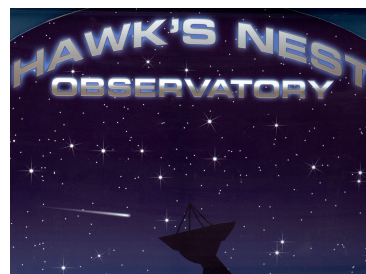


HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: January 10, 2019

Object: Jupiter Io-B

Observer: Unattended

Start - Time UT:	1243	Planetary K-index:	1
Jupiter Altitude (deg):	20.9	Jupiter Azimuth (deg):	148.4
Jupiter CML:	119.61	Jupiter Io Phase:	088.48
Jupiter RA (hr/min):	16:47	Jupiter Dec (hr/min):	-21:46
Hour Angle (hr/min):	-02:07	Polarization	RCP
Sun Altitude (deg):	00.0	Sun Azimuth (deg):	119.9
Sun RA (hr/min):	19:18	Sun Dec (hr/min):	-22:14

End - Time UT:	1430	De:	-2.8
Jupiter Altitude (deg):	27.4	Jupiter Azimuth (deg):	174.8
Jupiter CML:	184.28	Jupiter Io Phase	103.68
Hour Angle (hr/min):	-00:20	Duration (min):	187
Sun Altitude (deg):	15.6	Sun Azimuth (deg):	139.3
Max Frequency MHz	24 (and higher)	Min Frequency MHz	19 (and lower)

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	-3.66 dB	#3 Linear	Port 4 +3 dB	08/21/2018
SDRPlay RSP1	Experimental*					

JOVE dipoles phased @ 32 degrees for 2017-2018 season

TFD array phased @ 35 degrees for 2017-2018 season

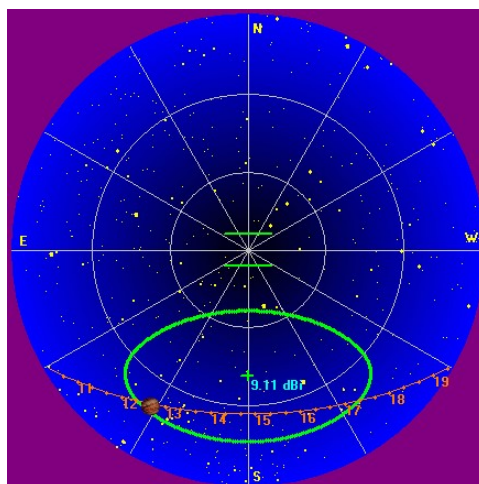
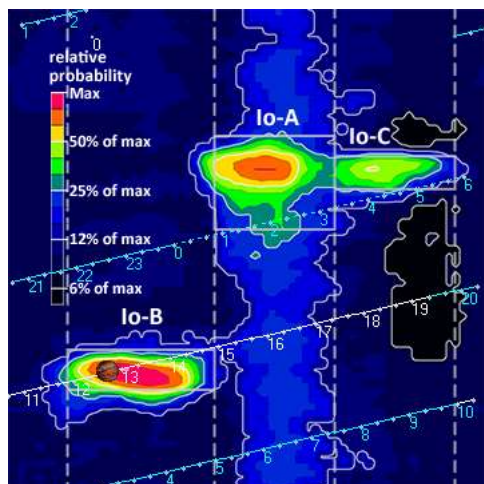
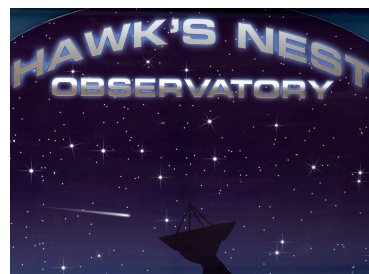
LWA antenna phased @ 35 degrees and orientation for observation: 45 degrees

* Used for testing and evaluating antenna systems

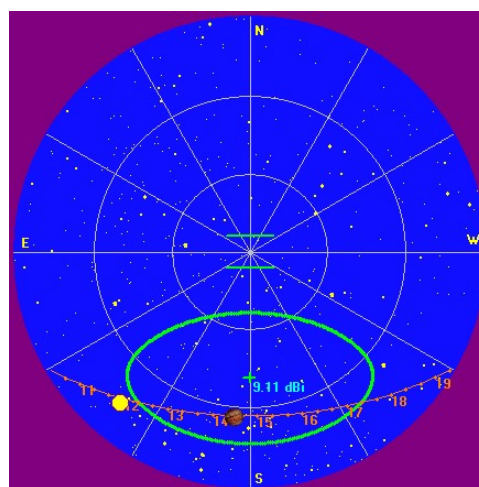
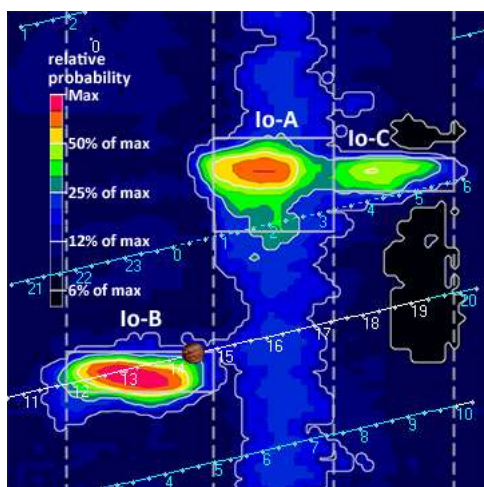
Software Radio Sky Spectrograph 2.8.50

Red = Offline

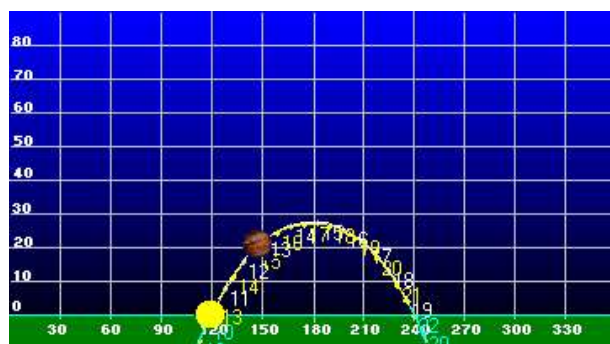
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



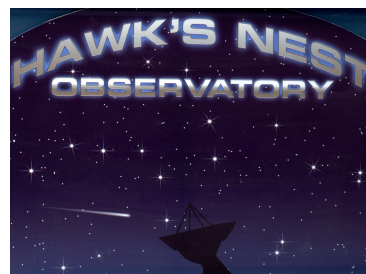
Beginning of Pass



End of Pass



HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



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	

HNRAO Observing Log
40.673181 N – 80.437885 W
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Observations made with FSX-8S/TFD Array, FSX-2/LWA Array, SDRPlay RSP2 (RCP) /TFD Array, SDRPlay RSP2 (LCP) /TFD Array and Jove II receiver/Jove dipoles. Observations at the start of the storm were acceptable, but as the sun rose above the horizon, conditions changed, and foreign broadcast stations below 18 MHz began to overload the front end of the receivers.

No emissions were more than several dB above the background.

S-bursts began at 1243 here between 22 MHz and 23 MHz. Positive drift S-bursts at 1248 from 18 MHz to 22 MHz. It seemed as if this storm was composed of S-bursts only. The weakness of the emissions made identification of L-bursts difficult, if there were any.

At 1255 UT, emissions began to negatively drift from 24 MHz to 19 MHz.

Positive slope, L2, modulation lanes became apparent at 1305 UT. At 1426:30 UT, L3 modulation lanes were evident.

An N-event was seen at 1337 UT. at 21 MHz. A second N-event was recorded at 1342 UT at 21.5 MHz.

At 1256 UT, S-bursts were visible in the spectra of the FSX-2 / LWA Array spectrograph at 29 MHz. Heat pump RFI is evident from 22 MHz to 26 MHz, essentially blocking any weak emission from being observed. A few other S-bursts were seen with the FSX-2 at 29 MHz and above, however they were very weak in this spectrum and I would have missed them had I not had the SDRPlay RSP2 spectra for comparison.

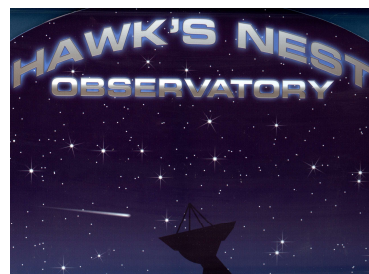
No emissions were observed with the FSX-8S / TFD Array spectrograph.

All SkyPipe data has been uploaded to the Radio Jove Data Archive.

Overall, a weak storm but given its proximity to the sun, and the bulk of the storm in daytime skies, it was surprisingly visible in the spectra.

