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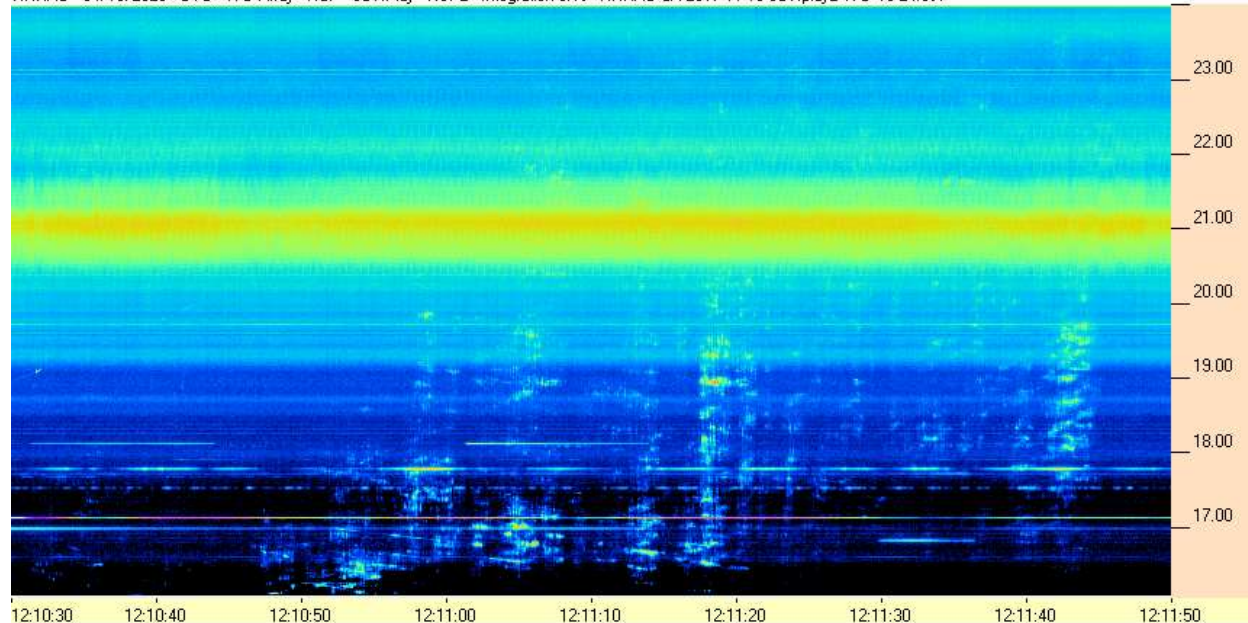
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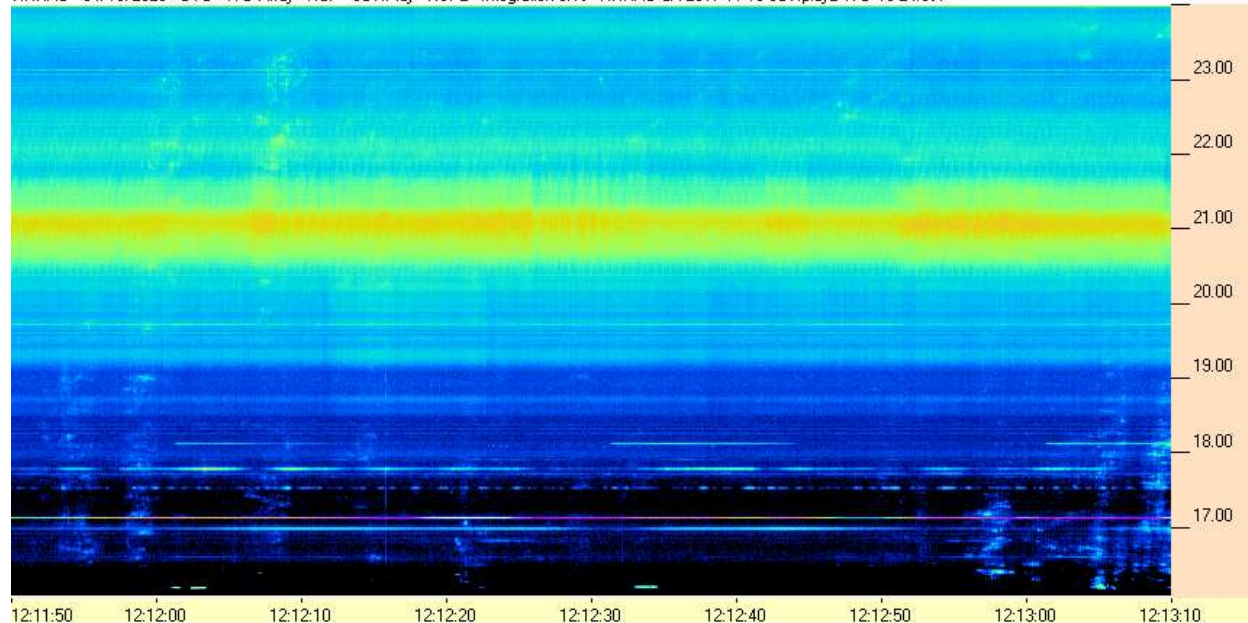
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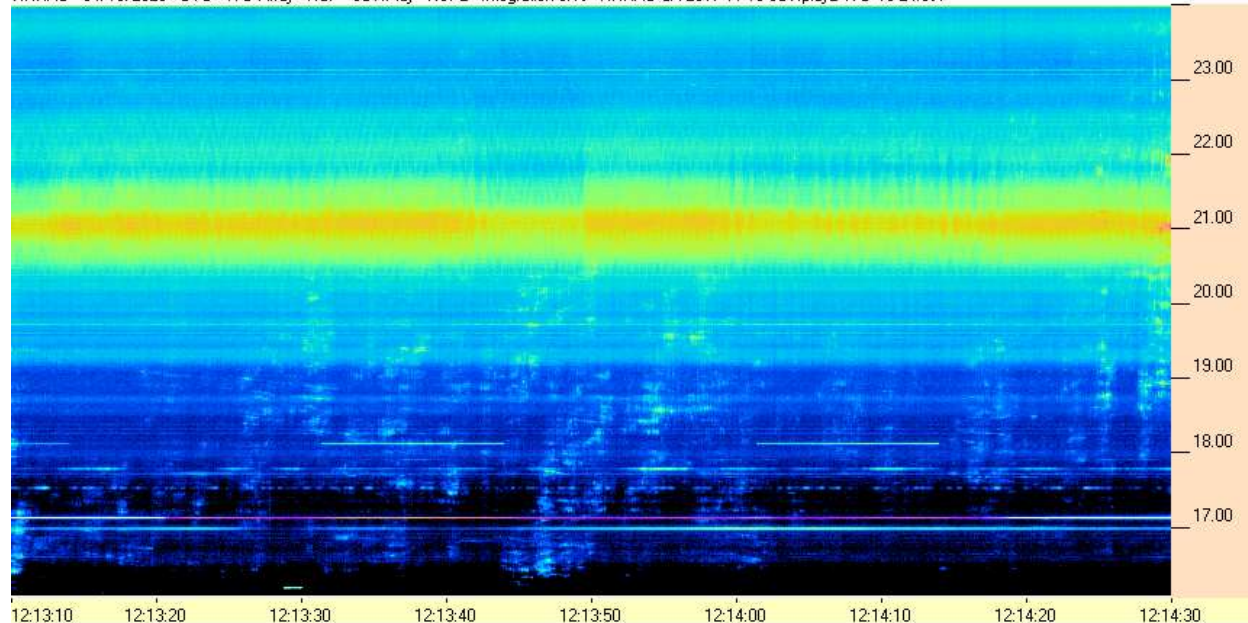
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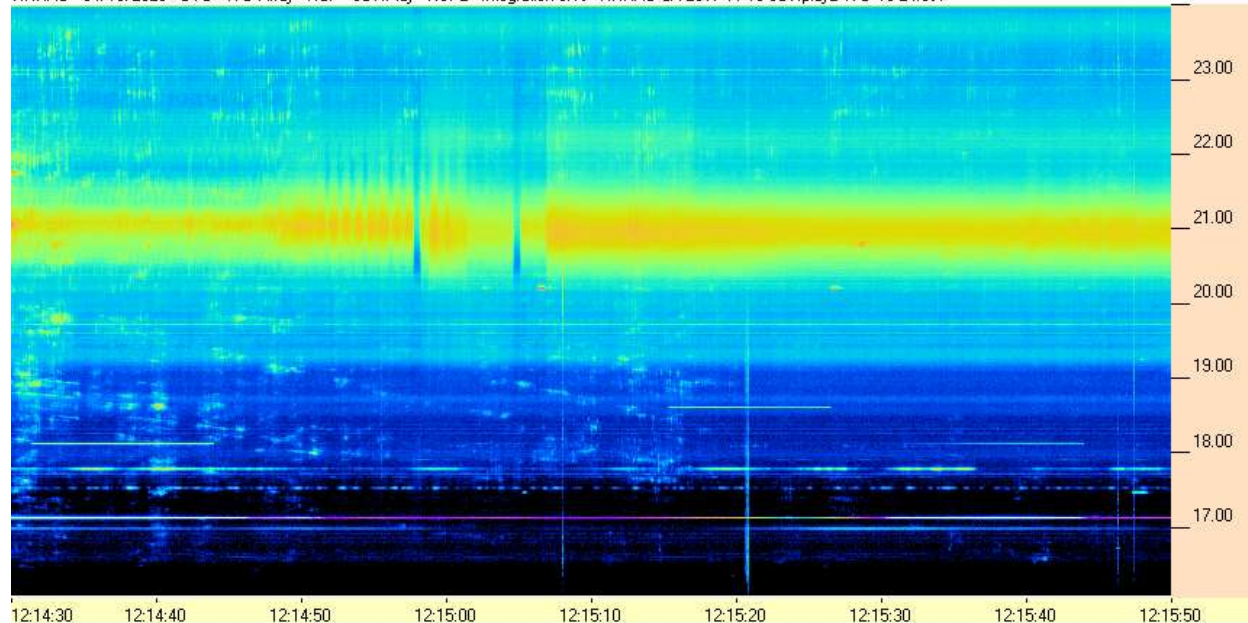
