

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: July 4, 2018

Object: Jupiter – Io-C

Observer: Unattended

Start - Time UT:	0119	Planetary K-index:	
Jupiter Altitude (deg):	34.6	Jupiter Azimuth (deg):	180.3
Jupiter CML:	301.2	Jupiter Io Phase:	240.62
Jupiter RA (hr/min):	14:44	Jupiter Dec (hr/min):	-14:45
Hour Angle (hr/min):	00:01	Polarization	LCP
Sun Altitude (deg):	-05.5	Sun Azimuth (deg):	307.0
Sun RA (hr/min):	06:44	Sun Dec (hr/min):	23:03

End – Time UT:	0324	De:	-3.1
Jupiter Altitude (deg):	27.3	Jupiter Azimuth (deg):	214.8
Jupiter CML:	16.77	Jupiter Io Phase	258.42
Hour Angle (hr/min):	02:06	Duration (min):	205
Sun Altitude (deg):	-21.0	Sun Azimuth (deg):	331.9
Max Frequency MHz	23	Min Frequency MHz	16

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	TFD	RCP	-8.35 dB	#2 RCP	Port 2 +3dB	Twice daily
SDRPlay RSP2	TFD	LCP	-7.59 dB	#1 LCP	Port 2 +3dB	Twice daily
JOVE 1	TFD	RCP	-8.35 dB	#2 RCP	Port 3 +3 dB	04/20/2018
JOVE 1	TFD	LCP	-7.59 dB	#1 LCP	Port 3 +3 dB	04/20/2018
JOVE II	Jove dipoles	Linear	-3.12 dB	#3 Linear	Port 4 +3 dB	06/23/2018
SDRPlay RSP1	Experimental*					

JOVE dipoles phased @ 32 degrees for 2017-2018 season

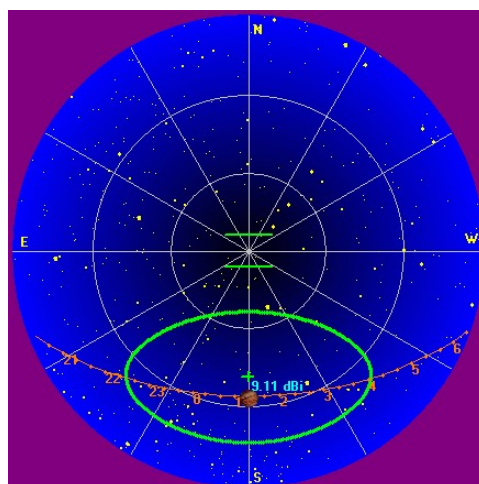
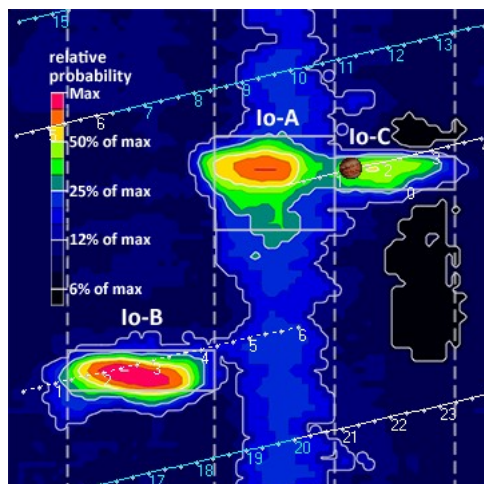
TFD array phased @ 35 degrees for 2017-2018 season

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

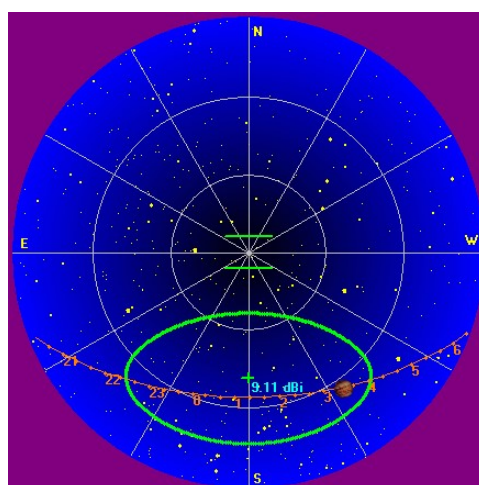
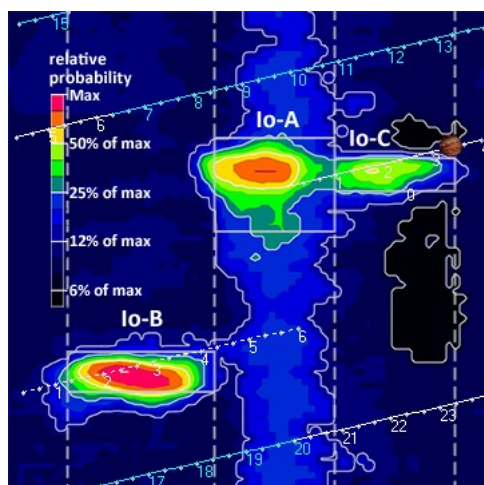
* Used for testing and evaluating antenna systems

Software Radio Sky Spectrograph 2.8.50

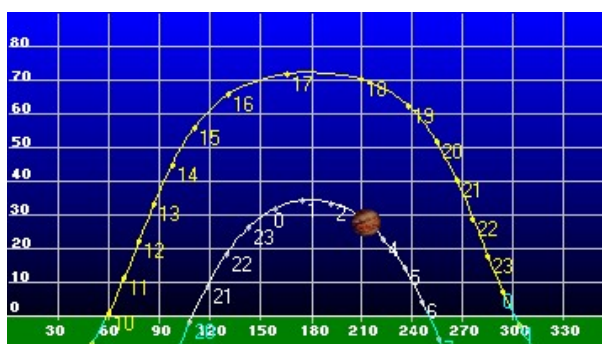
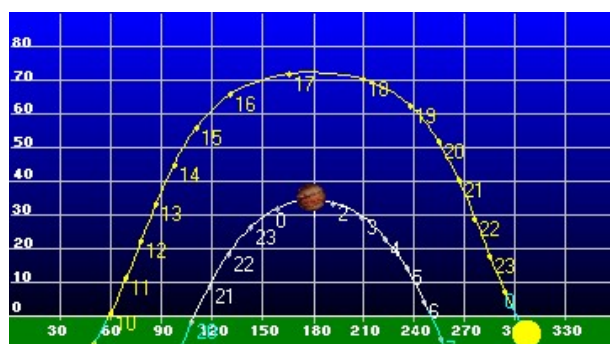
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Beginning of Pass



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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Observations of this event were made with the FSX-8S spectrograph and TFD array, the SDRPlay RSP2 and TFD array and the Jove 2 receiver and Jove dipole array.

This event was recorded unattended, and the operator was not present on site, or in the state during the storm. Weather conditions can only be inferred from the spectrographs. There are numerous lightning spikes throughout the storm indicating relatively close storms. However, the lack of precipitation static in the spectrographs show that no rain was falling.

A Io-C storm, lasting 205 minutes, starting at transit at this observatory. S-bursts starting at 0119 UT and continued through duration of storm. No L-bursts were detected. Scintillation quite noticeable at 0231 UT but was evident through entire length of storm.

The N-event that dominated this storm was quite remarkable in that it's duration was 1:20 minutes long. It spanned 20 MHz to 22 MHz in this time. The emissions that made up the N-event were S-bursts in very tight, undulating emissions such as 0127 UT.

The remainder of the S-bursts, which were all below the N-event in frequency, came in either weak, +/- 1 dB above GB, to rather strong clusters, such as the group from 0227 to 0228 UT.

Measurements made with the calibrated Jove 2 receiver and linear dipole array measured some of the bursts reaching 700 kK at 20 MHz.

The segment of the storm which passed through the 20 MHz passband of the Jove 2 receiver has been uploaded to the Radio Jove Data Archive.

There were several places which looked as if modulation lanes were present, but there weren't enough of them to measure accurately.

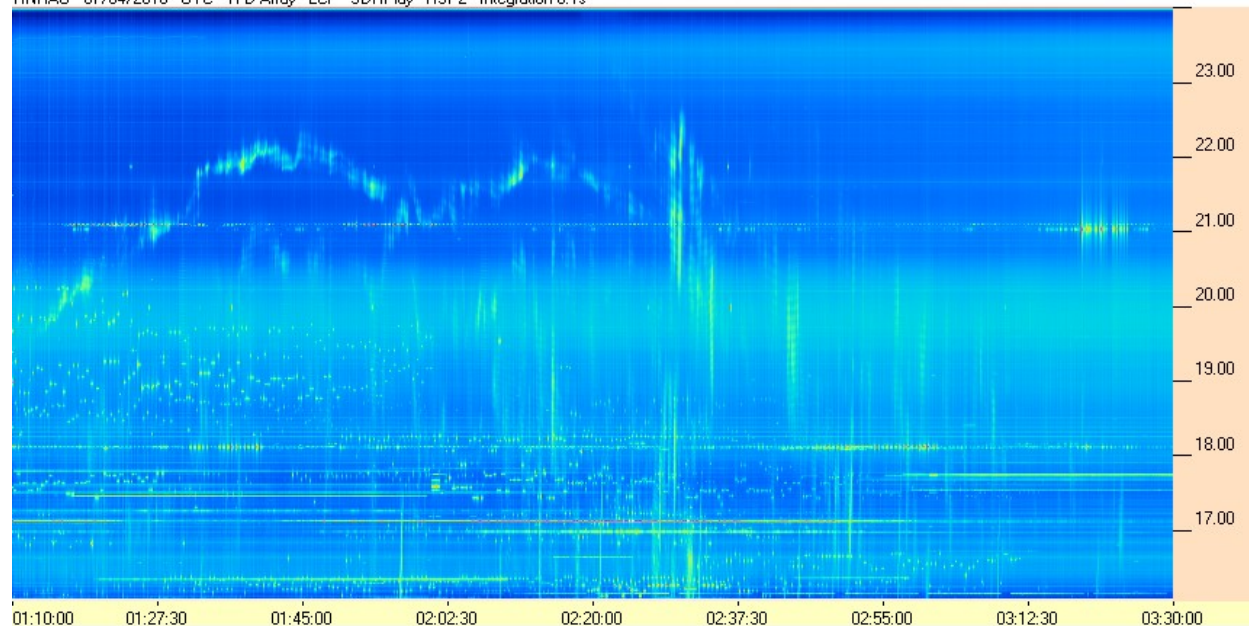
EOR

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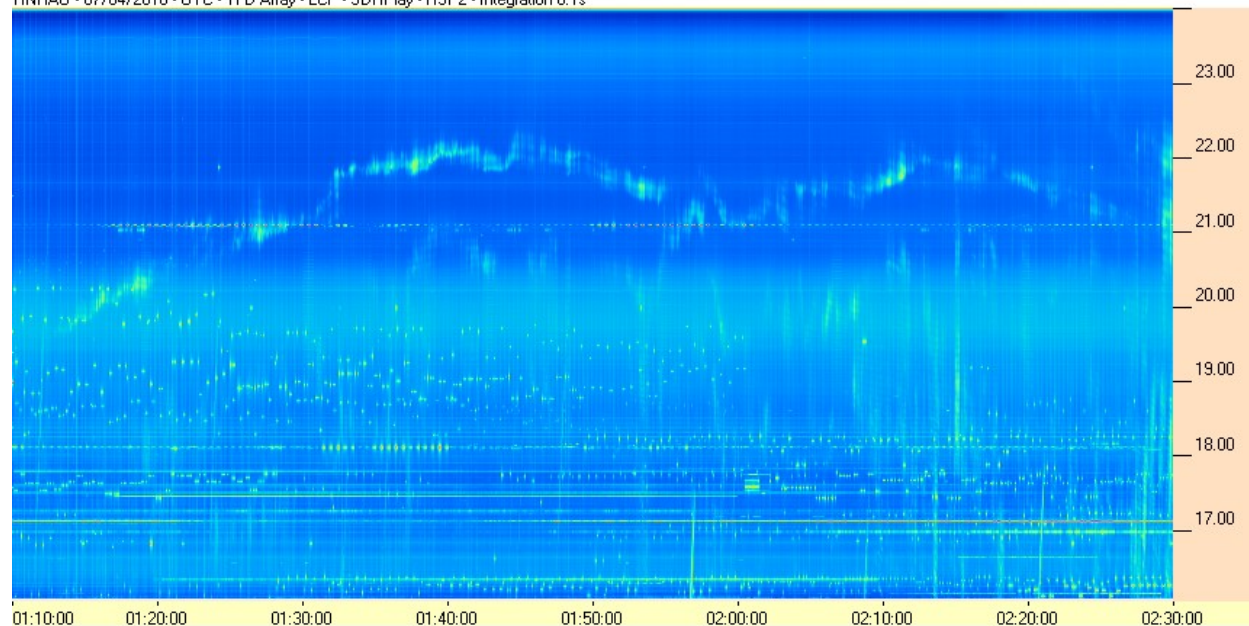


