

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: September 9, 2019

Object: Jupiter – Io-B

Observer: Unattended

Start - Time UT:	2127:17	Planetary K-index:	
Jupiter Altitude (deg):	23.1	Jupiter Azimuth (deg):	155.7
Jupiter CML:	148.93	Jupiter Io Phase:	085.44
Jupiter RA (hr/min):	16:57	Jupiter Dec (hr/min):	-22:20
Hour Angle (hr/min):	-01:37	Polarization	RCP
Sun Altitude (deg):	23.5	Sun Azimuth (deg):	256.9
Sun RA (hr/min):	11:05	Sun Dec (hr/min):	05:54

End – Time UT:	2153:11	De:	-2.5
Jupiter Altitude (deg):	24.9	Jupiter Azimuth (deg):	161.9
Jupiter CML:	164.48	Jupiter Io Phase	089.05
Hour Angle (hr/min):	-01:11	Duration (min):	26
Sun Altitude (deg):	18.7	Sun Azimuth (deg):	261.5
Max Frequency MHz	24	Min Frequency MHz	18

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	8/25/2019

Radio JOVE dipoles phased @ 32 degrees for 2018-2019 season

Typinski AN-TFD-24-4 array phased @ 35 degrees for 2018-2019 season

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

Radio Sky Spectrograph software version 2.9.26

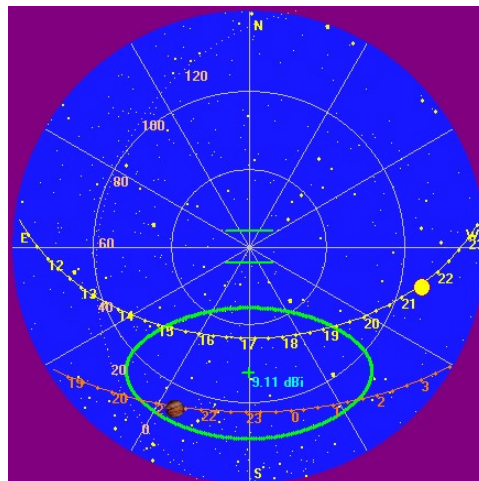
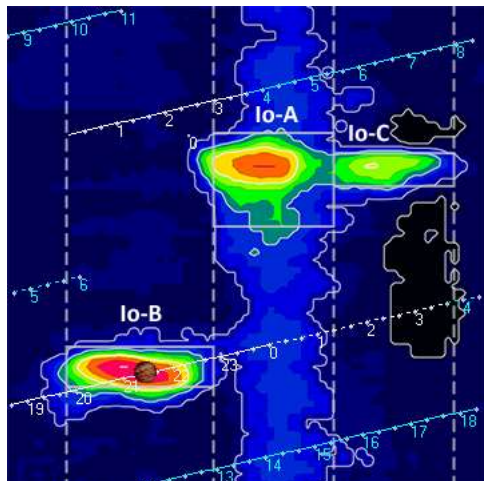
Radio-SkyPipe software version 2.7.33

Radio-Jupiter Pro software version 3.8.2

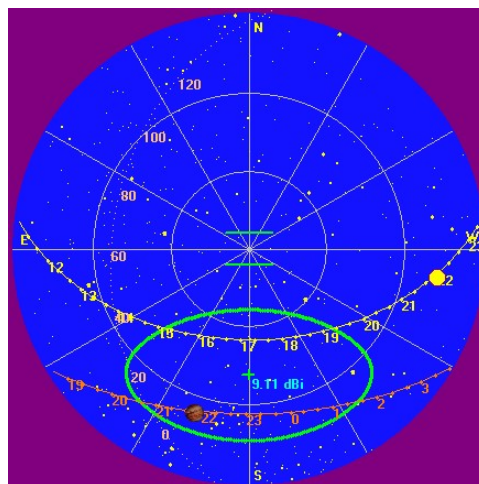
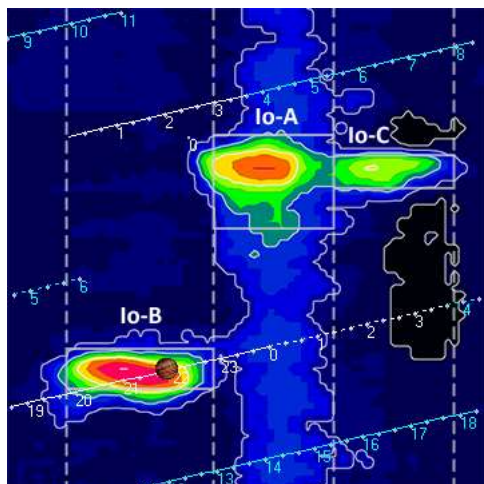
Network Time Server GpsNtp-Pi, Reeve Engineering

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

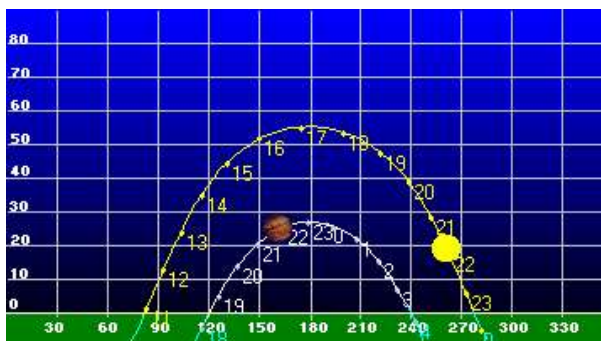
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Beginning of Pass



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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All spectrographs and receivers operating normally except for the SDRPlay RSP2 RCP. A software or hardware issue has caused the spectrograph to stop randomly. Various attempts to rectify the problem have been tried. Fortunately, it was functioning during this Io-B storm. All antennas functioning normally. No other known issues.