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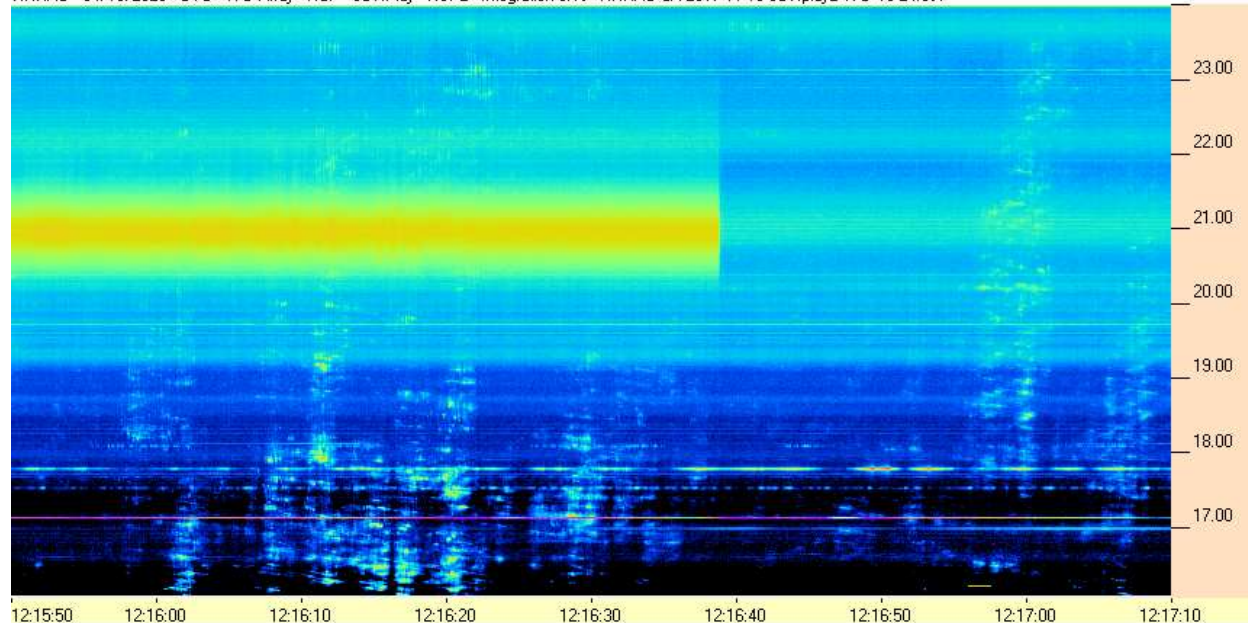
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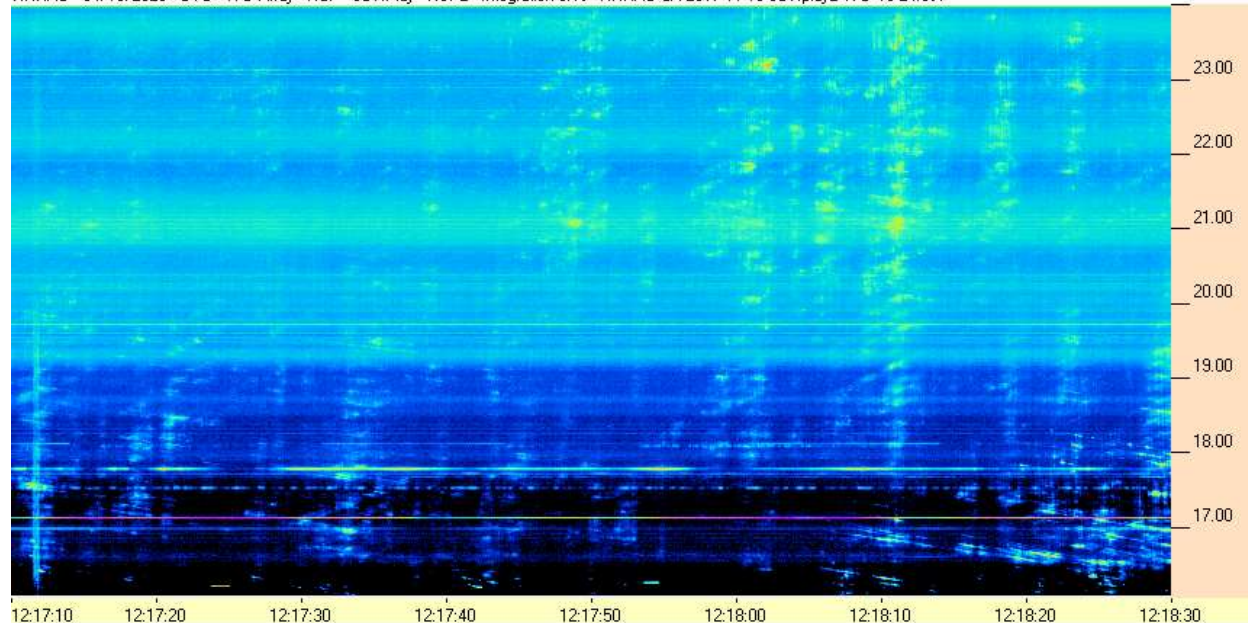
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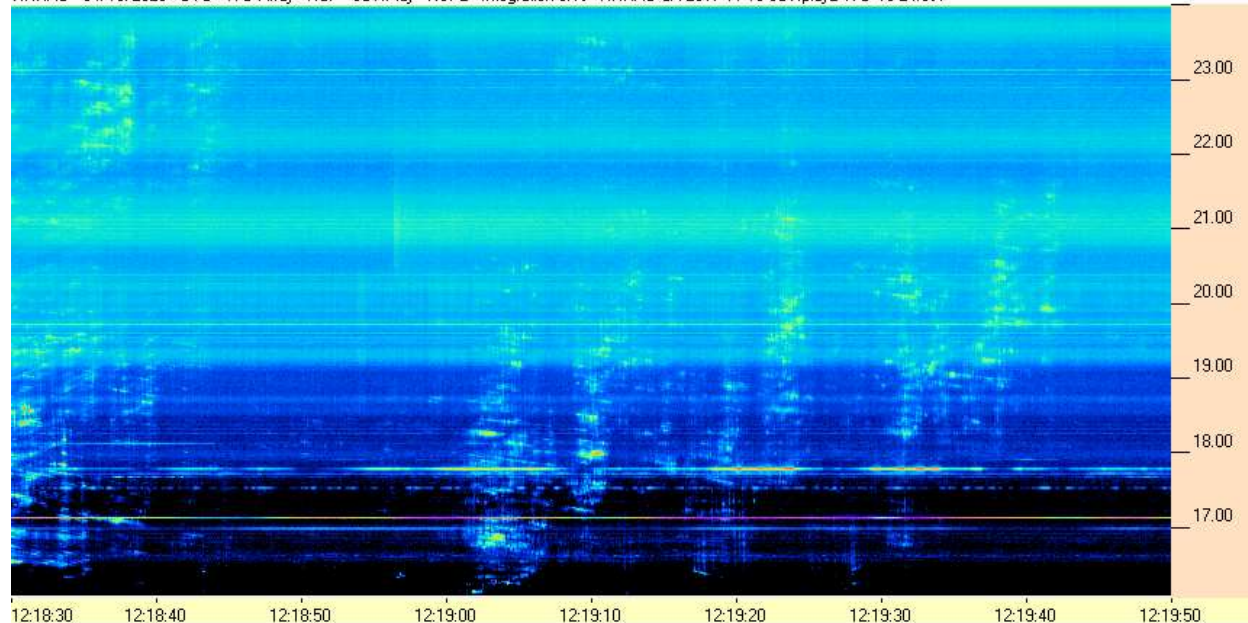
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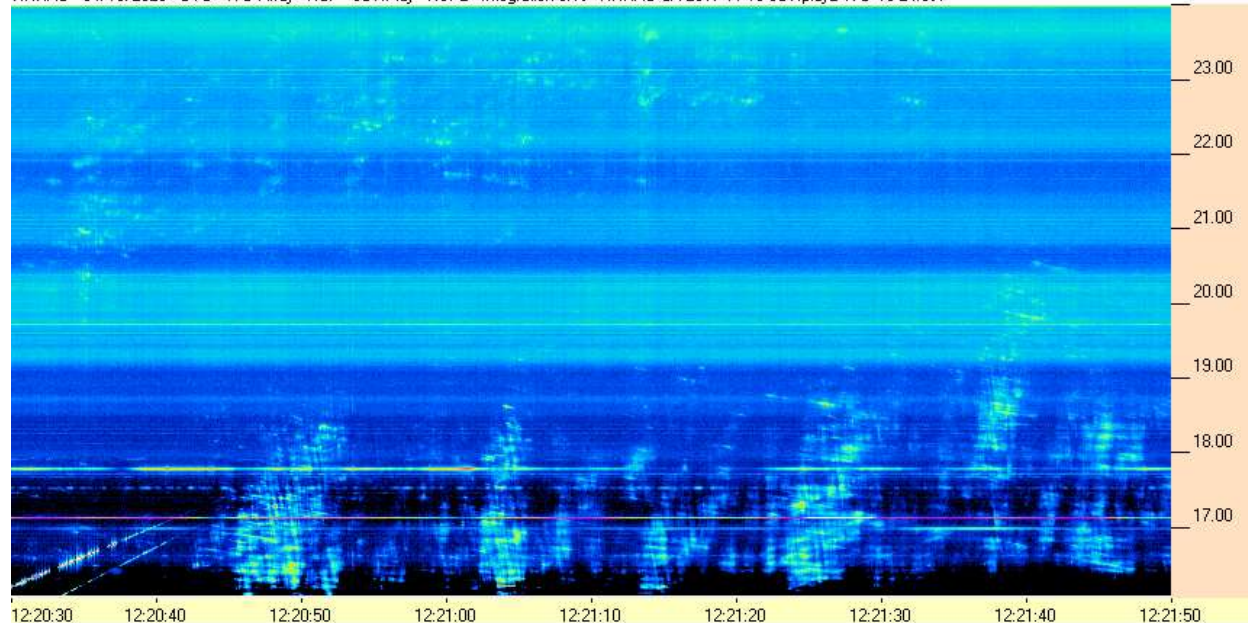
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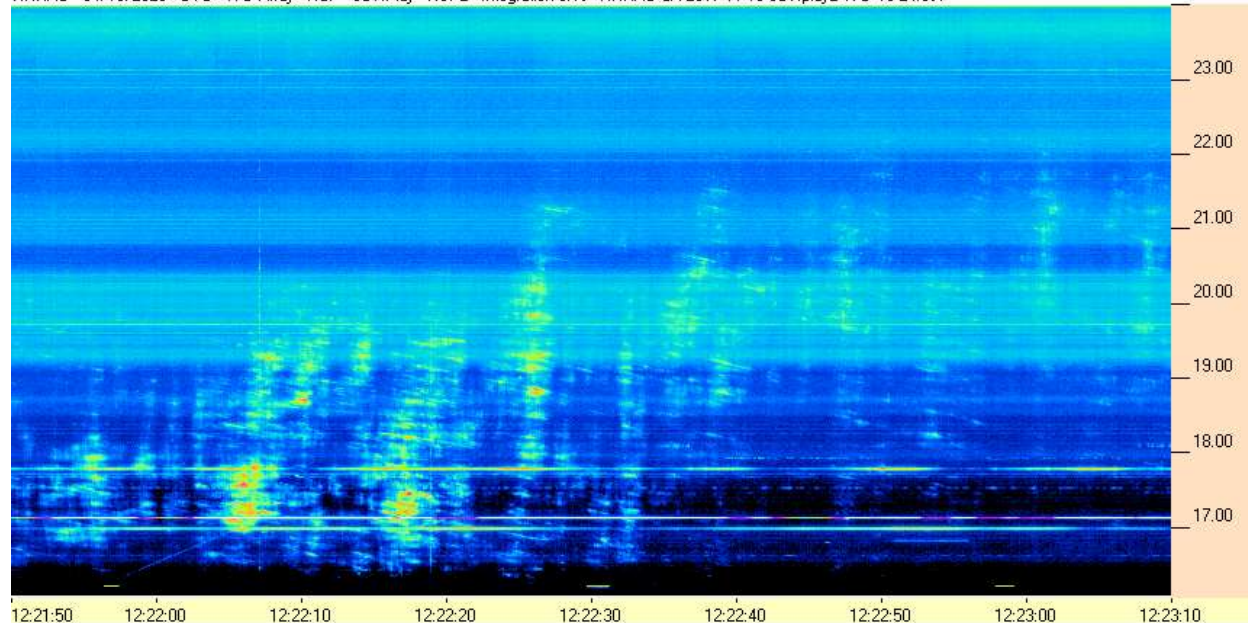
