

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: May 26, 2018

Object: Jupiter – Io-C

Observer: Unattended

Start - Time UT:	0400	Planetary K-index:	1
Jupiter Altitude (deg):	33.8	Jupiter Azimuth (deg):	179.1
Jupiter CML:	286.62	Jupiter Io Phase:	244.74
Jupiter RA (hr/min):	14:56	Jupiter Dec (hr/min):	-15:29
Hour Angle (hr/min):	-00:03	Polarization	LCP
Sun Altitude (deg):	-26.4	Sun Azimuth (deg):	341.5
Sun RA (hr/min):	04:04	Sun Dec (hr/min):	20:46

End – Time UT:	0530	De:	-3.3
Jupiter Altitude (deg):	30.3	Jupiter Azimuth (deg):	204.4
Jupiter CML:	341.04	Jupiter Io Phase	257.57
Hour Angle (hr/min):	01:27	Duration (min):	90
Sun Altitude (deg):	-28.4	Sun Azimuth (deg):	005.1
Max Frequency MHz	23	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	04/10/2018
SDRPlay RSP1	Experimental*					

JOVE dipoles phased @ 32 degrees for 2017-2018 season

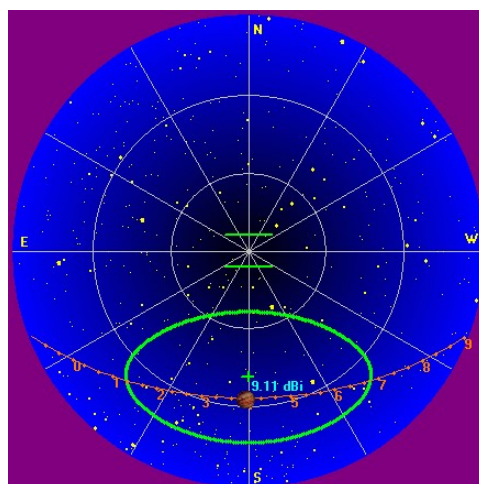
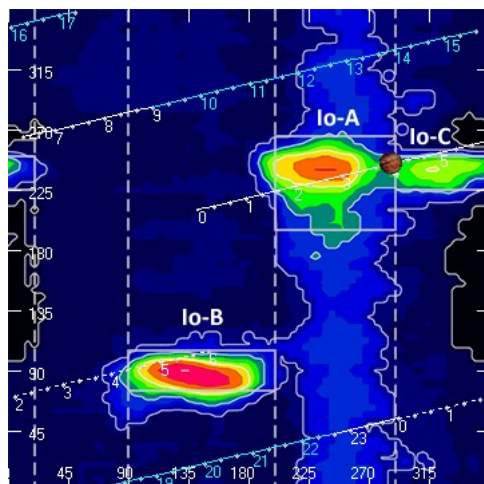
TFD array phased @ 35 degrees for 2017-2018 season

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

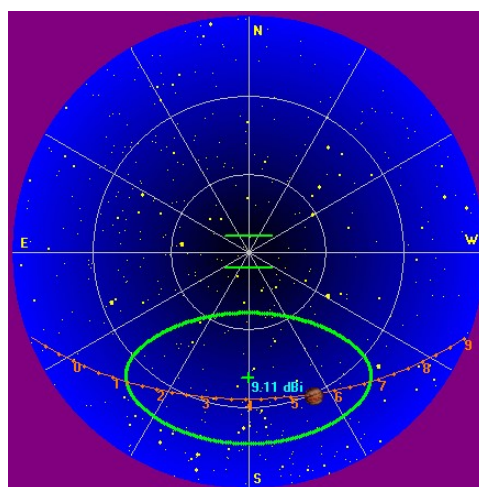
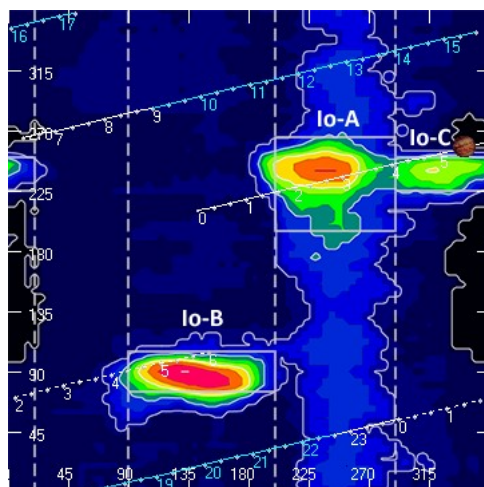
* Used for testing and evaluating antenna systems

Software Radio Sky Spectrograph 2.8.50

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Beginning of Pass



End of Pass



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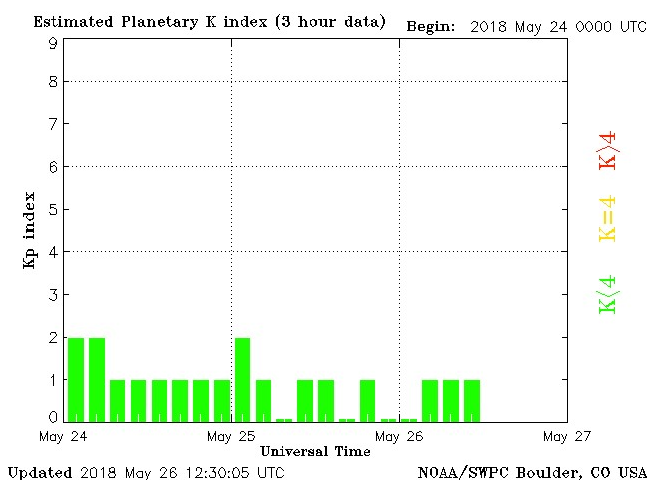


MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360	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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The FSX-8S spectrograph with the TFD array, SDRPlay RSP2 spectrograph with the TFD array and Radio JOVE receiver and dipoles were used in this observation.