The spectrograph charts show unknown RFI as horizontal bright bands and lines. Unknown RFI in the SkyPipe record however, S-bursts were recorded during a quiet period.

Neither the FSX-8S or FSX-2 observed any activity. Only the SDRPlay RSP2 RCP / TFD array spectrograph captured any data.

This negative drift RCP Io-B storm was observed late in the afternoon, local time. The sun was still above the horizon so there is a lot of atmospherics and foreign broadcast station interference in the data. This made identification of the emissions challenging at times.

The storm was characterized as primarily S-bursts with L-burst/S-burst mix. There were several periods of very strong emissions as observed here. Most emissions were above or below 20 MHz, although there was one cluster that was at 20 MHz, so the JOVE II / JOVE dipole array captured a brief segment of S-bursts. The strongest of the burst were nearly 241 kK.

Capturing this storm at this time of day and conditions is the only thing note.

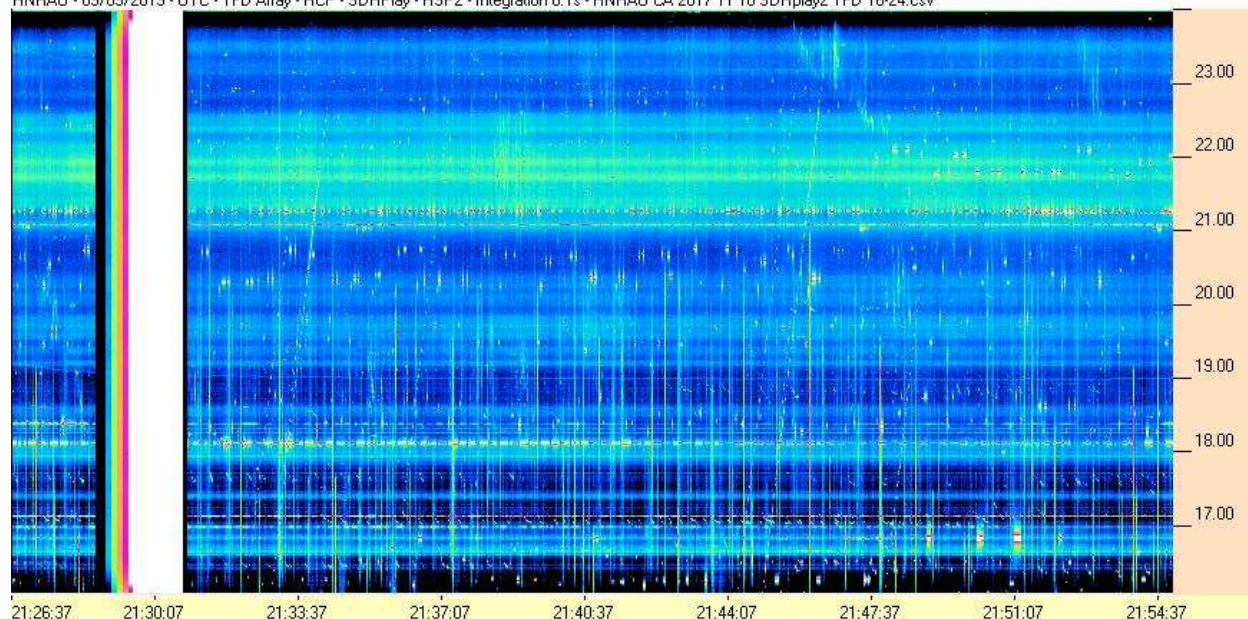
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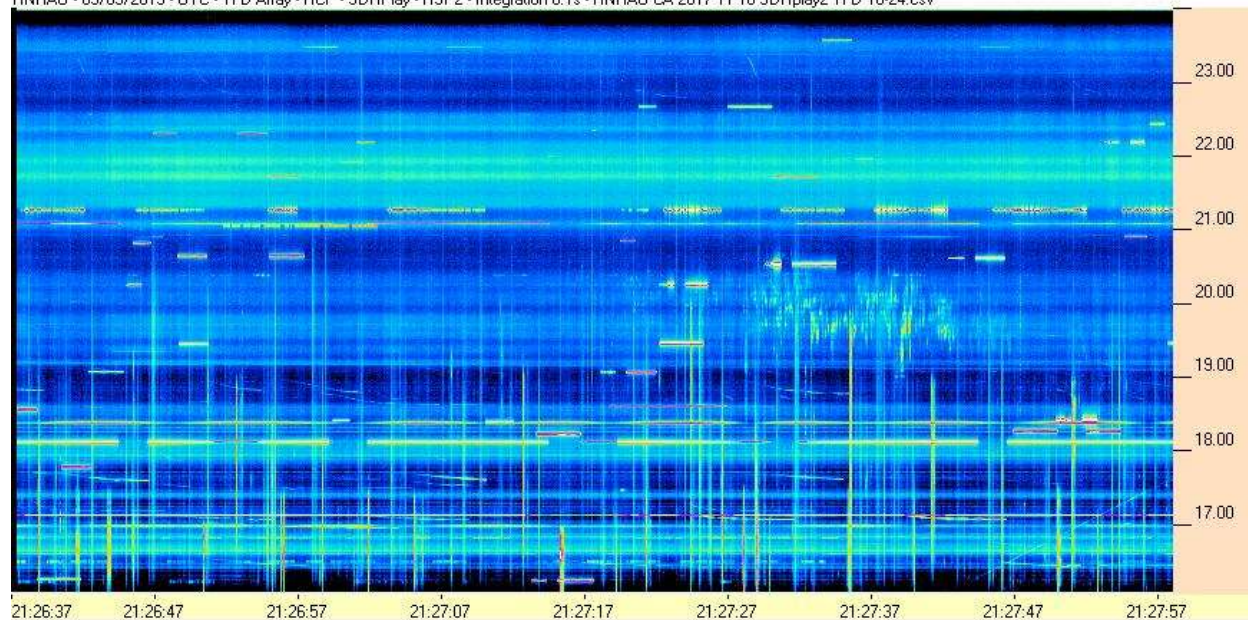