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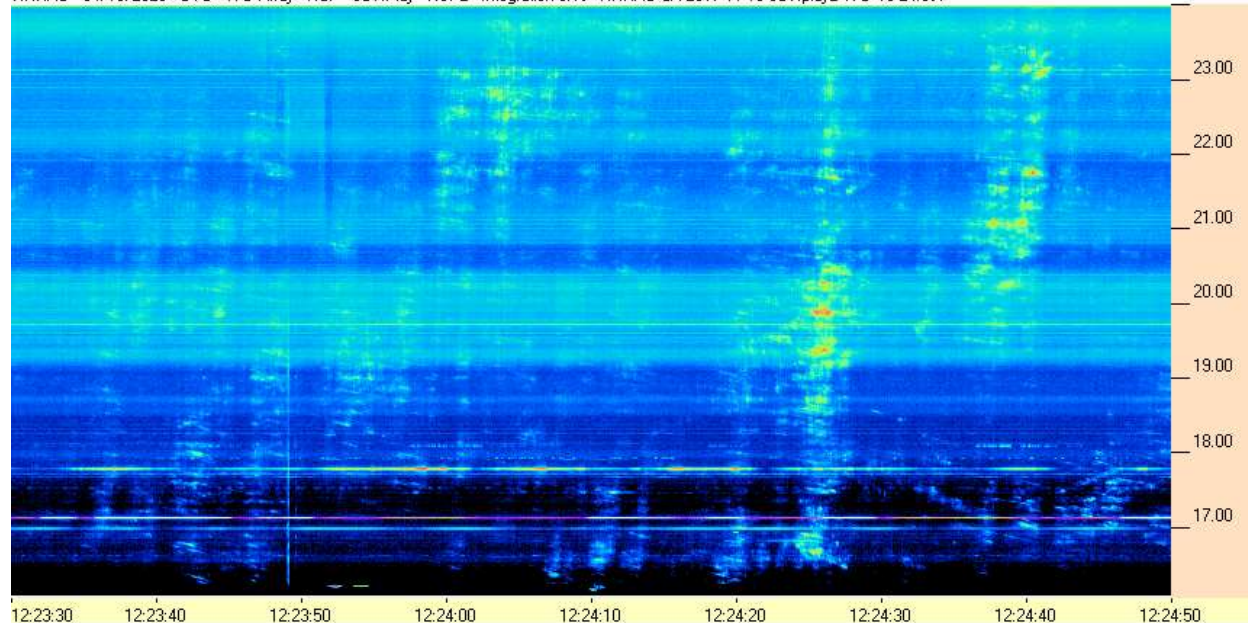
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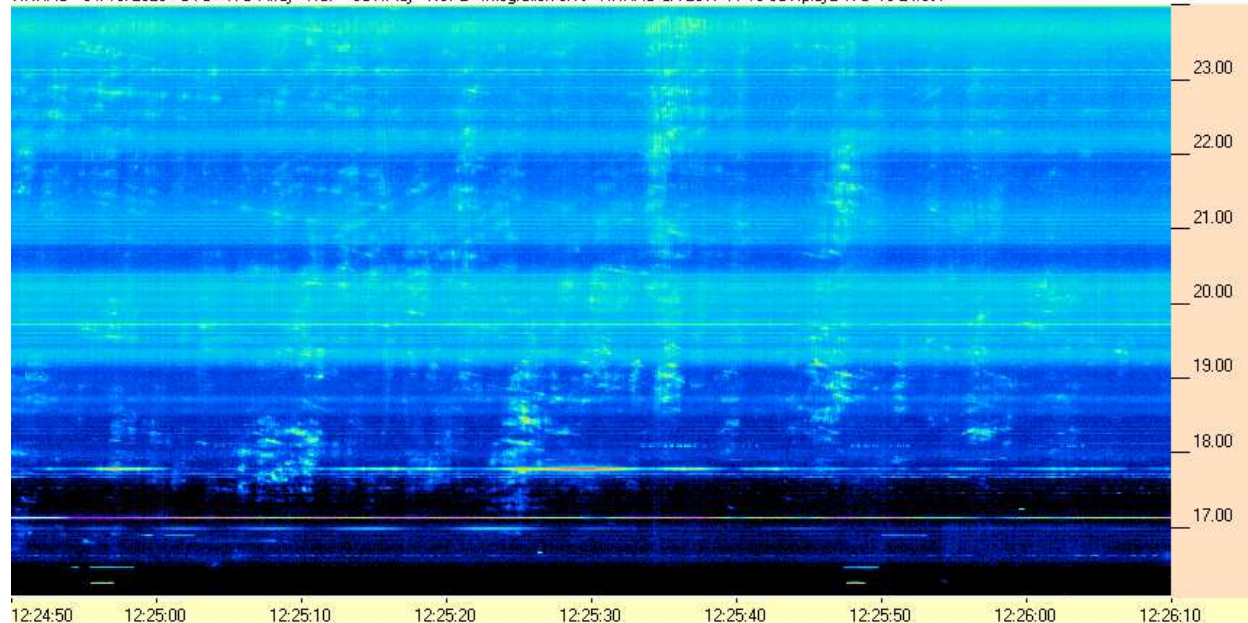
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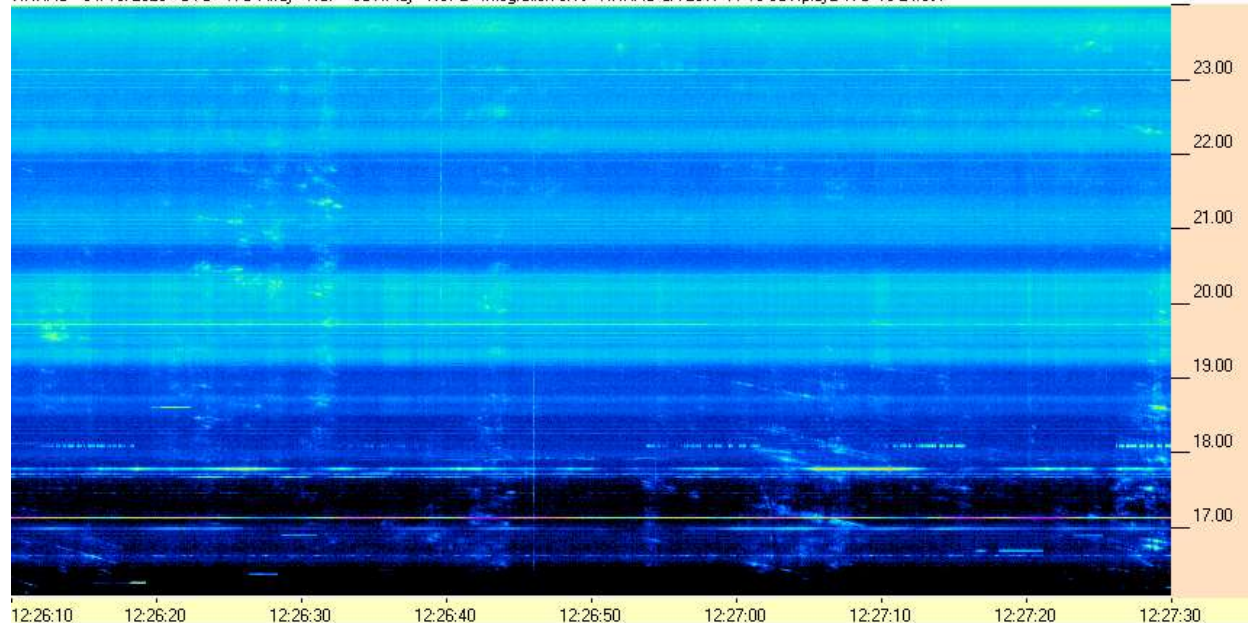
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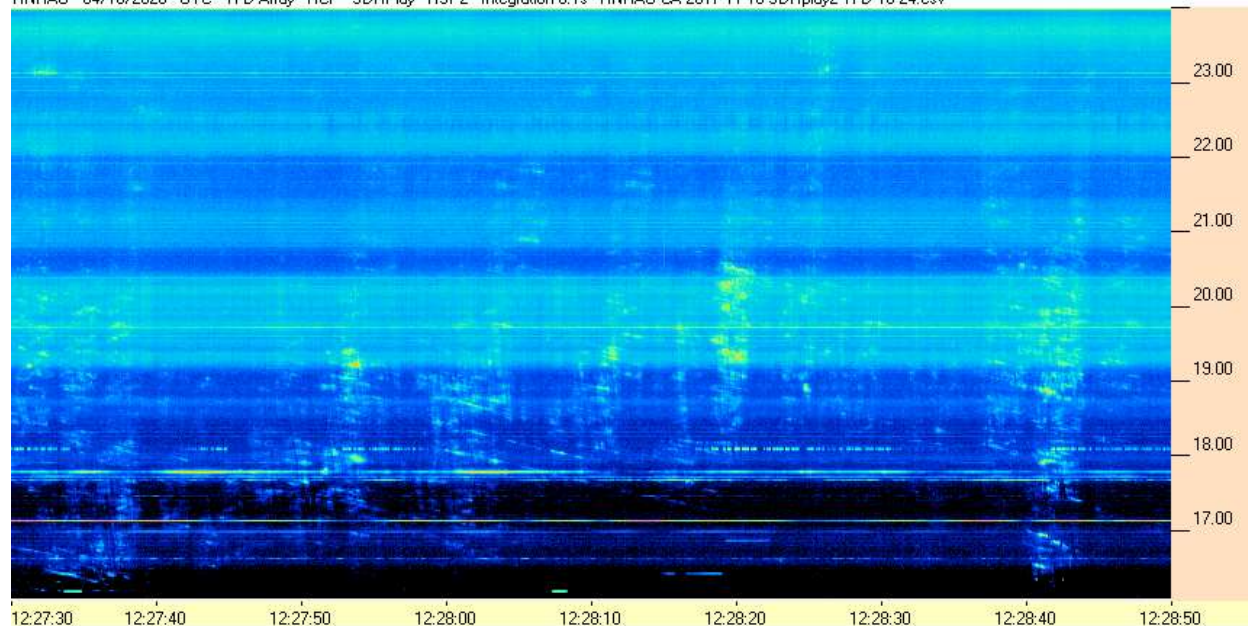