SDRPlay RSP2 / TFD Array

HNRAO - 07/04/2018 - UTC - TFD Array - LCP - SDRPlay - RSP2 - Integration 0.1s



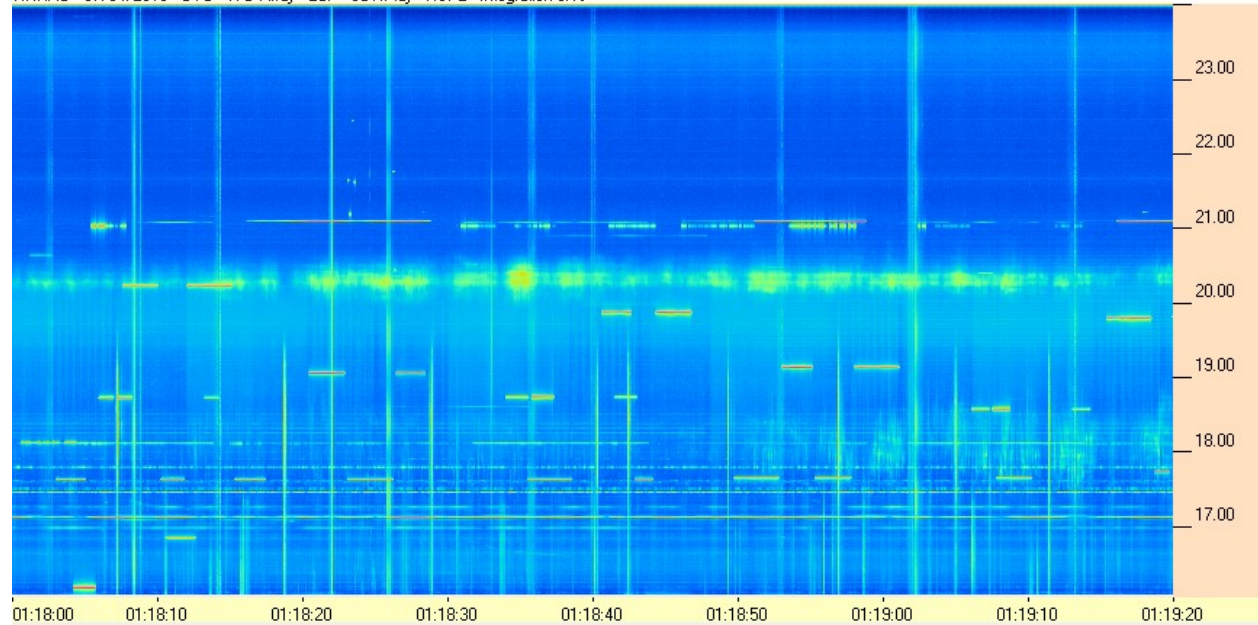
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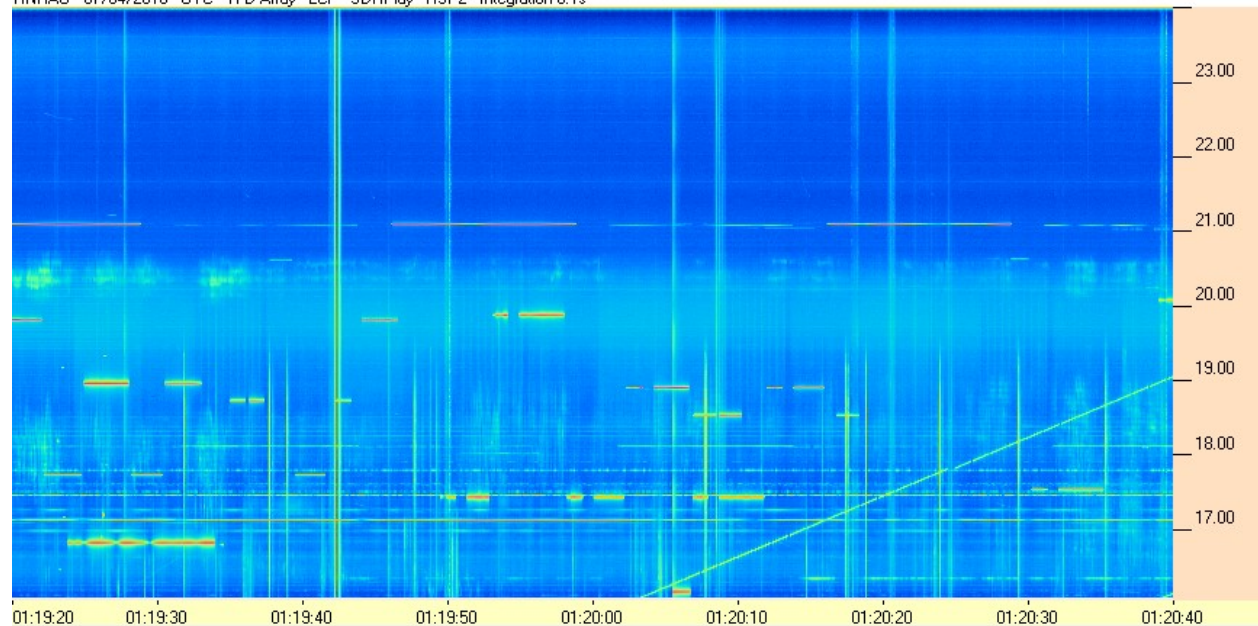
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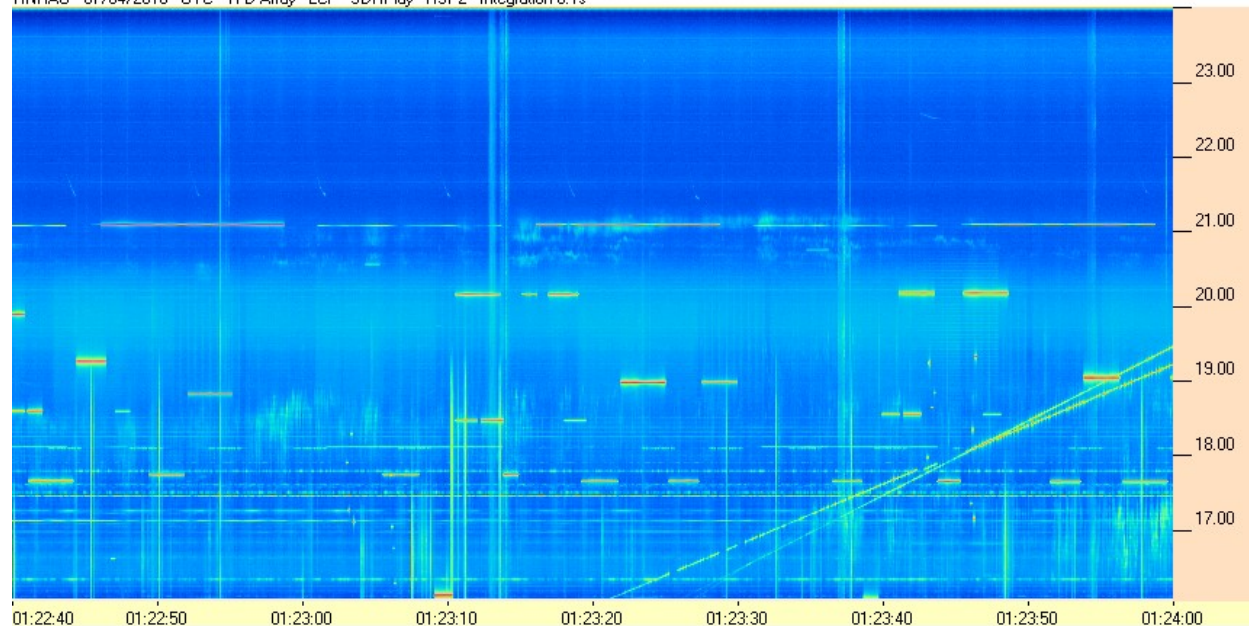
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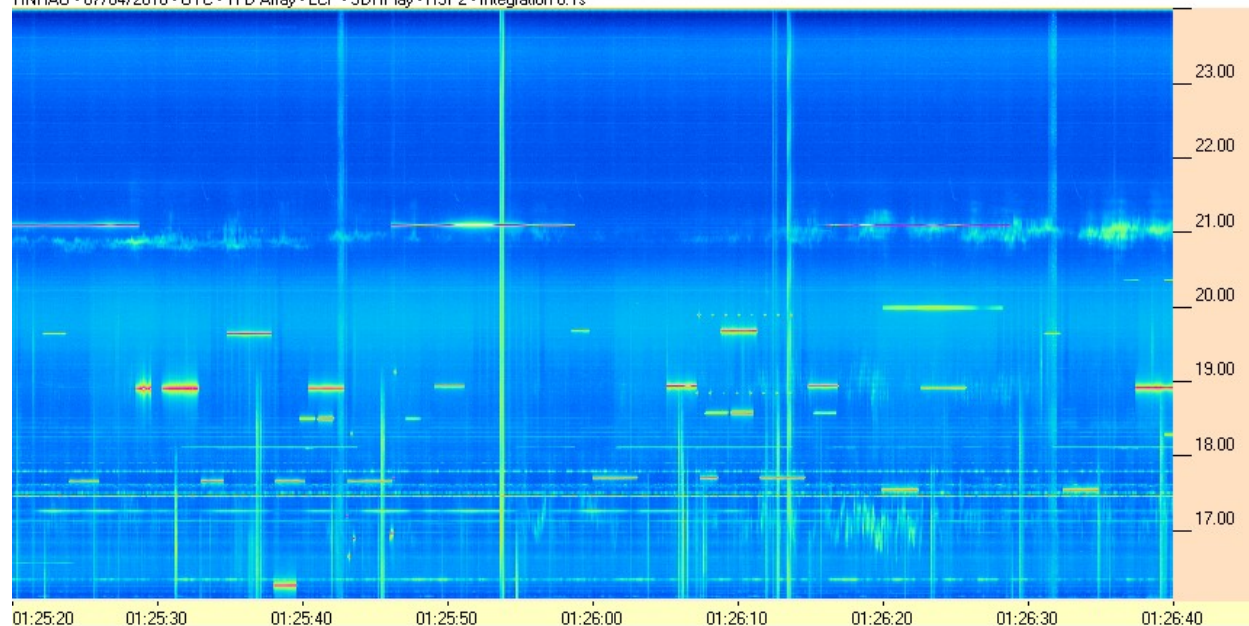
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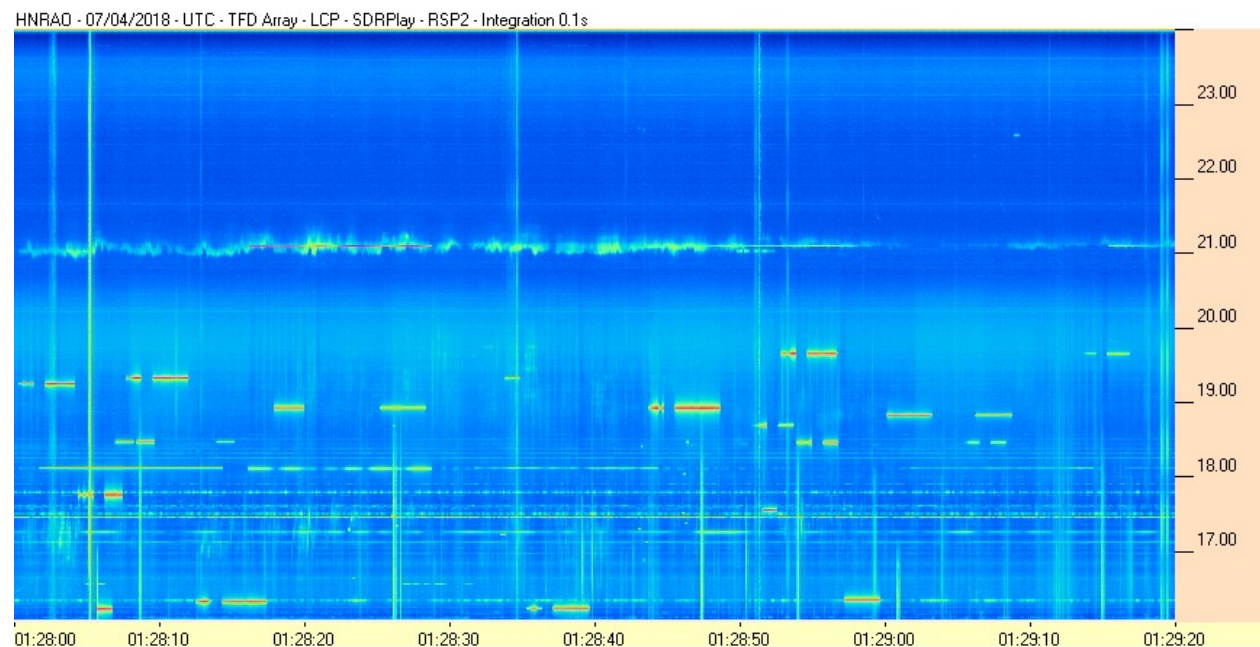
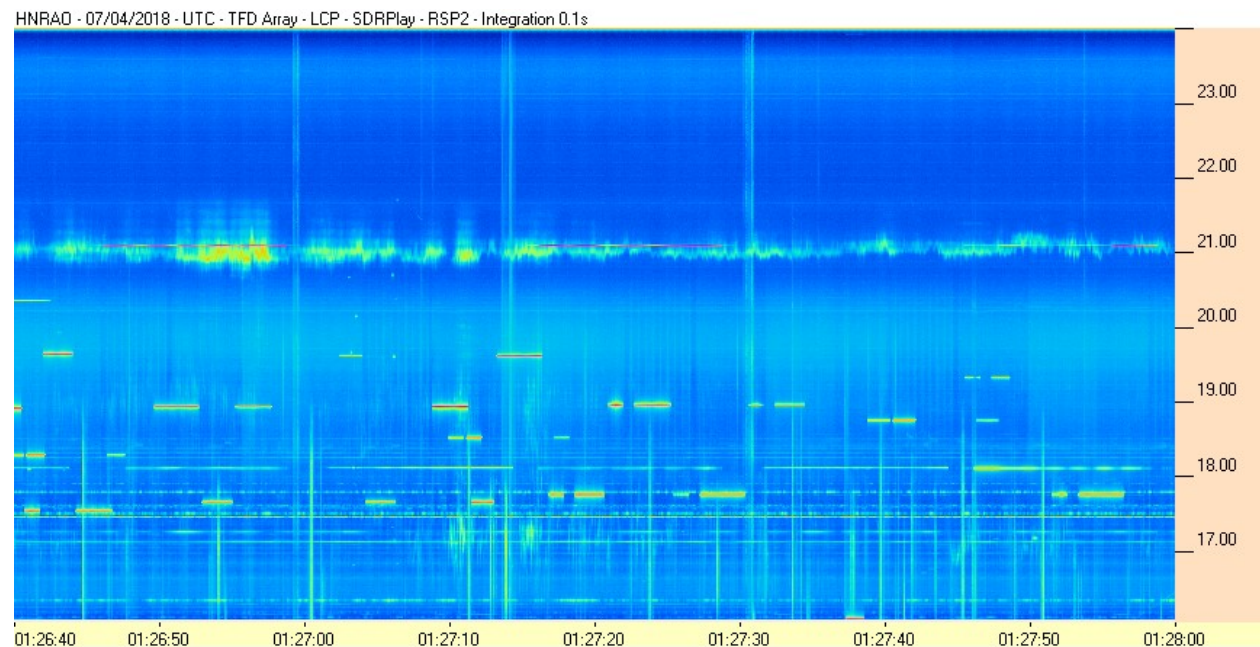