SDRPlay RSP2 / TFD Array

HNRAO - 09/09/2019 - UTC - TFD Array - RCP - SDRPlay - RSP2 - Integration 0.1s - HNRAO CA 2017 11 10 SDRplay2 TFD 16-24.csv



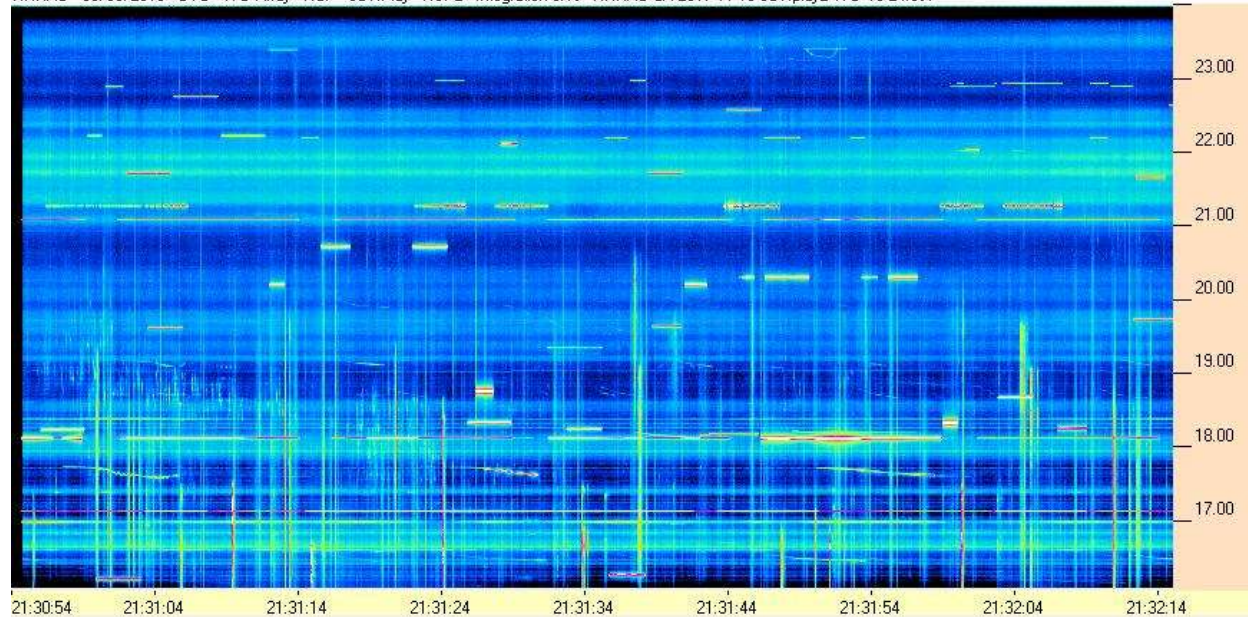
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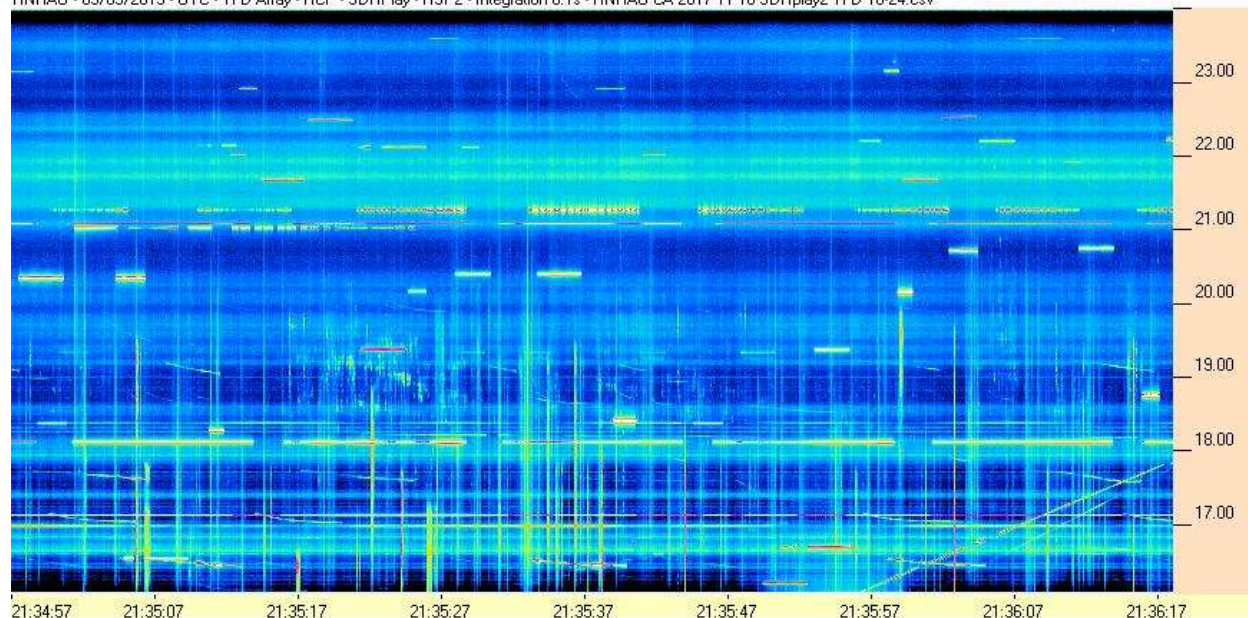
