

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: August 4, 2018

Object: Jupiter – Io-C

Observer: Unattended

Start - Time UT:	2230	Planetary K-index:	2
Jupiter Altitude (deg):	33.3	Jupiter Azimuth (deg):	167.0
Jupiter CML:	332.98	Jupiter Io Phase:	247.19
Jupiter RA (hr/min):	14:47	Jupiter Dec (hr/min):	-15:06
Hour Angle (hr/min):	-00:45	Polarization	LCP
Sun Altitude (deg):	20.7	Sun Azimuth (deg):	275.8
Sun RA (hr/min):	08:52	Sun Dec (hr/min):	17:34

End – Time UT:	2336	De:	-3.0
Jupiter Altitude (deg):	34.0	Jupiter Azimuth (deg):	186.2
Jupiter CML:	12.87	Jupiter Io Phase	256.56
Hour Angle (hr/min):	00:21	Duration (min):	106
Sun Altitude (deg):	08.5	Sun Azimuth (deg):	285.9
Max Frequency MHz	21	Min Frequency MHz	15

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

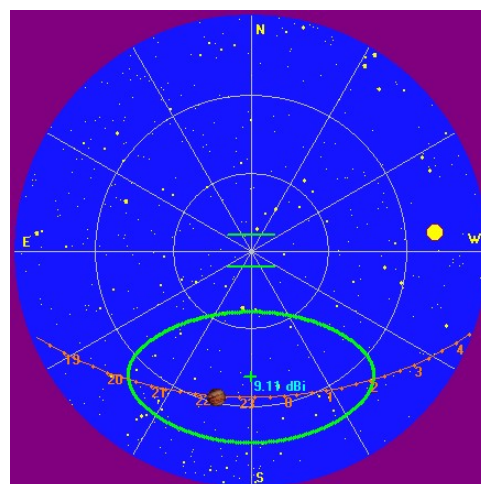
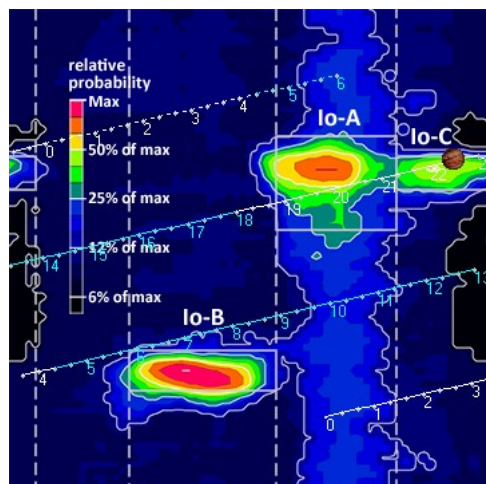
TFD array phased @ 35 degrees for 2017-2018 season

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

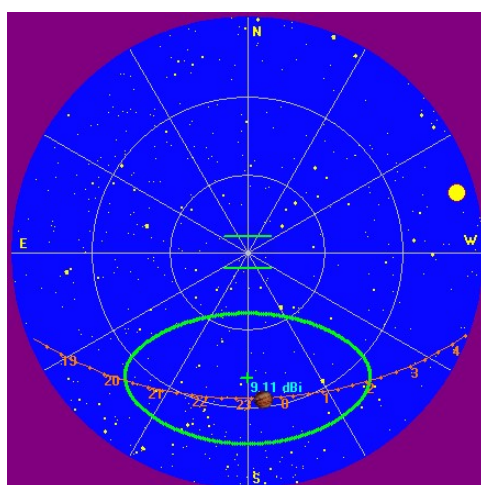
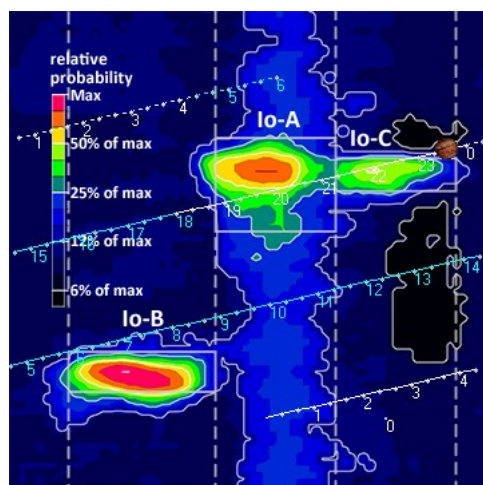
* Used for testing and evaluating antenna systems

Software Radio Sky Spectrograph 2.8.50

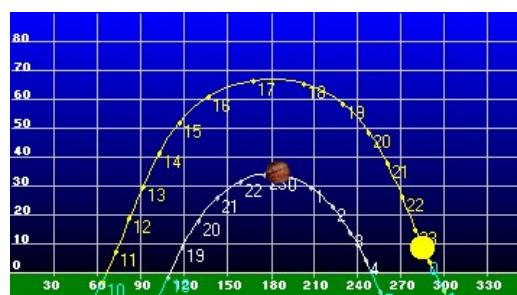
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Beginning of Pass



End of Pass



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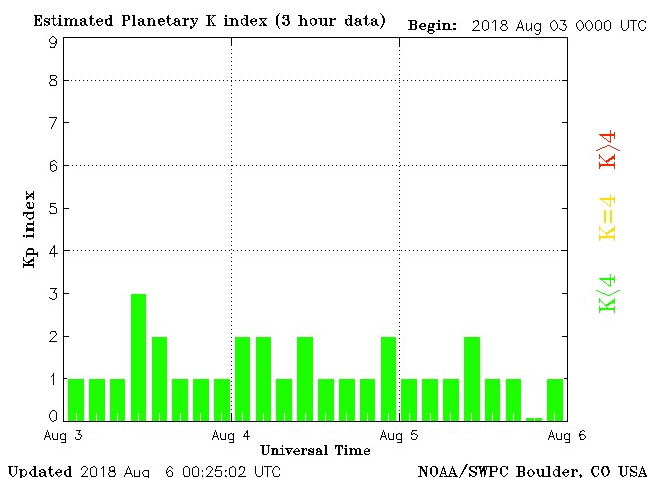


MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360	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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An Io-C storm well within the beam of the TFD array and Jove dipole array. While there was little in the way of RFI, there was a little lightning and broadcast stations at 17 MHz, but they did little to obscure the bursts.

This storm was observed with both the FSX-8S spectrograph and SDRPlay RSP2 spectrograph with the LCP polarized TFD array as well as the Jove 2 receiver and linear Jove dual dipole array.

LCP emissions began with the start of a 26-minute-long N-event at 2232 UT and continued until 2258 UT. The N-event was comprised of S-bursts and centered around 20 MHz. It drifted as high as 21 MHz and as low as 19 MHz. Around 2237 UT, an interesting feature of the N-event as it appears to be “split” or “mirror”.

There were strong S-burst emissions at 2241 UT between 17 MHz and 18 MHz. Measurements with the calibrated, Jove 2 receiver and linear polarized Jove dipole array showed some S-bursts at 20 MHz reaching well over 900 kK equivalent antenna temperature. The SkyPipe record of the Jove 2 receiver was uploaded to the Radio Jove Data Archive.

There were some L-bursts at 2300 UT.

Indications of scintillation throughout the duration of the storm.

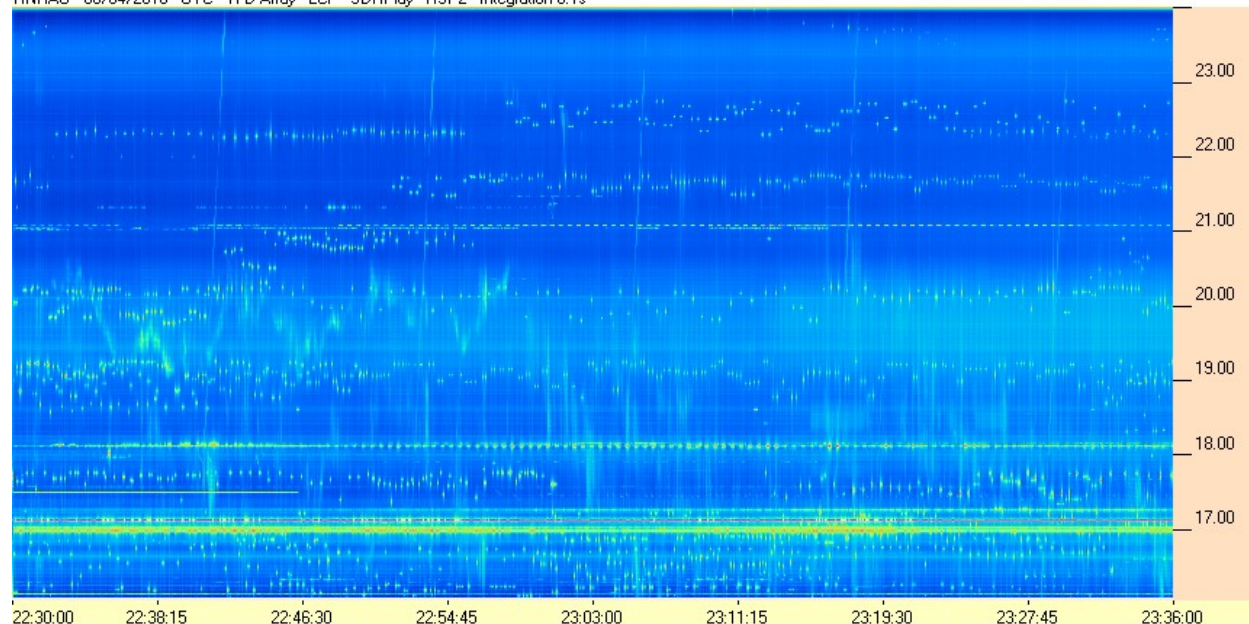
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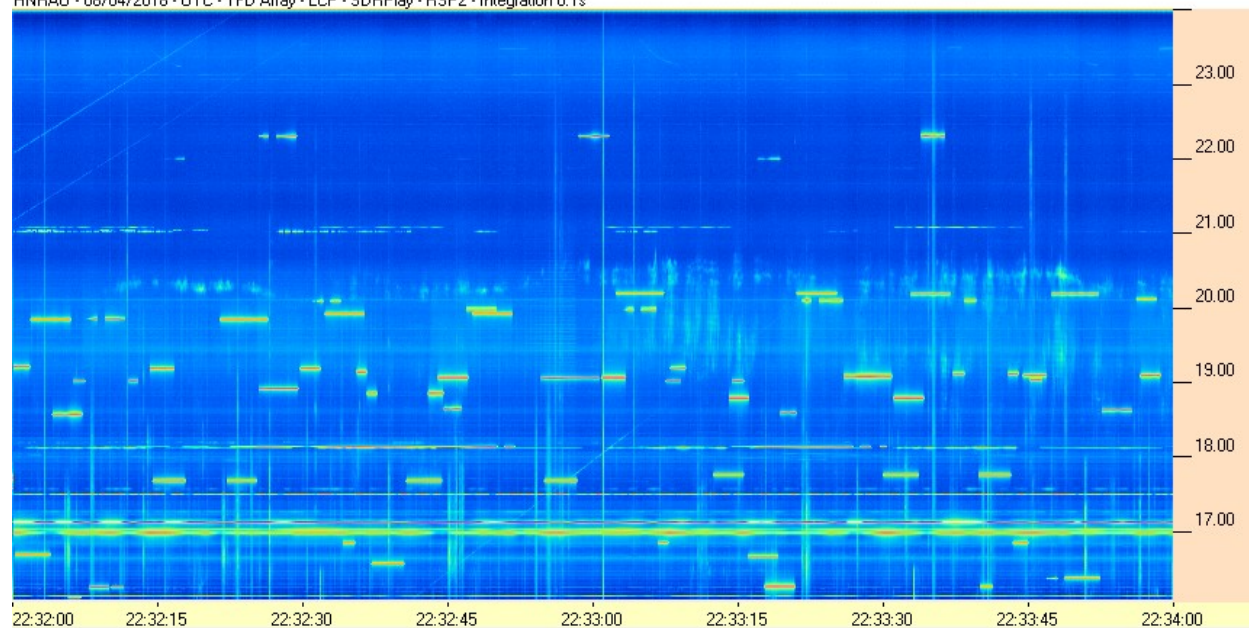