Given the positions of Jupiter and the Earth, this is one of the most respectable storms of this Jupiter season. At transit, the Io-C storm consisted of LCP L-bursts for 90 minutes. Modulation lanes visible of type L-3 and L4. Emissions began below 15 MHz and reached 23 MHz. Emissions were positive drift. It also appeared to me to have to have a lot of scintillation visible in the emissions. While there were no single strong bursts, the bursts were relatively consistent in strength.

This Io-C storm follows an Io-A storm.

There was substantial activity at 20.1 MHz as seen in the SkyPipe records. L-bursts in a calibrated linear antenna array reached 170 kK.

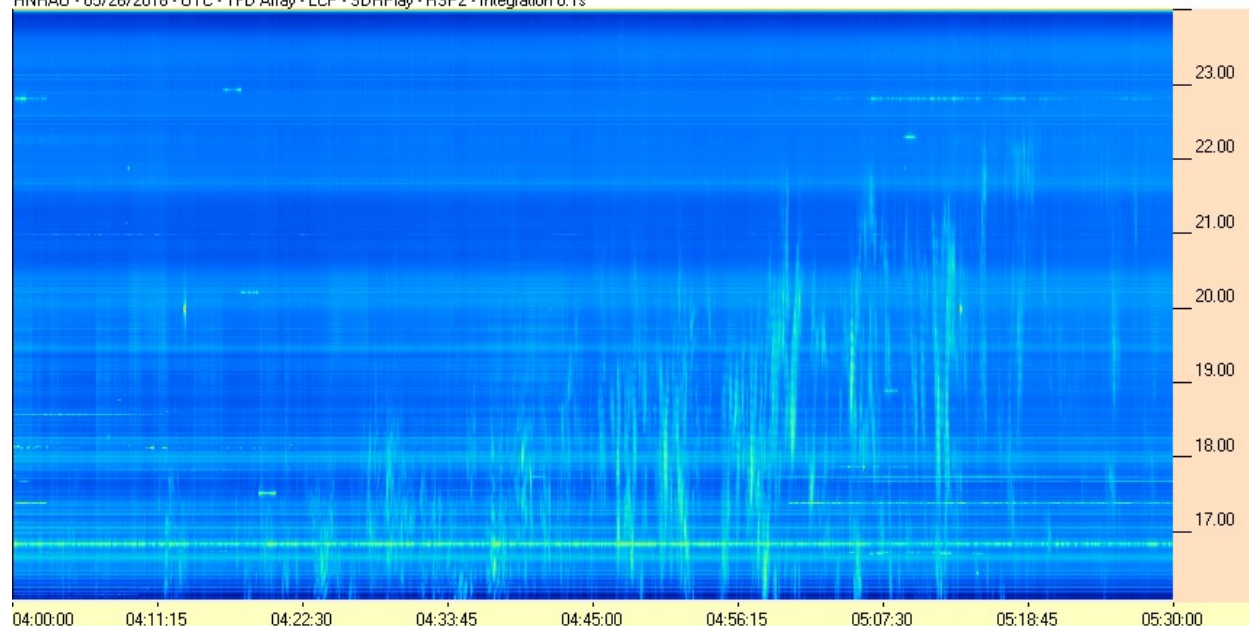
EOR

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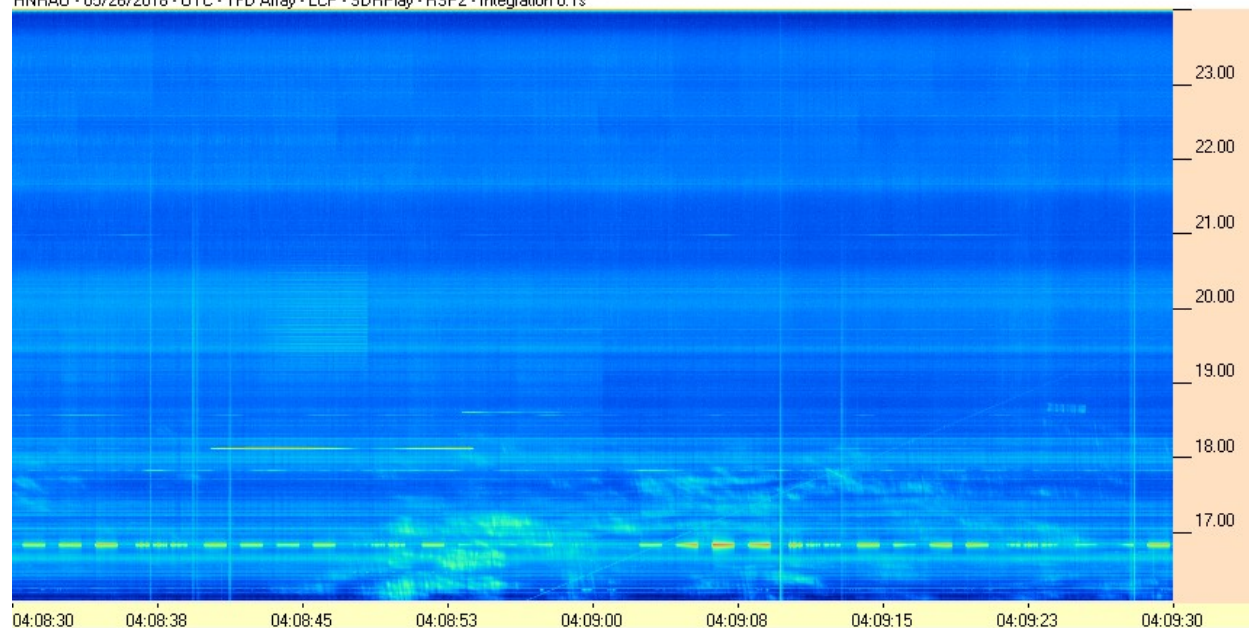