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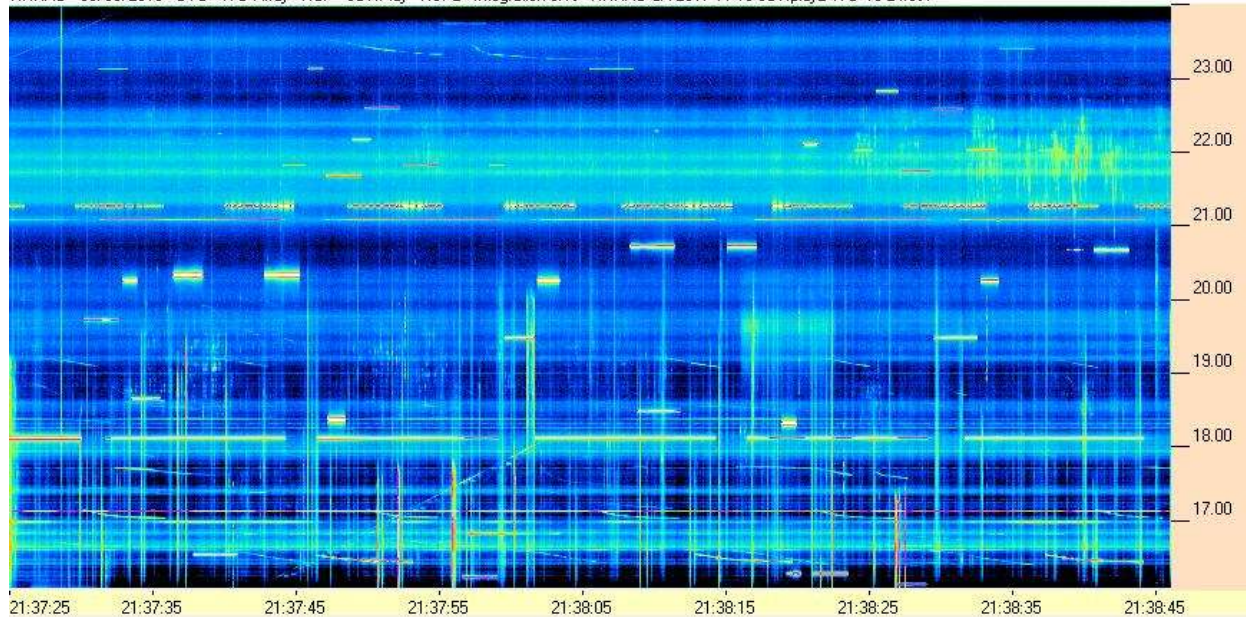
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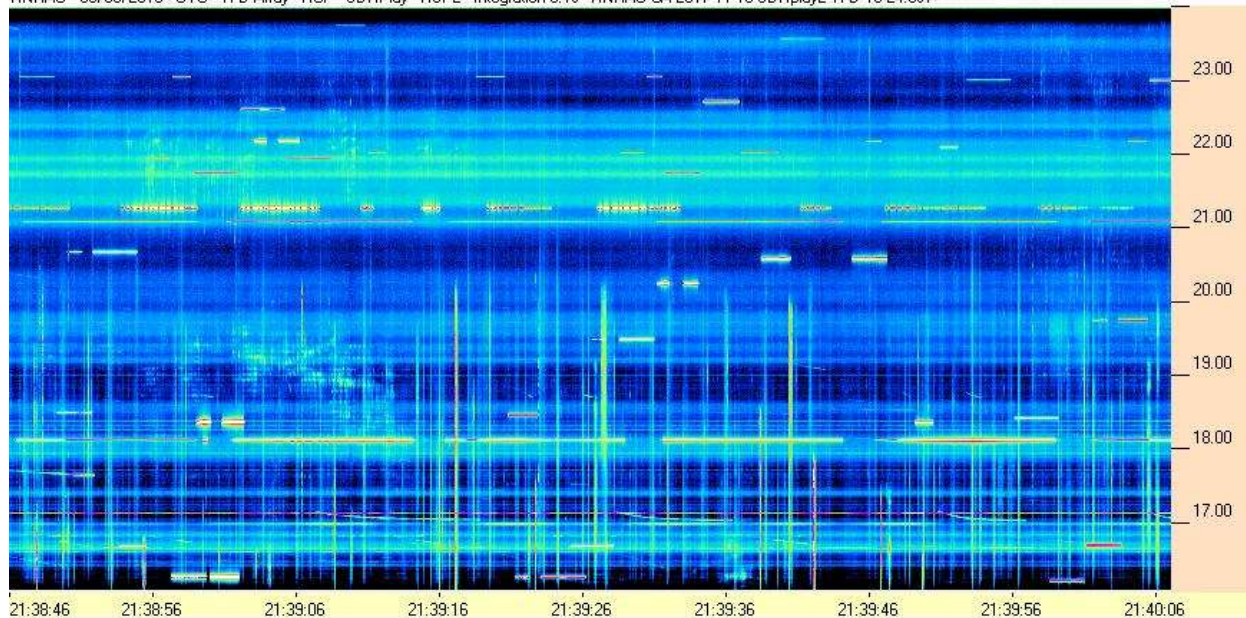
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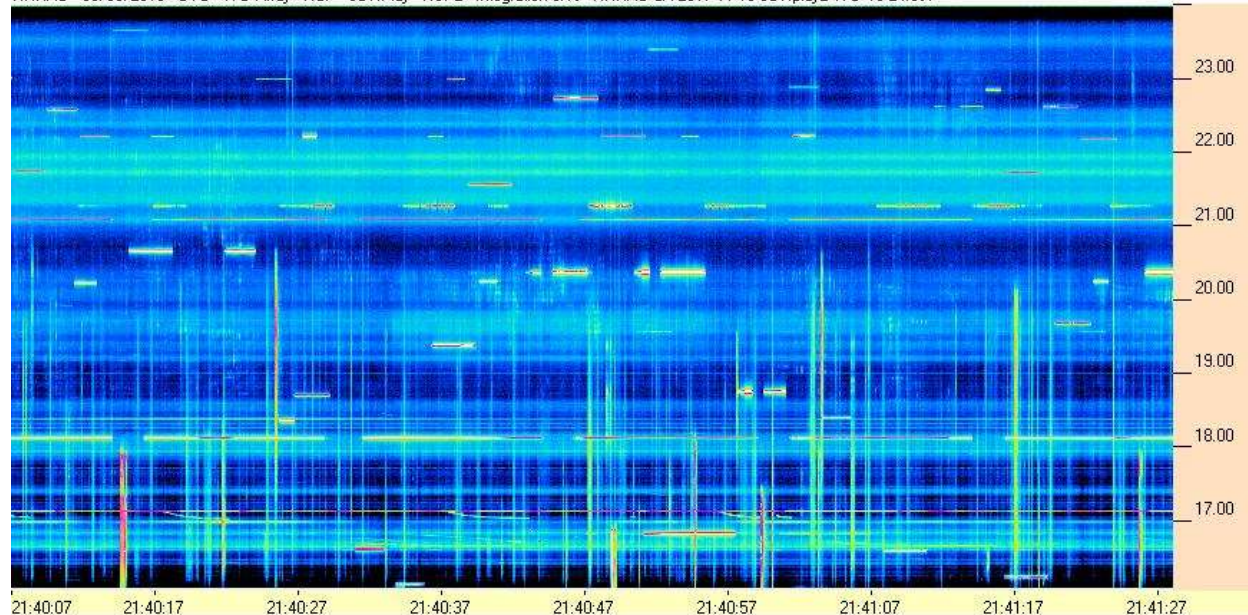