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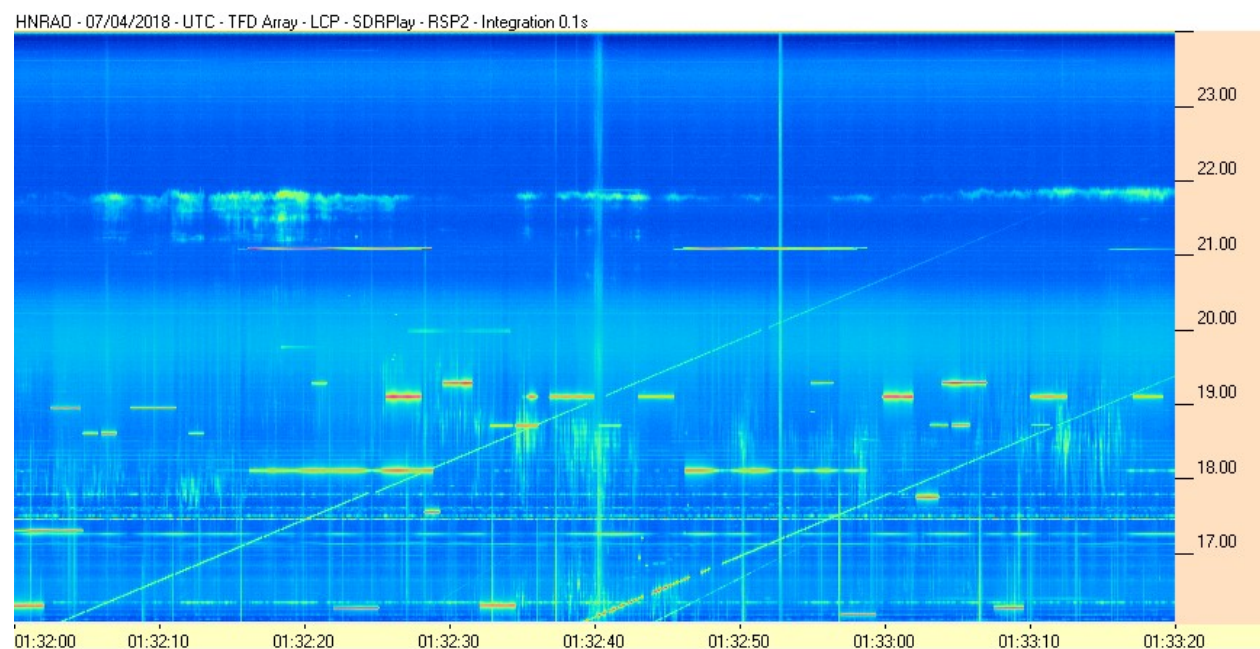
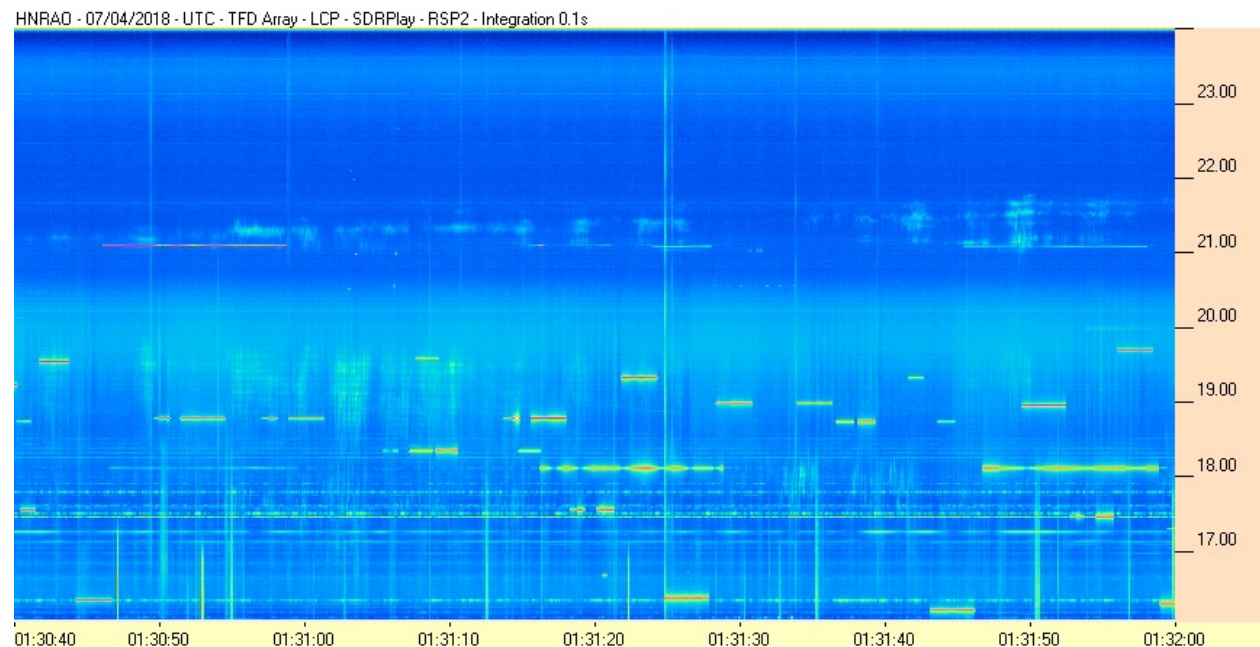
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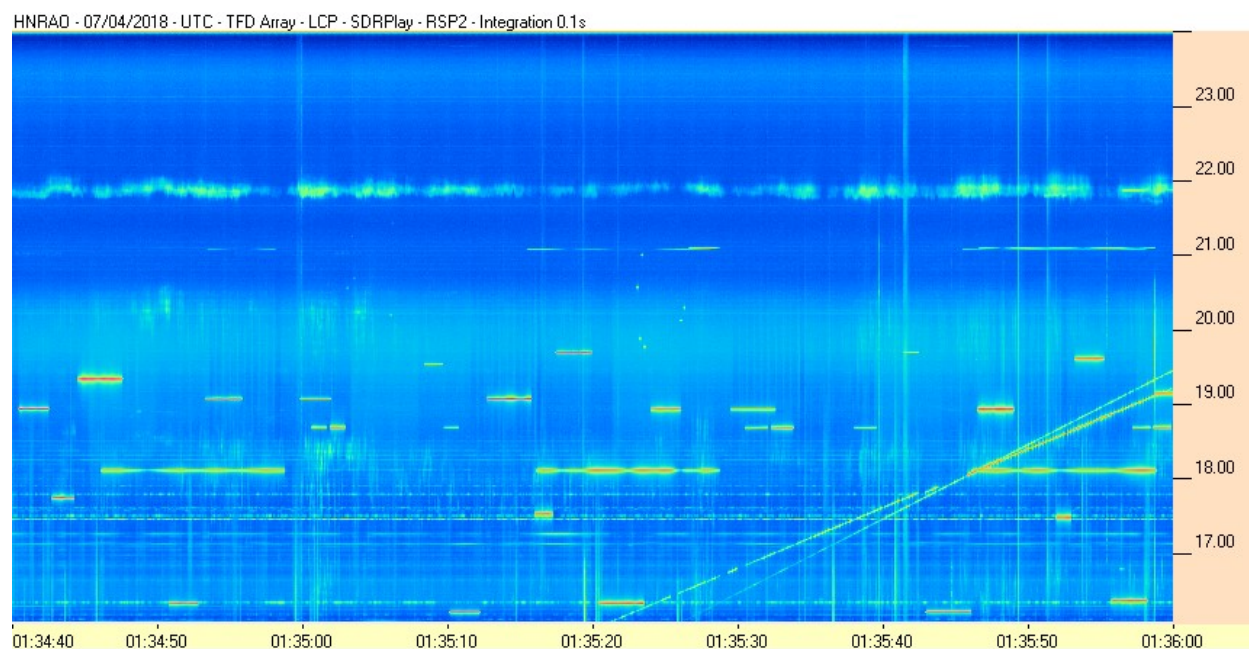
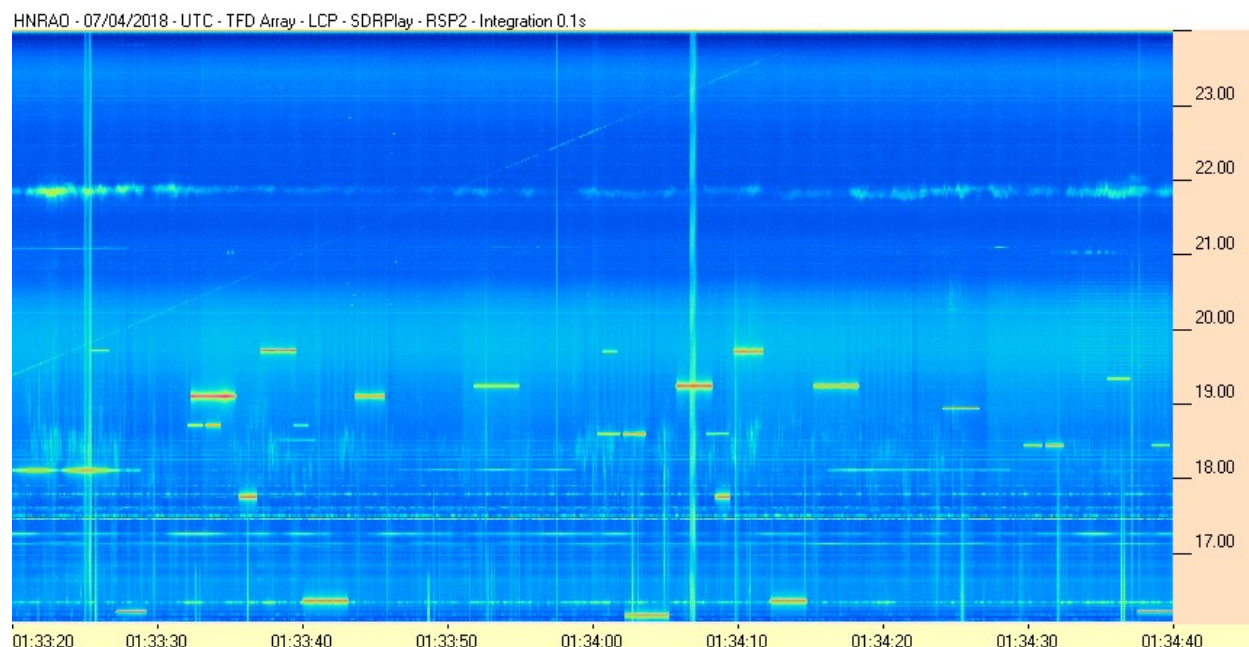
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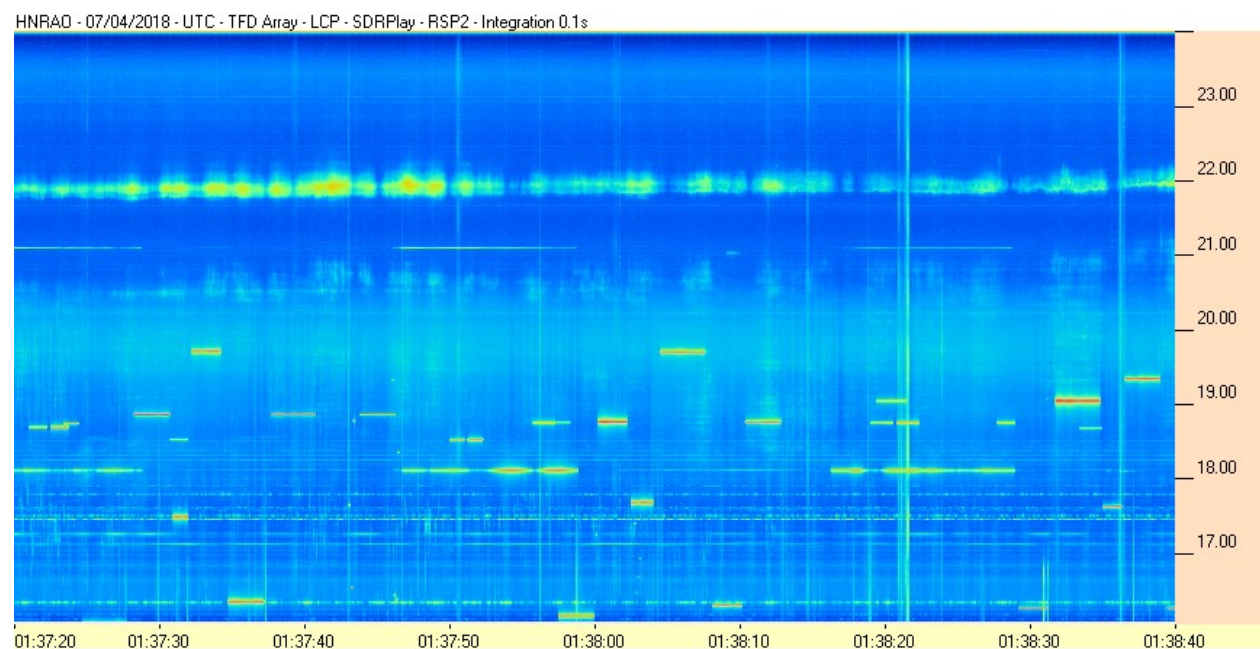
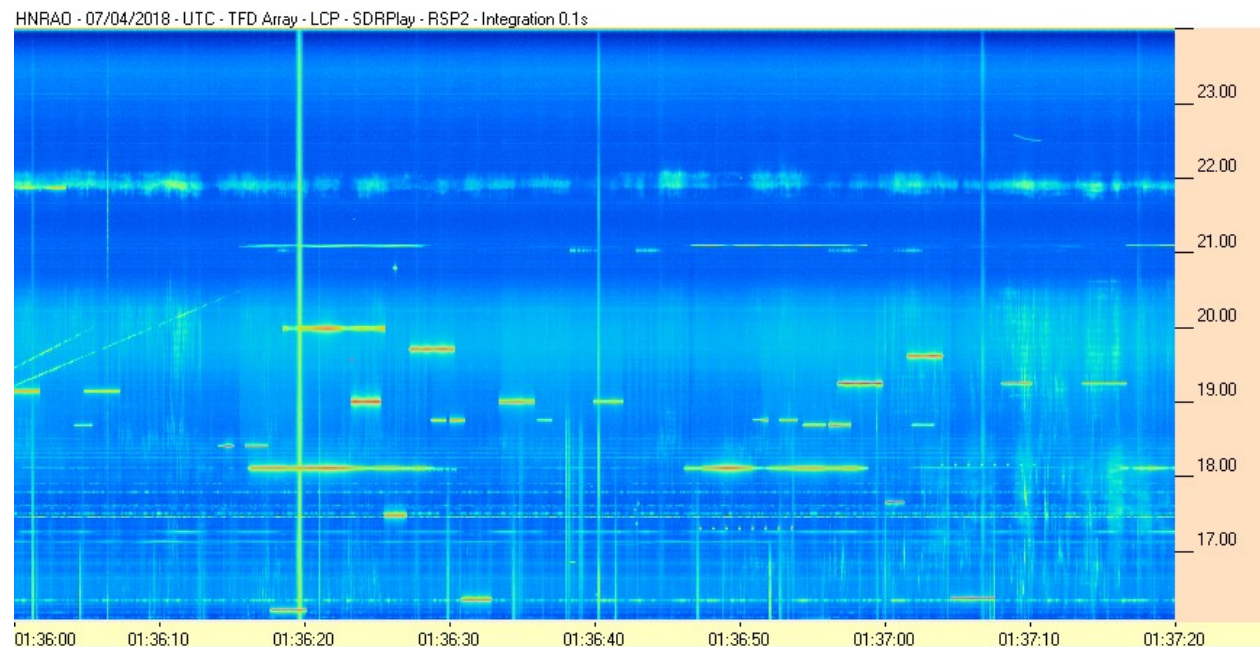
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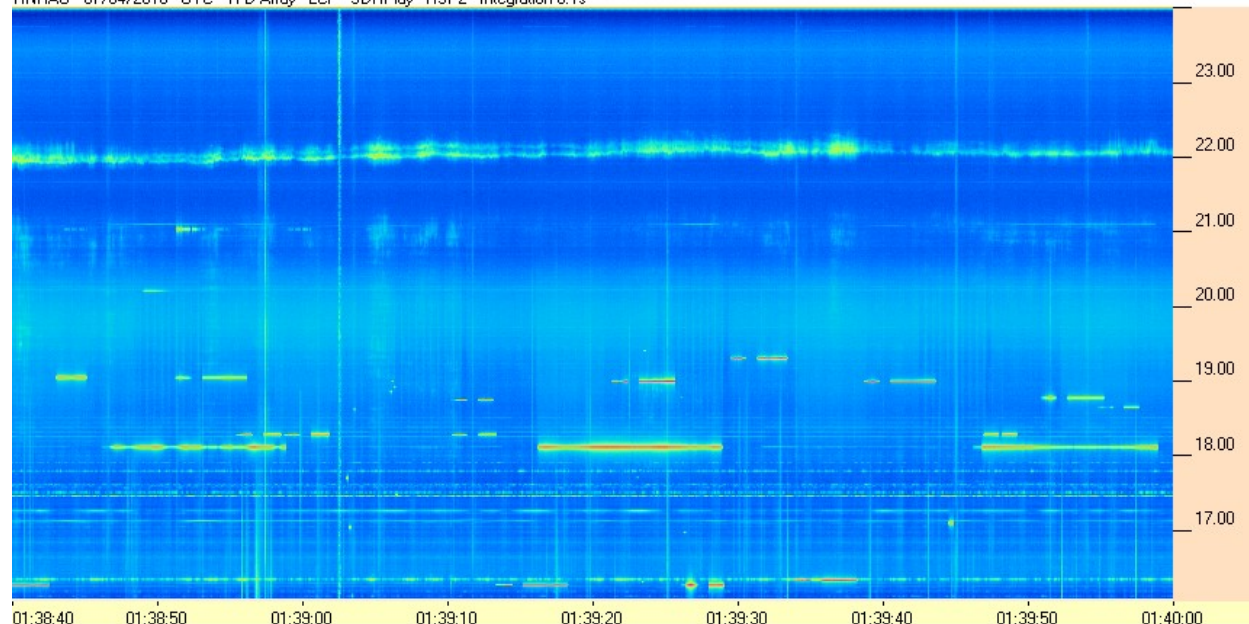
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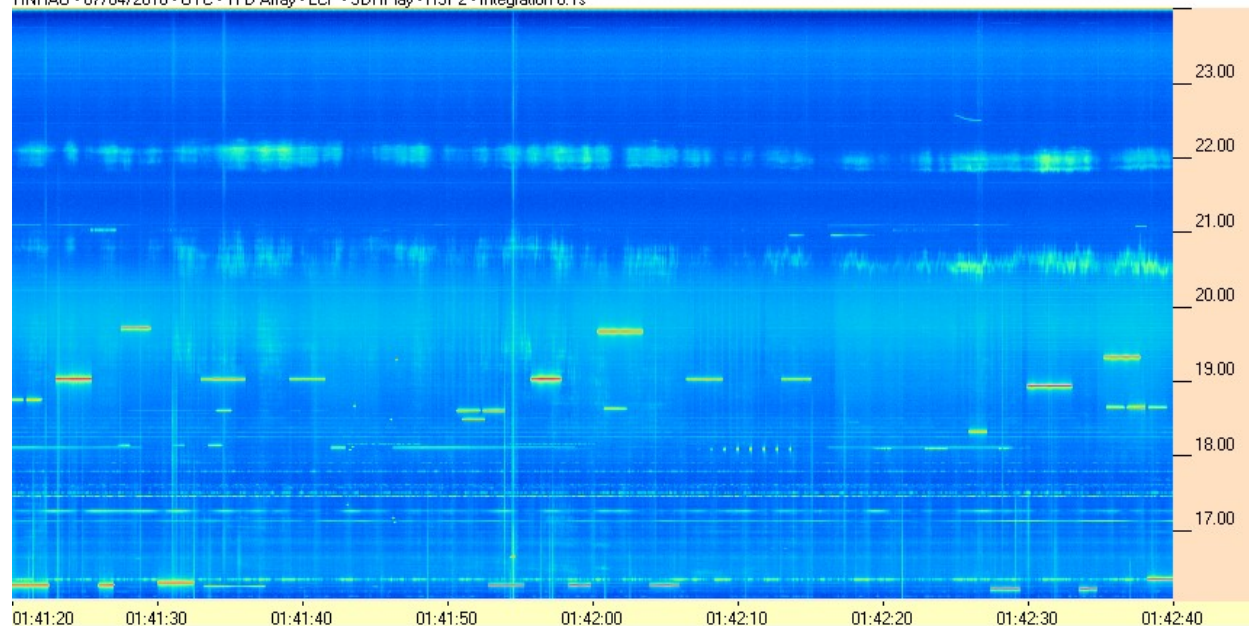