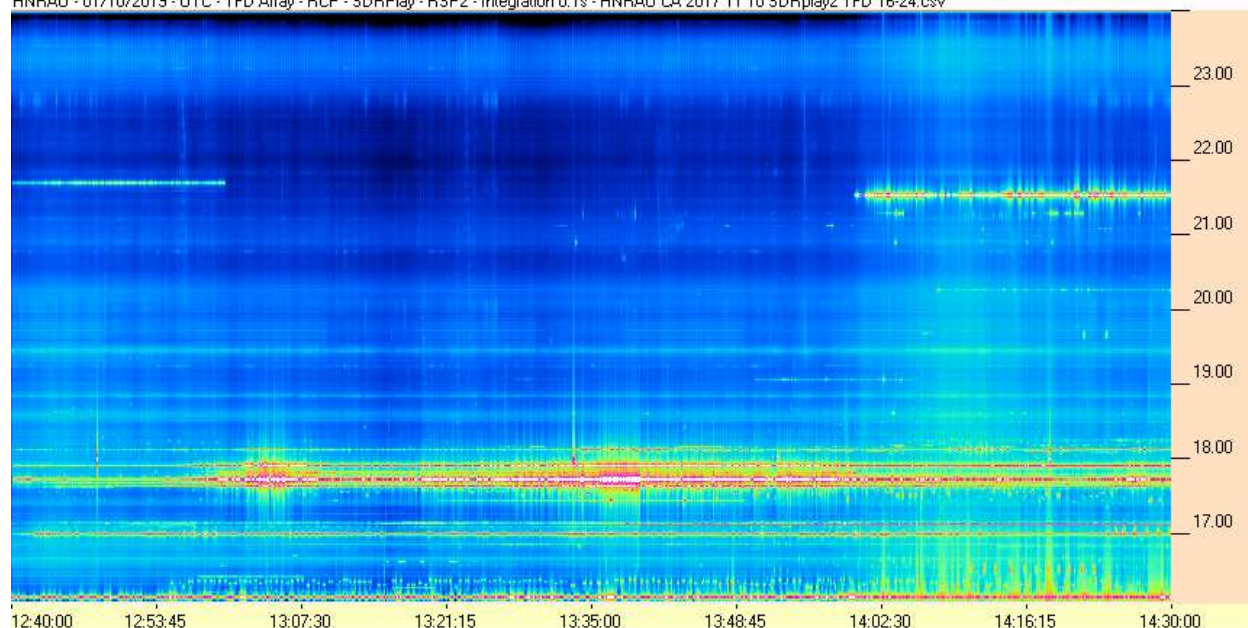
EOR

HNRAO Observing Log
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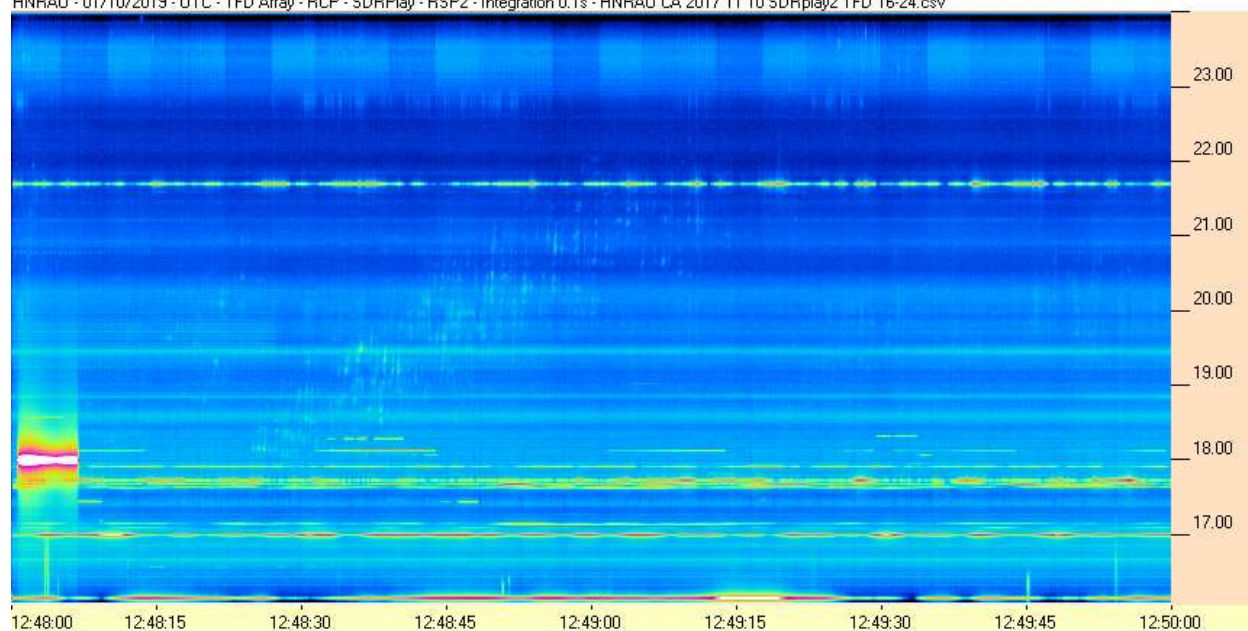