SDRPlay RSP2 / TFD Array

HNRAO - 05/26/2018 - UTC - TFD Array - LCP - SDRPlay - RSP2 - Integration 0.1s



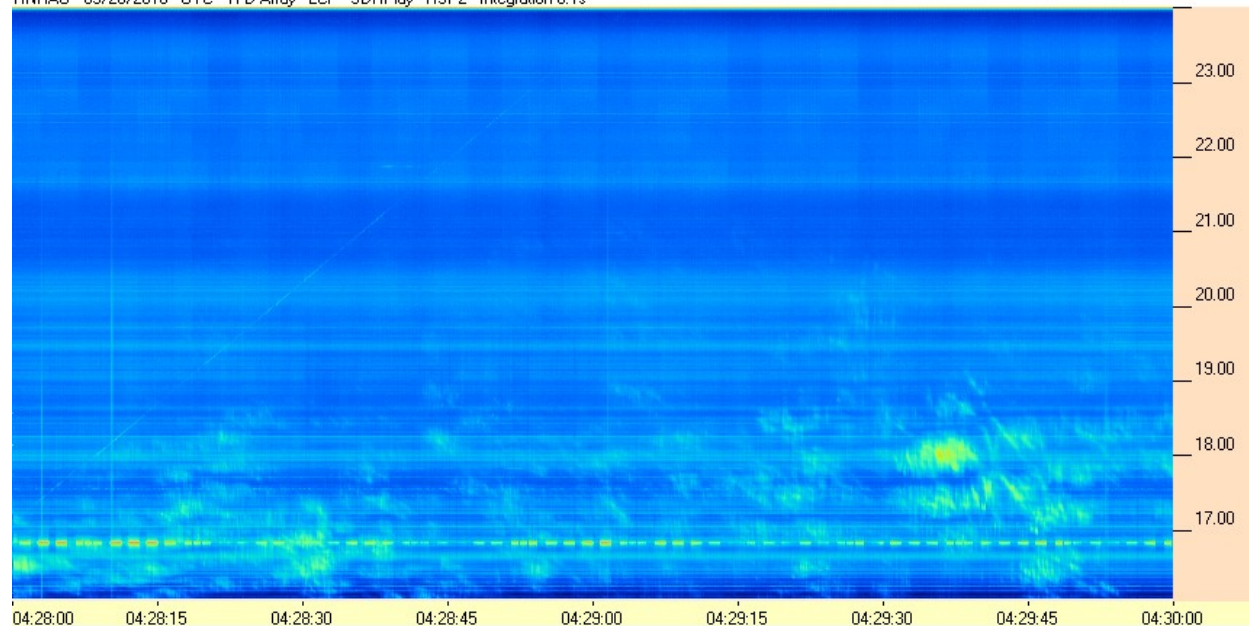
HNRAO - 05/26/2018 - UTC - TFD Array - LCP - SDRPlay - RSP2 - Integration 0.1s