SDRPlay RSP2 / TFD Array

HNRAO - 08/04/2018 - UTC - TFD Array - LCP - SDRPlay - RSP2 - Integration 0.1s



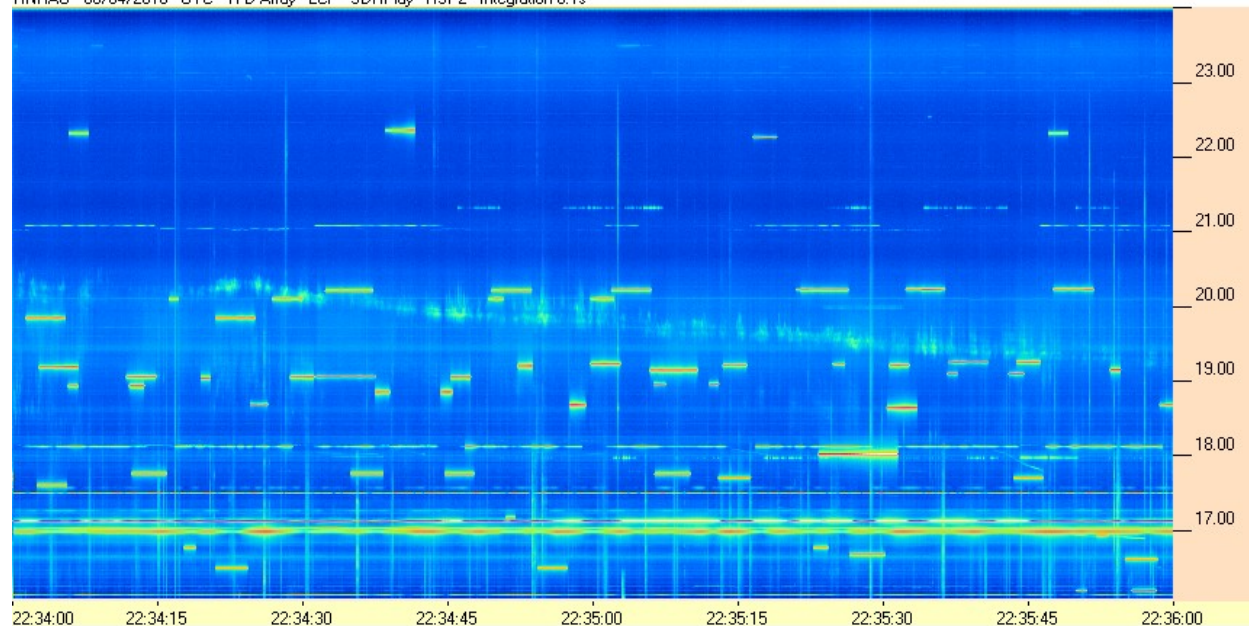
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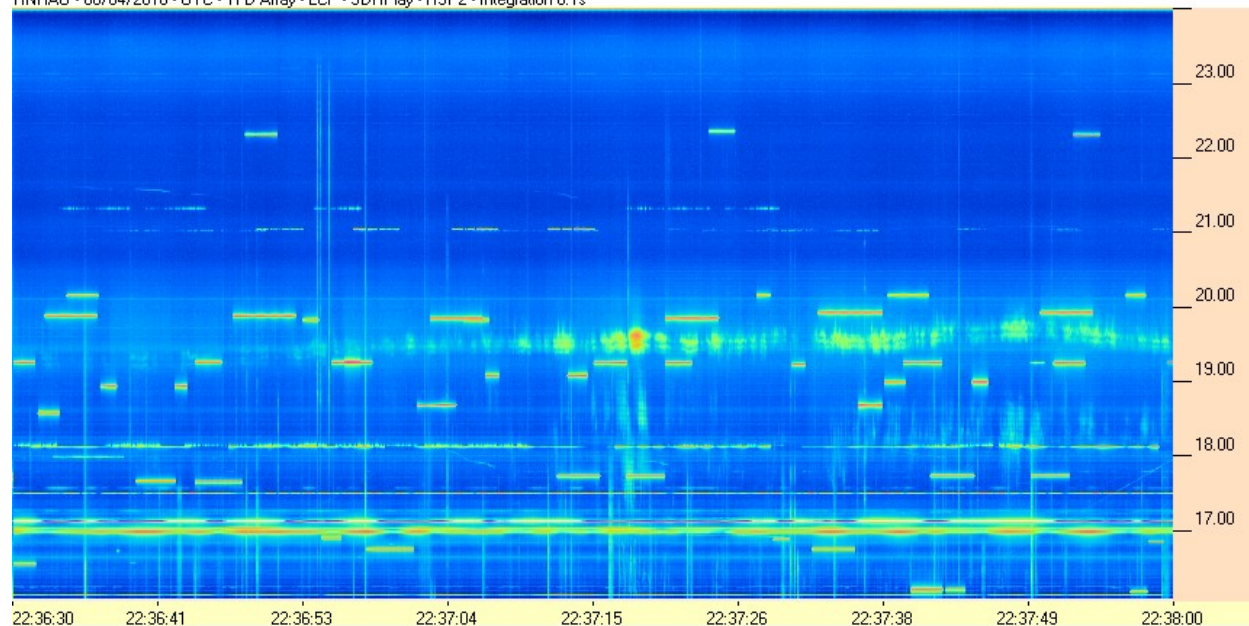
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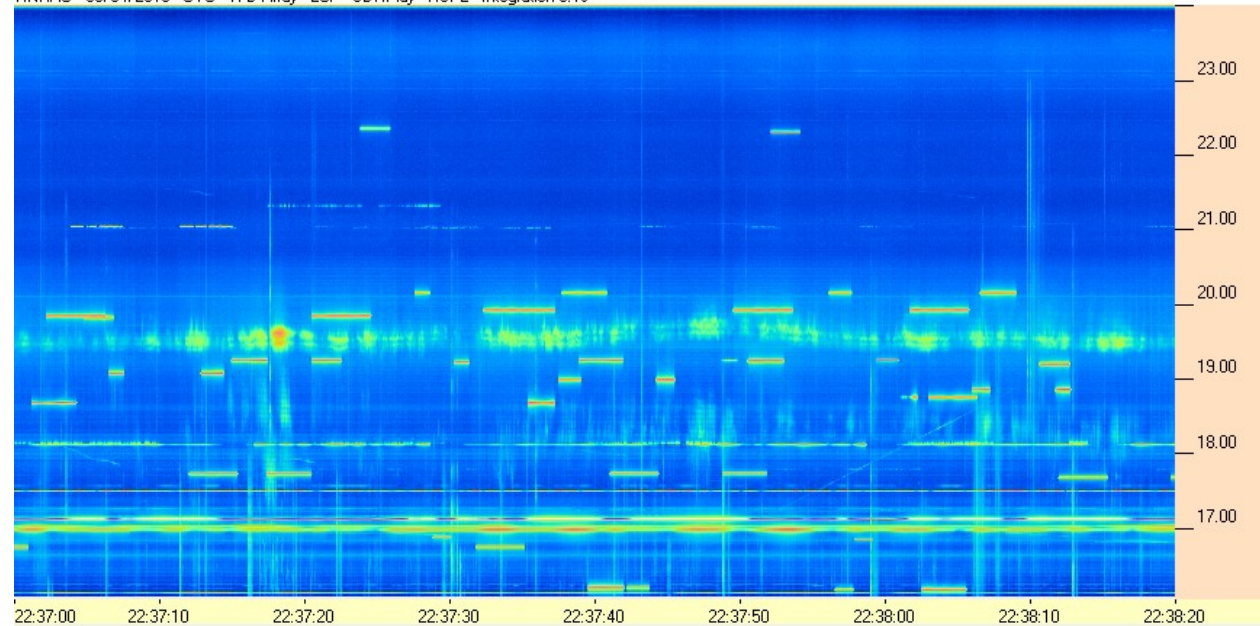
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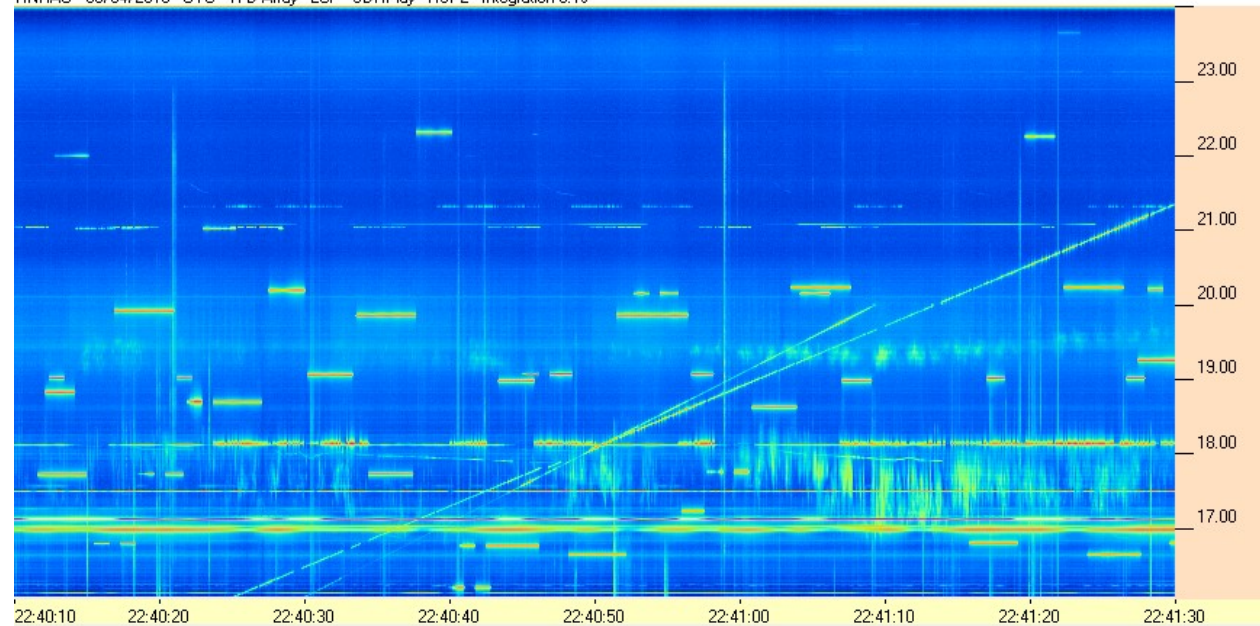