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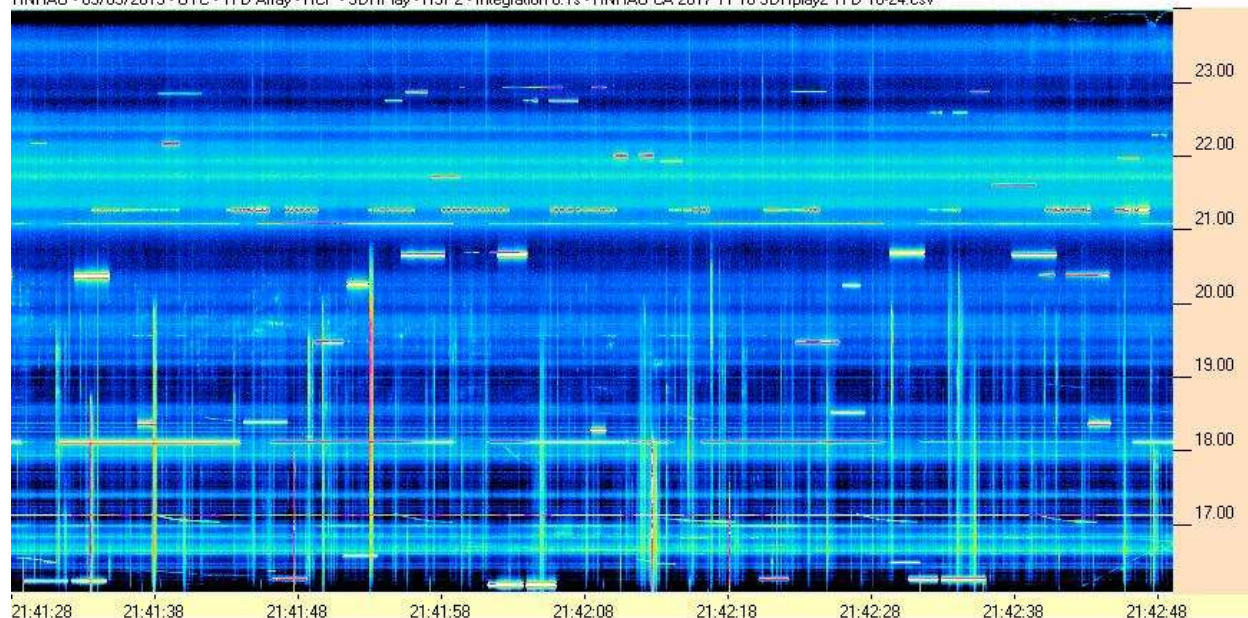
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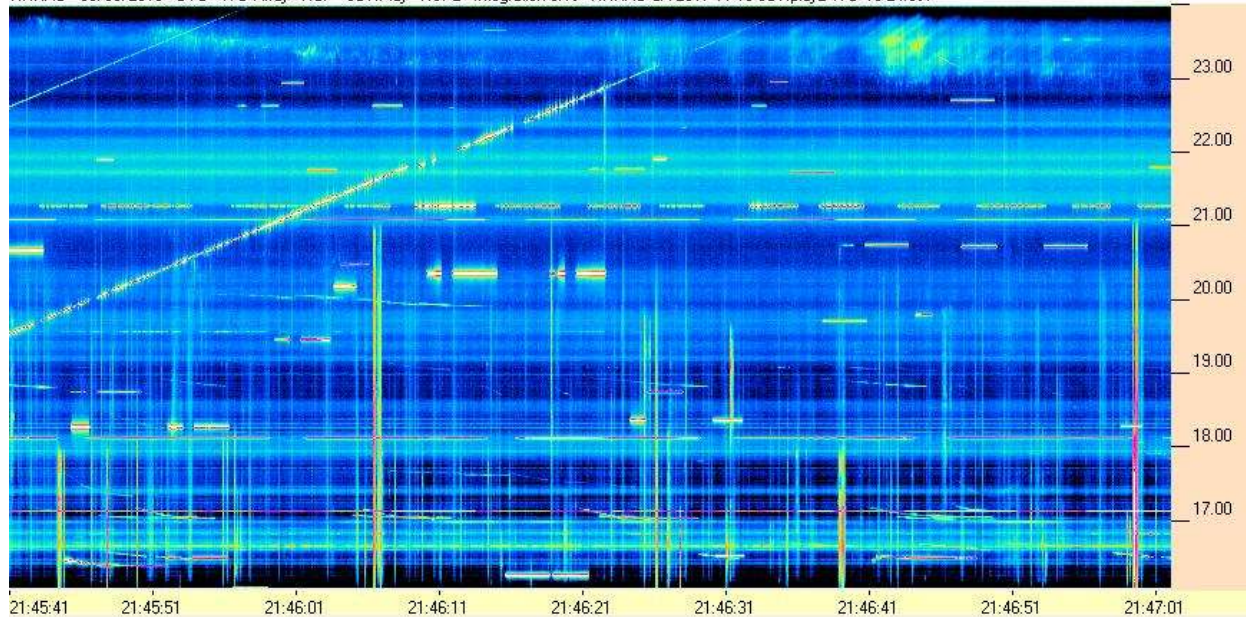
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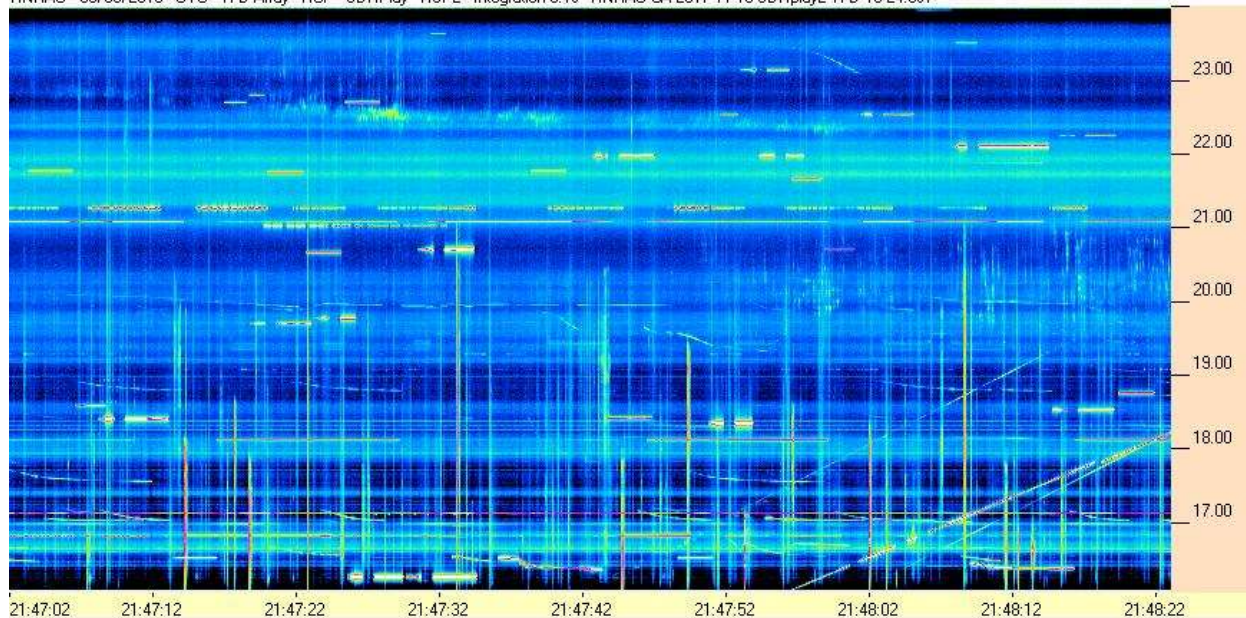