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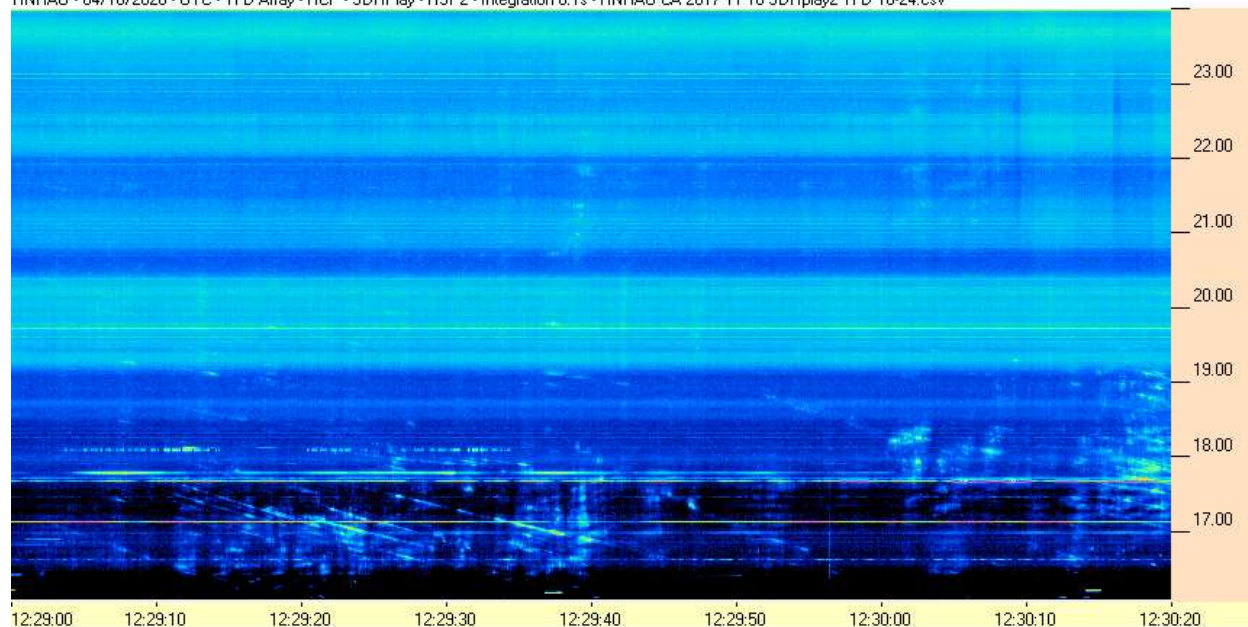
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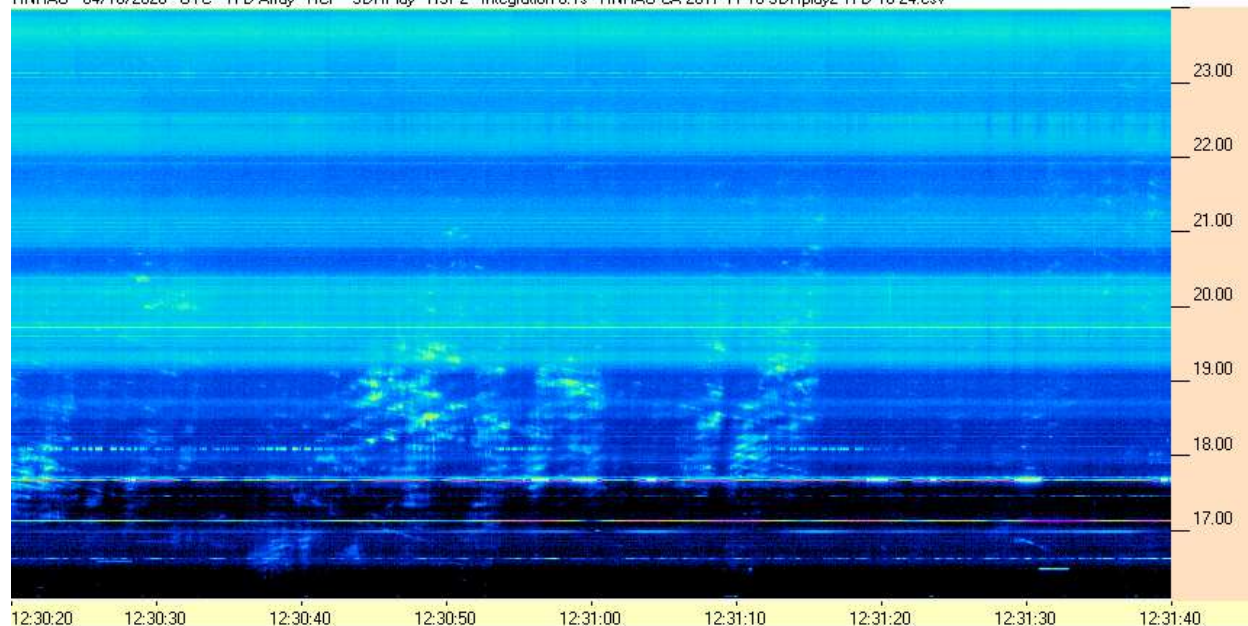
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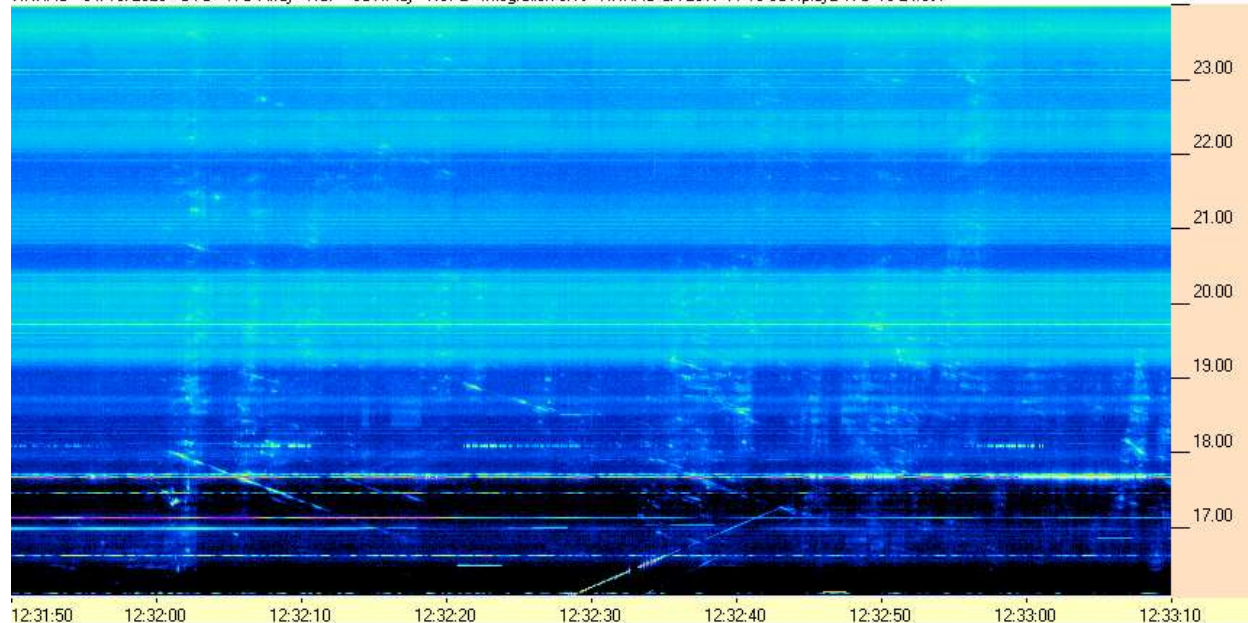
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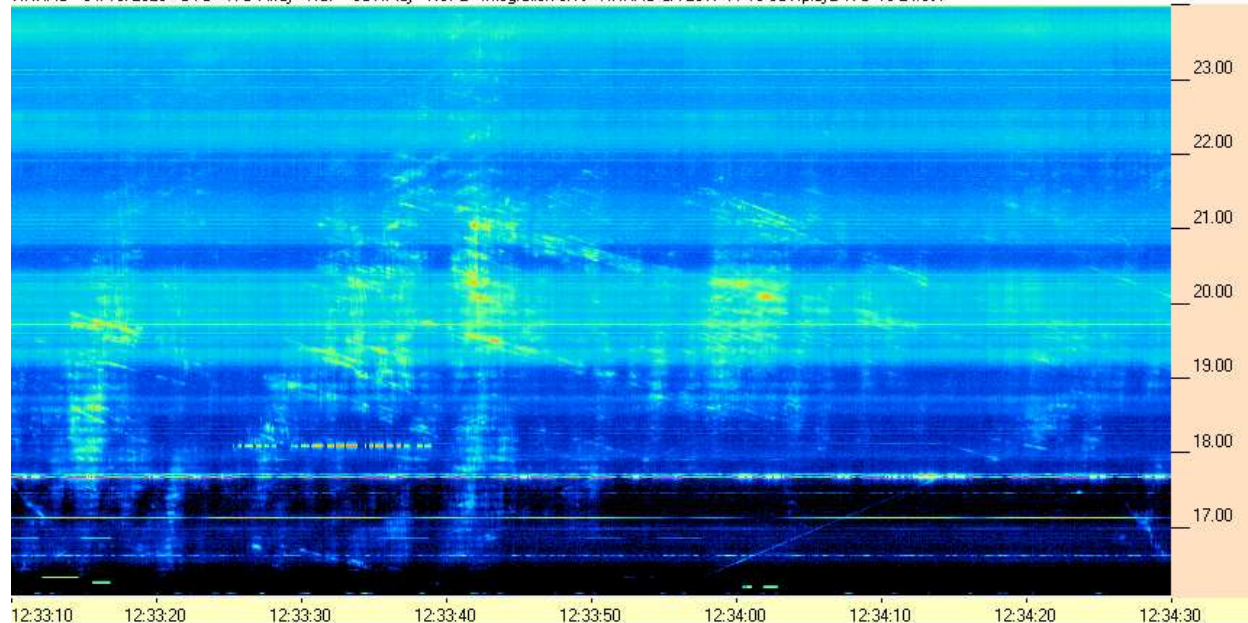