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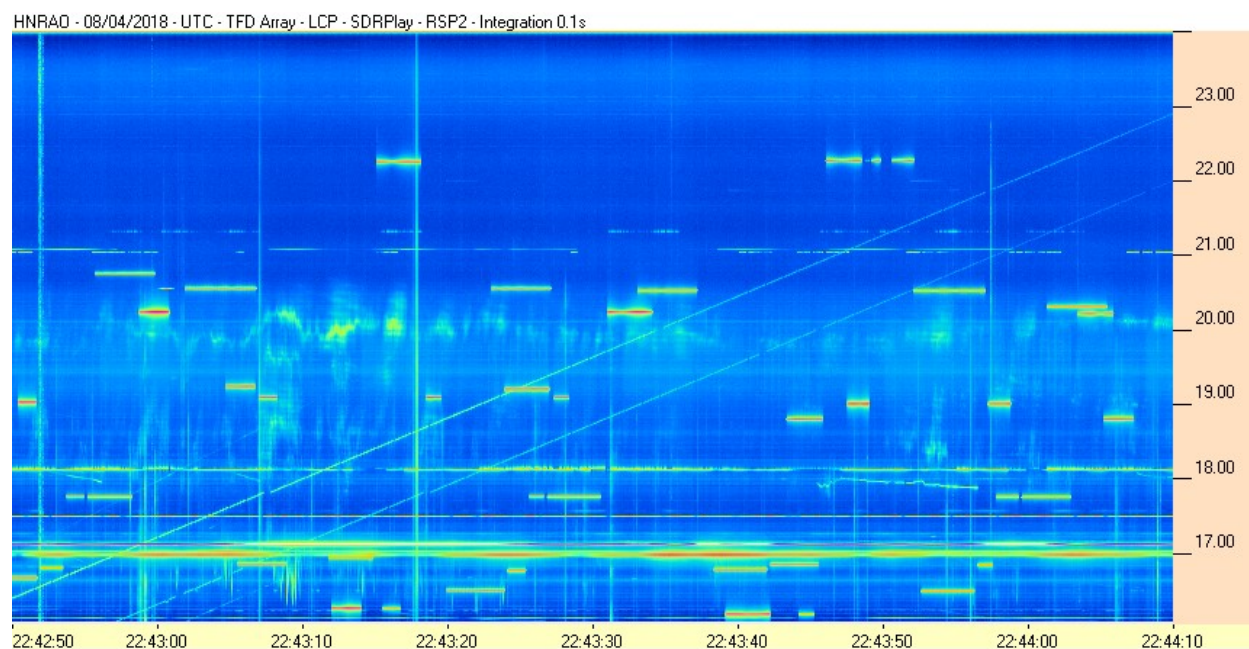
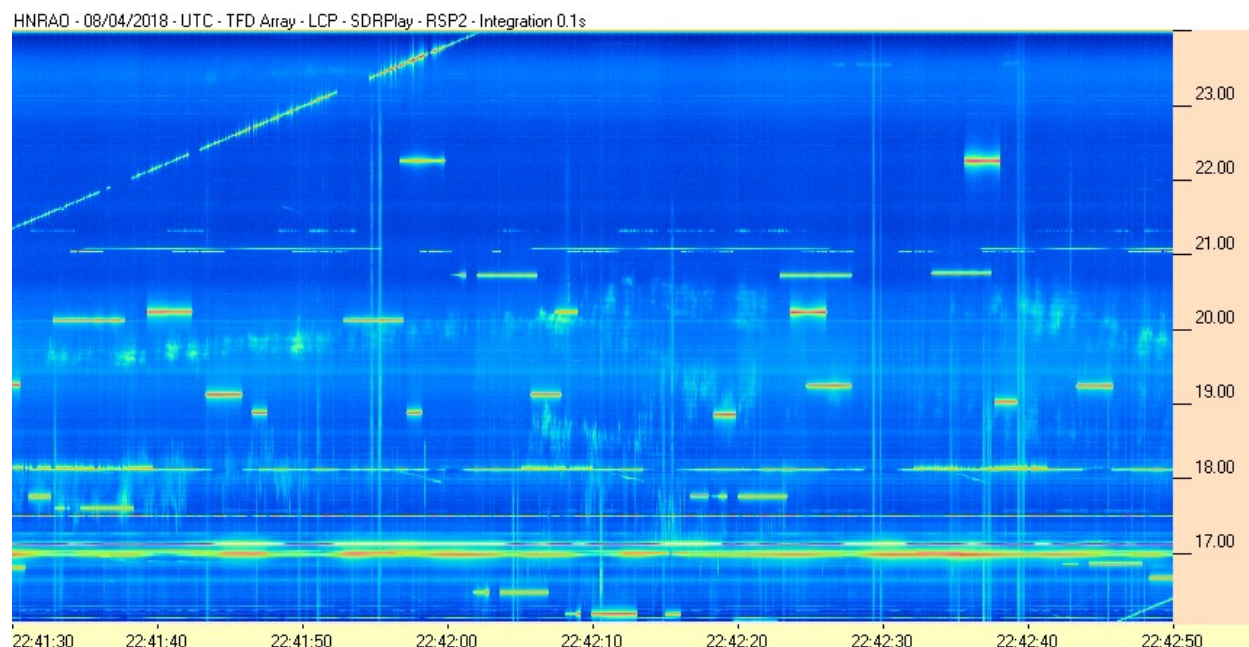
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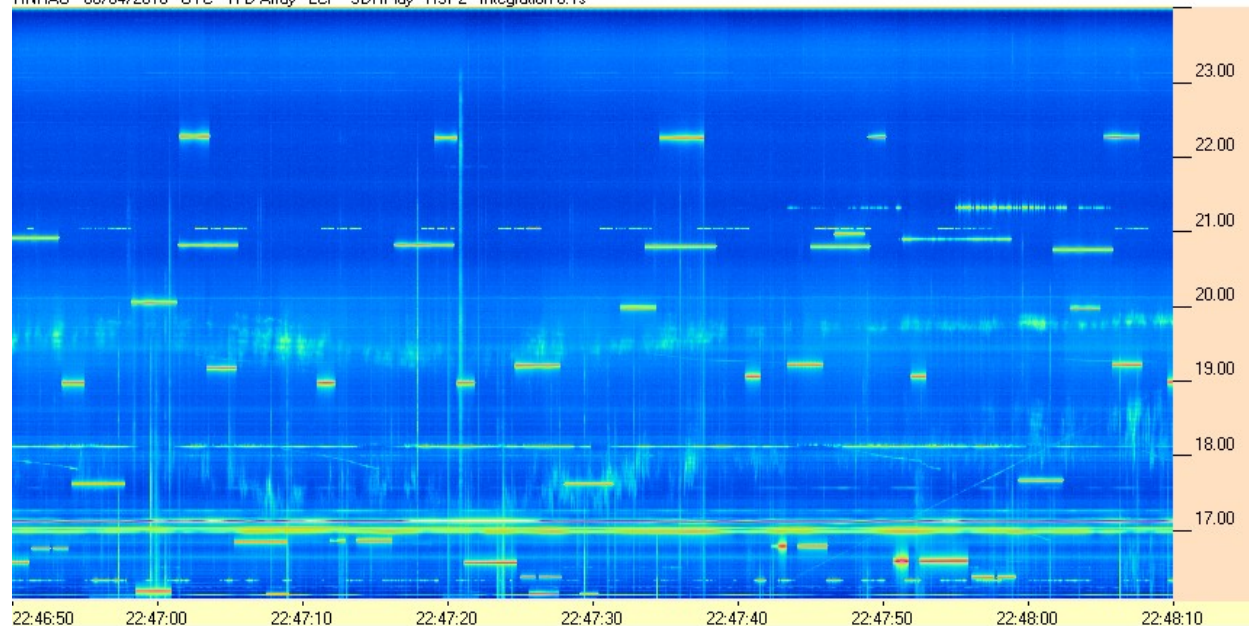
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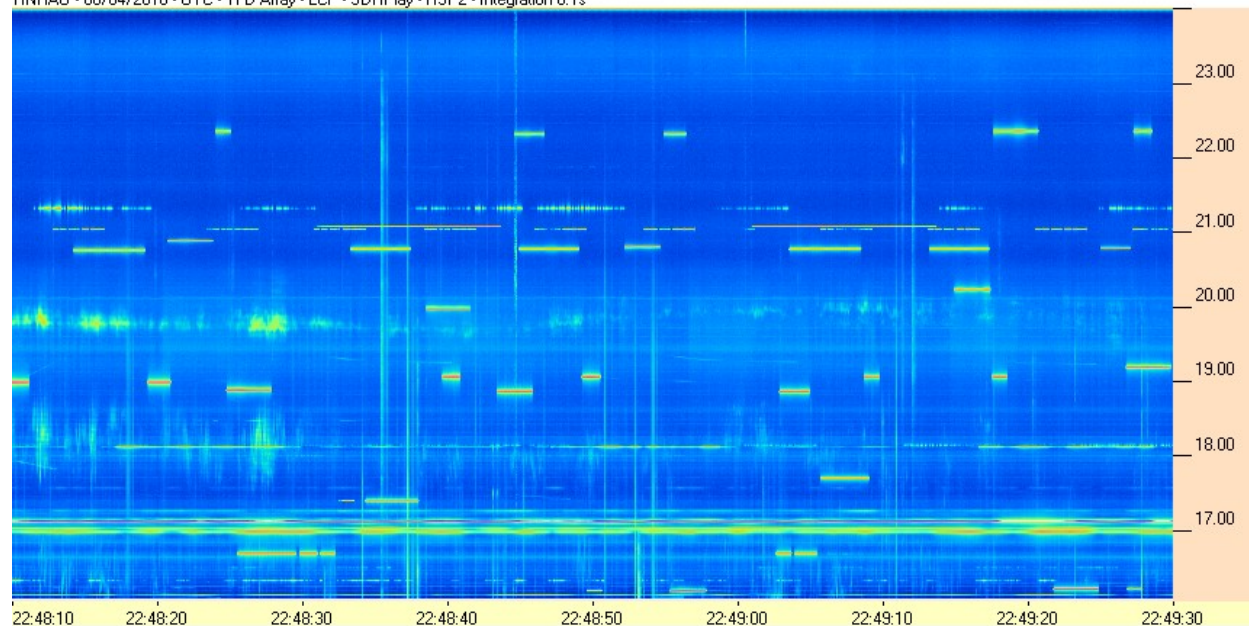
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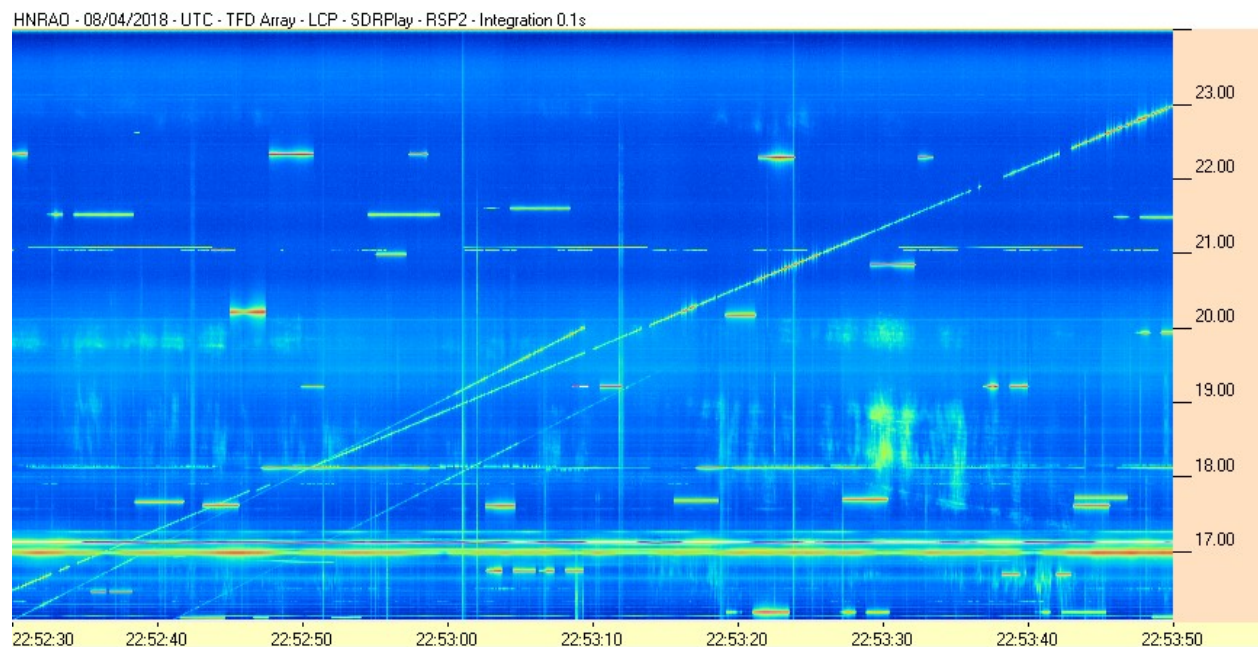
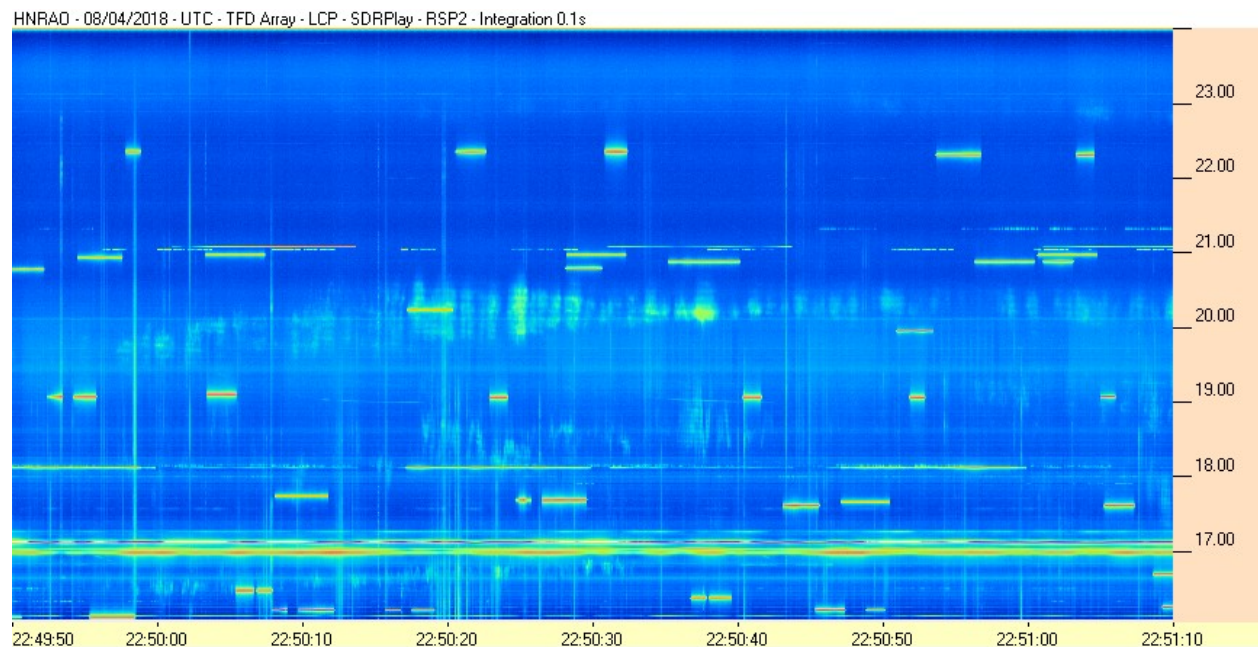