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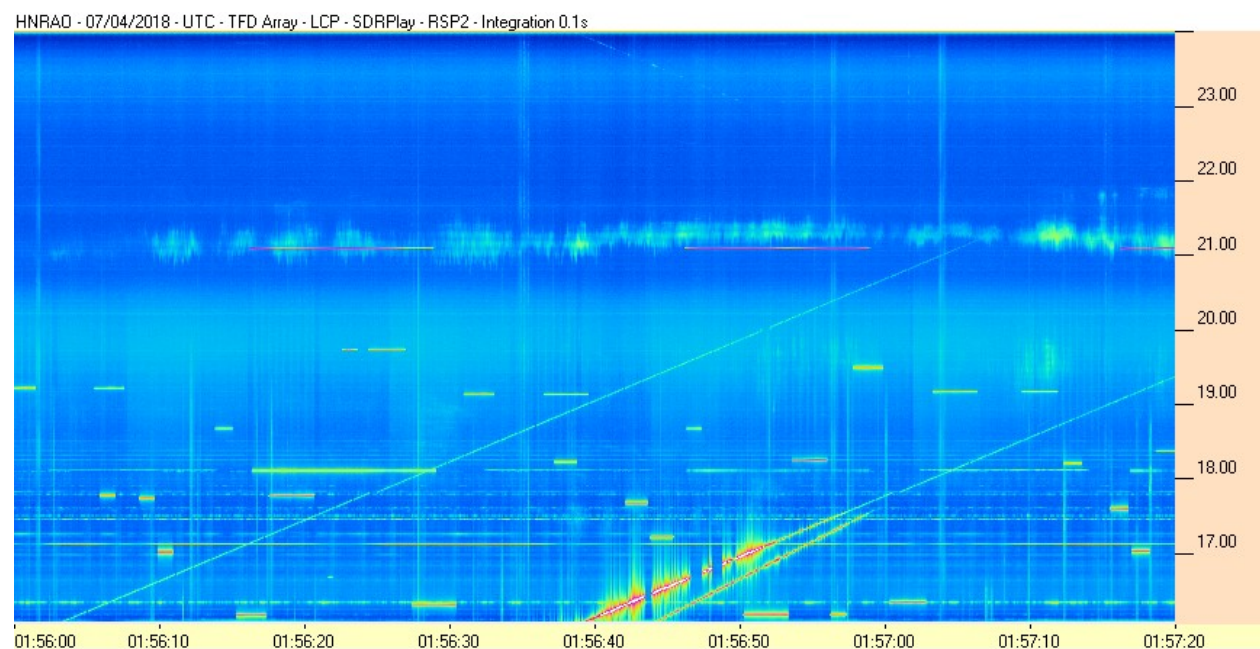
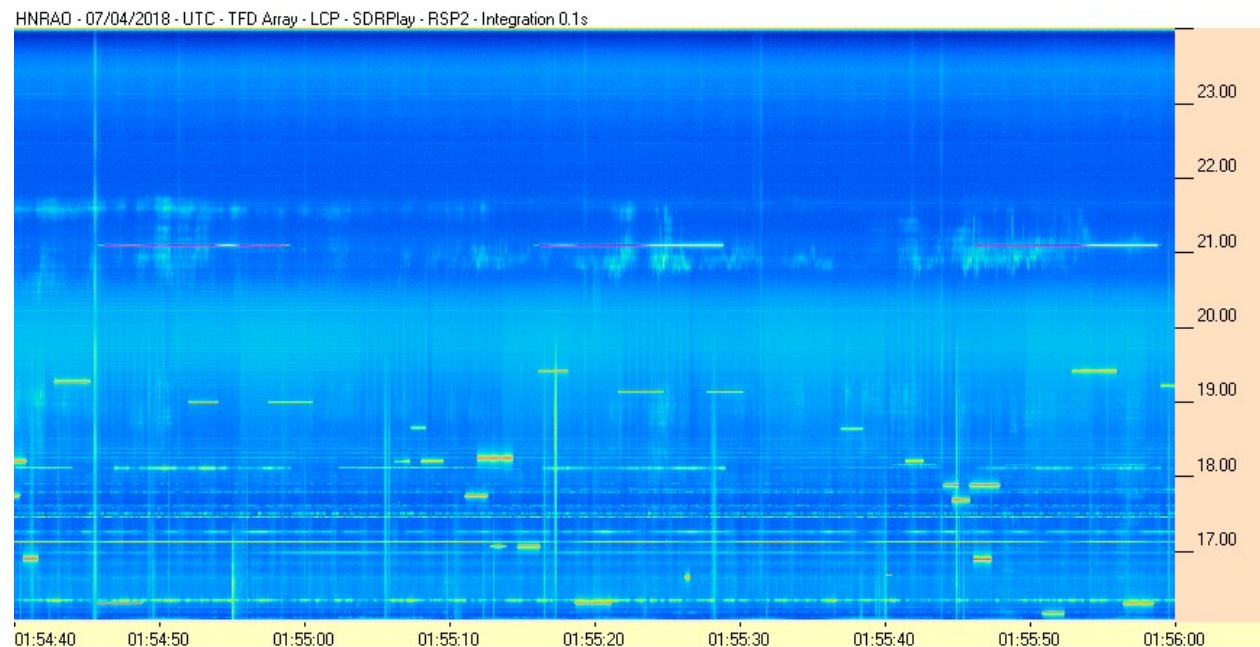
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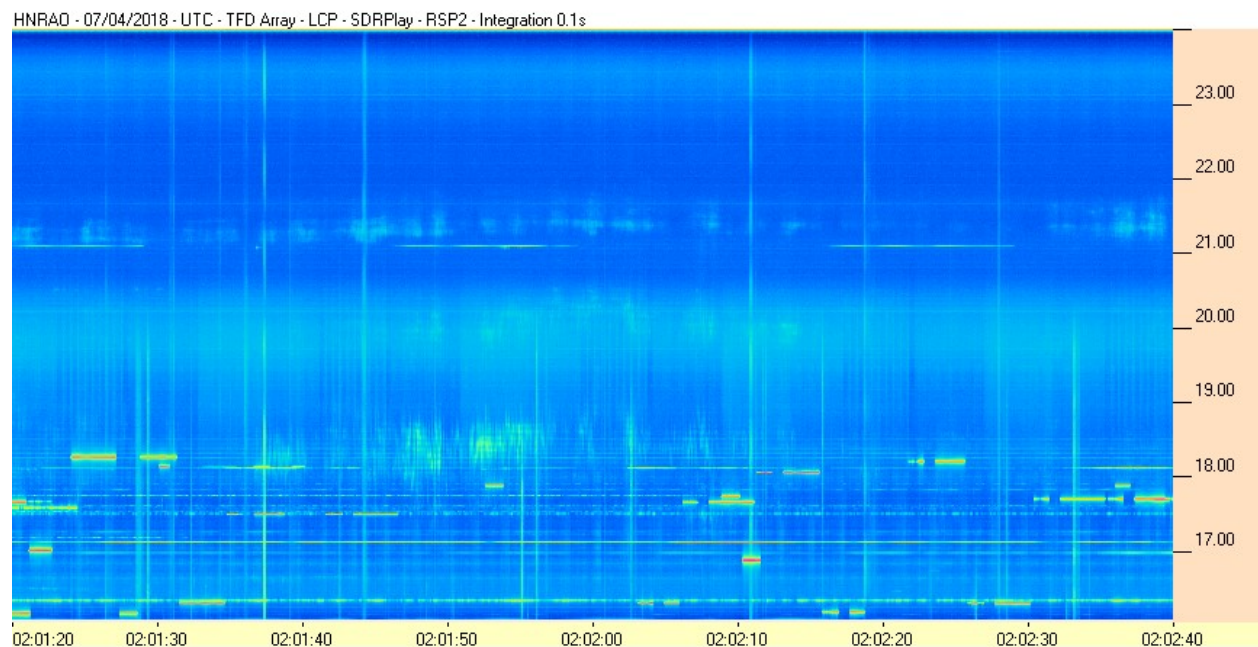
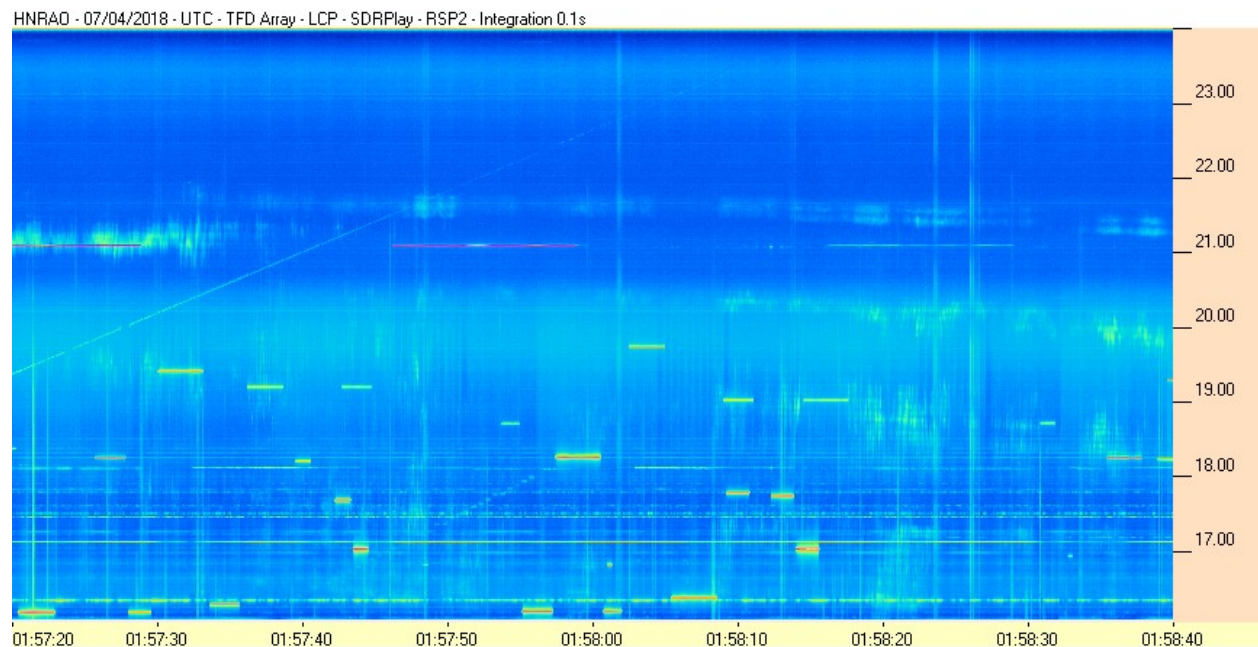
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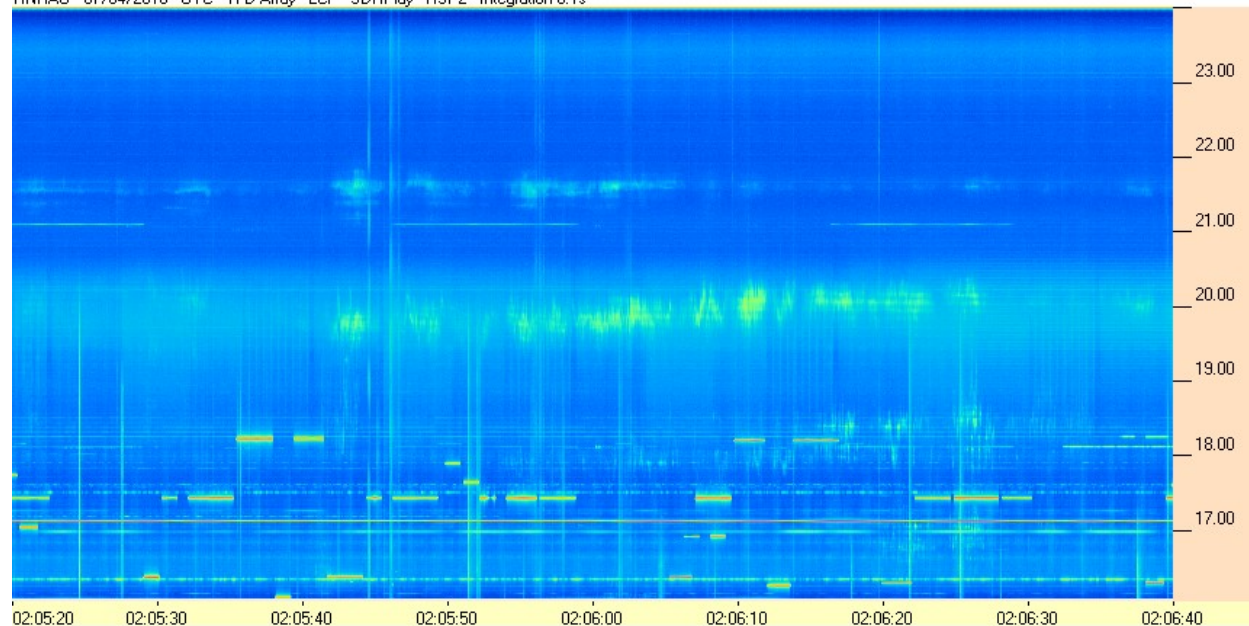
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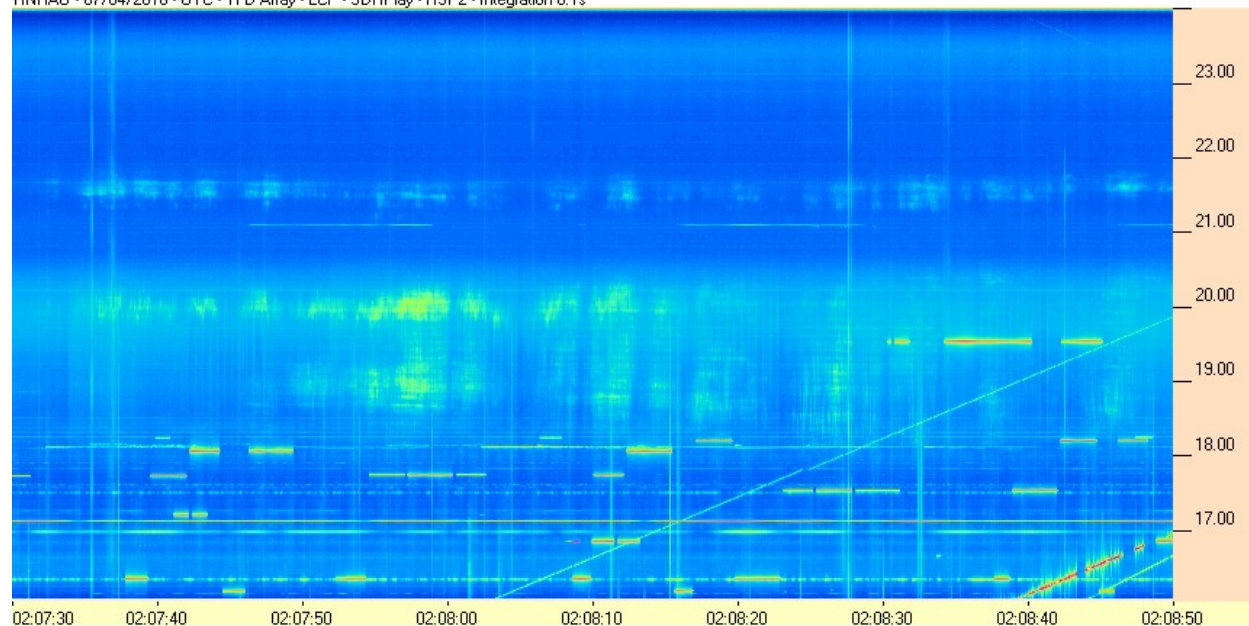
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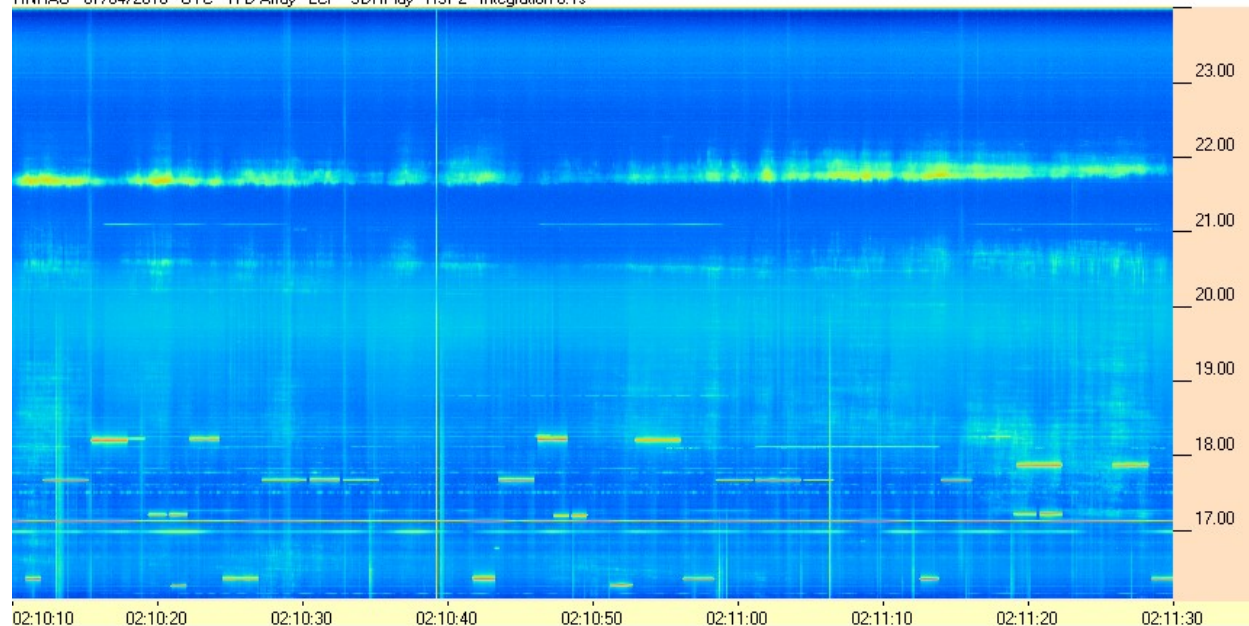
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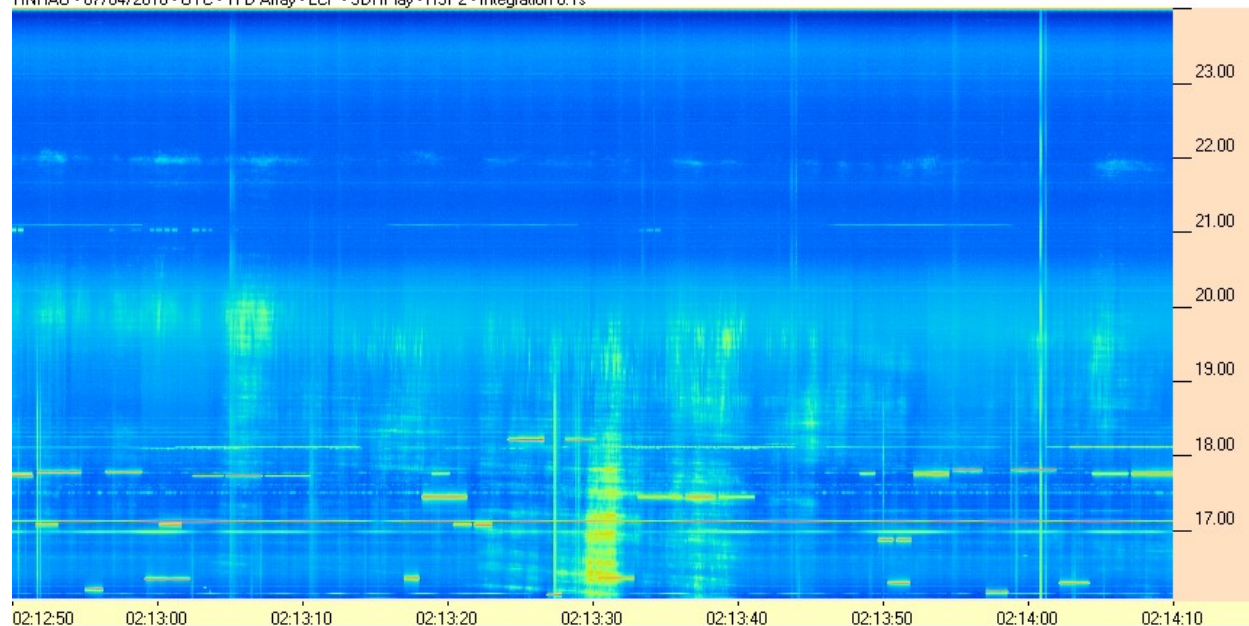