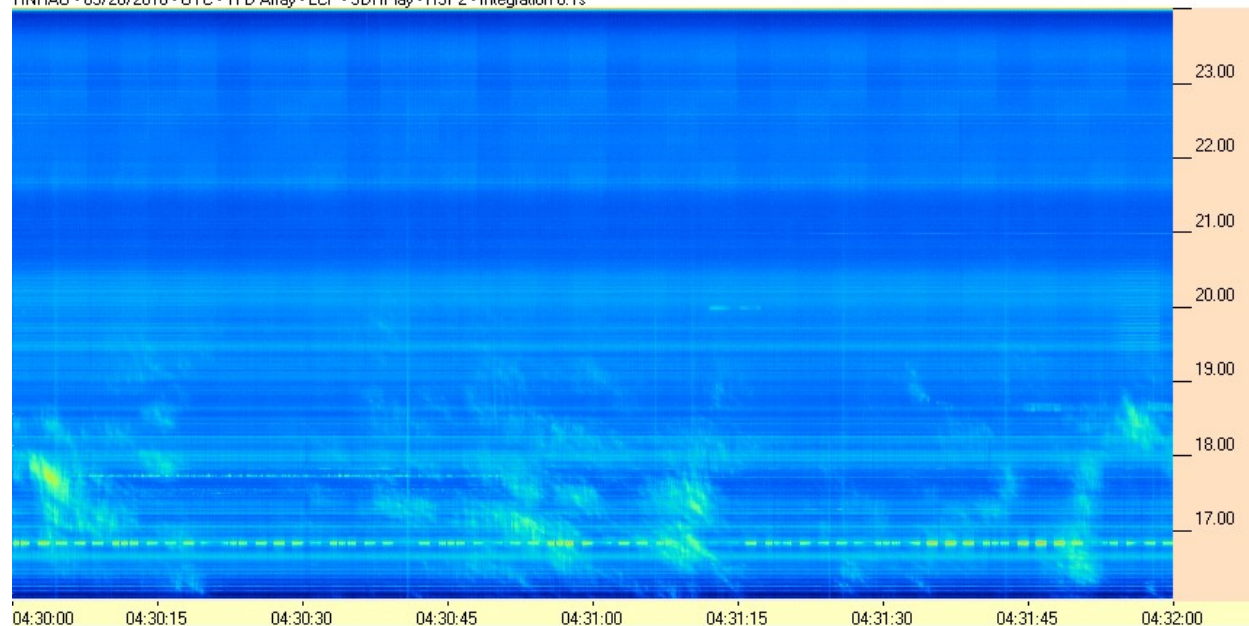
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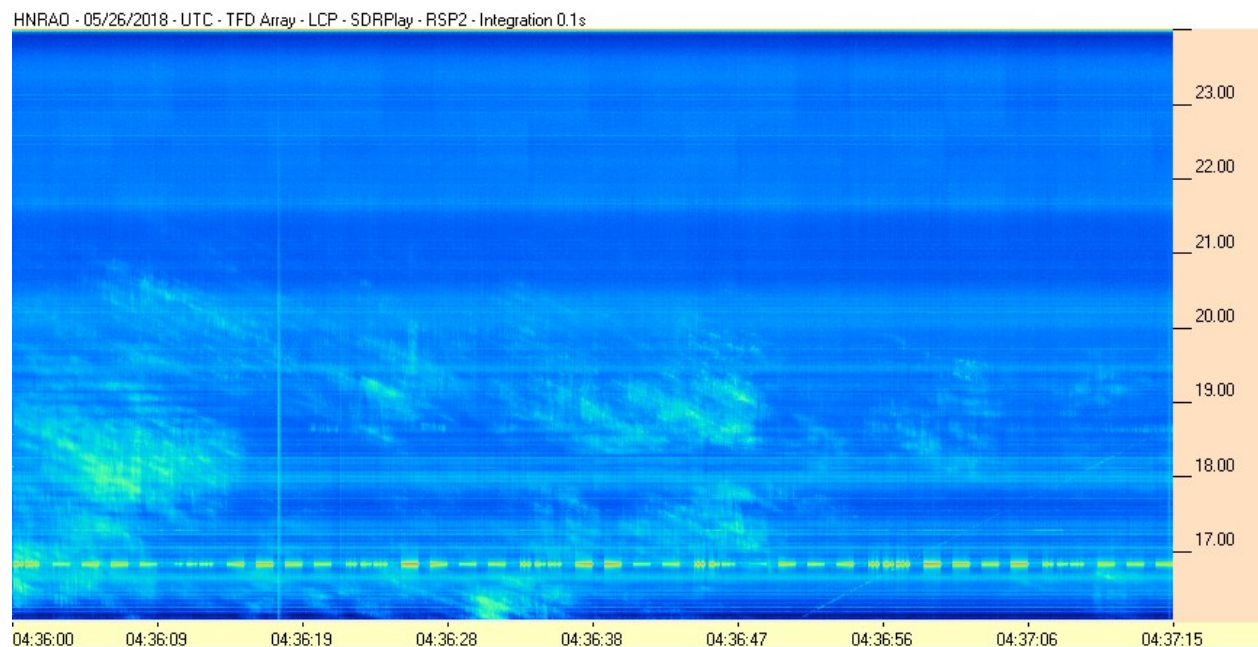
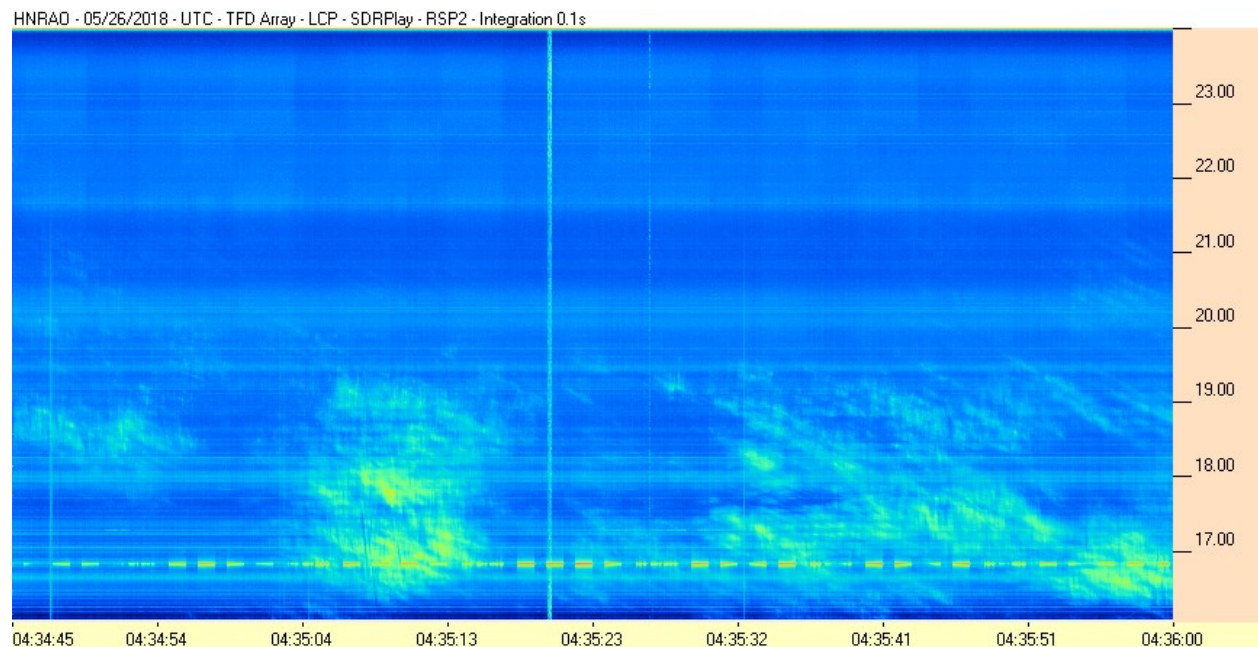
HNRAO - 05/26/2018 - UTC - TFD Array - LCP - SDRPlay - RSP2 - Integration 0.1s