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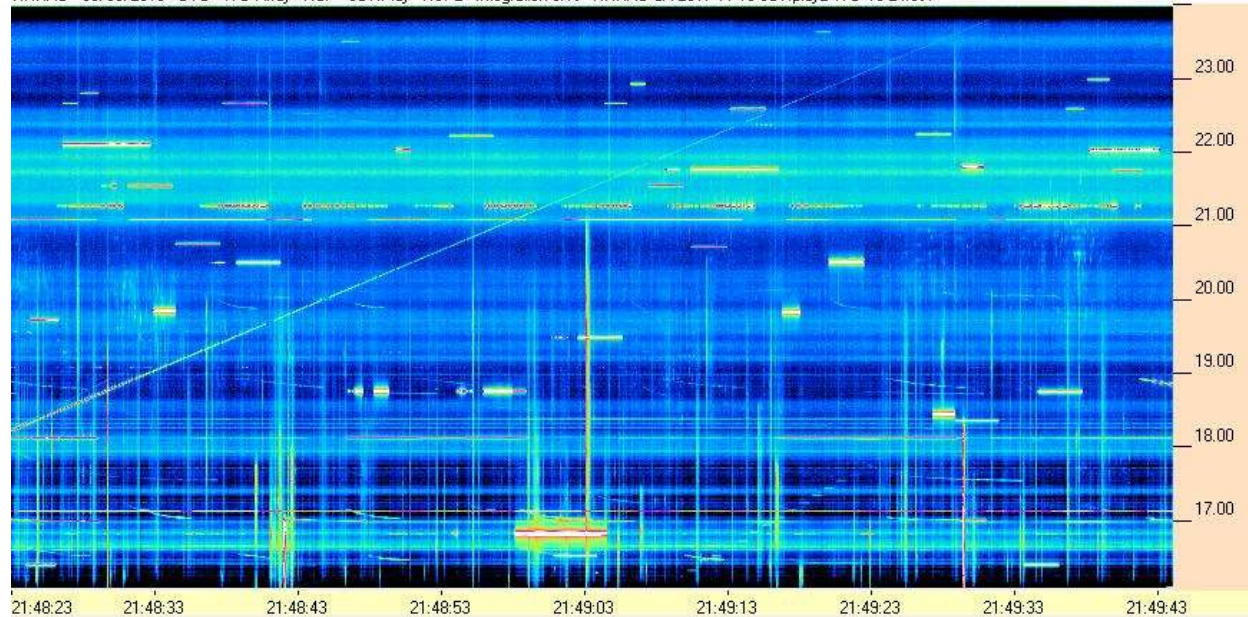
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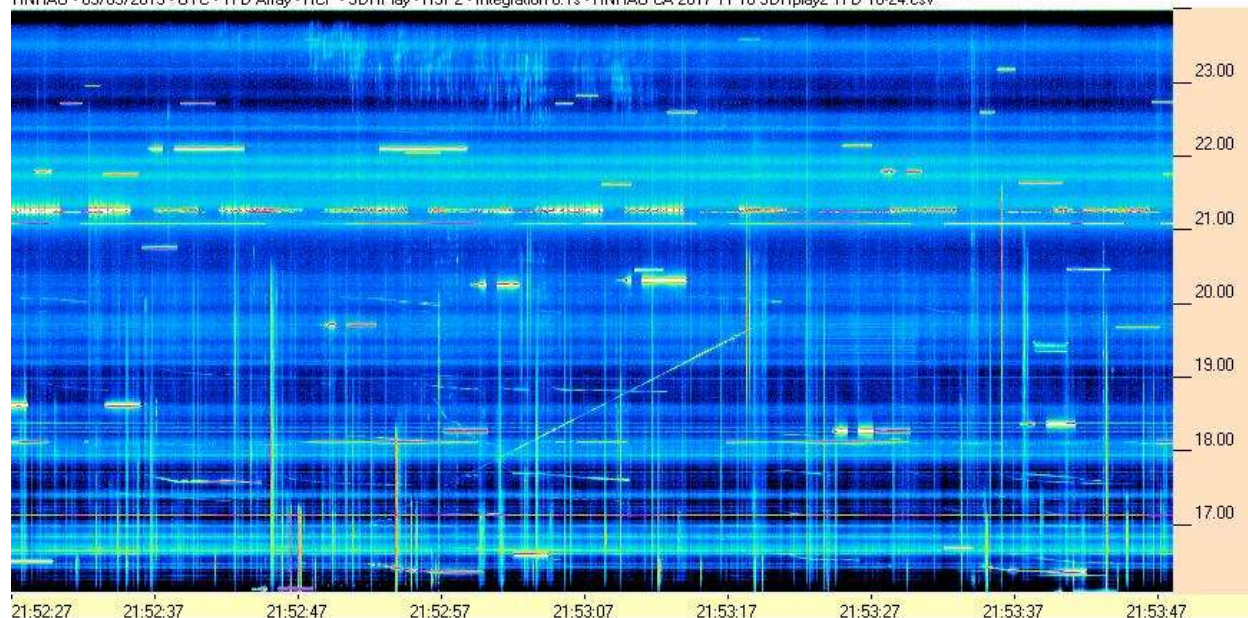
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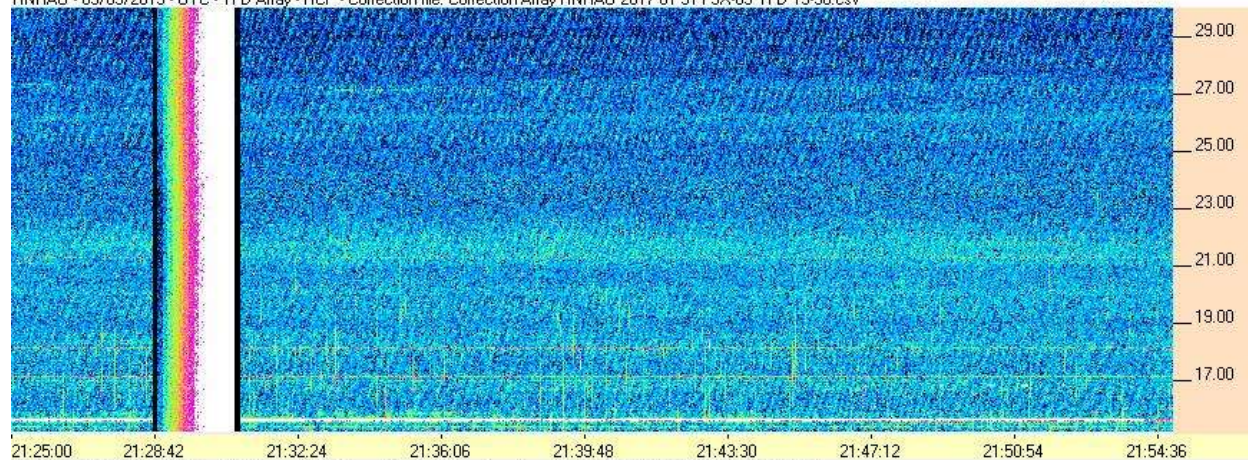