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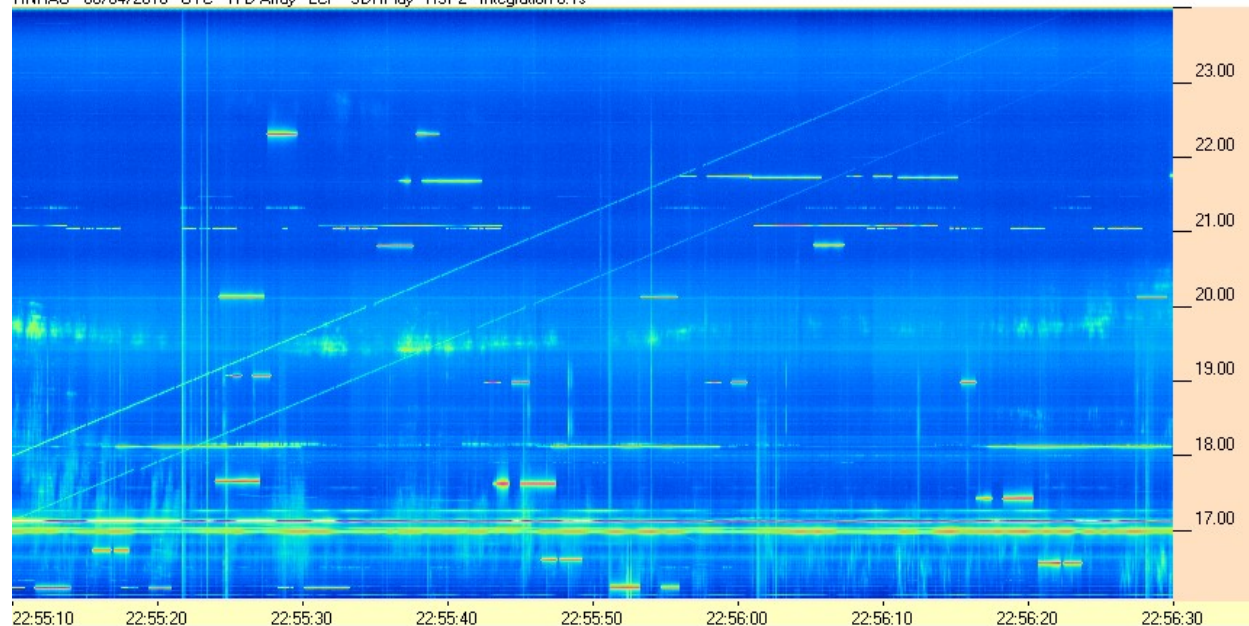
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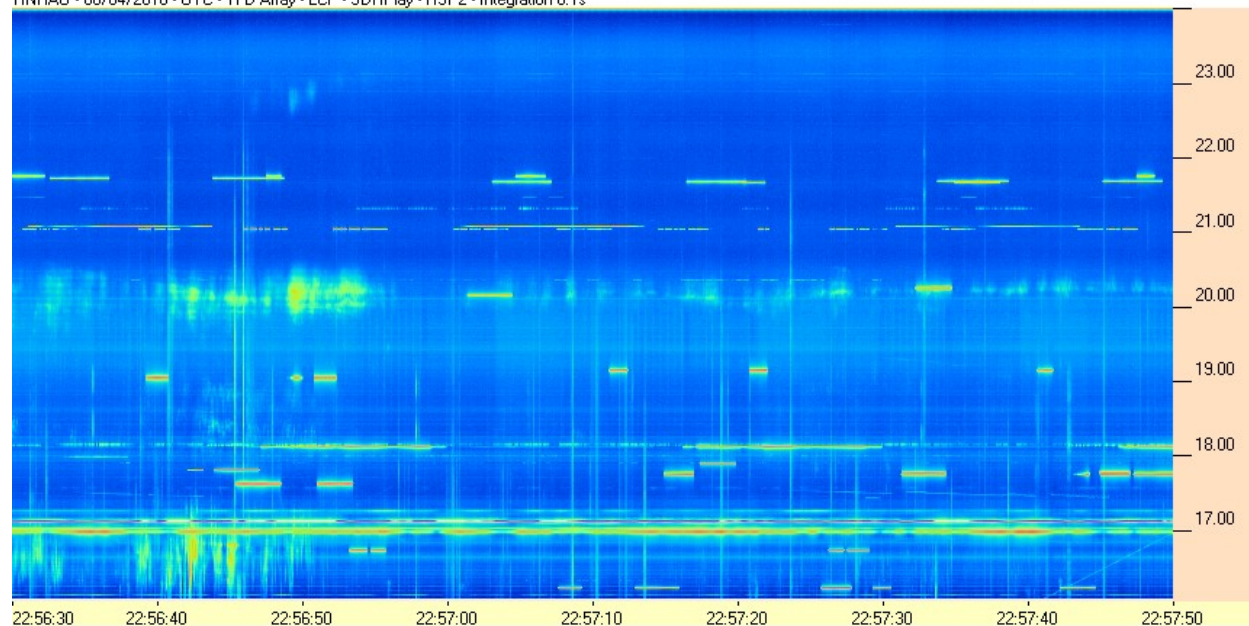
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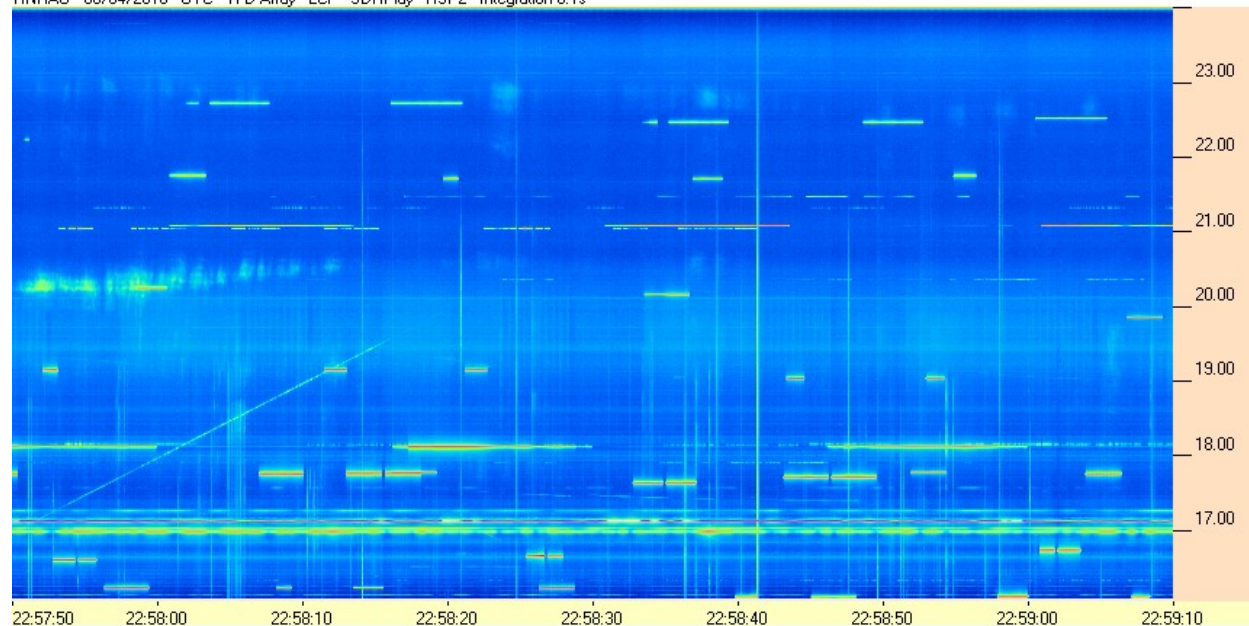
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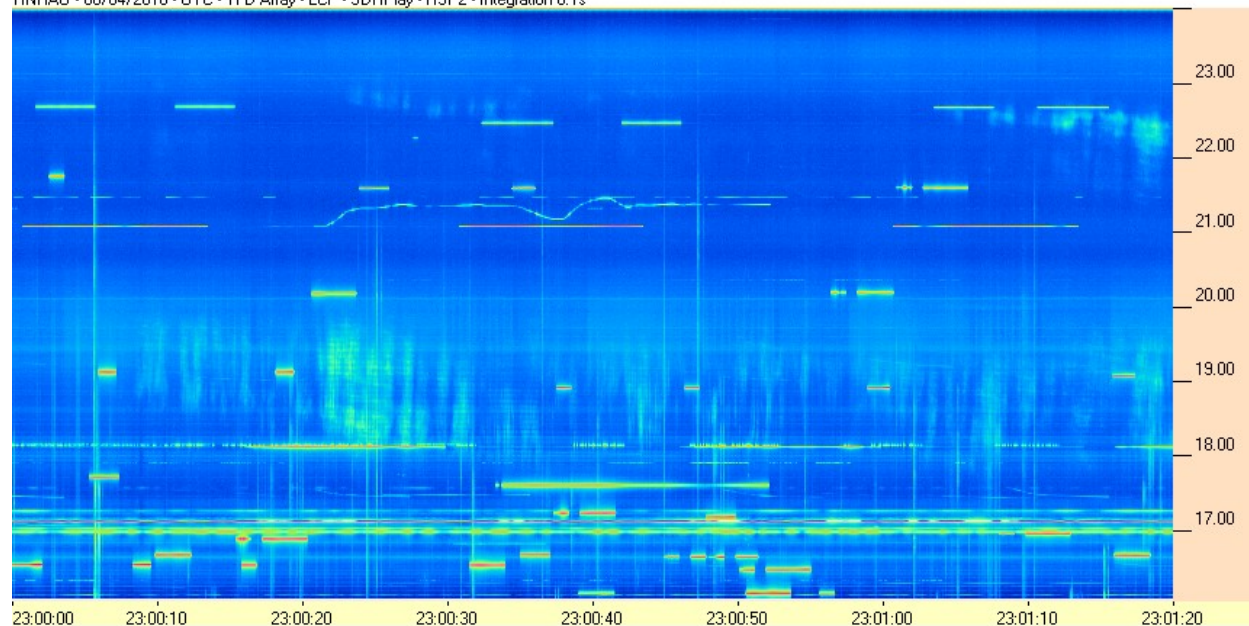
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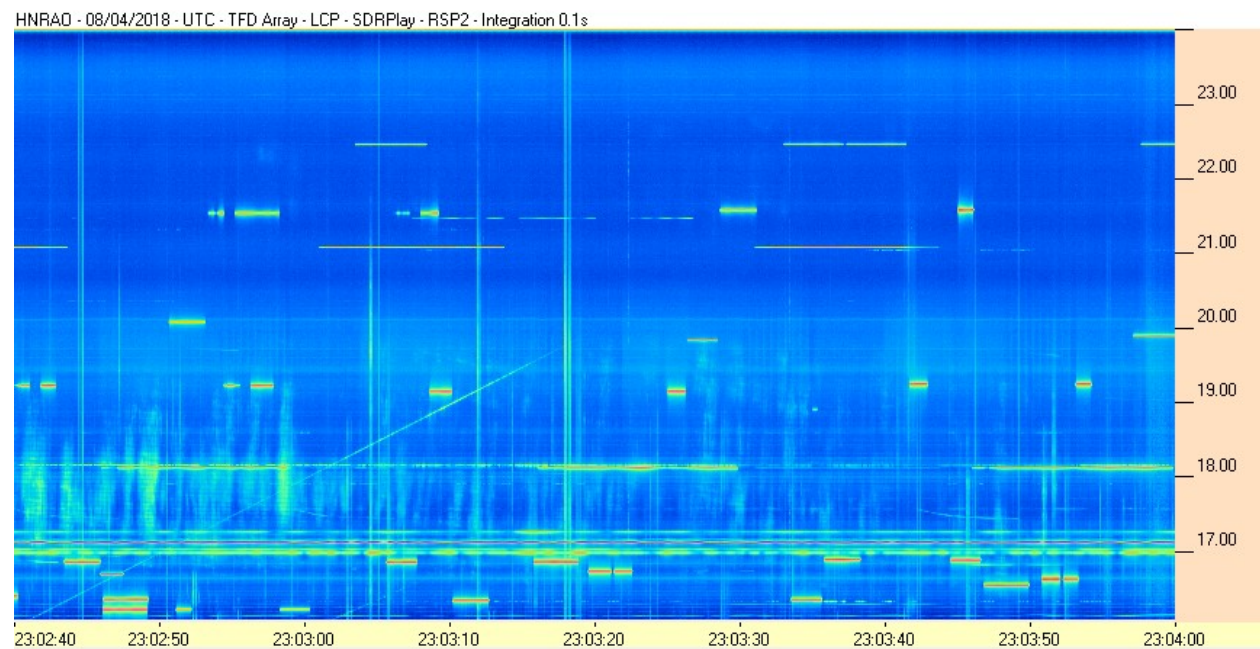