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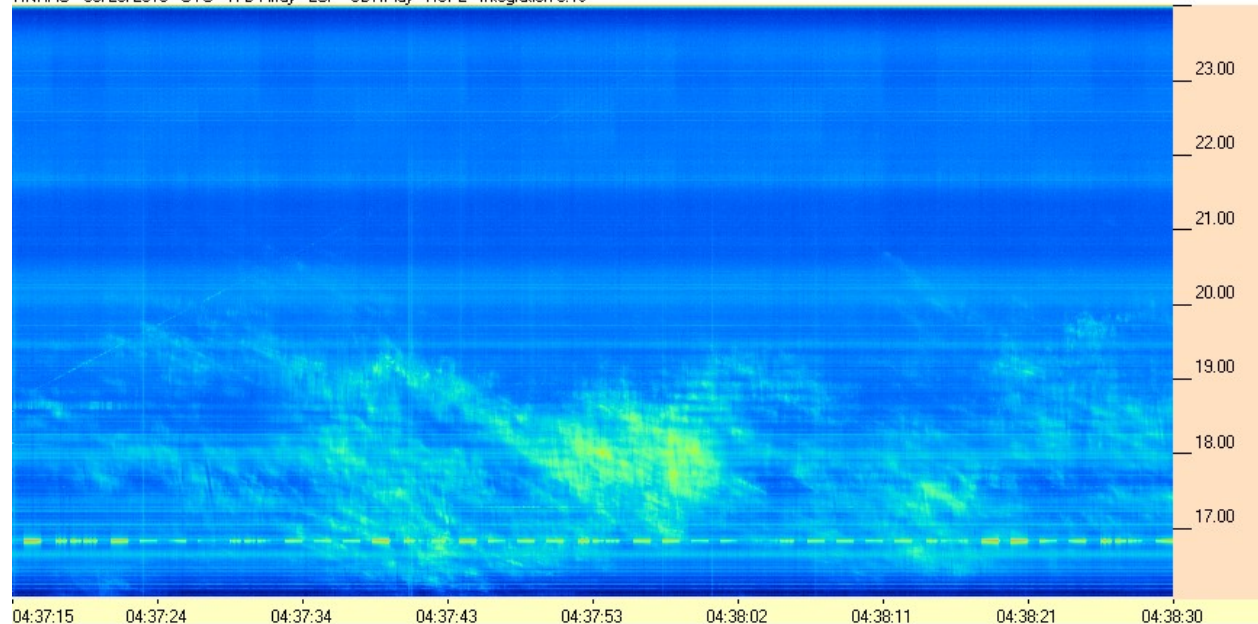
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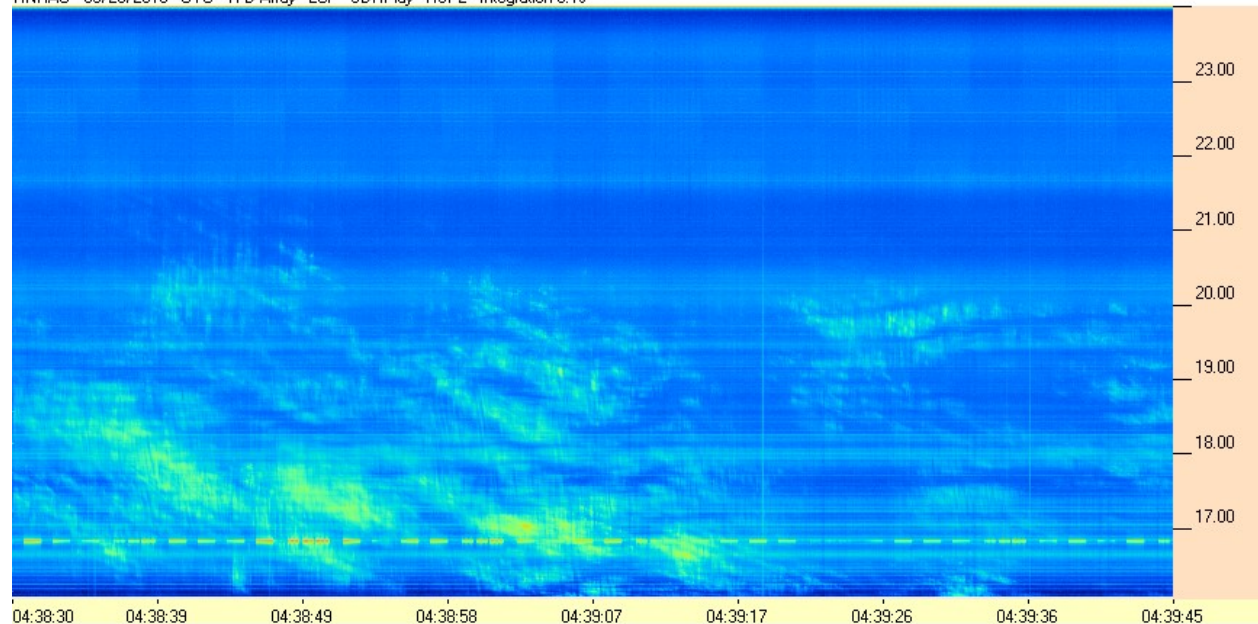
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