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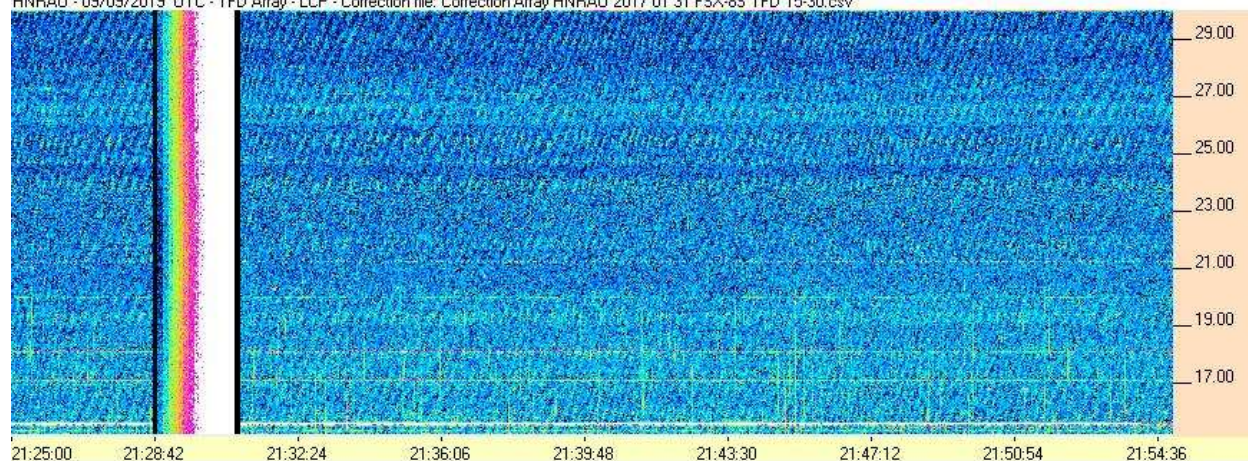