SDRPlay RSP2 / TFD Array

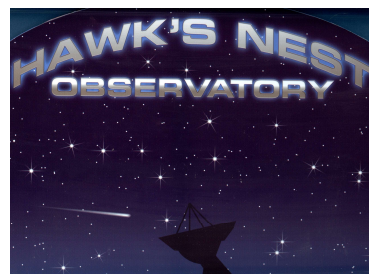
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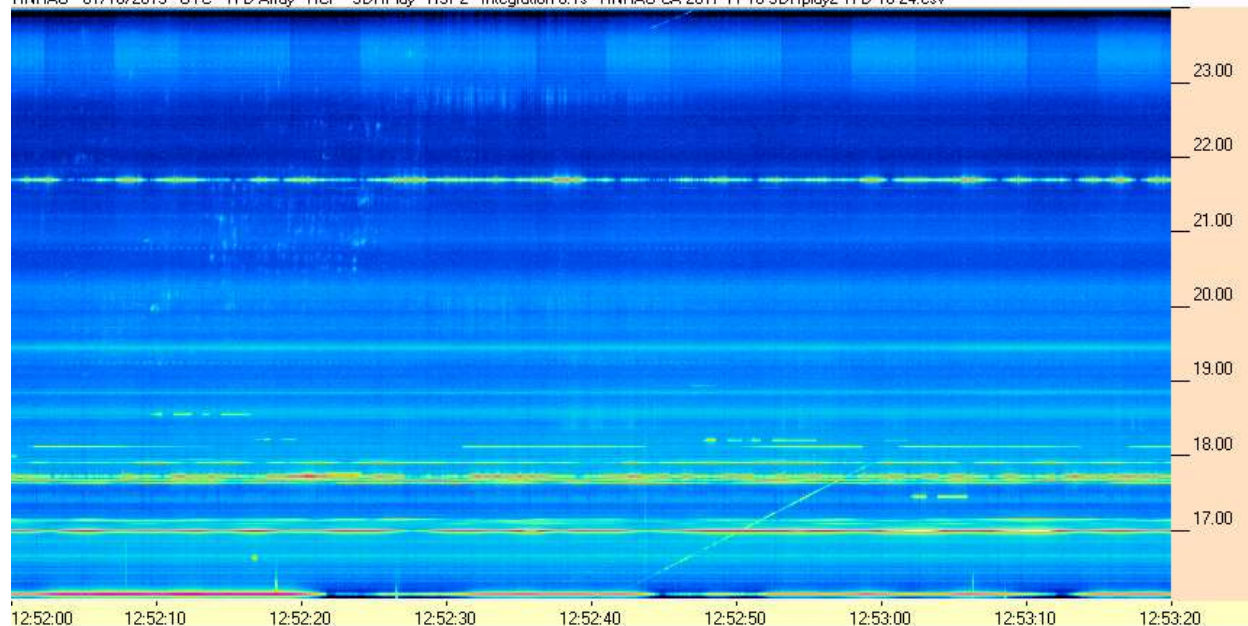
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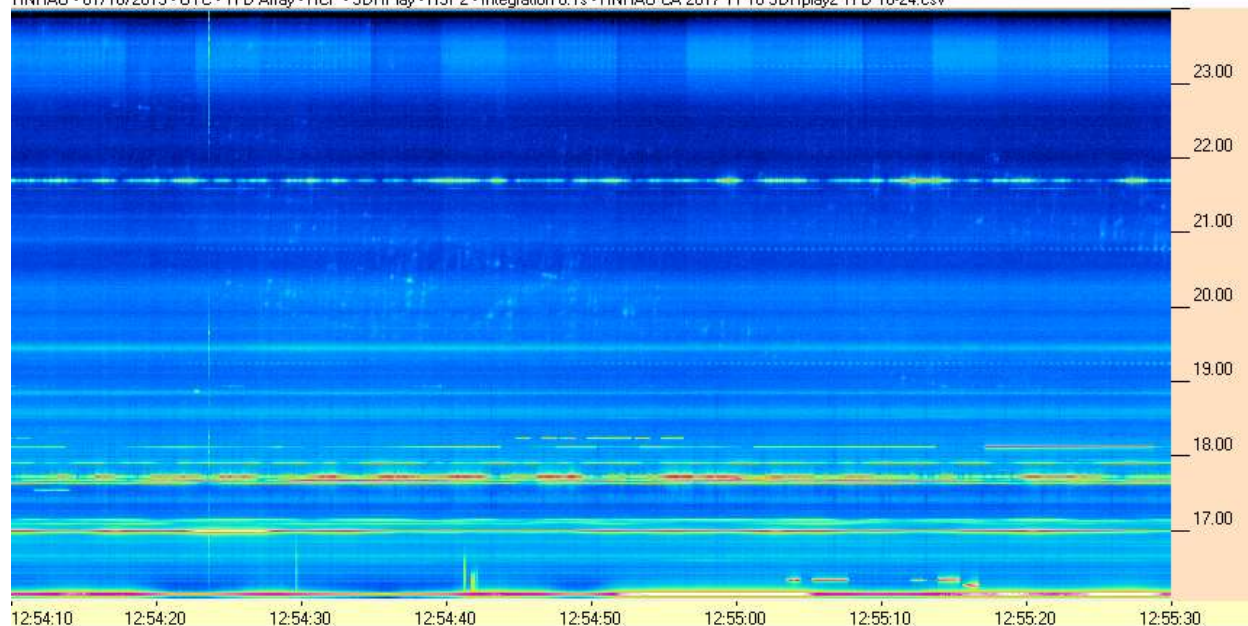
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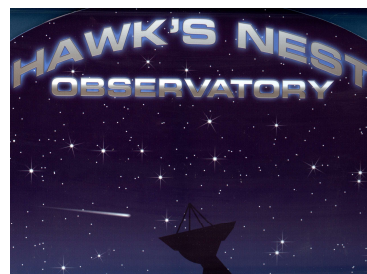
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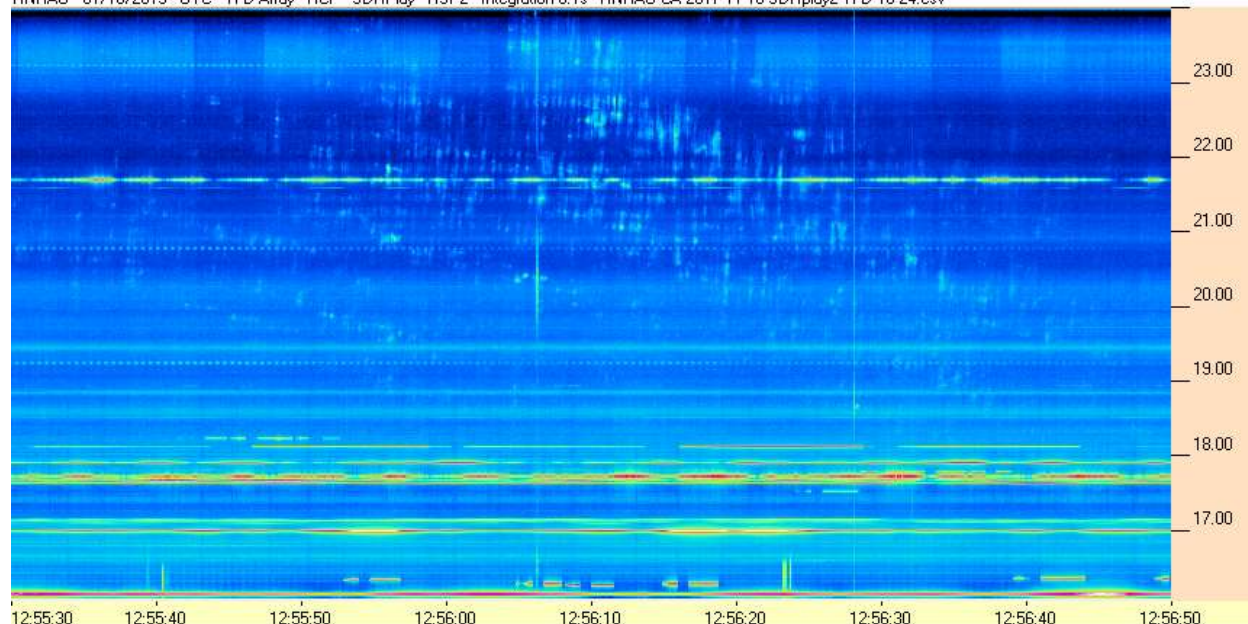
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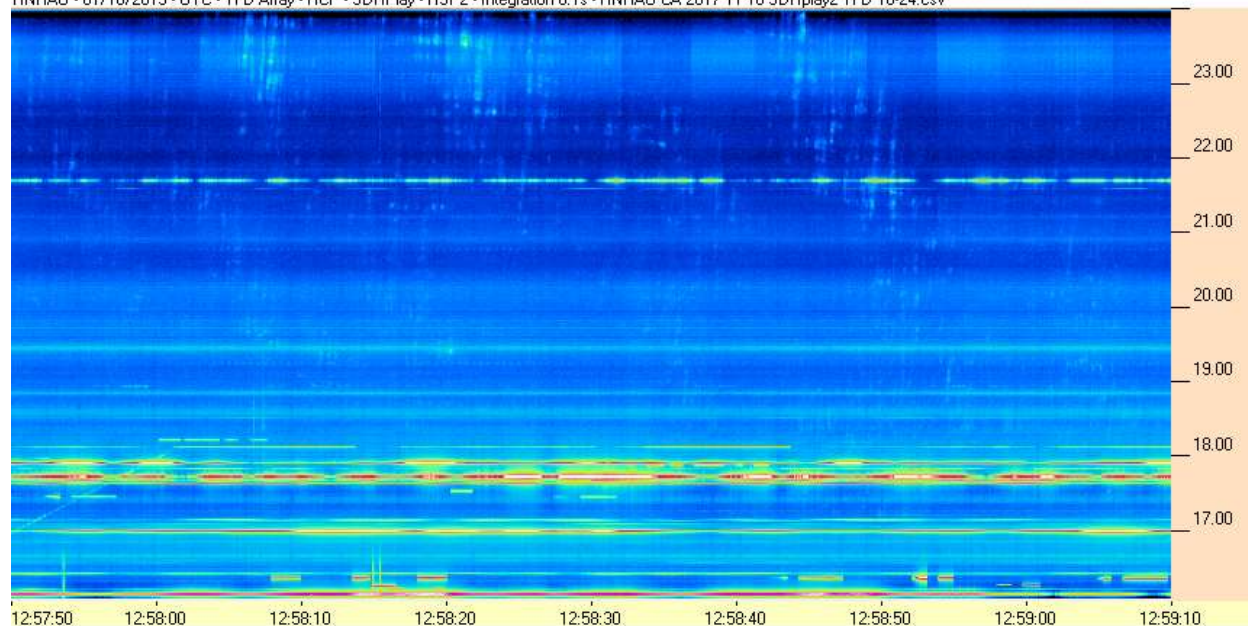
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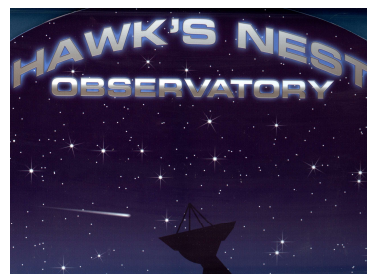
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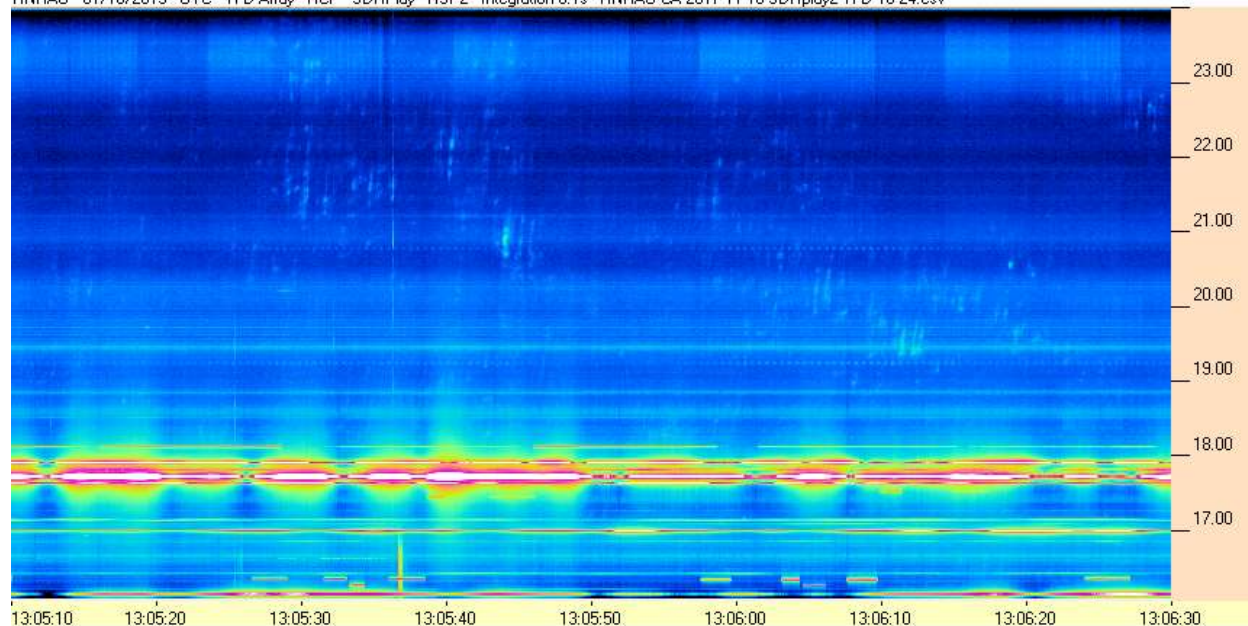