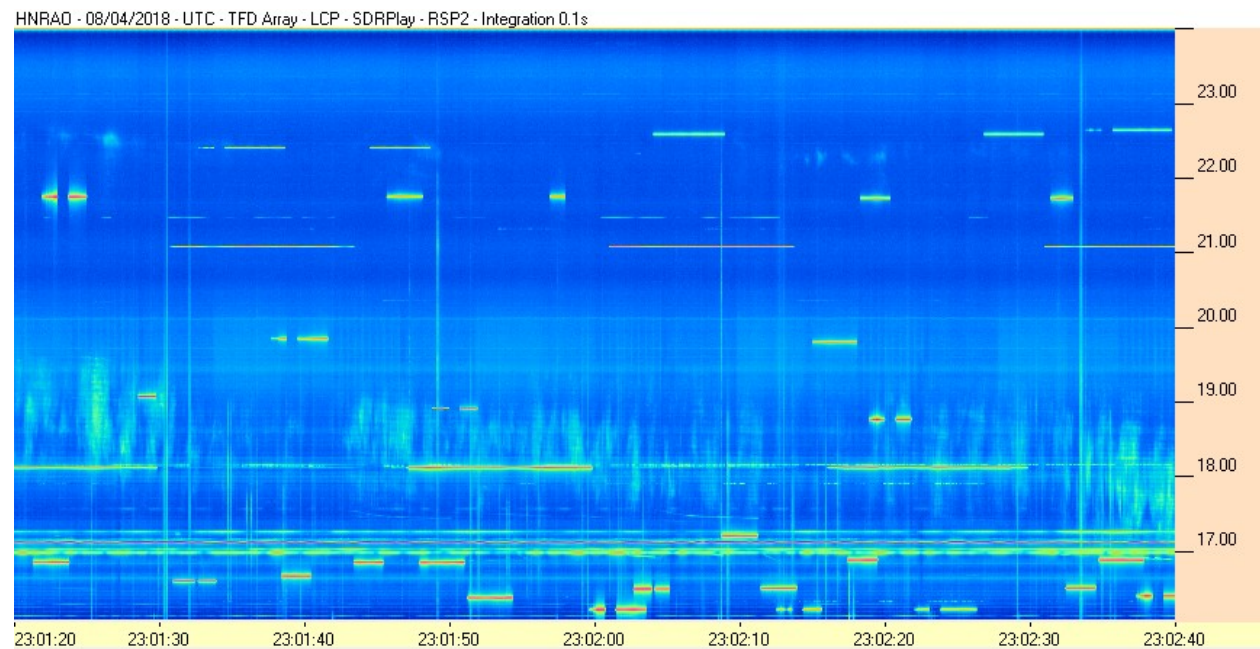
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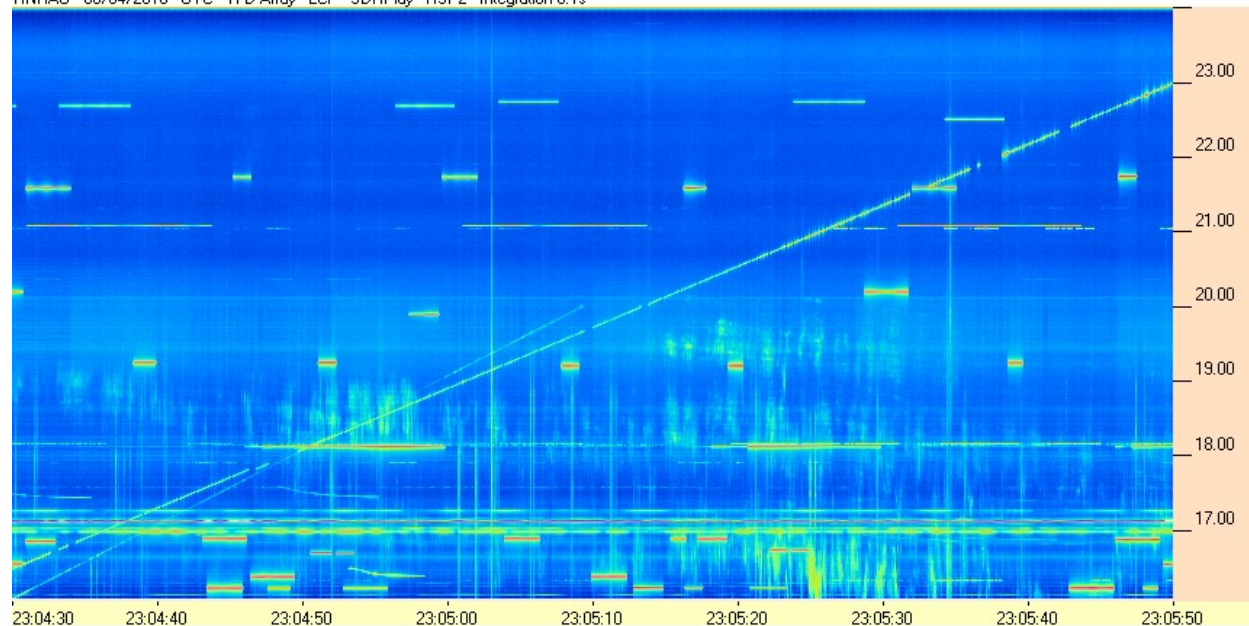
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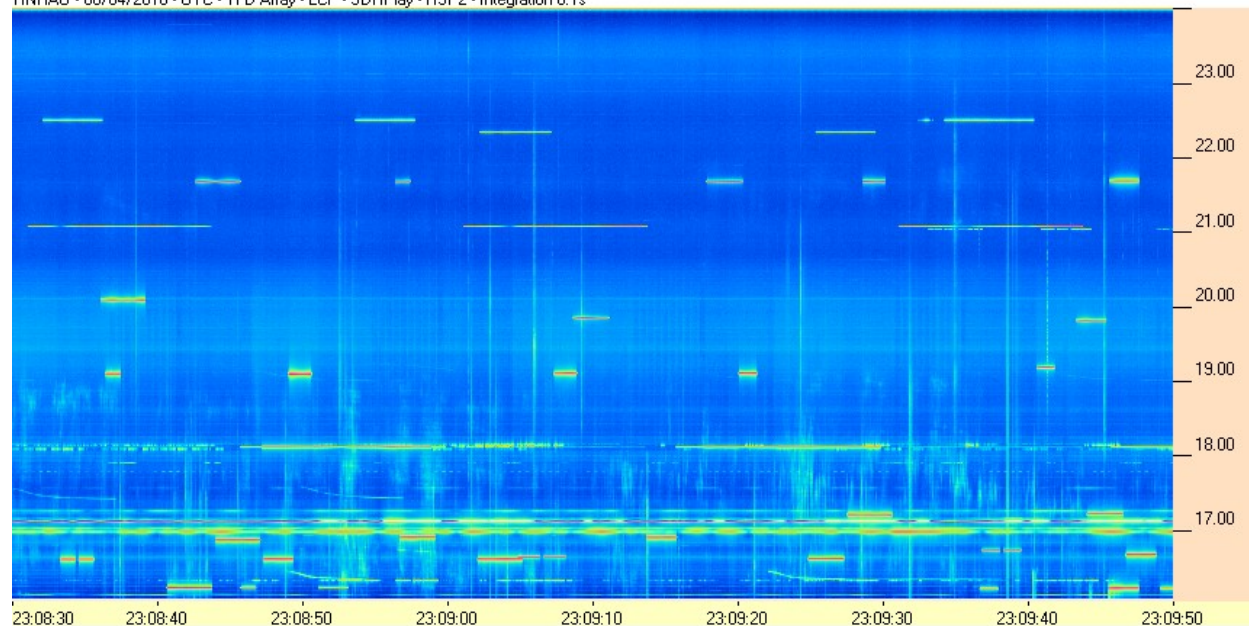
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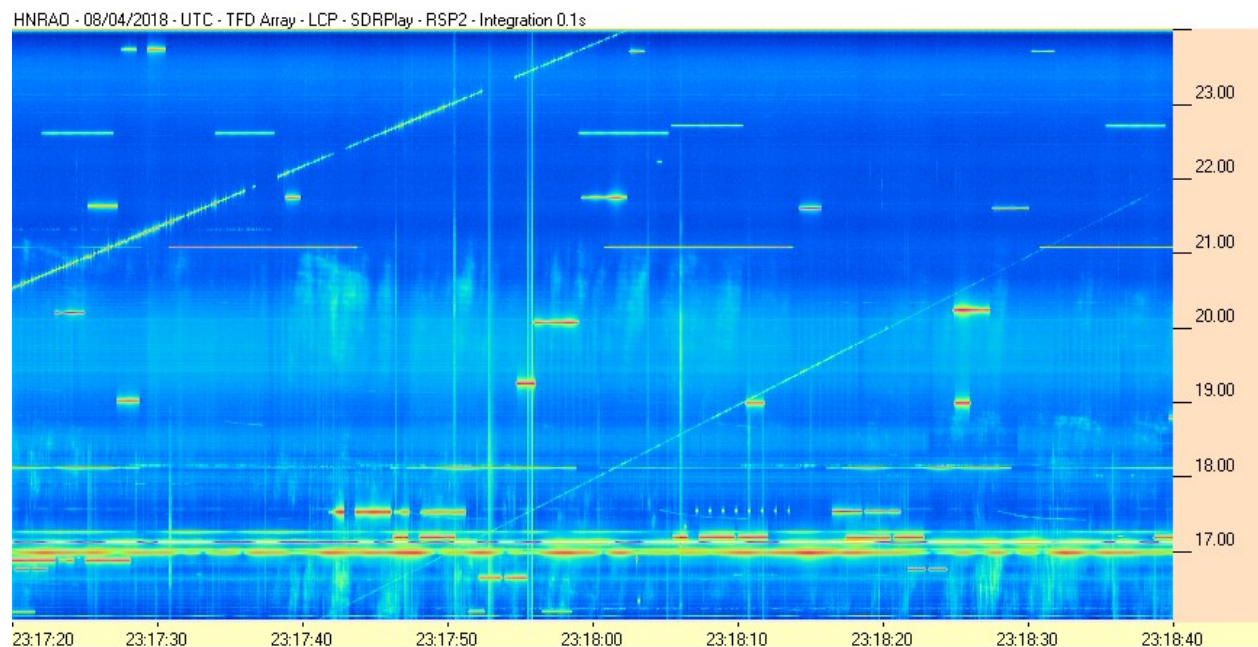
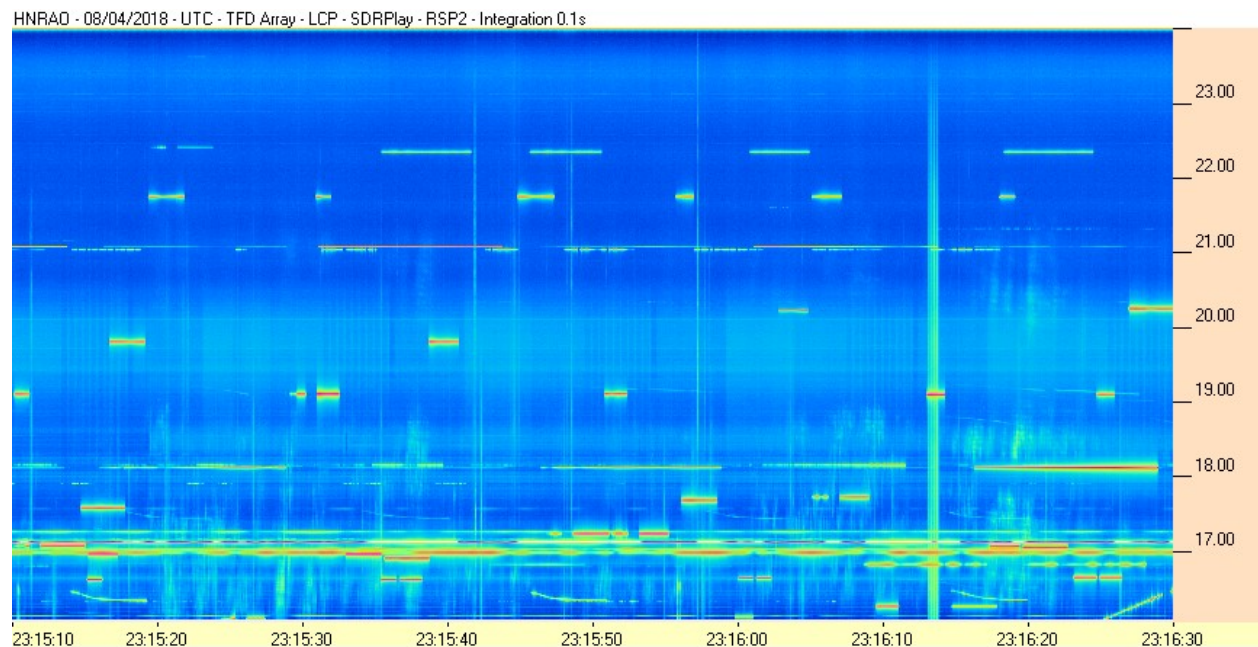
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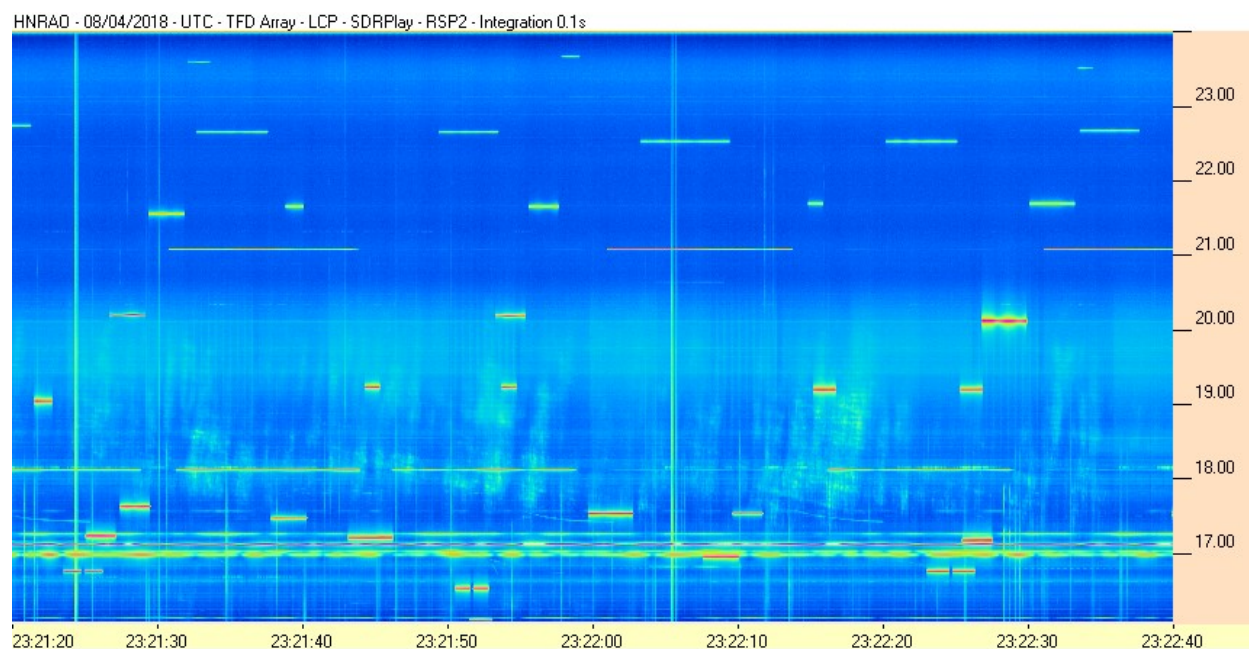