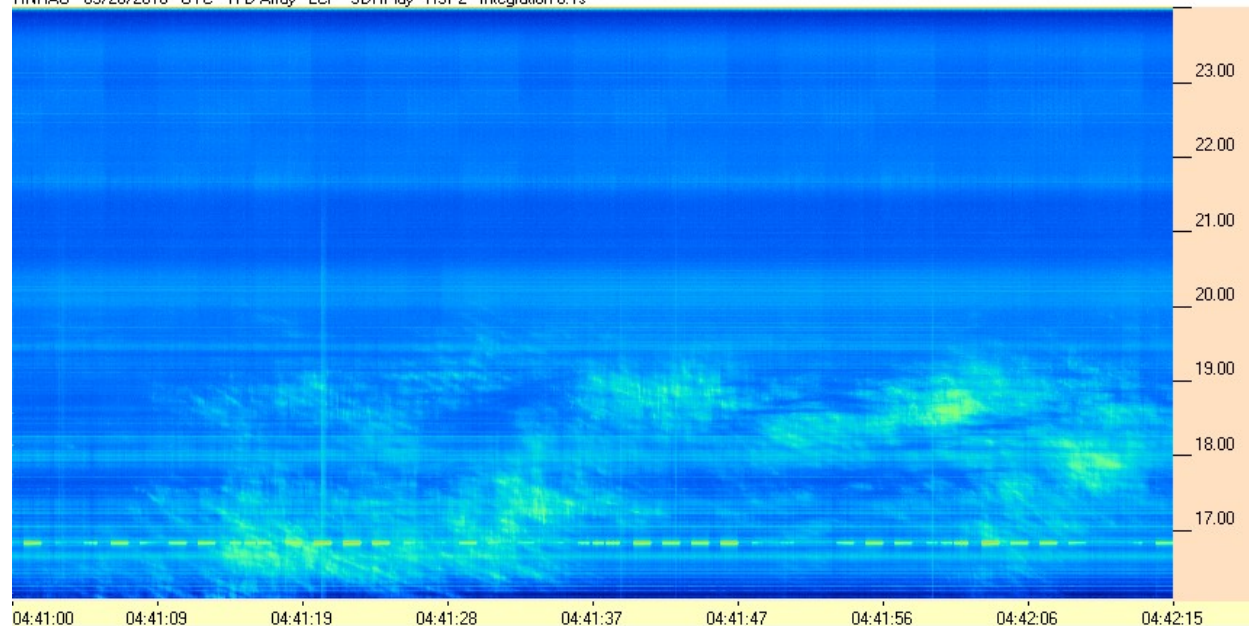
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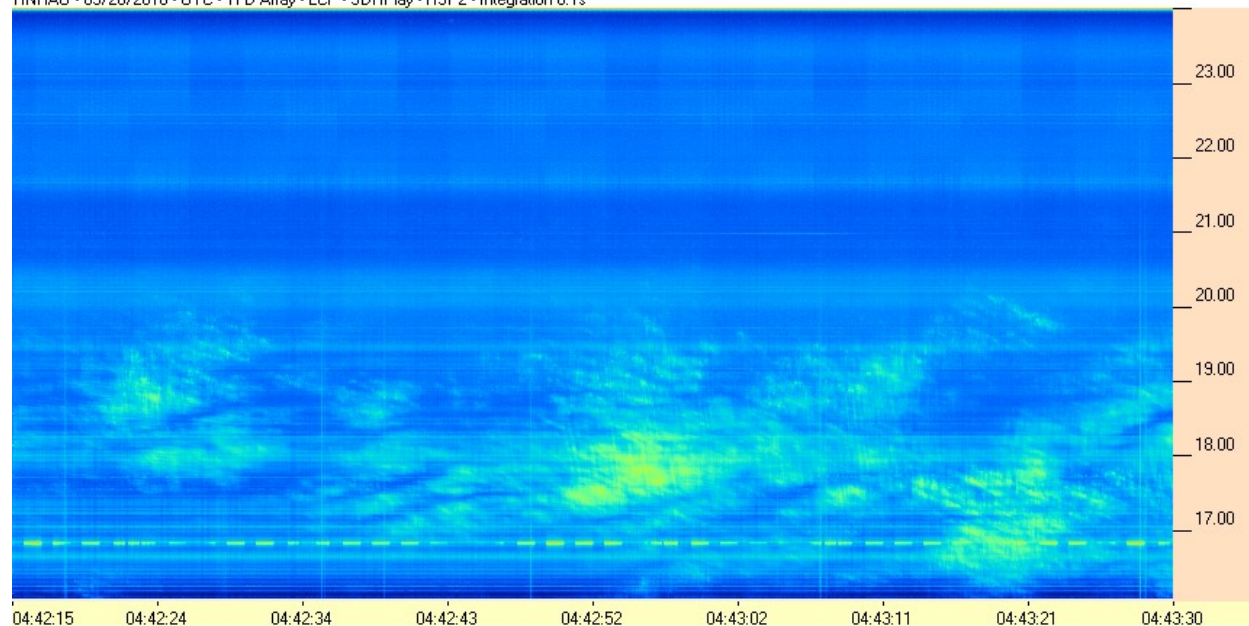
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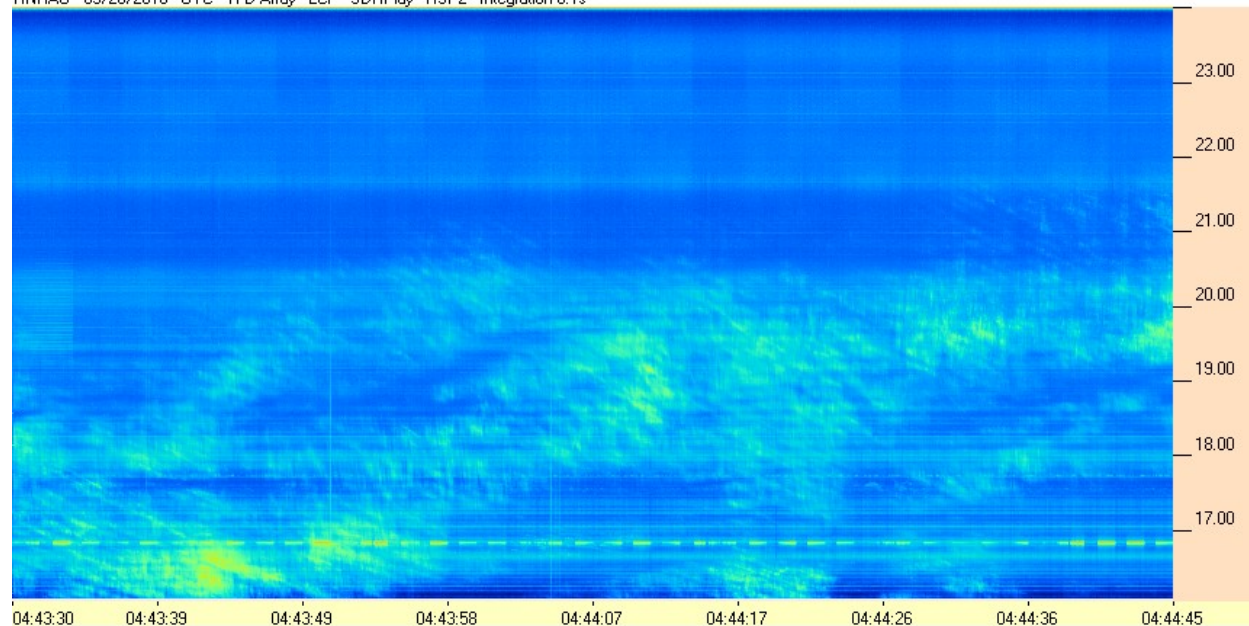