FSX-8S / TFD Array

HNRAO - 09/09/2019 - UTC - TFD Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv



HNRAO - 09/09/2019 - UTC - TFD Array - LCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv

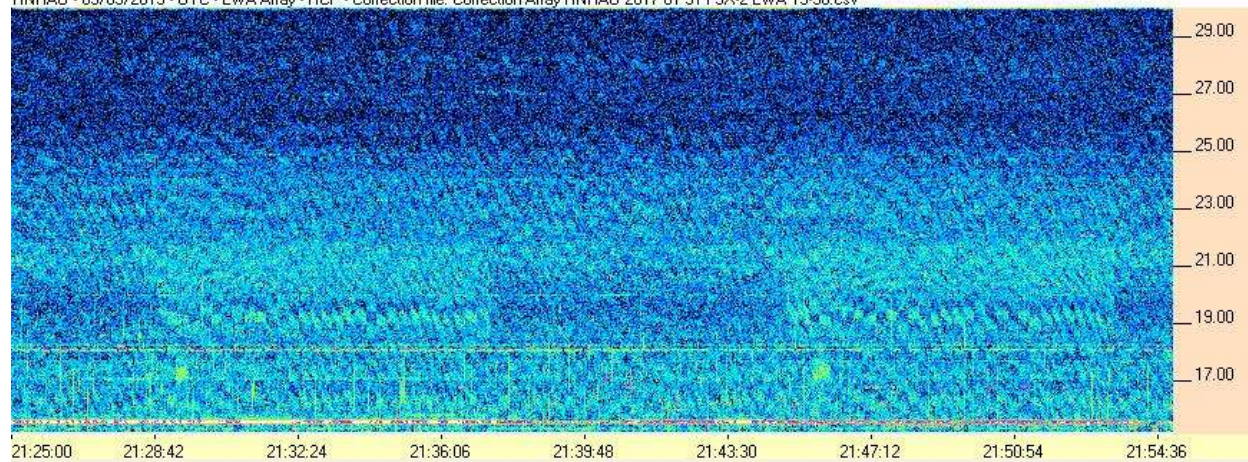


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FSX-2 / LWA Array

HNRAO - 09/09/2019 - UTC - LWA Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-2 LWA 15-30.csv



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JOVE II / JOVE Dipole Array