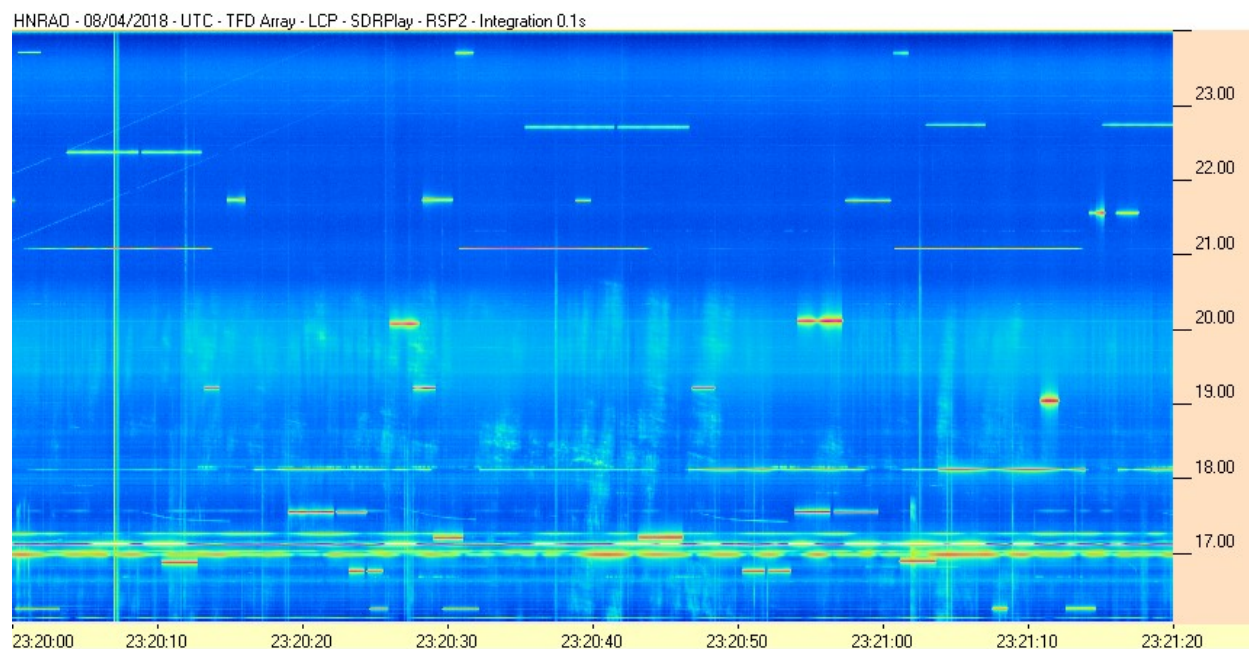
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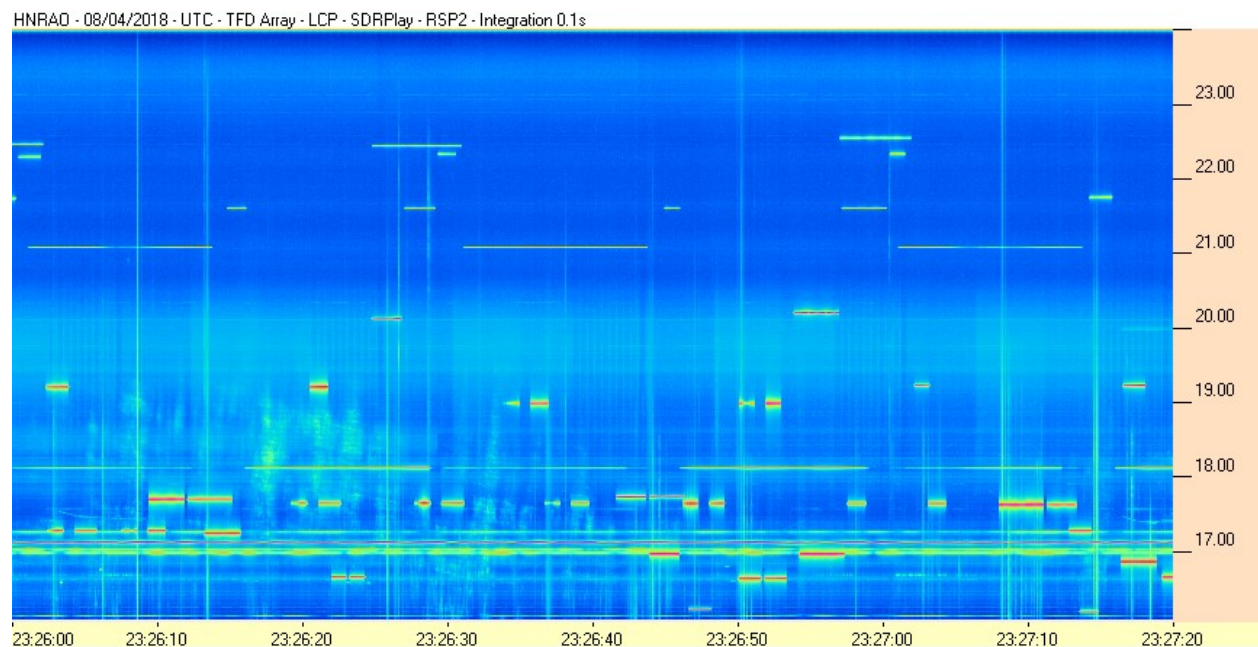
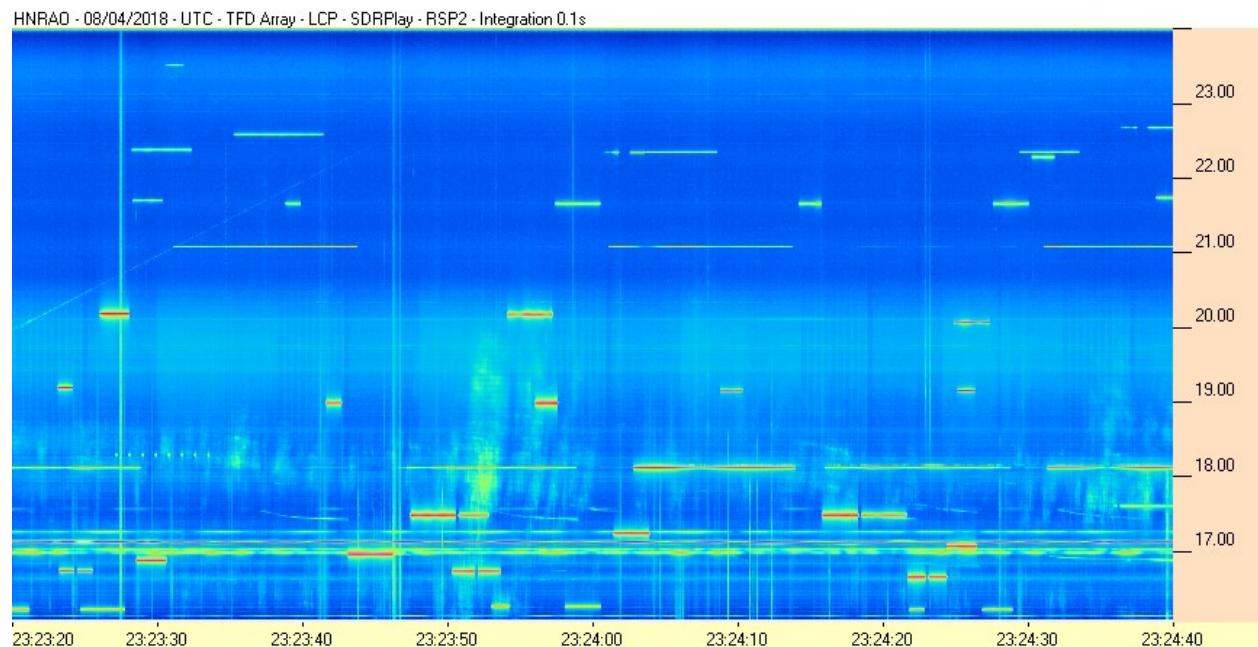
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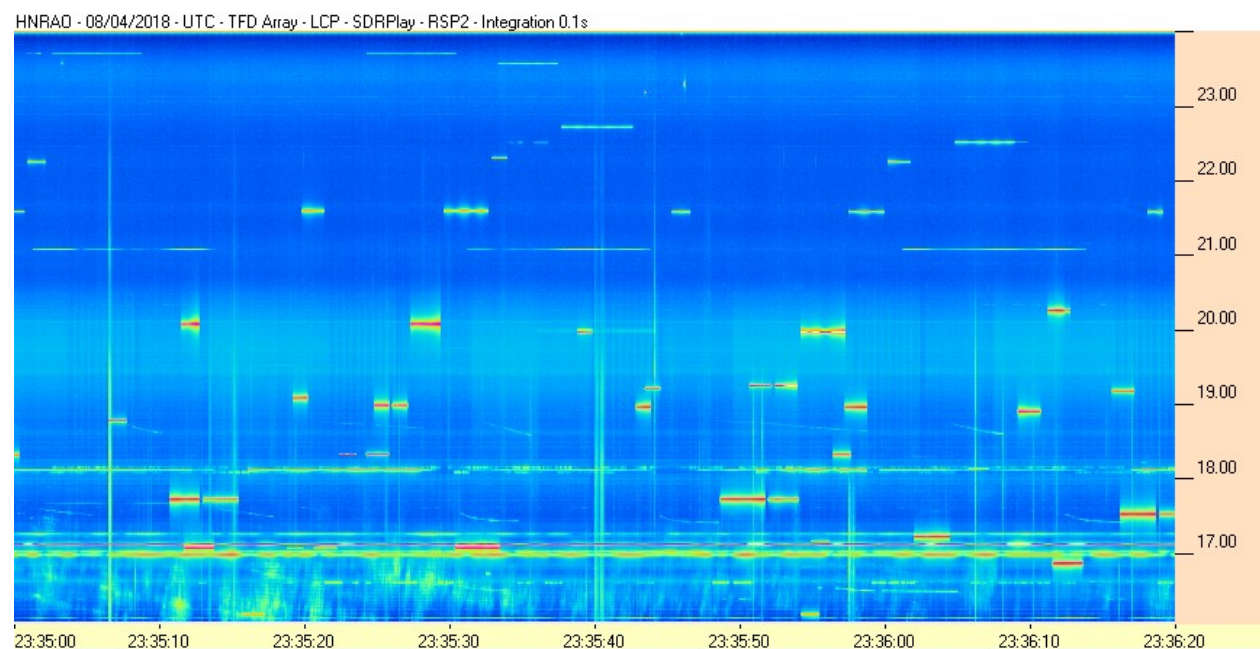
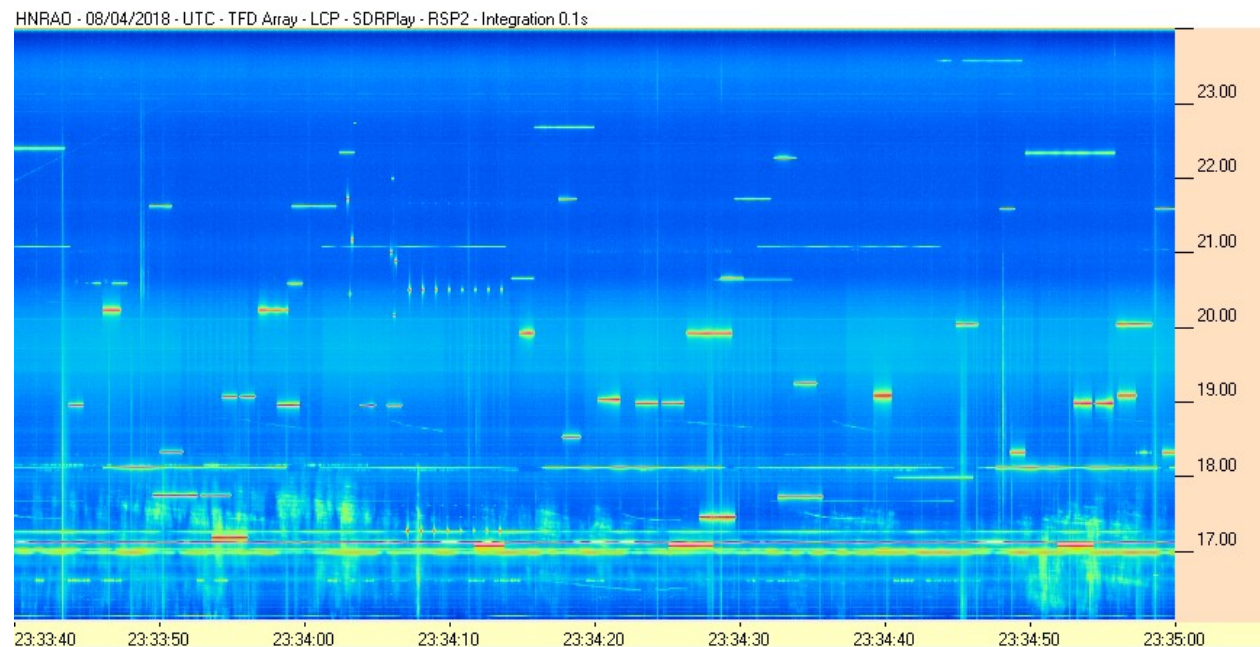
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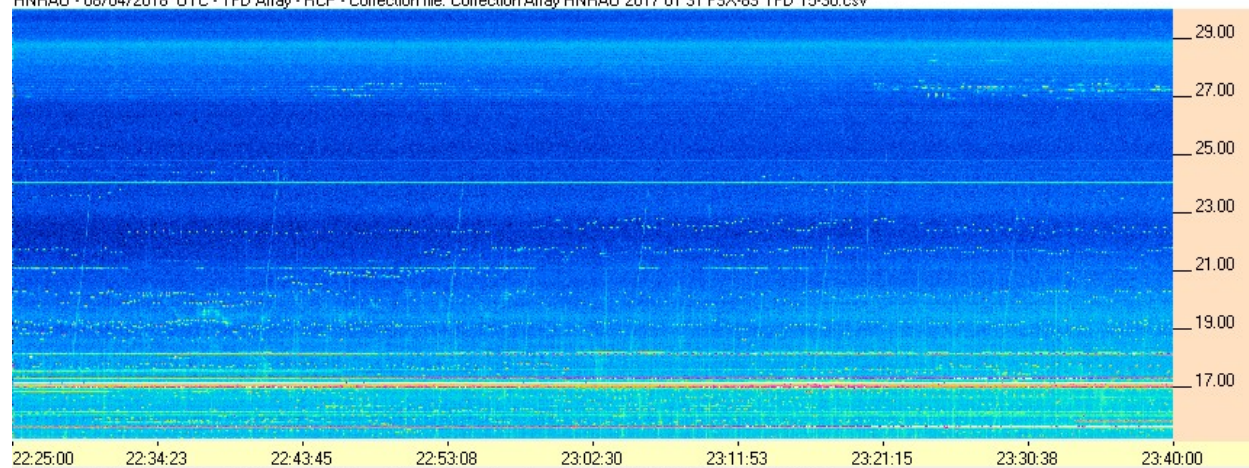