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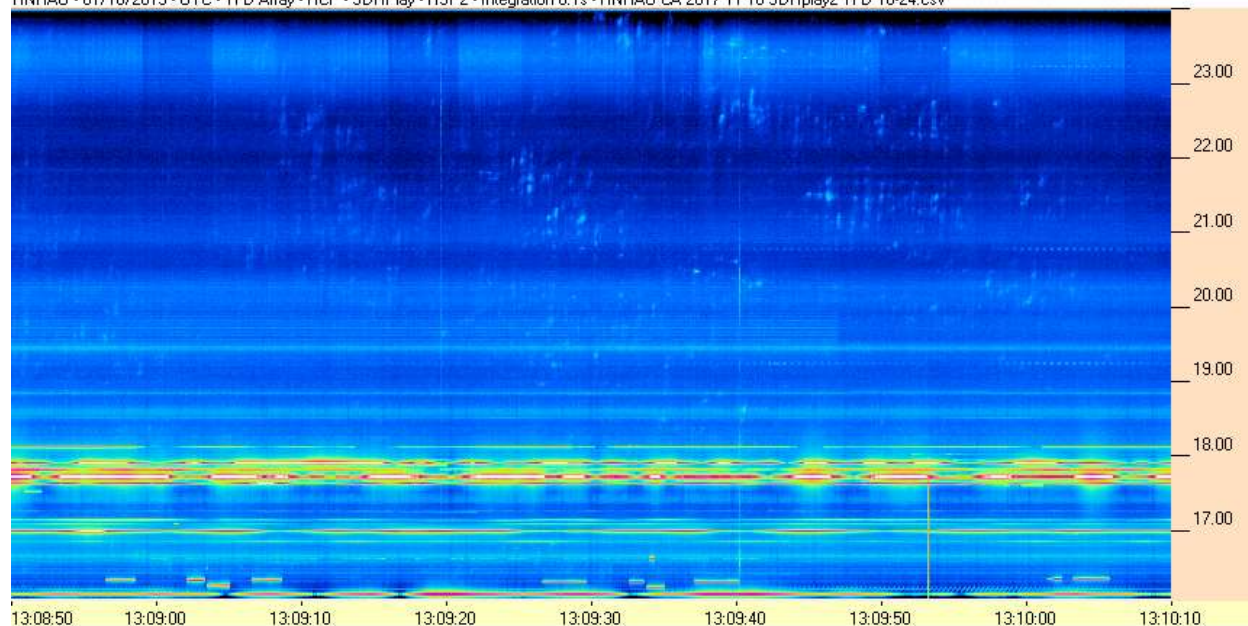
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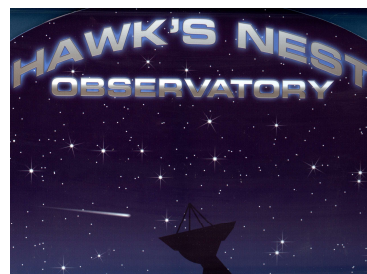
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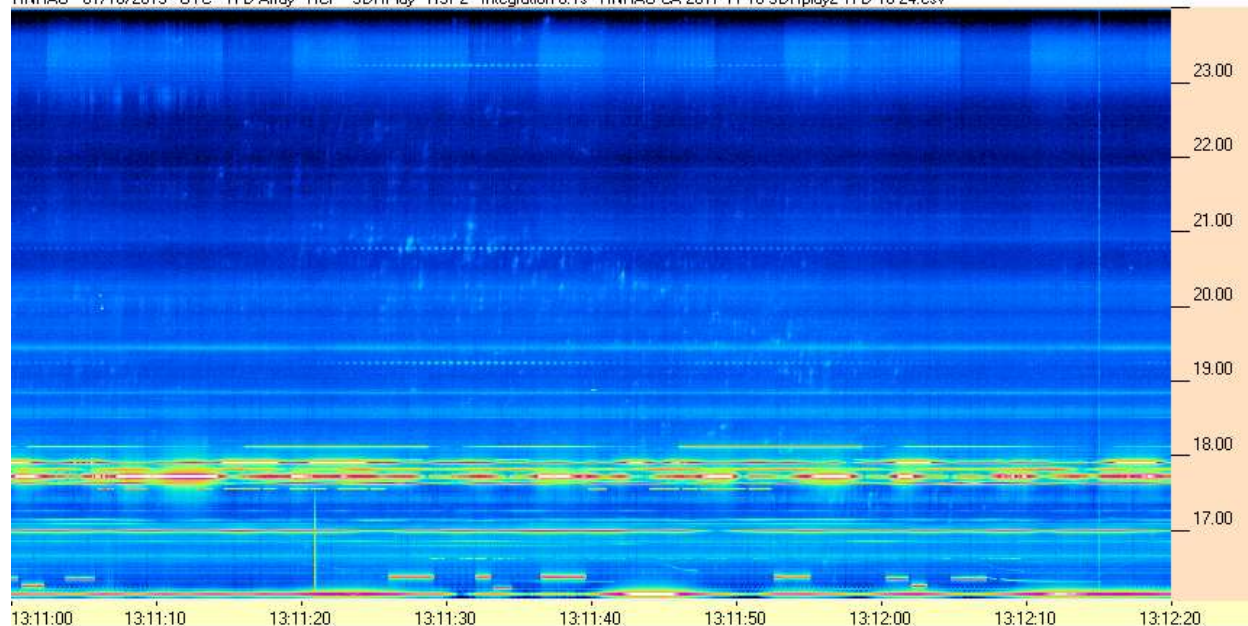
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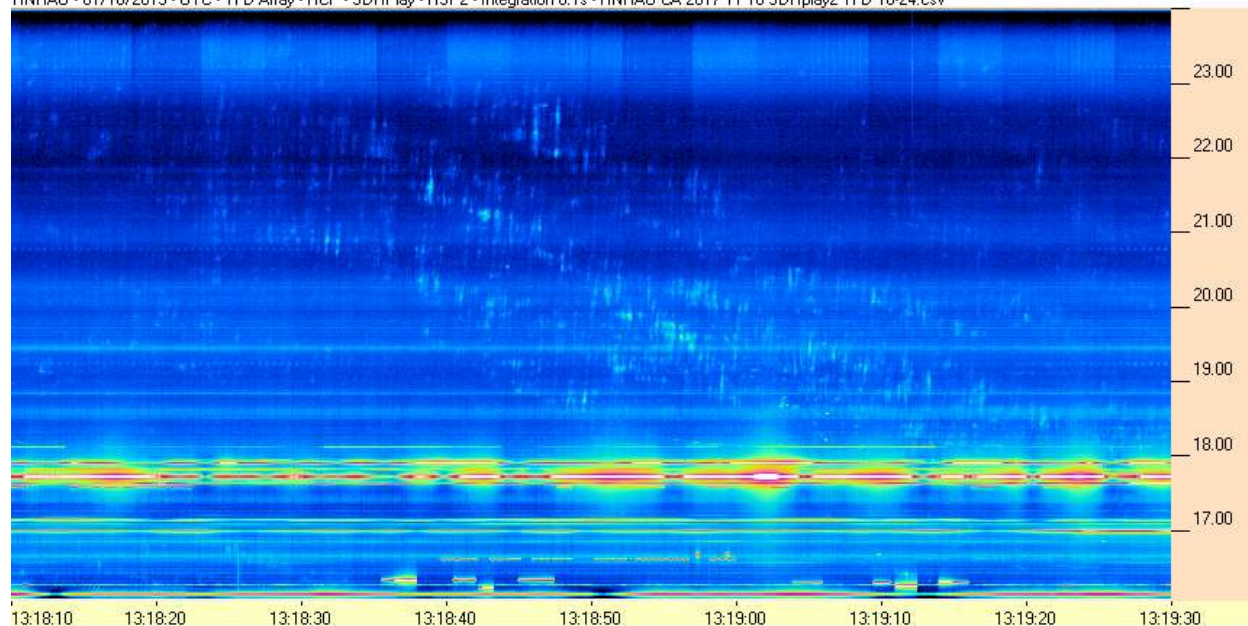
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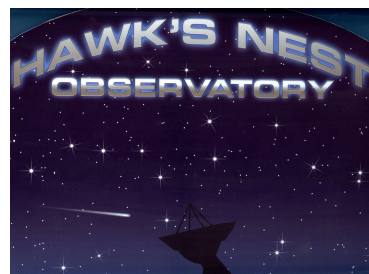
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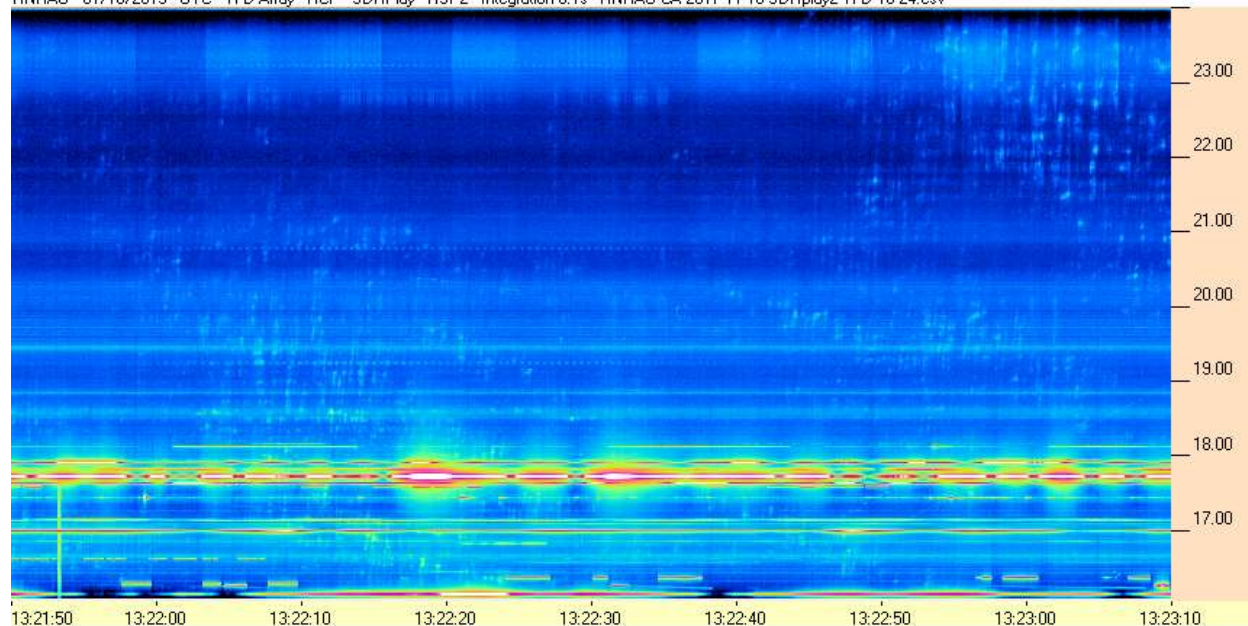
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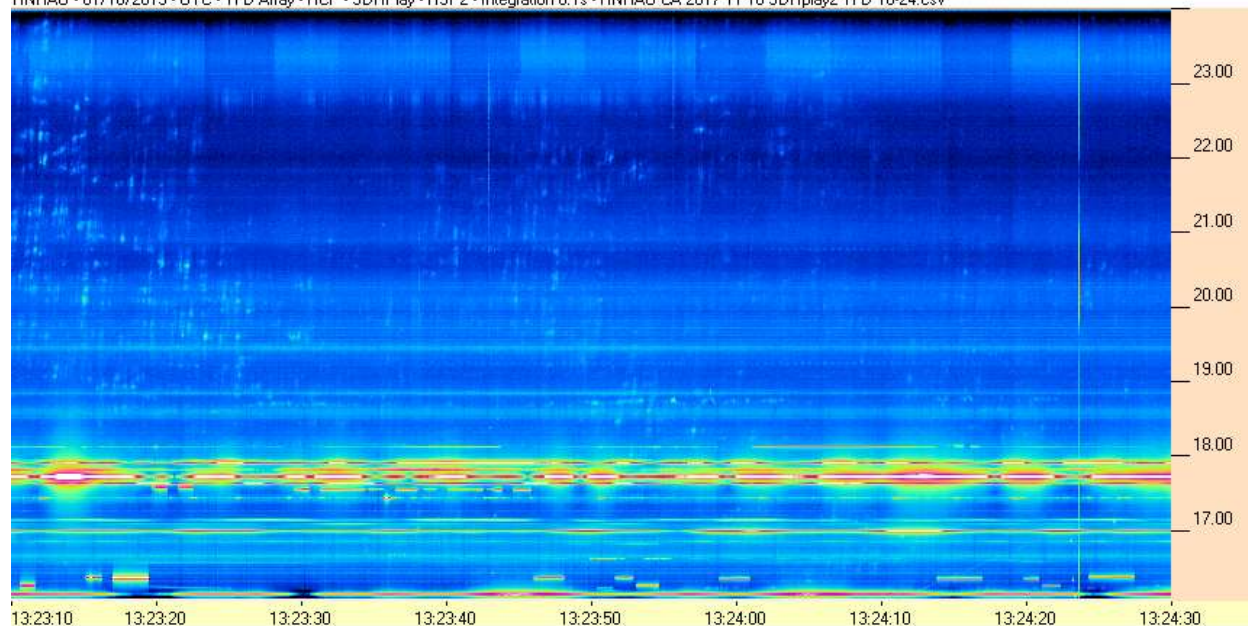