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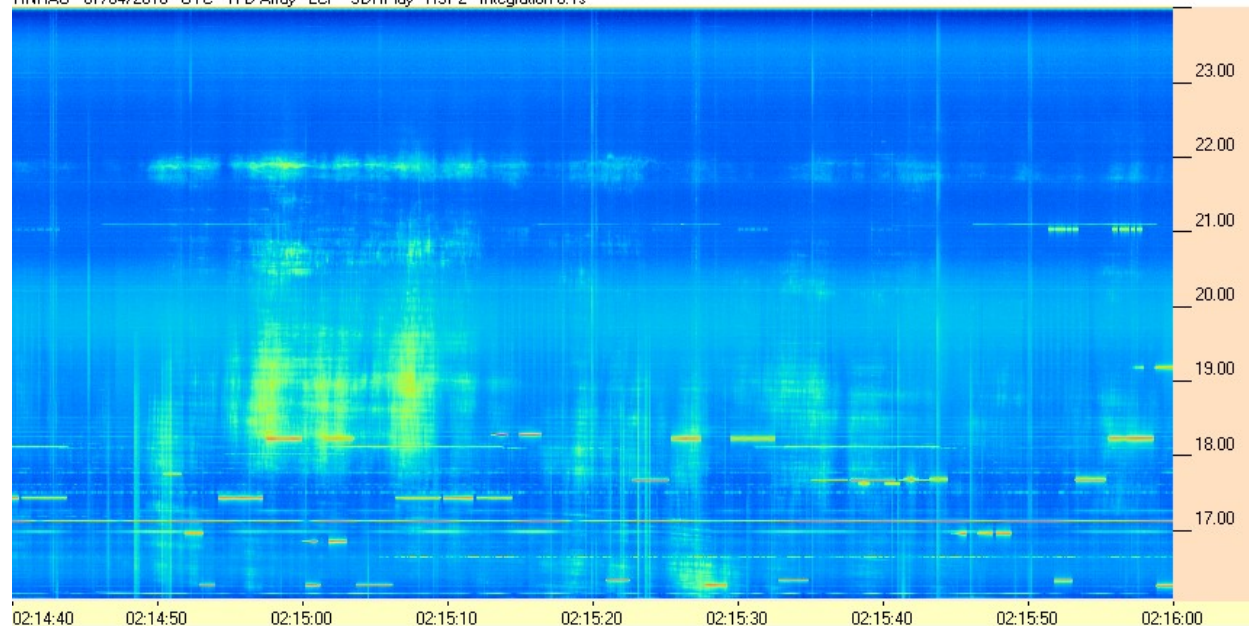
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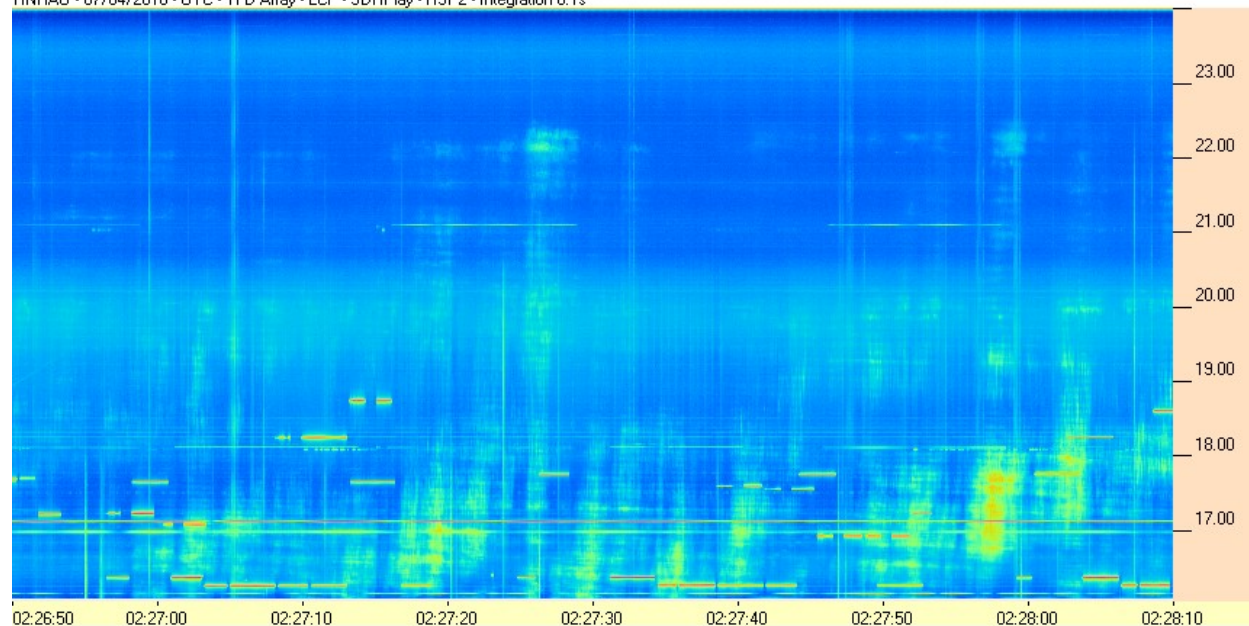
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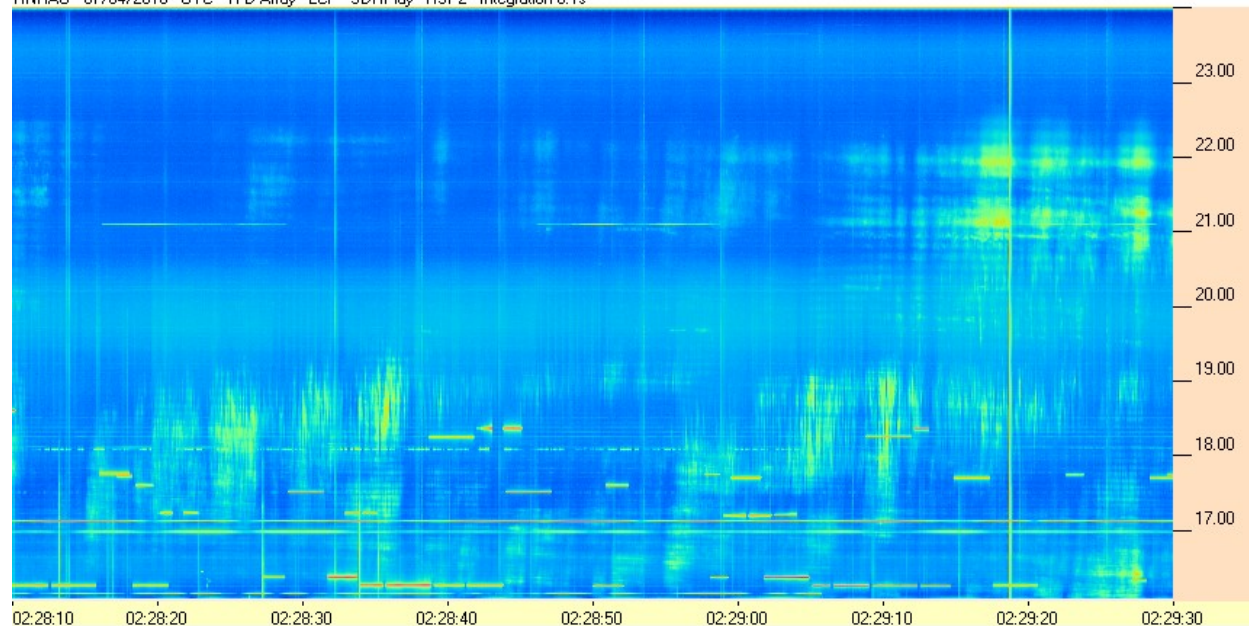
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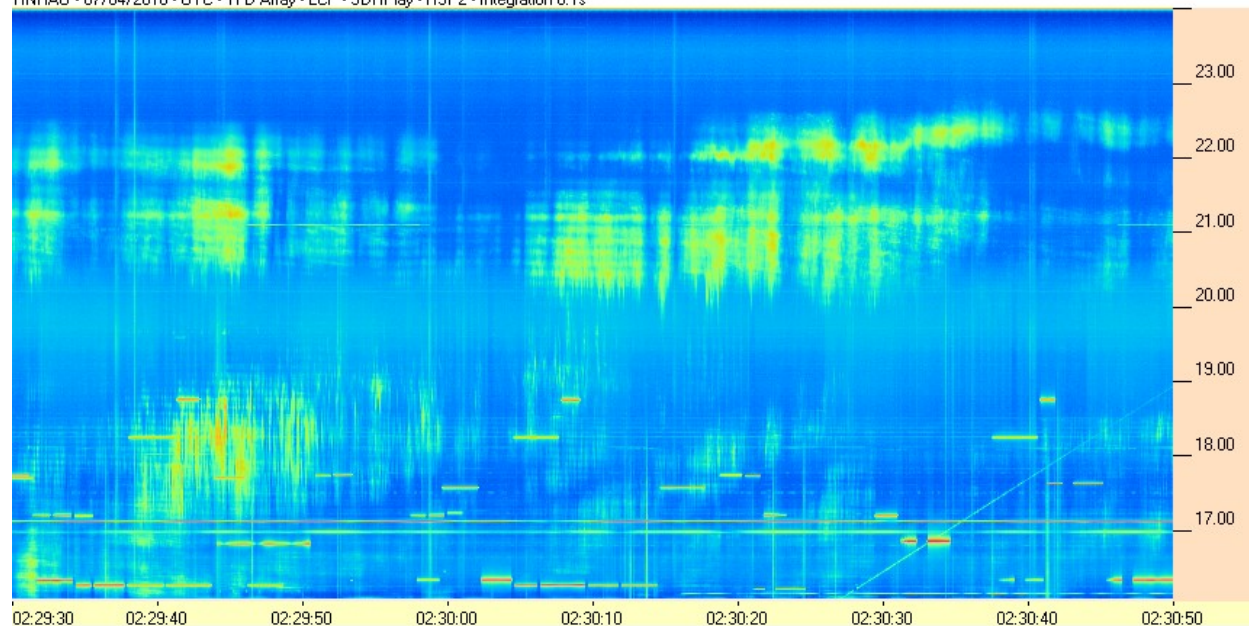
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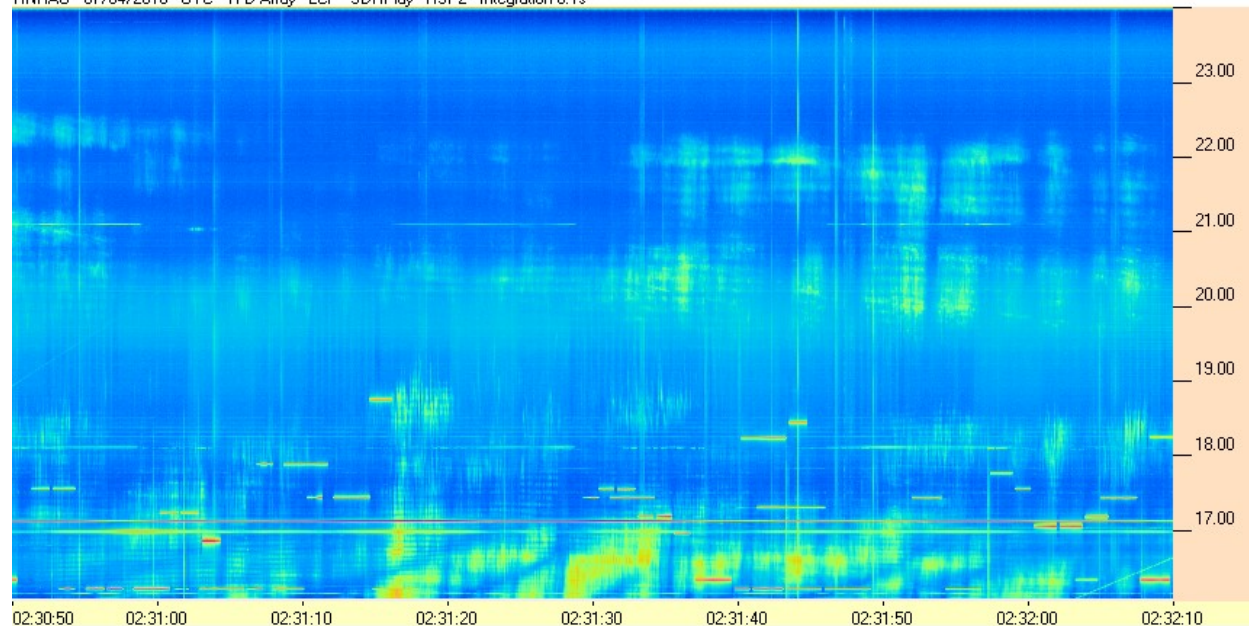
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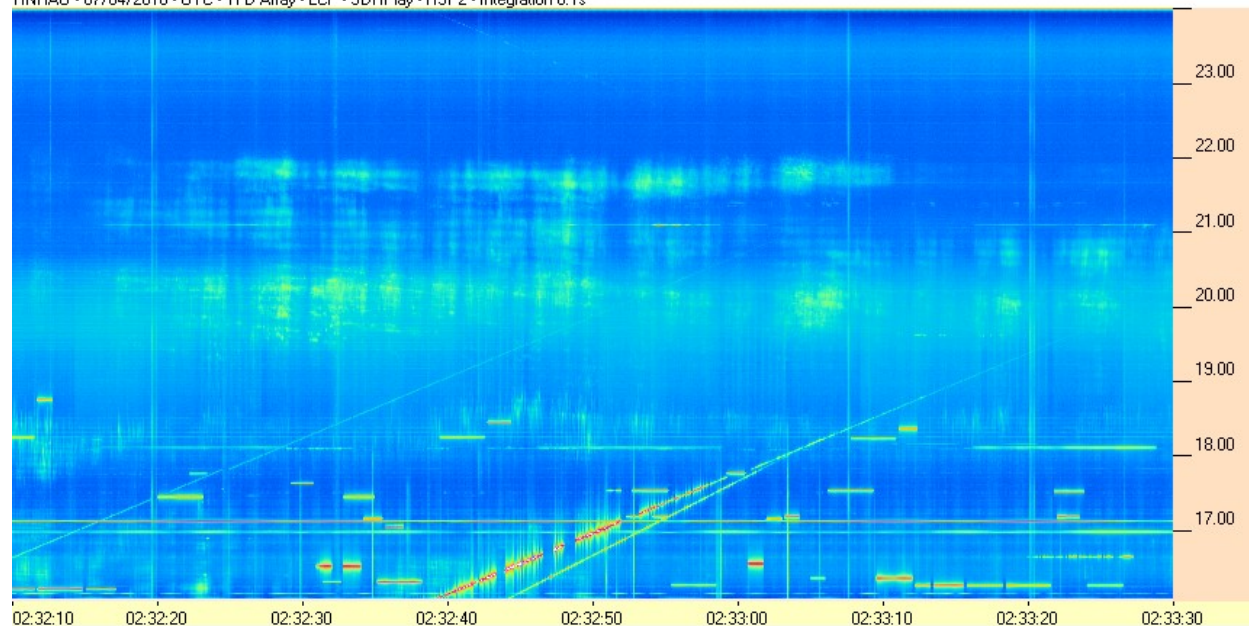