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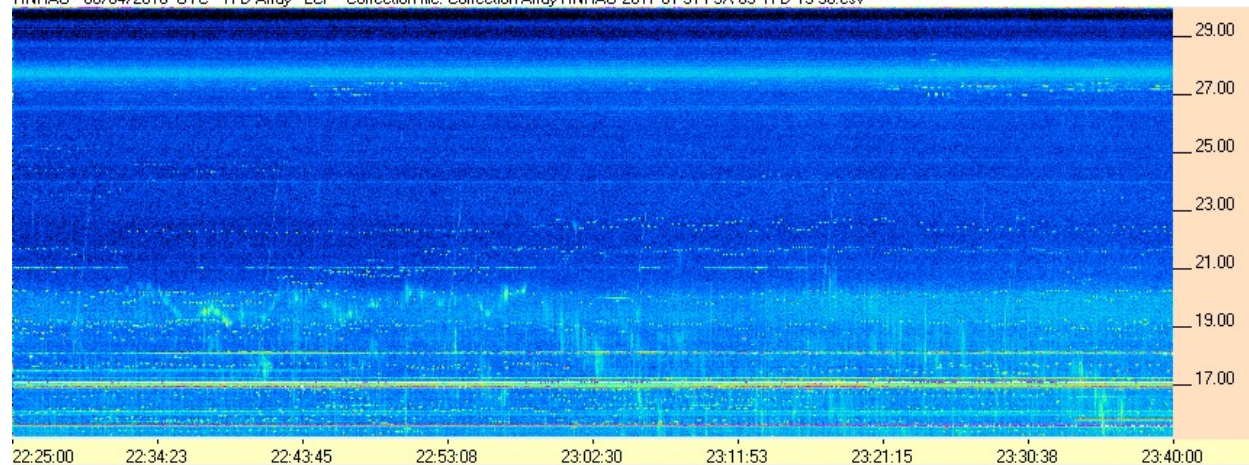