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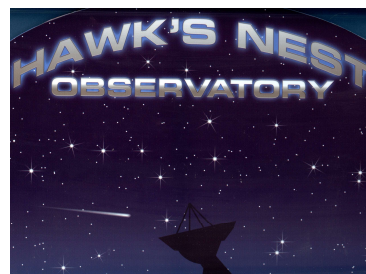
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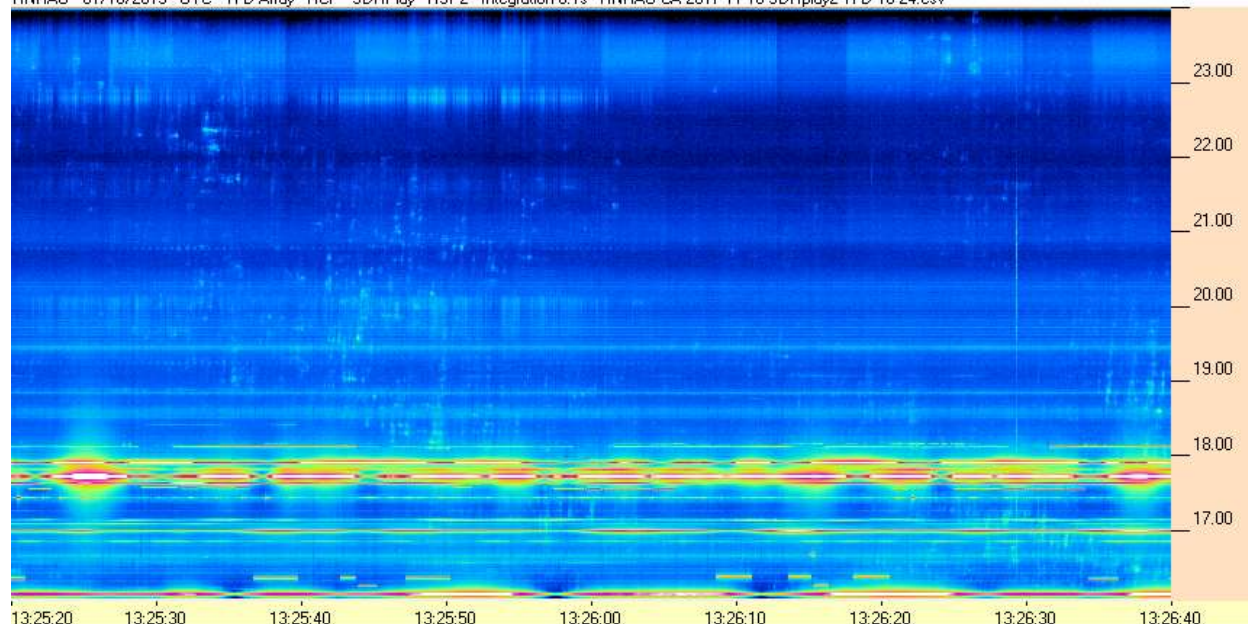
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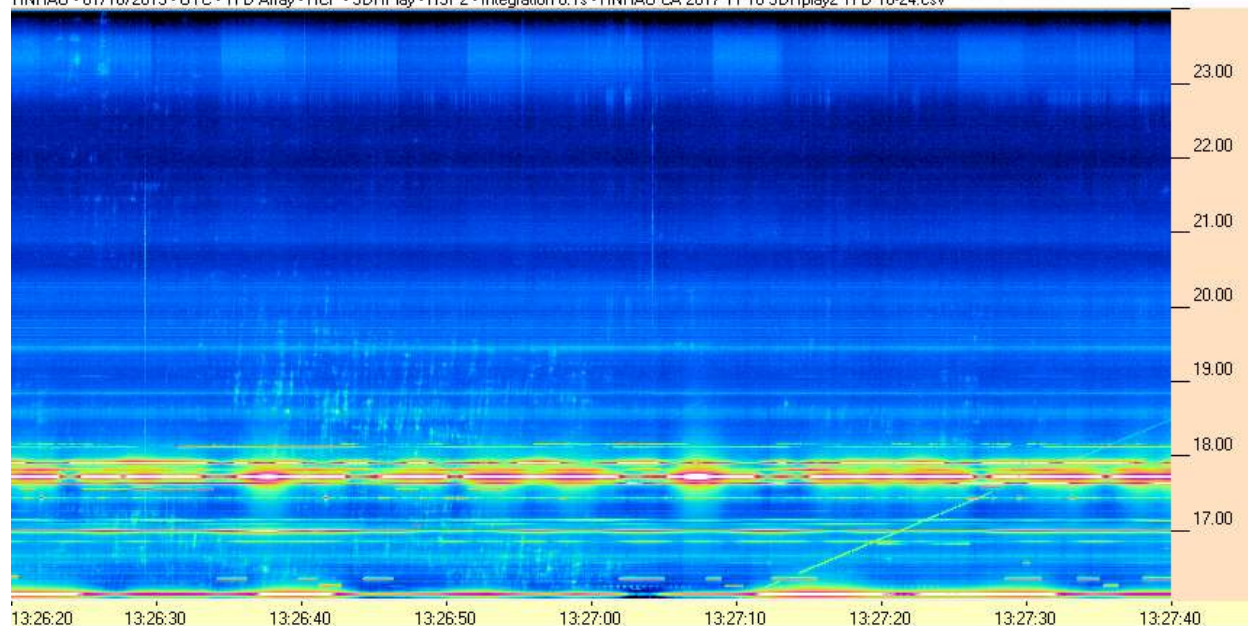
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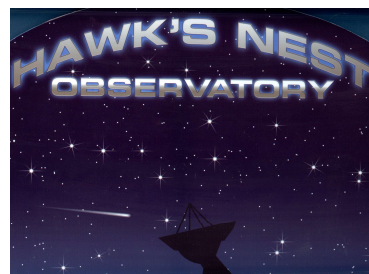
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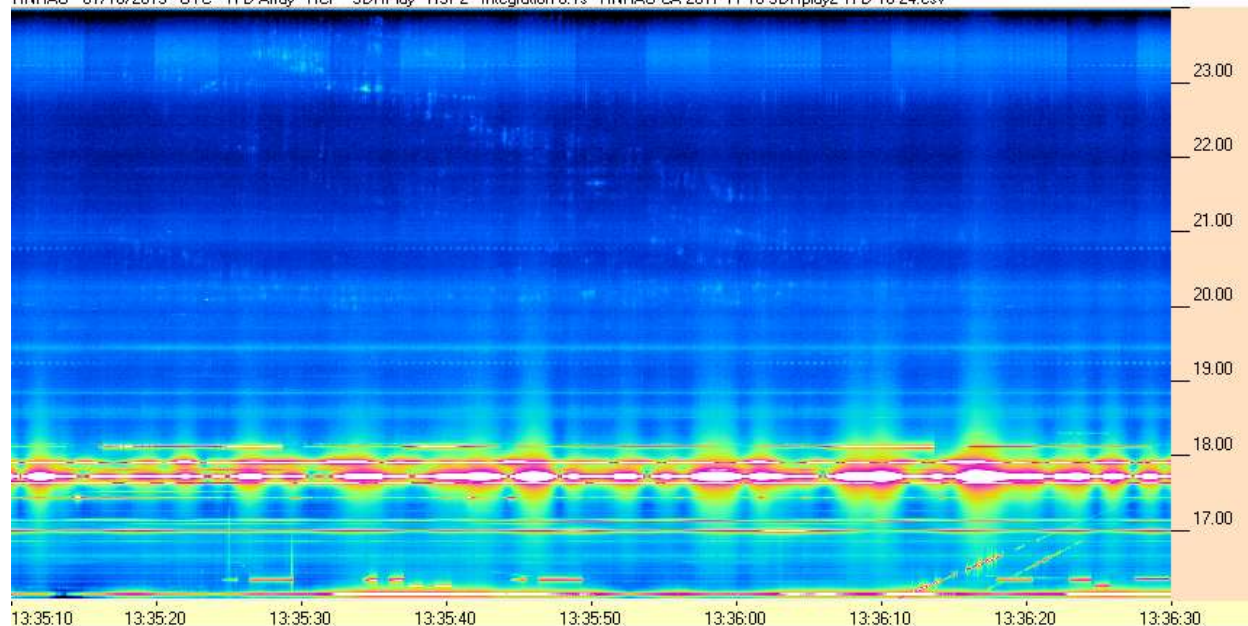
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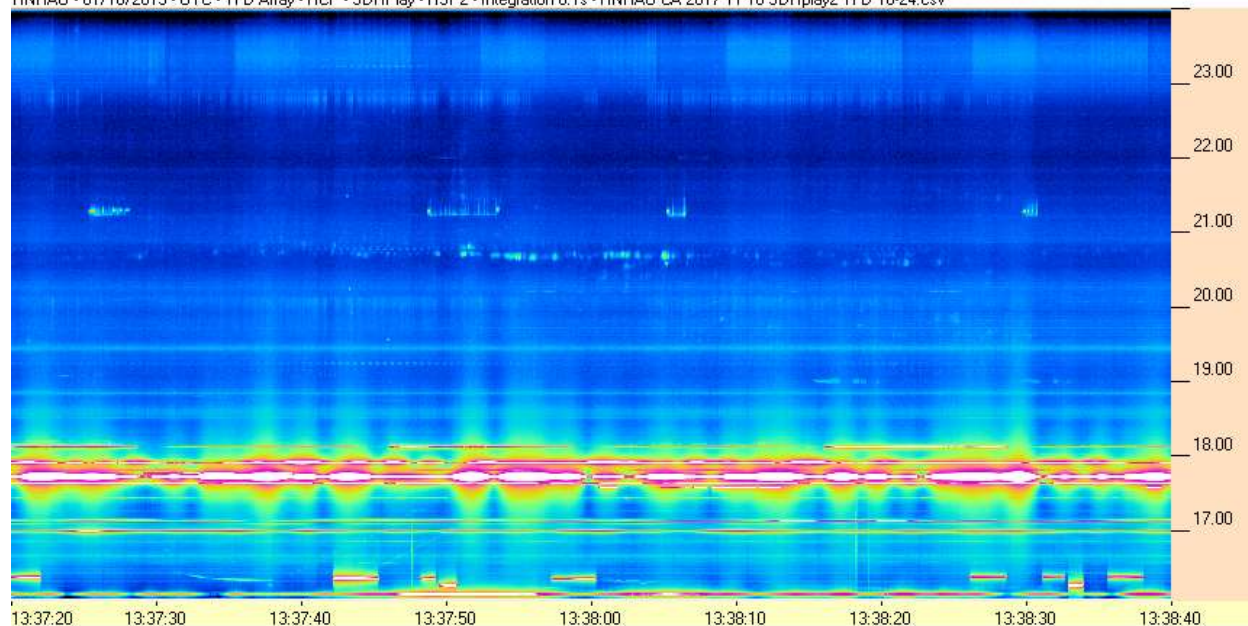
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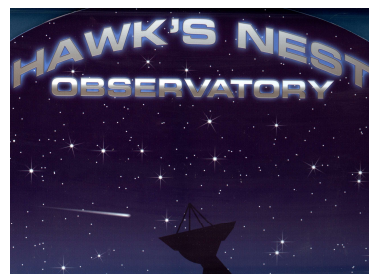