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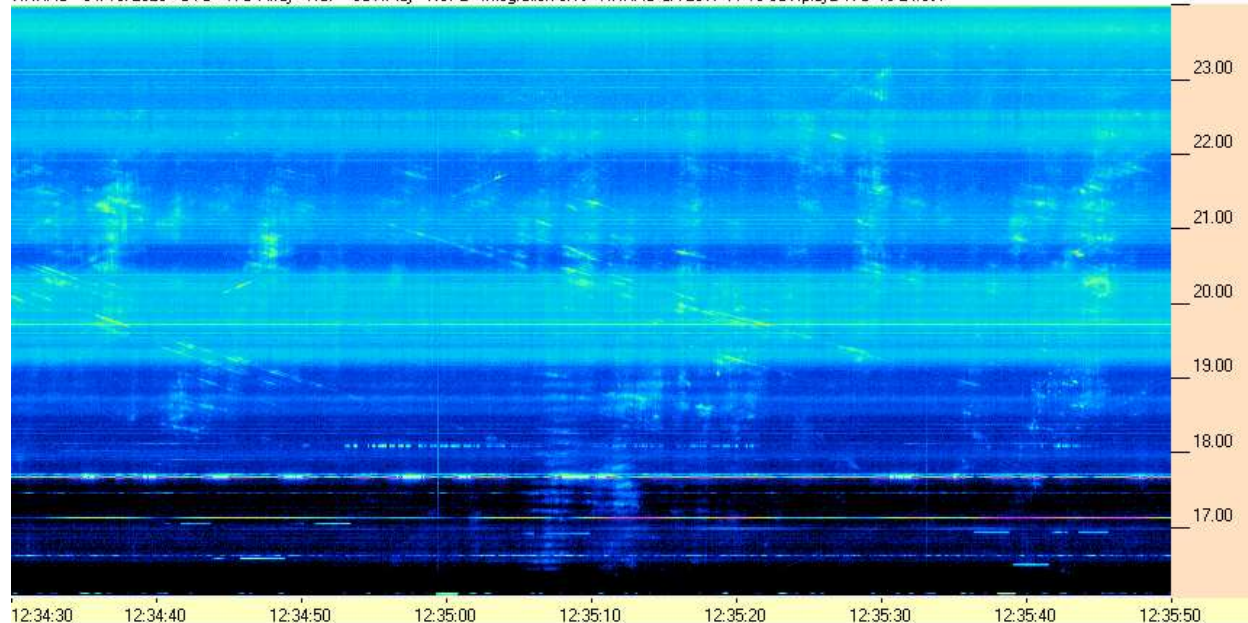
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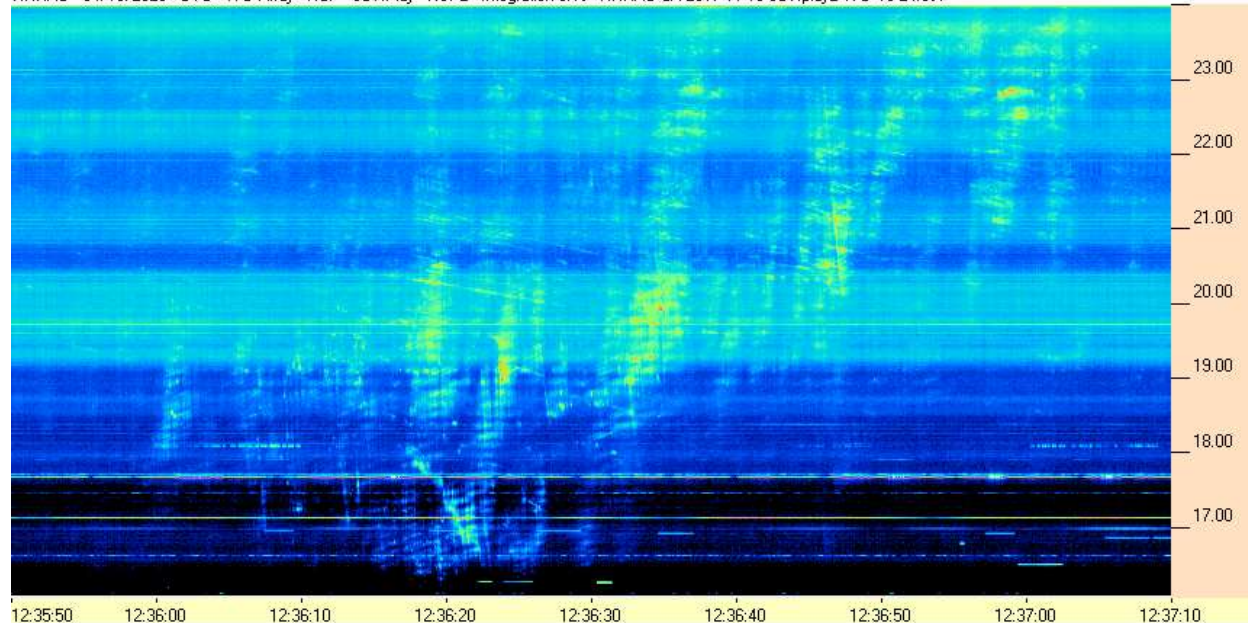
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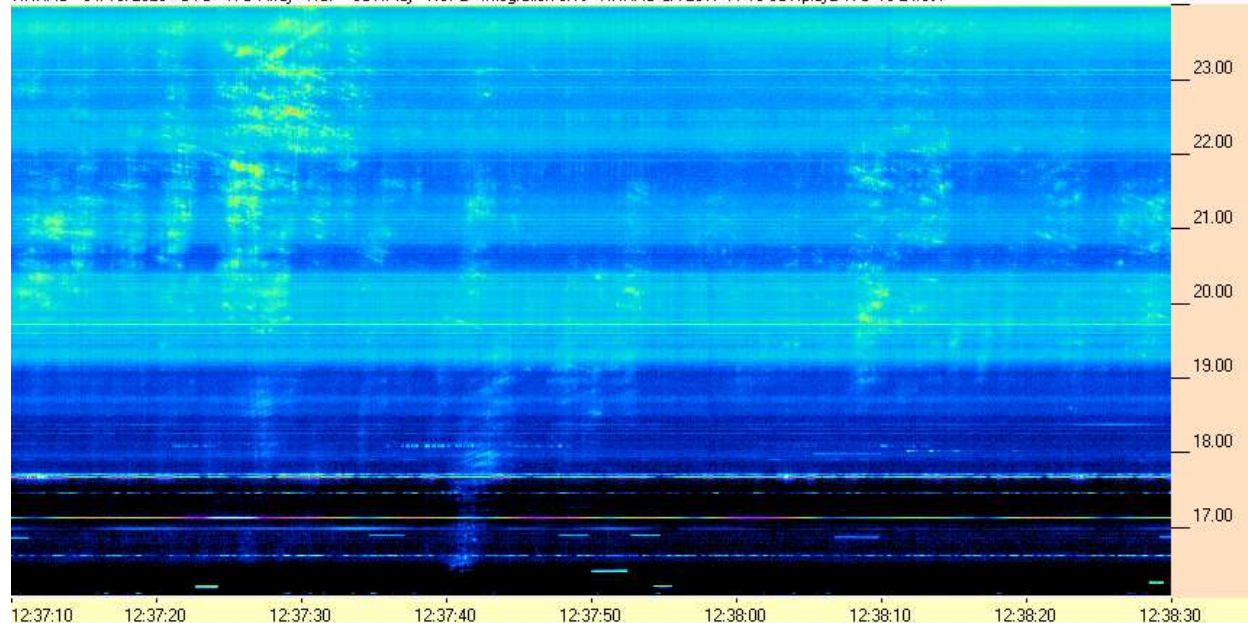
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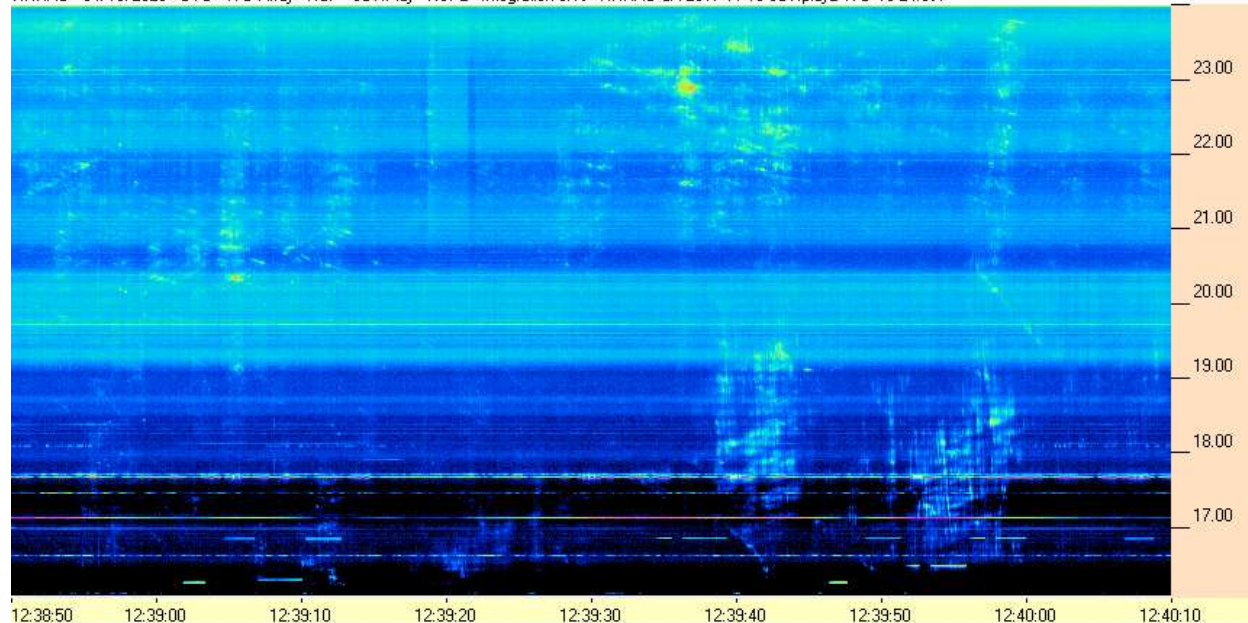