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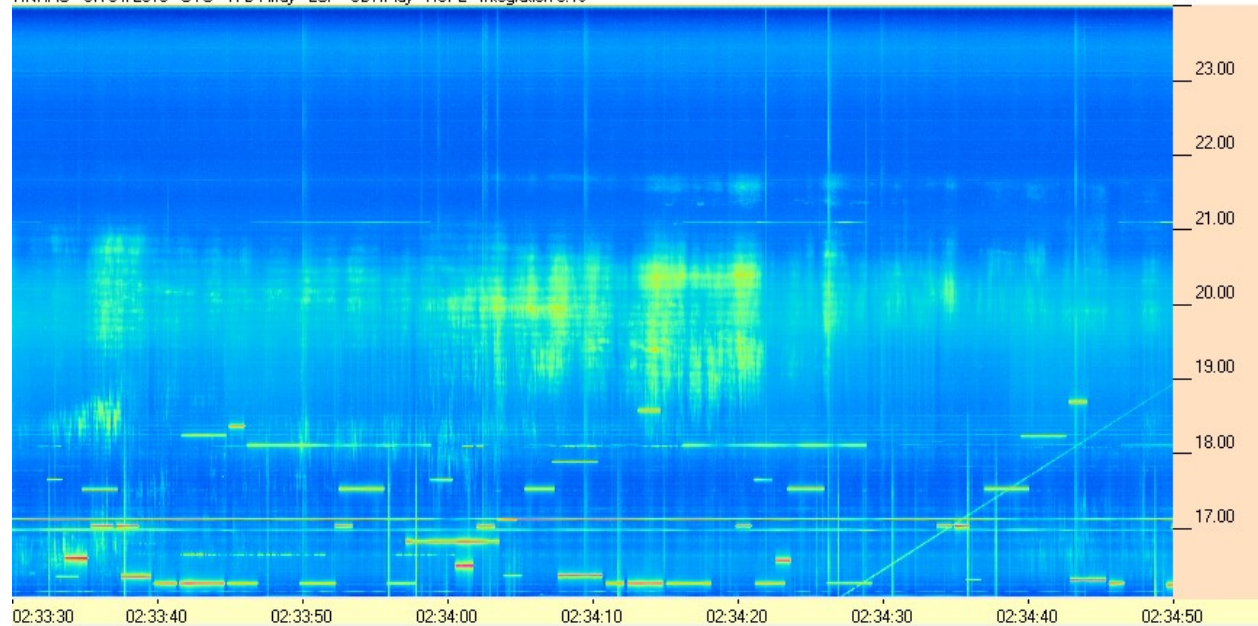
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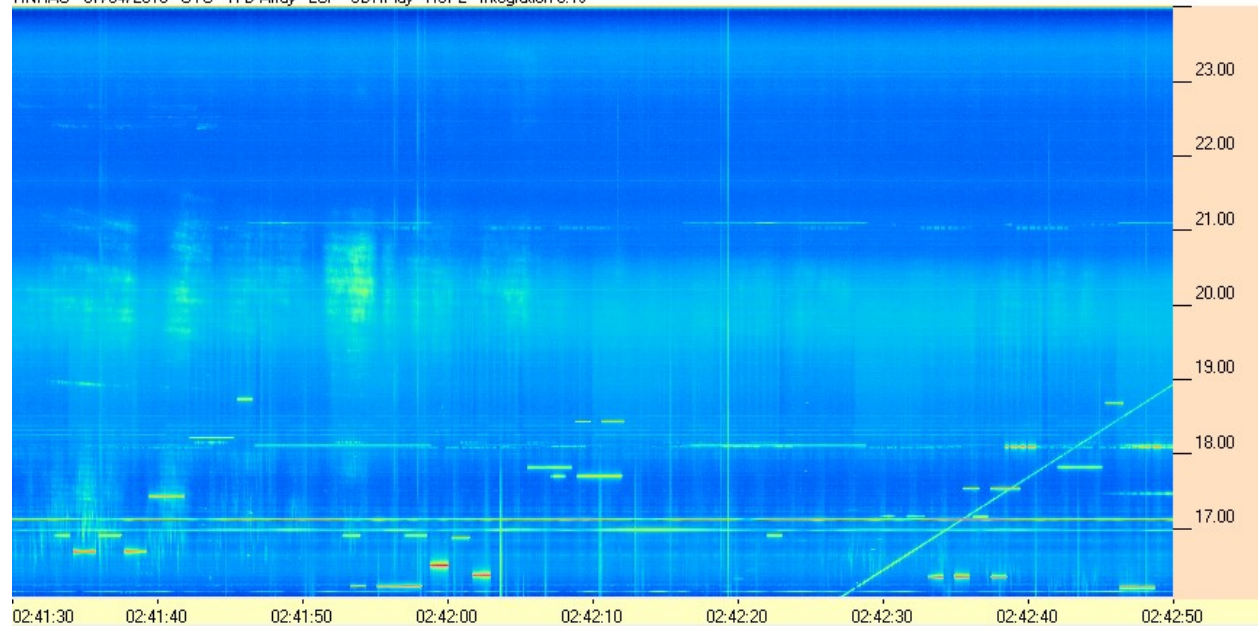
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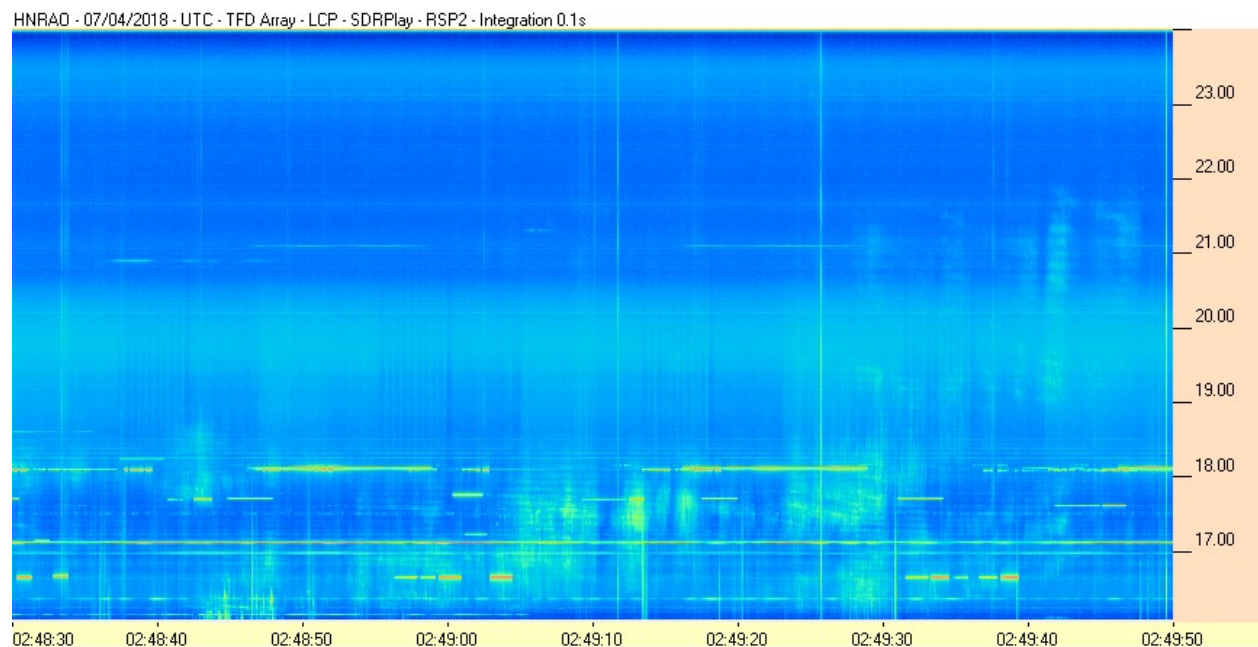
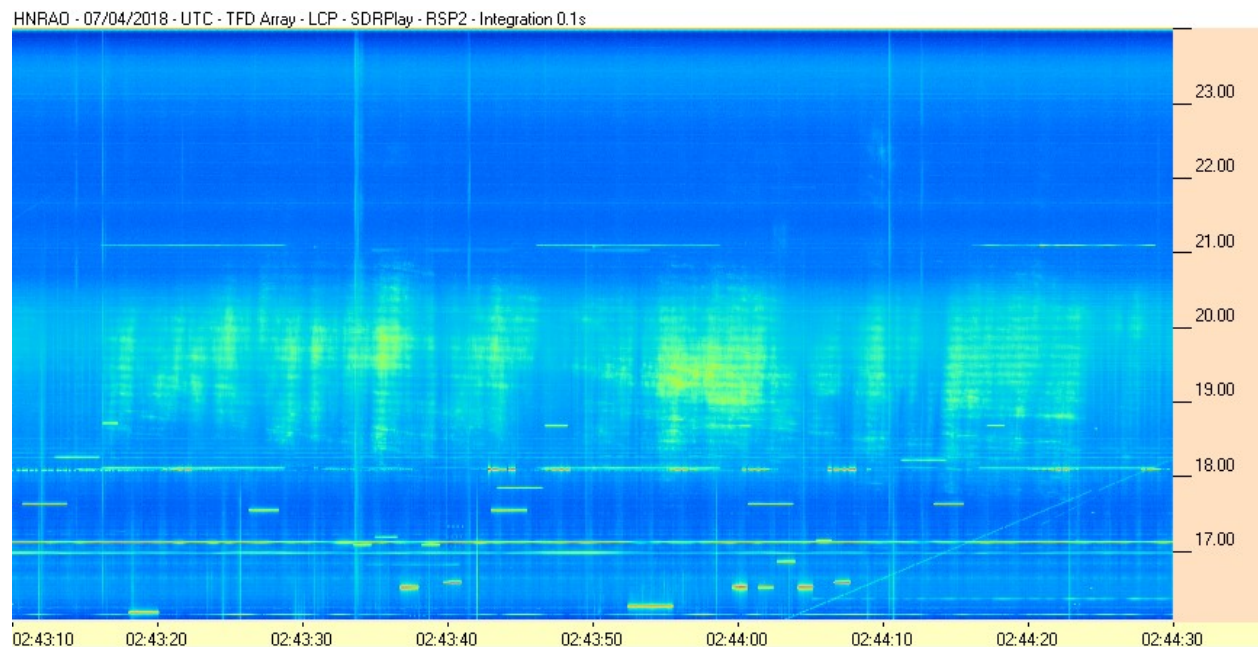
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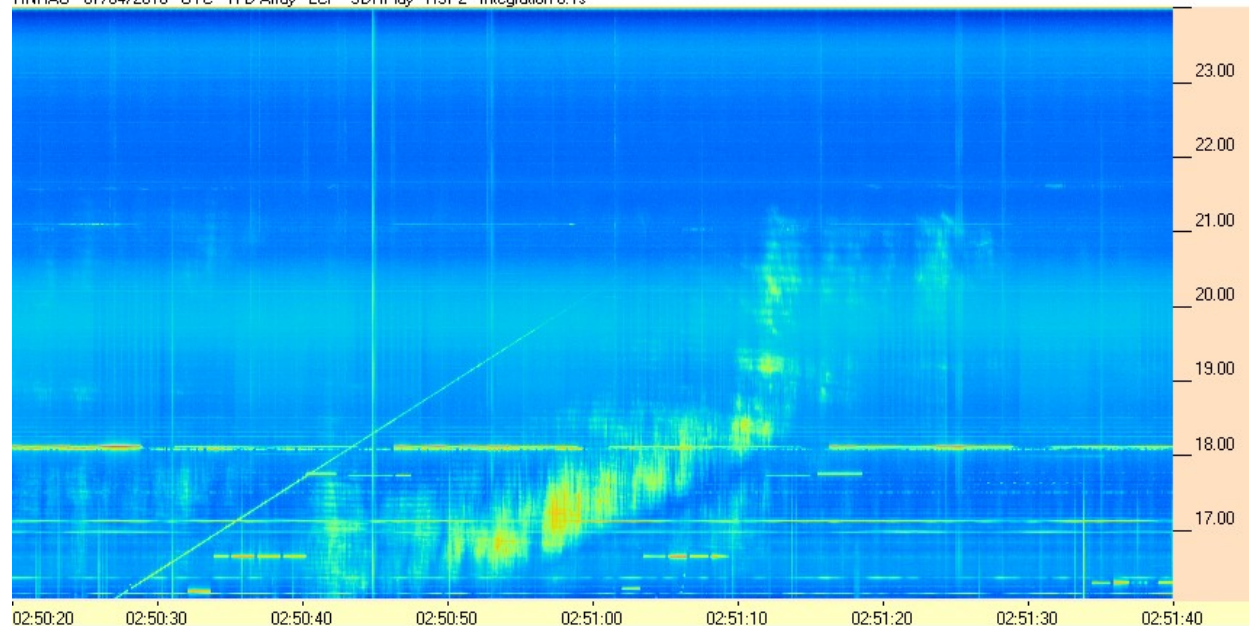
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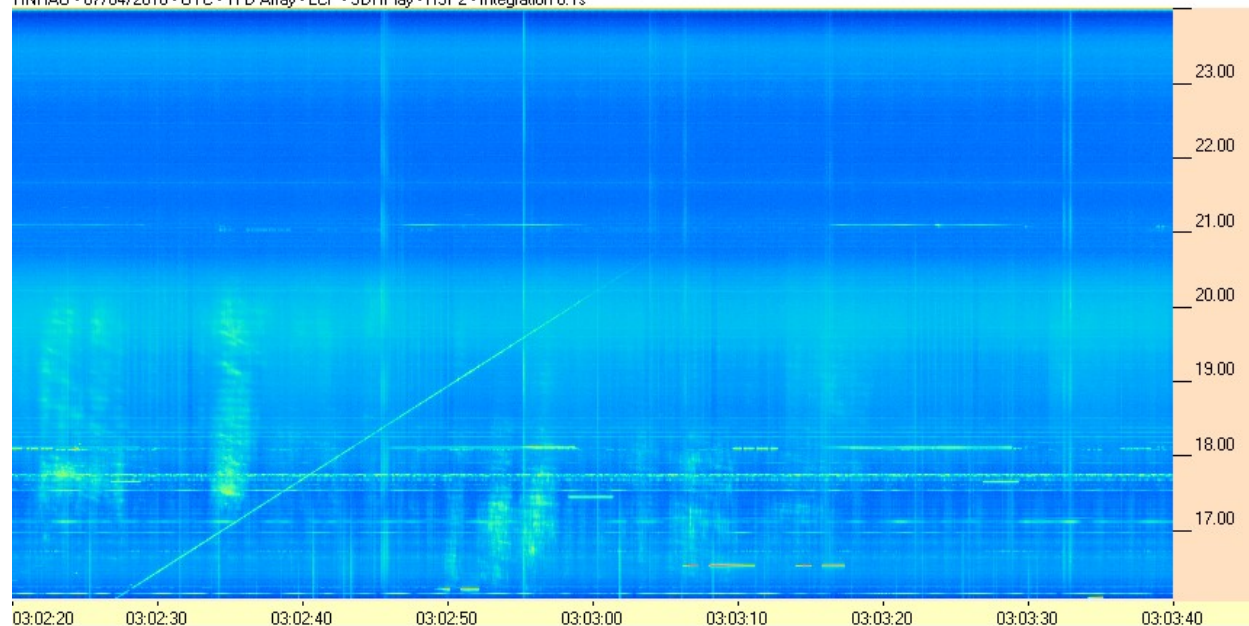
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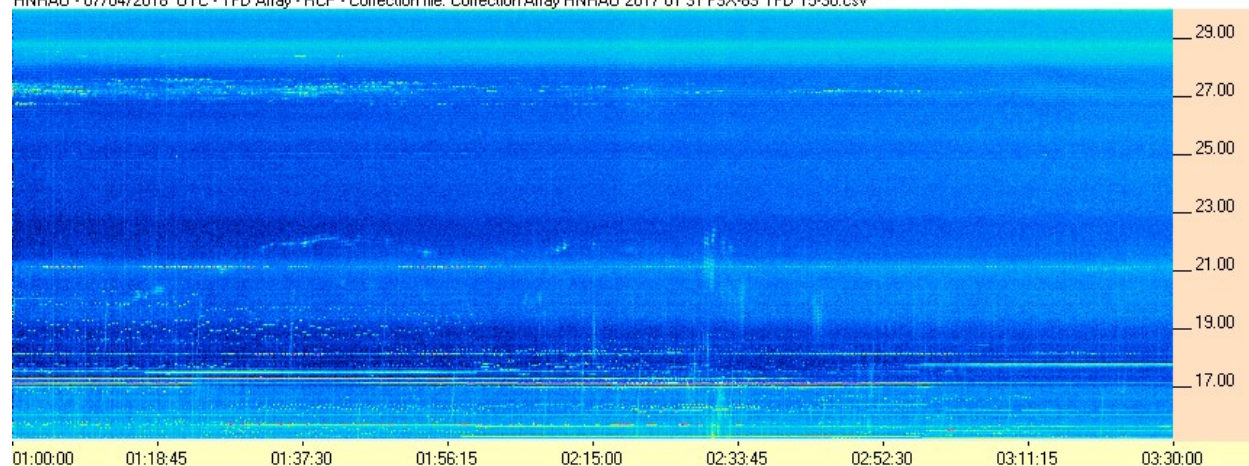