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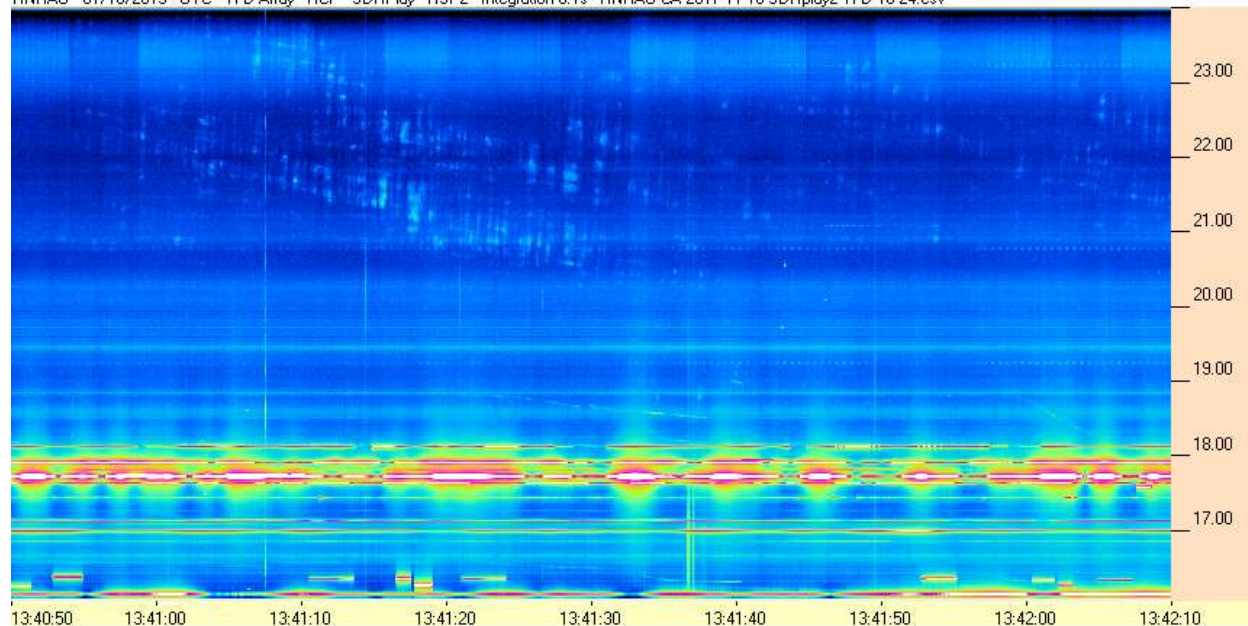
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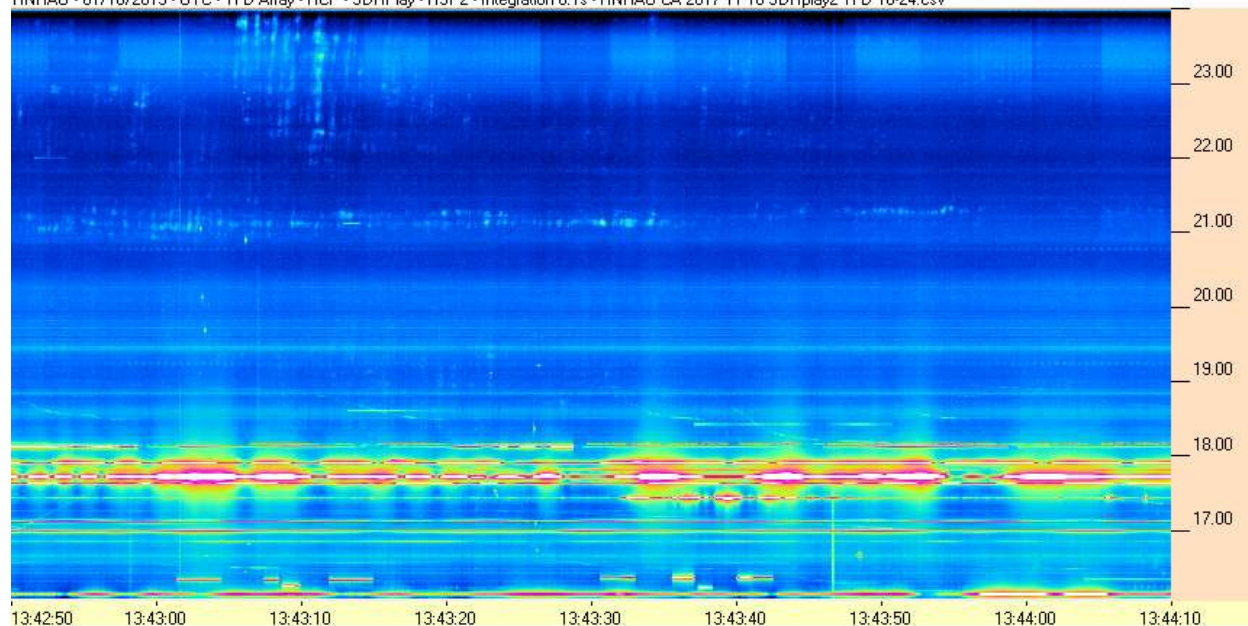
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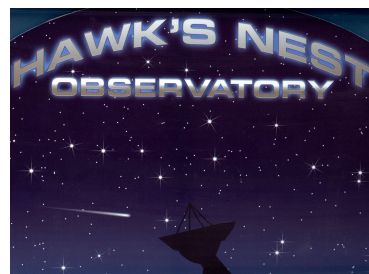
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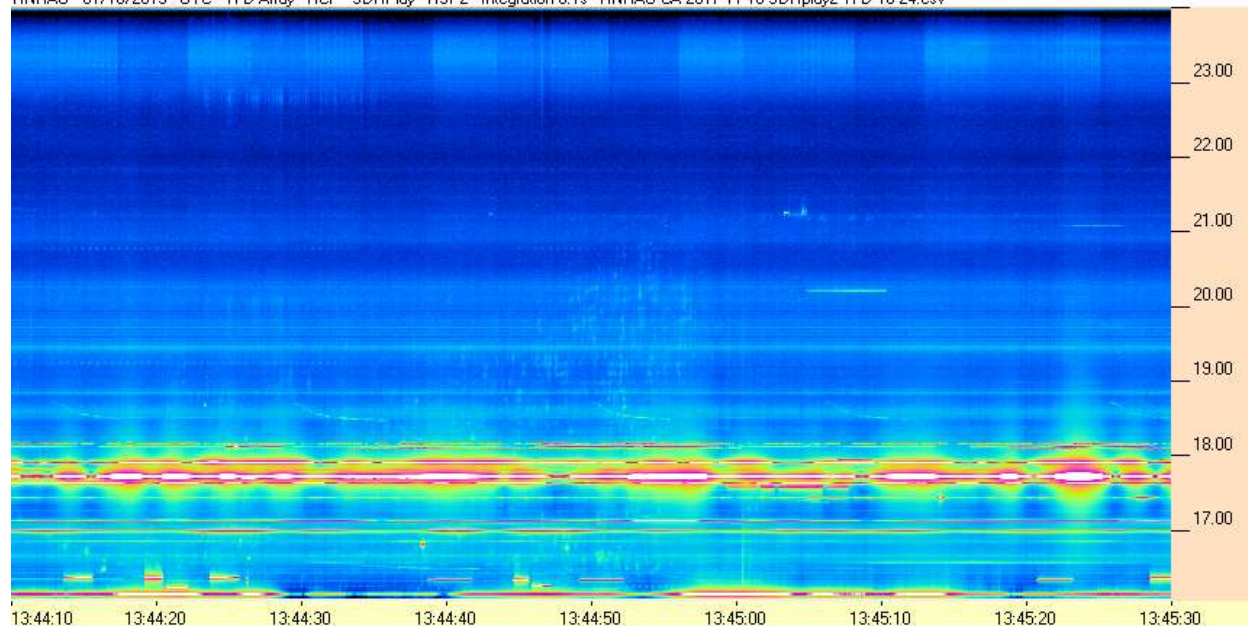
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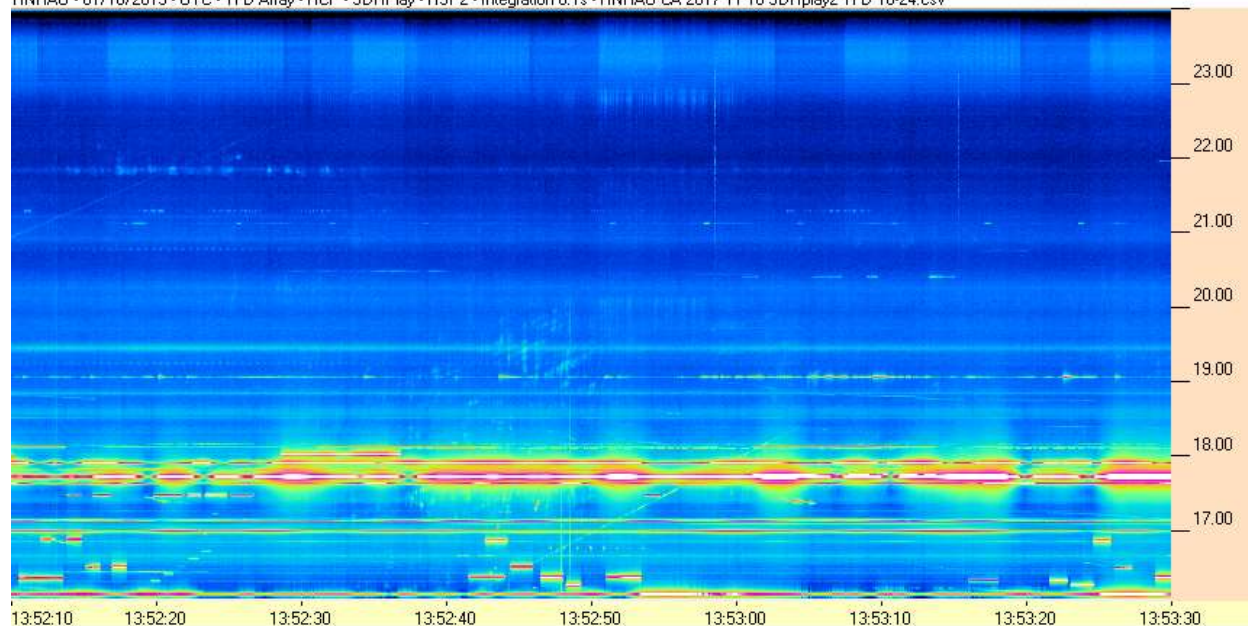
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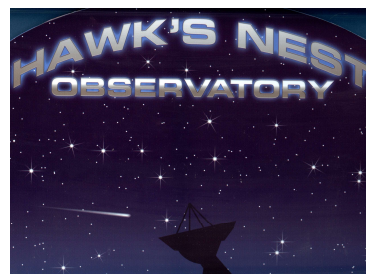
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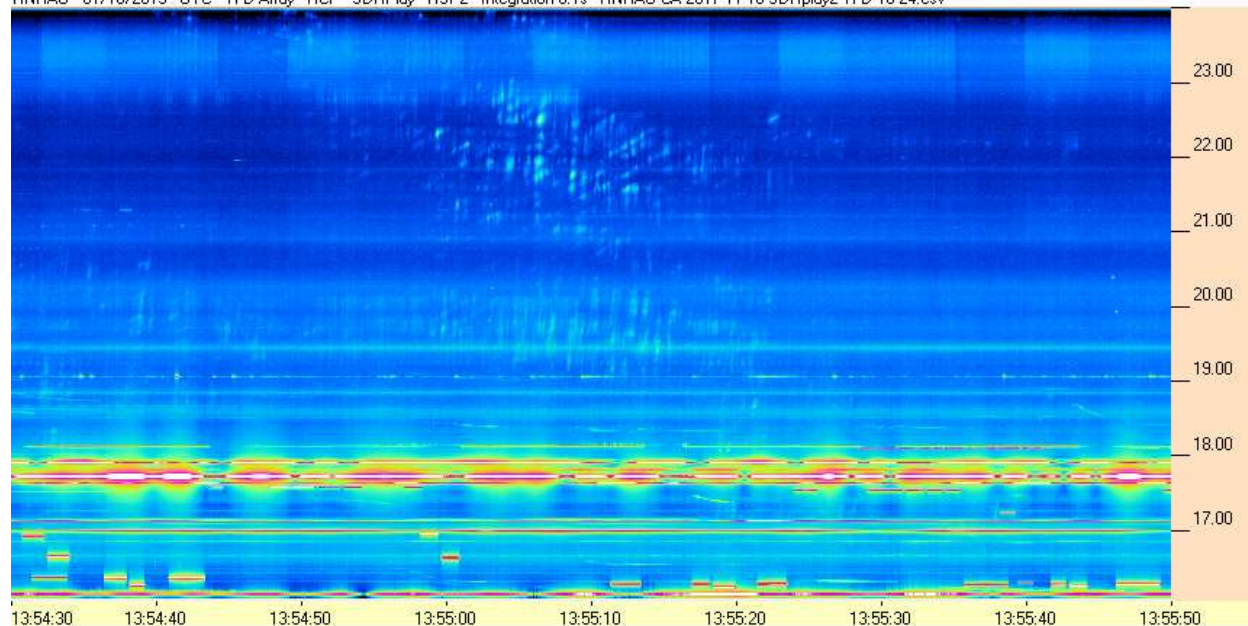
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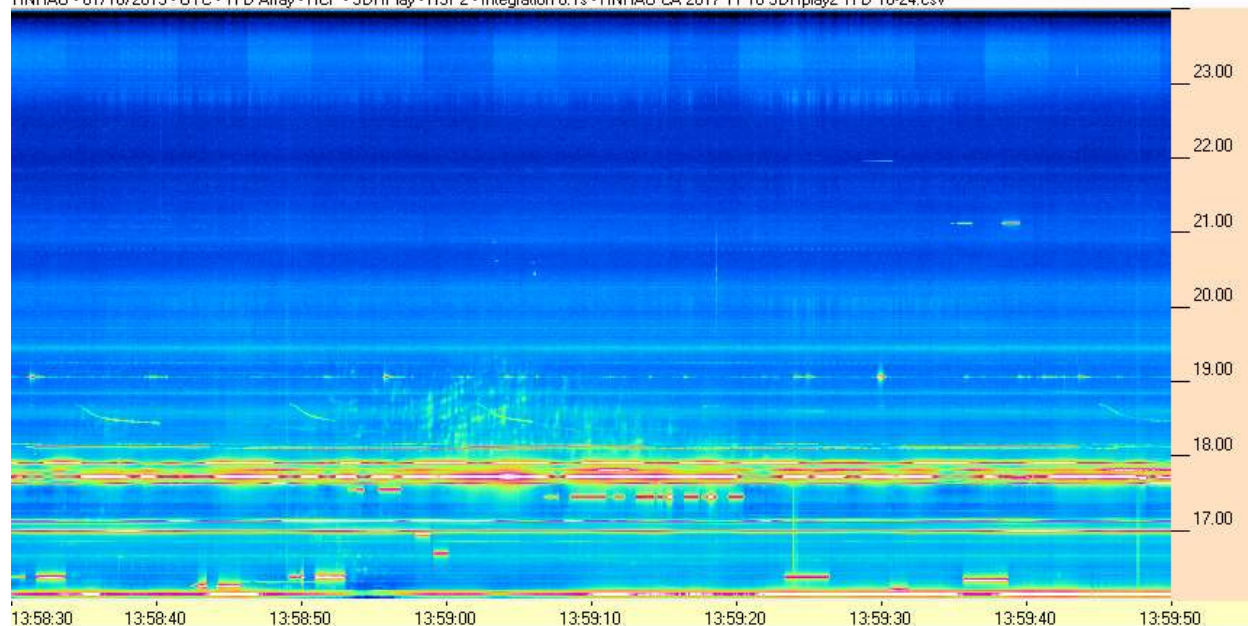