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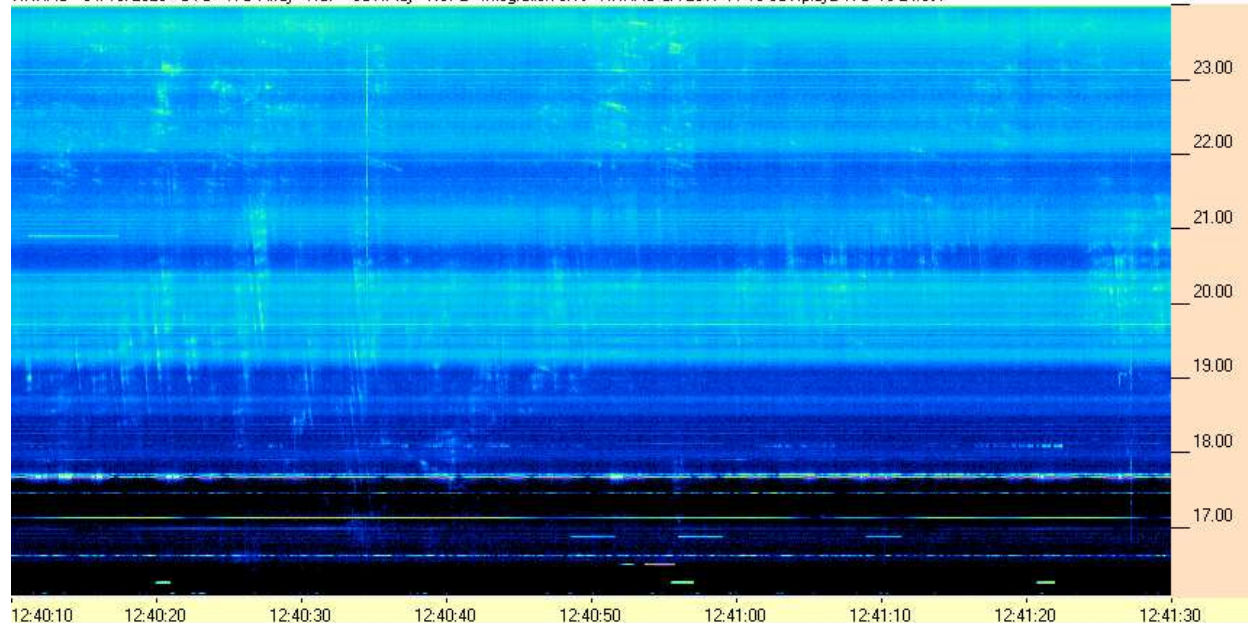
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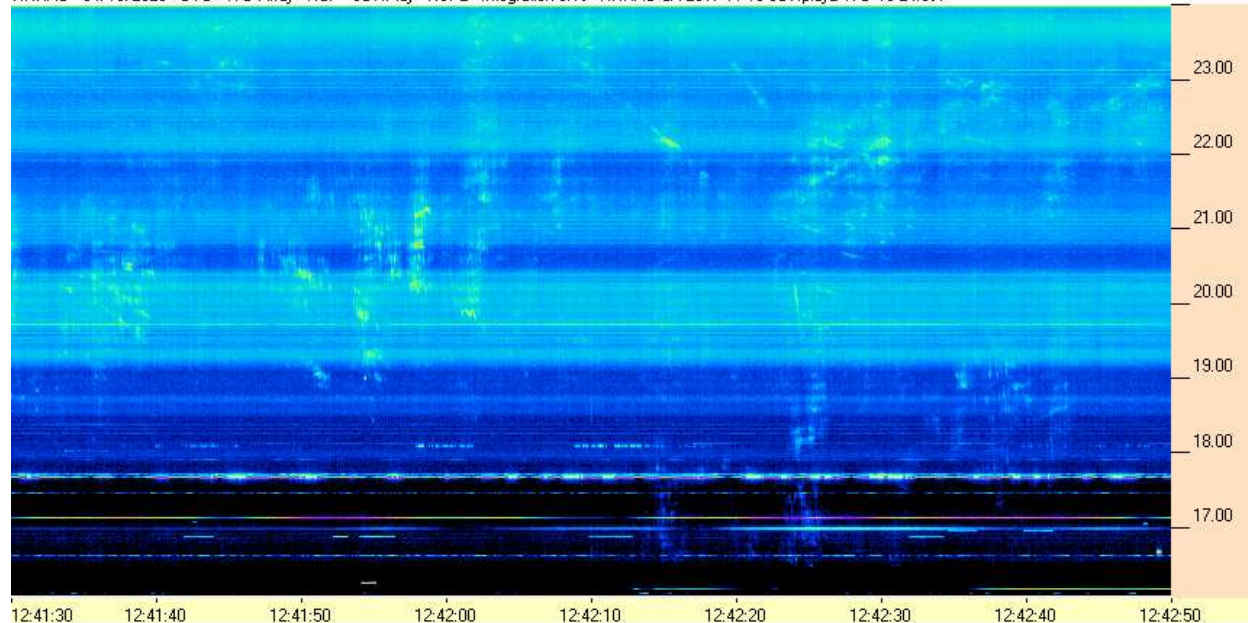
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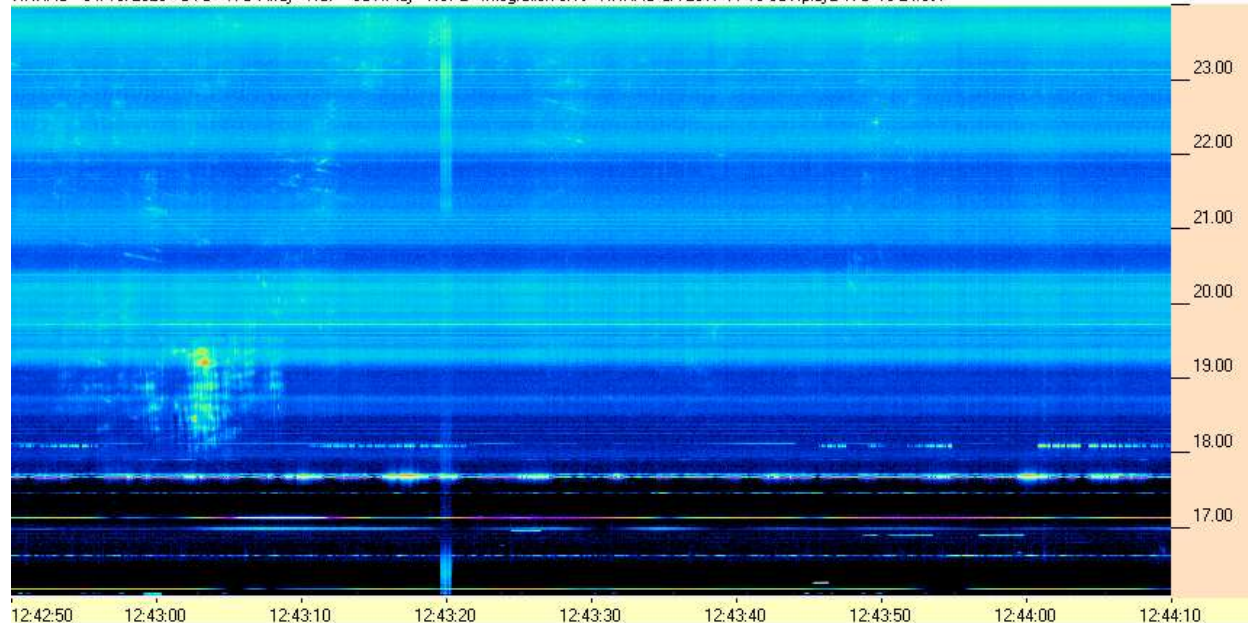
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



HNRAO - 04/16/2020 - UTC - TFD Array - RCP - SDRPlay - RSP2 - Integration 0.1s - HNRAO CA 2017 11 10 SDRplay2 TFD 16-24.csv