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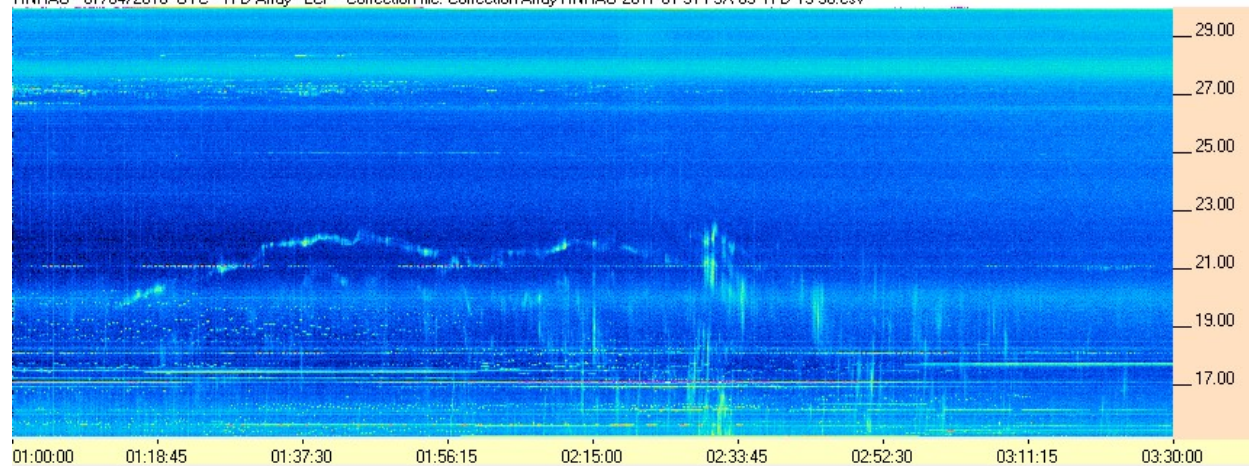