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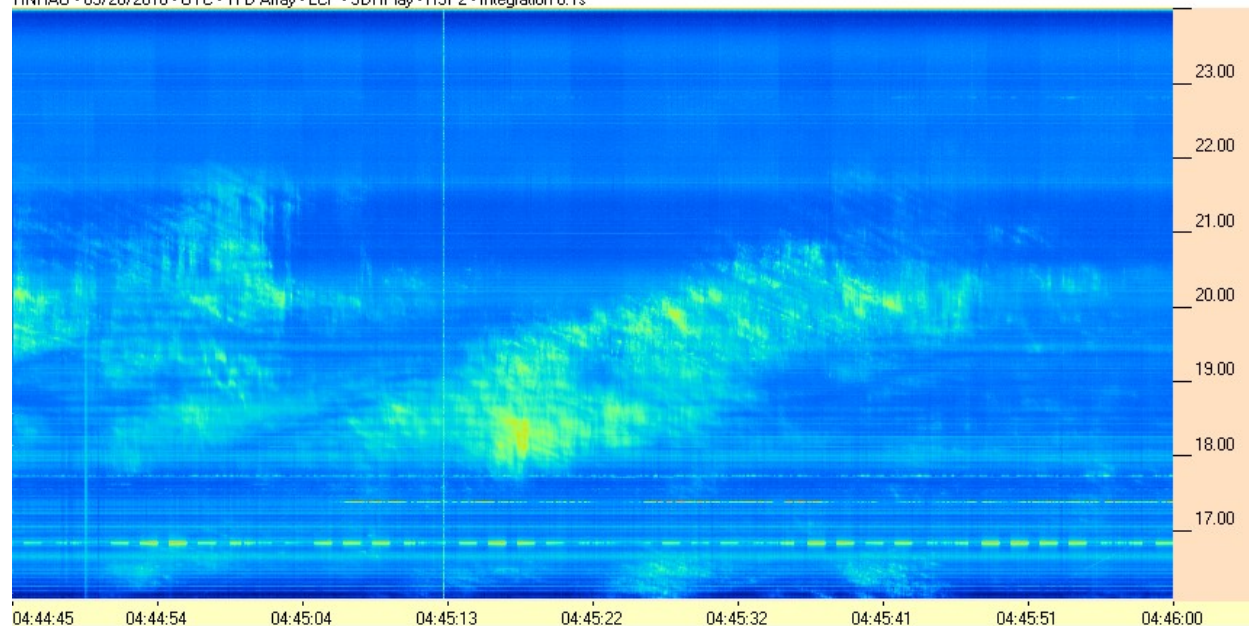
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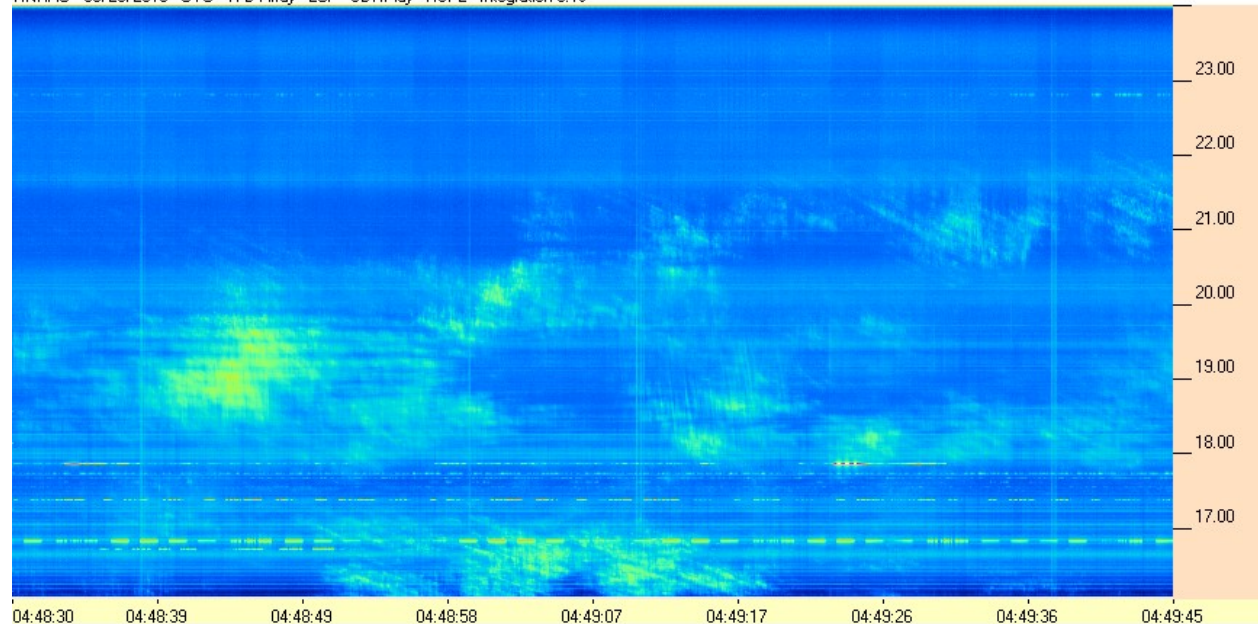