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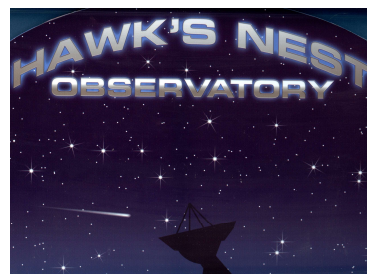
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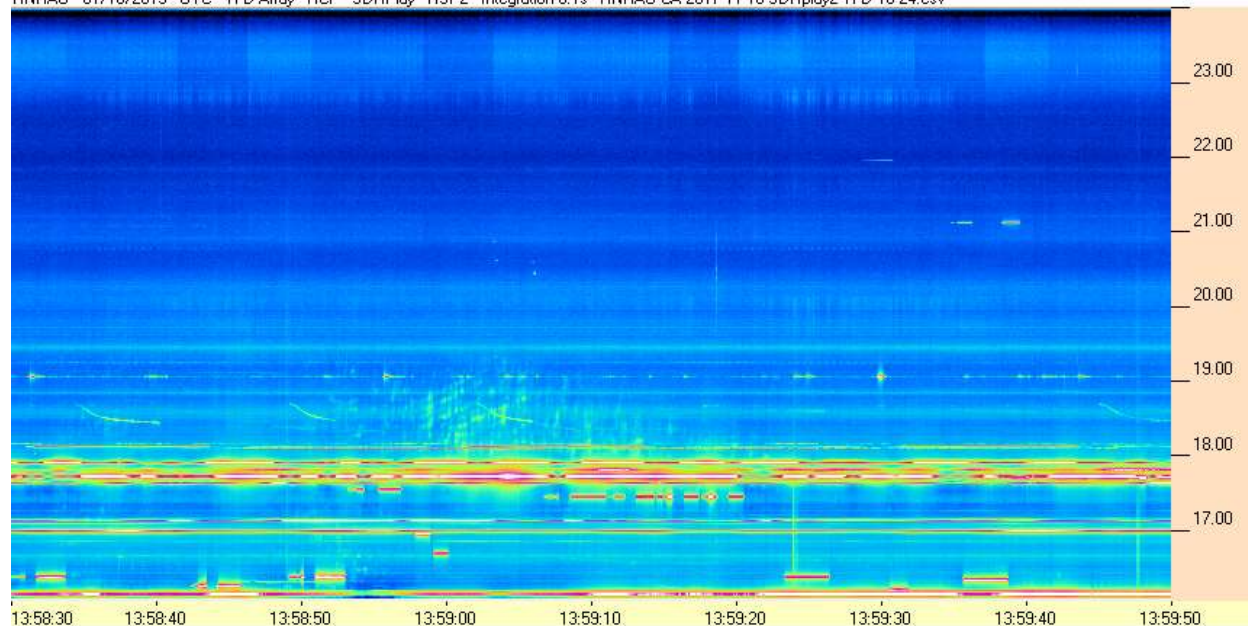
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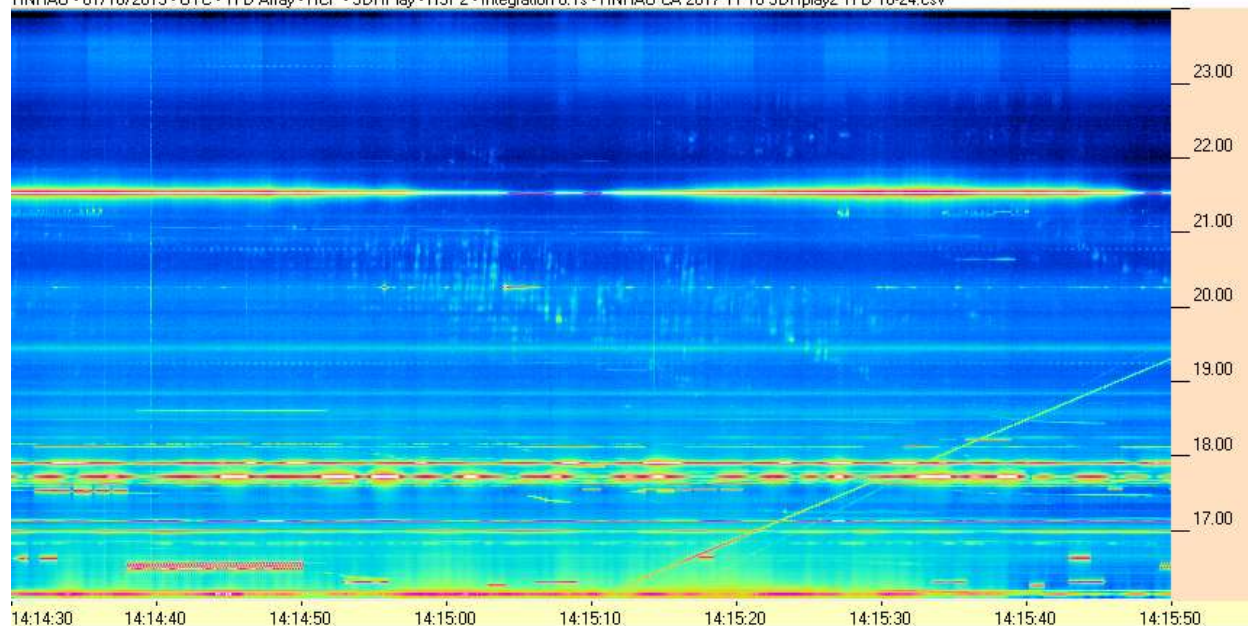
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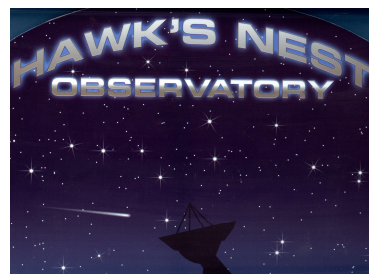
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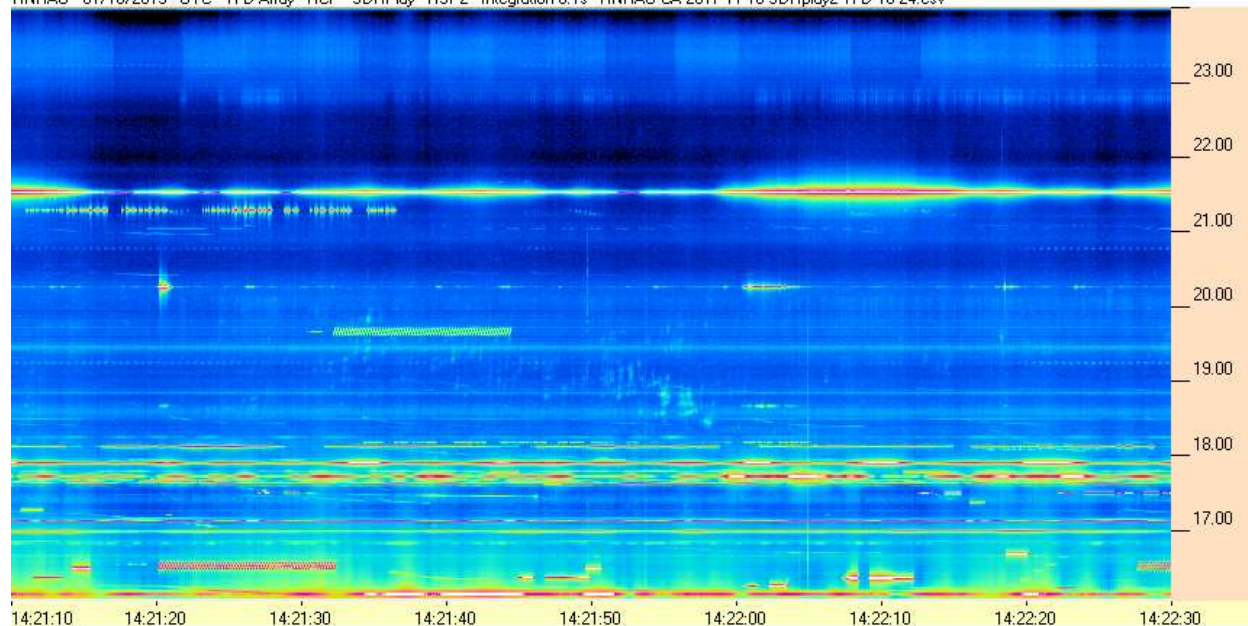
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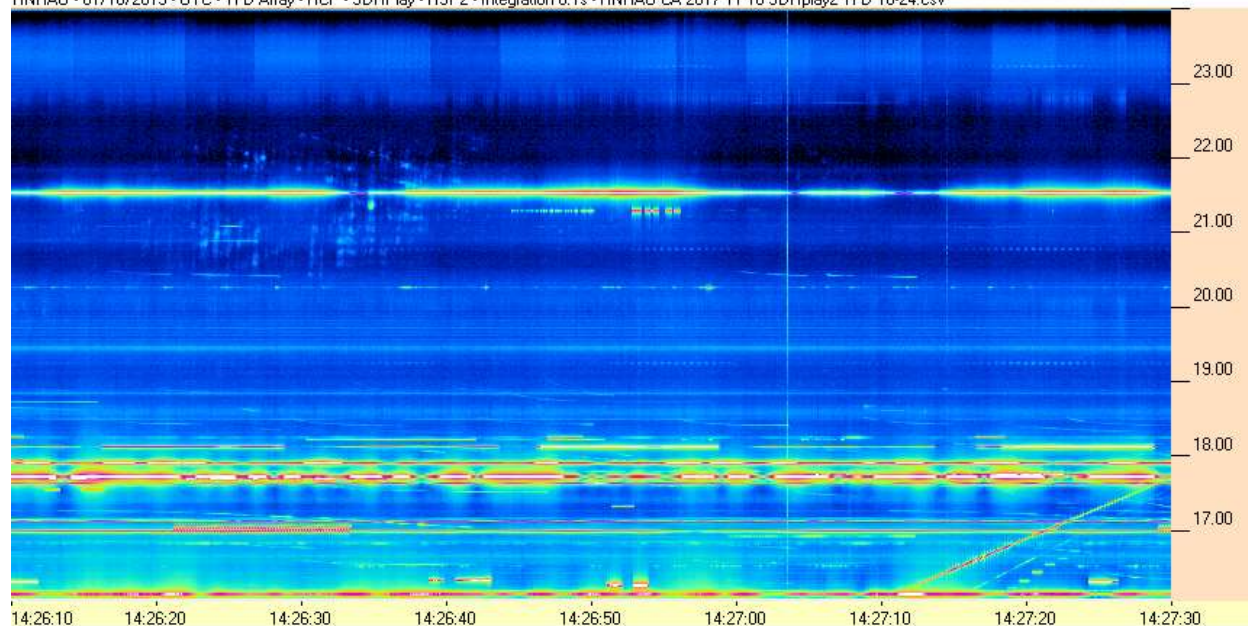
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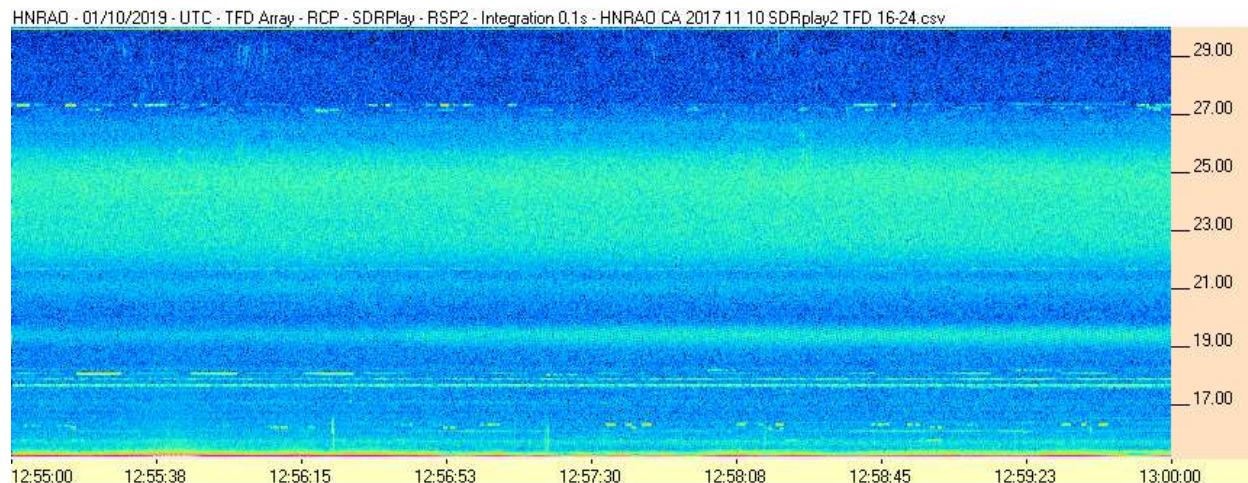
HNRAO Observing Log