FSX-8S / TFD Array

HNRAO - 07/04/2018 UTC - TFD Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv



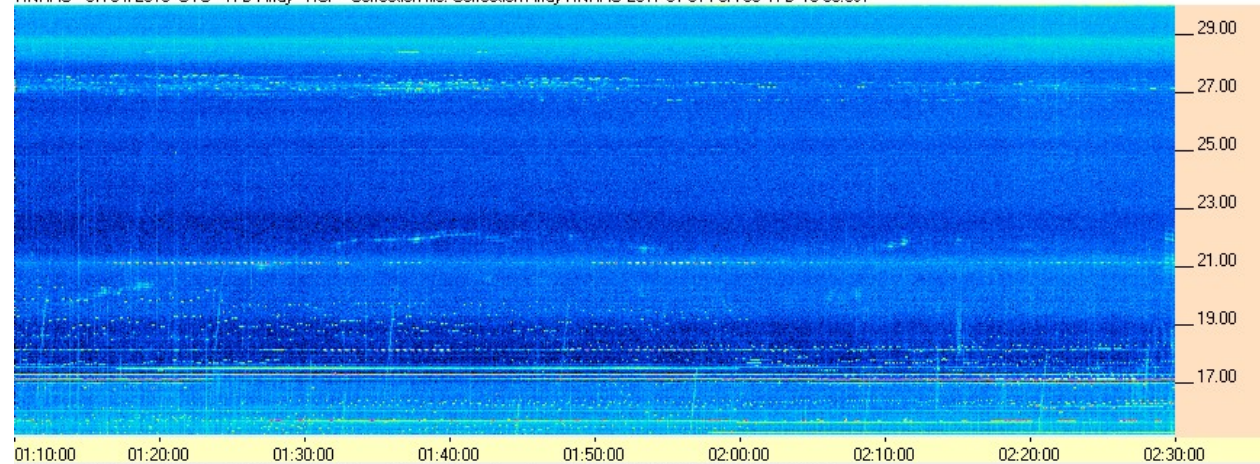
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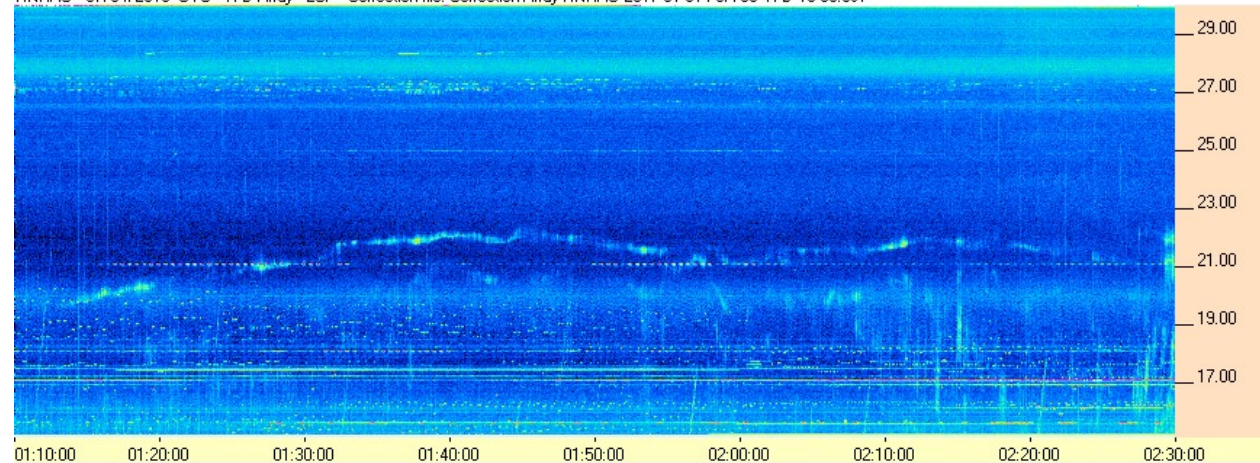
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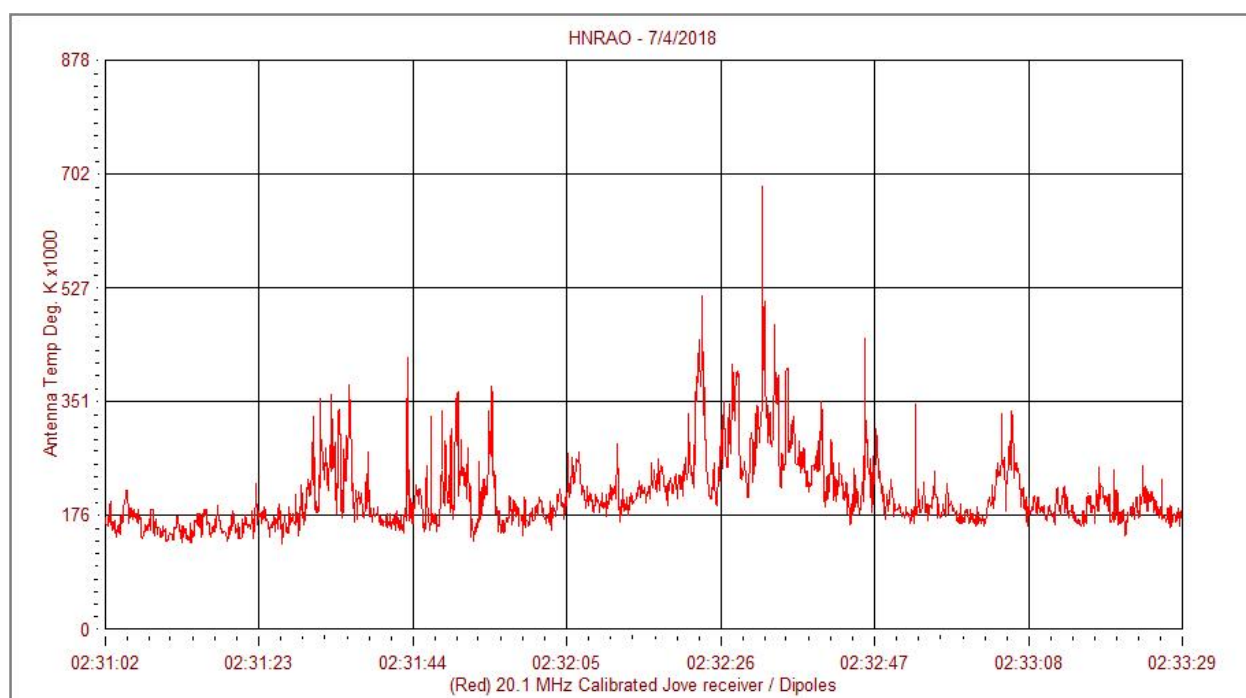
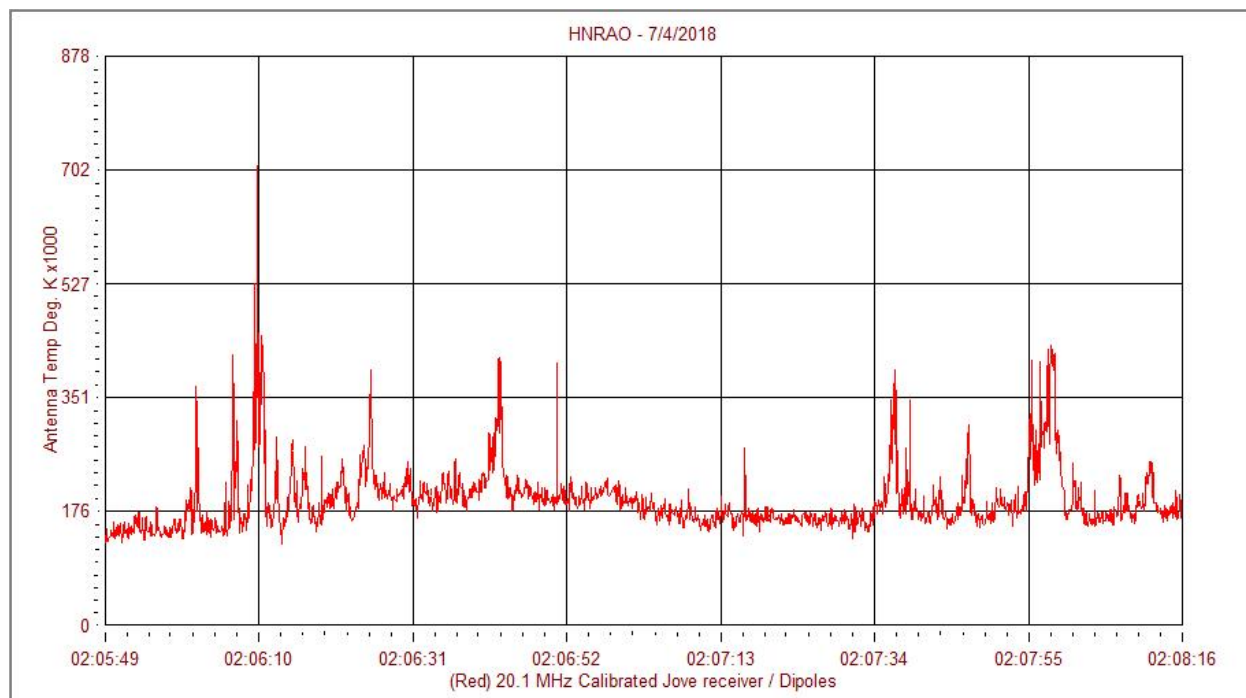
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Jove 2 Receiver / Jove Dipole Array



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