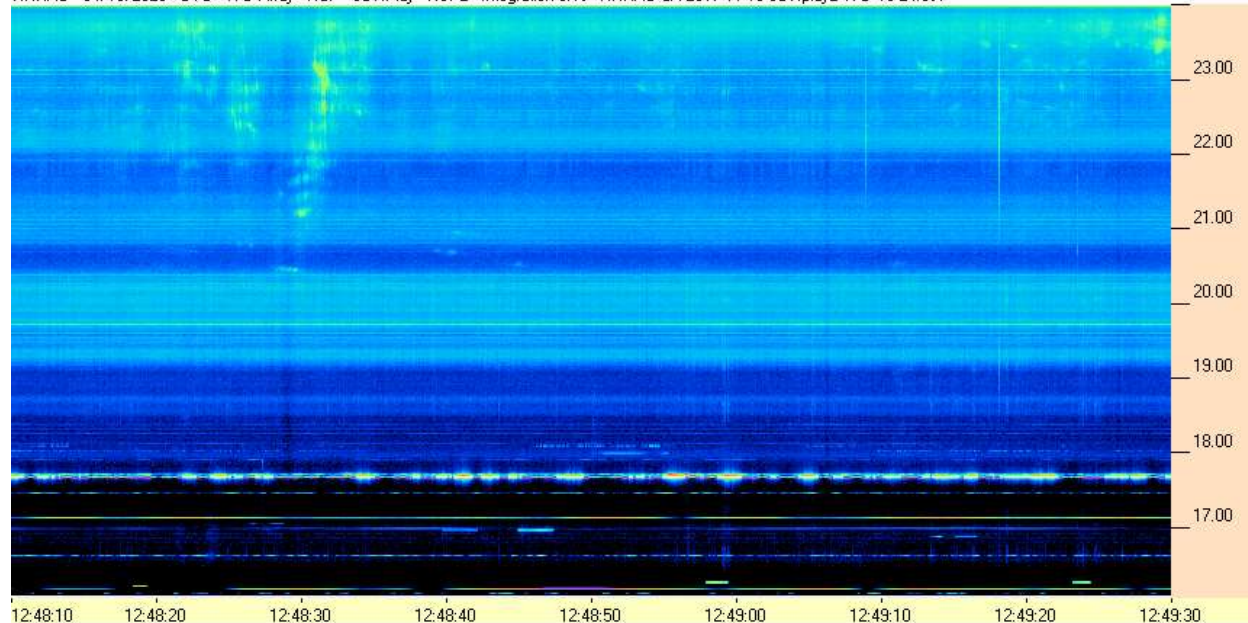
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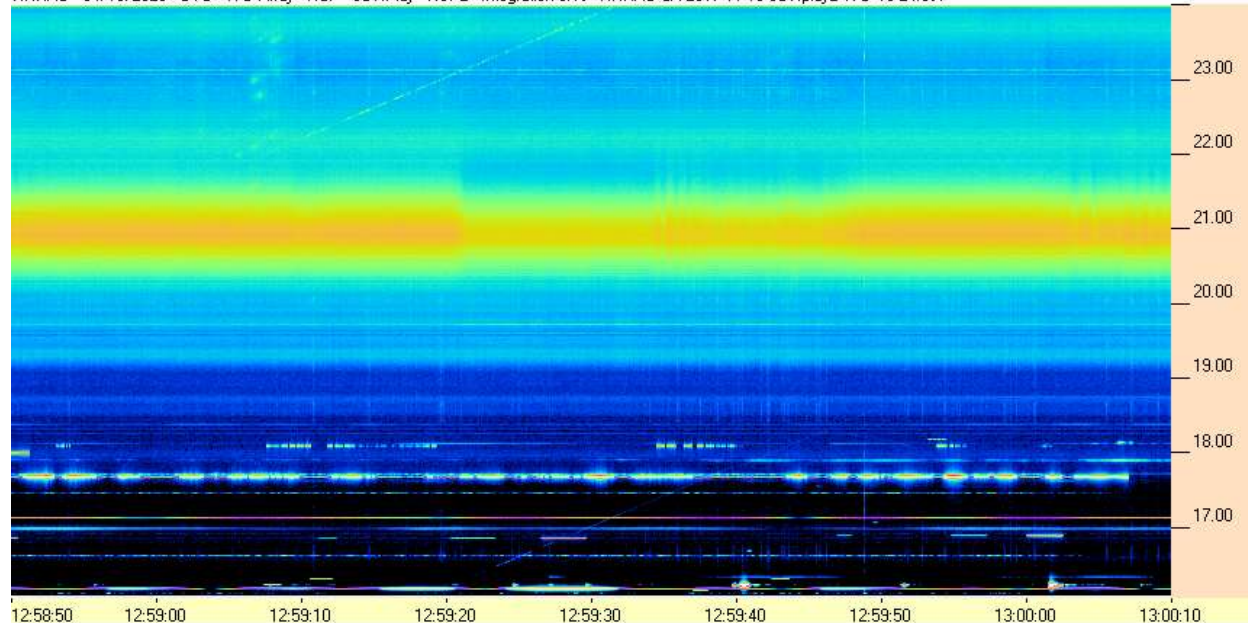
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



HNRAO - 04/16/2020 - UTC - TFD Array - RCP - SDRPlay - RSP2 - Integration 0.1s - HNRAO CA 2017 11 10 SDRplay2 TFD 16-24.csv



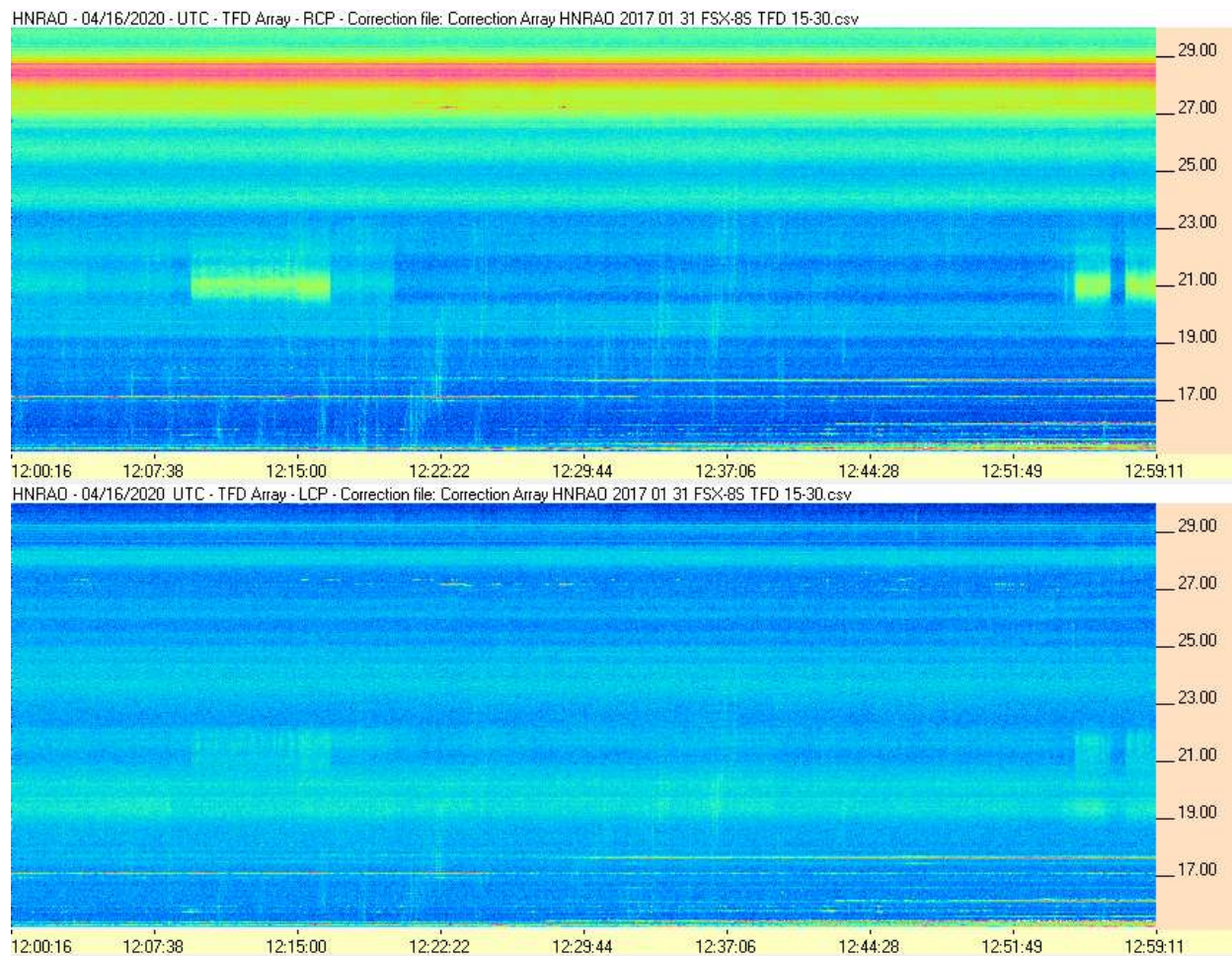