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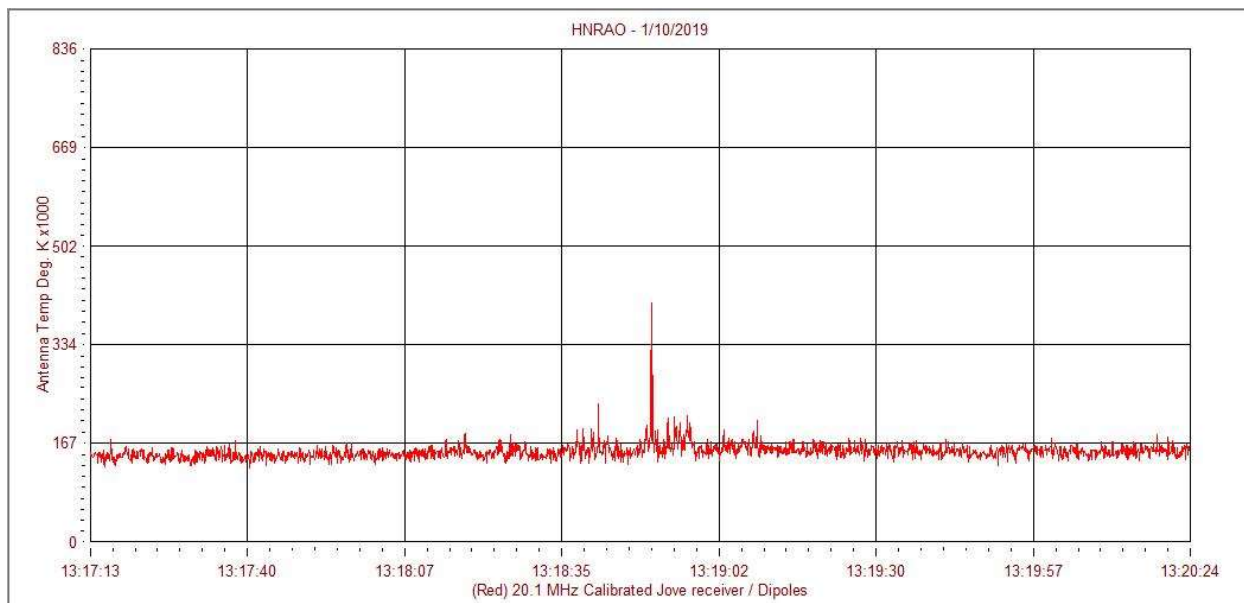
EN90sq



FSX-2 / LWA Array



JOVE II Receiver/JOVE Dipoles



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EN90sq