FSX-8S / TFD Array

HNRAO - 08/04/2018 UTC - TFD Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv



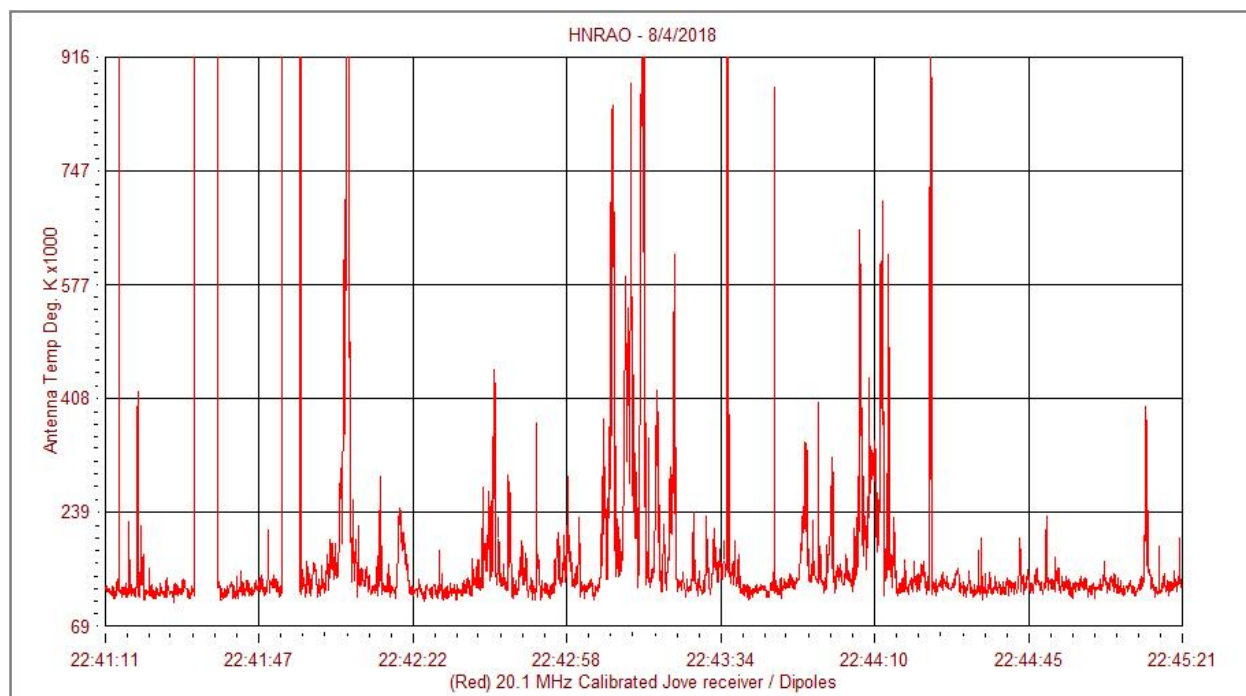
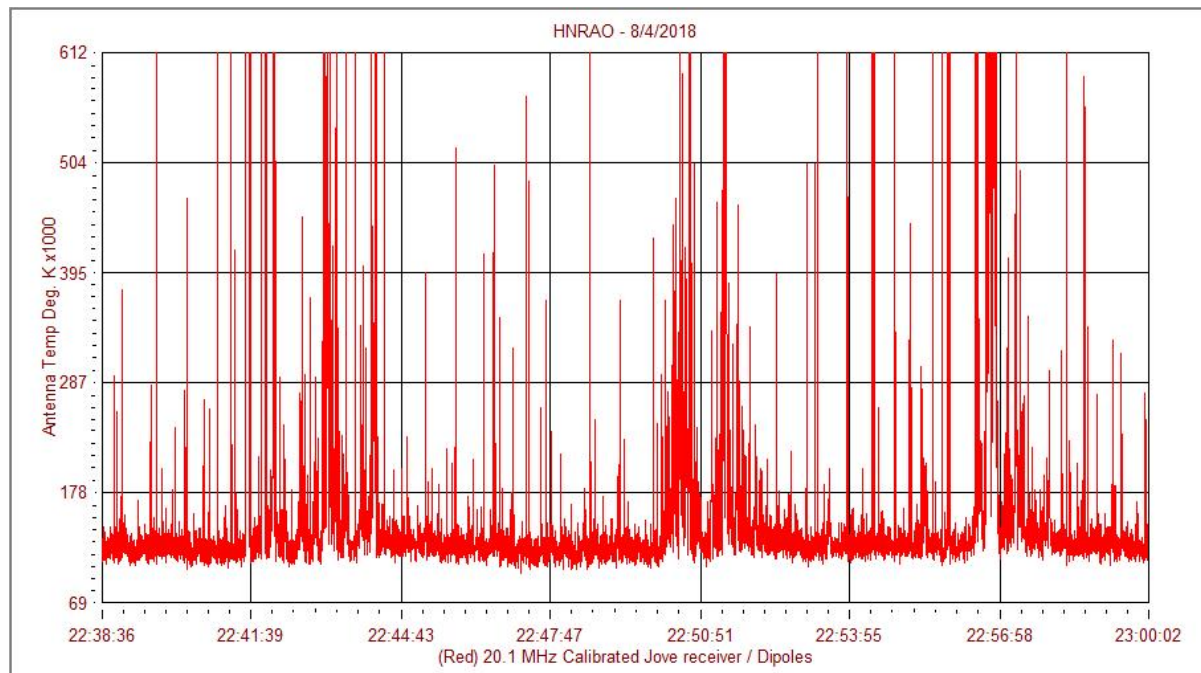
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Radio JOVE 2 Receiver / JOVE dual dipole array



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