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HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



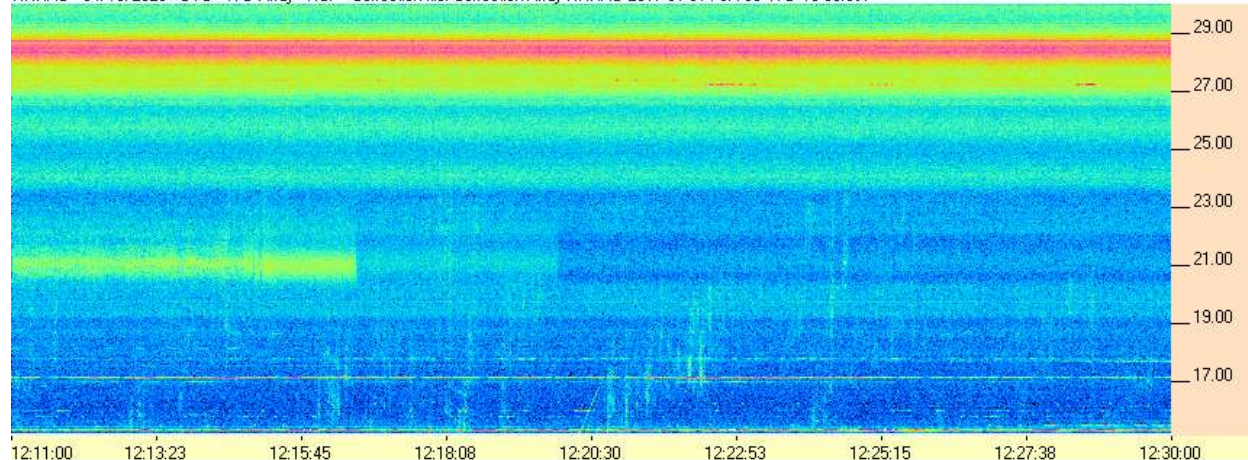
FSX-8S / TFD Array



HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



HNRAO - 04/16/2020 - UTC - TFD Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv



HNRAO - 04/16/2020 - UTC - TFD Array - LCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv