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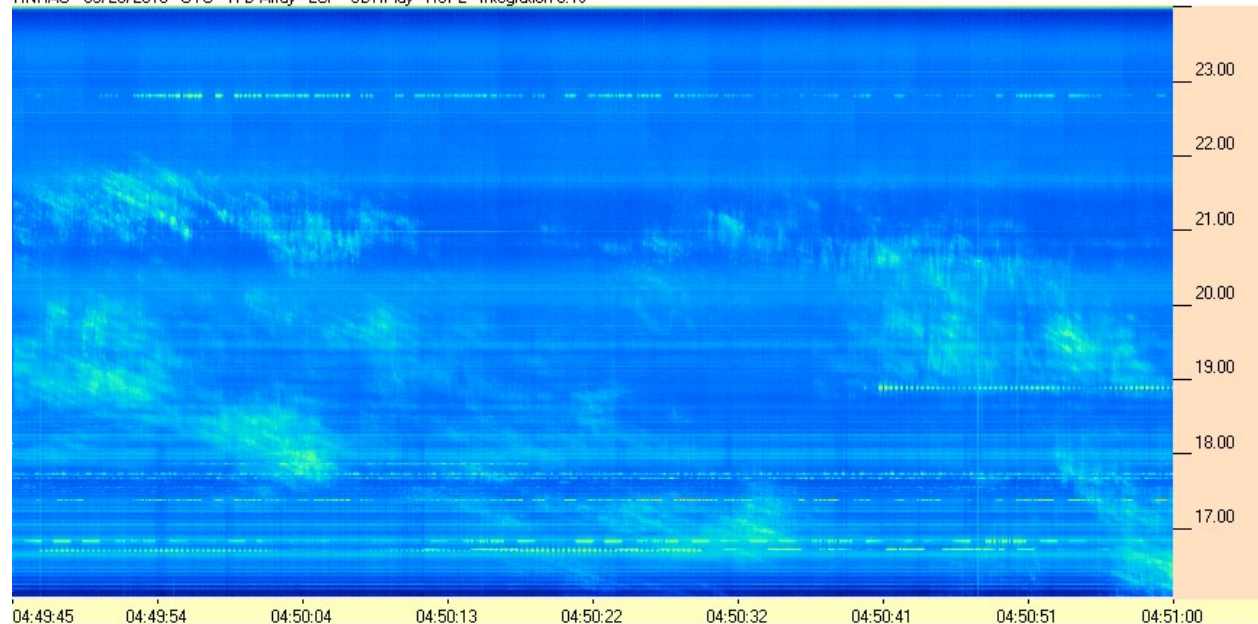
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HNRAO - 05/26/2018 - UTC - TFD Array - LCP - SDRPlay - RSP2 - Integration 0.1s



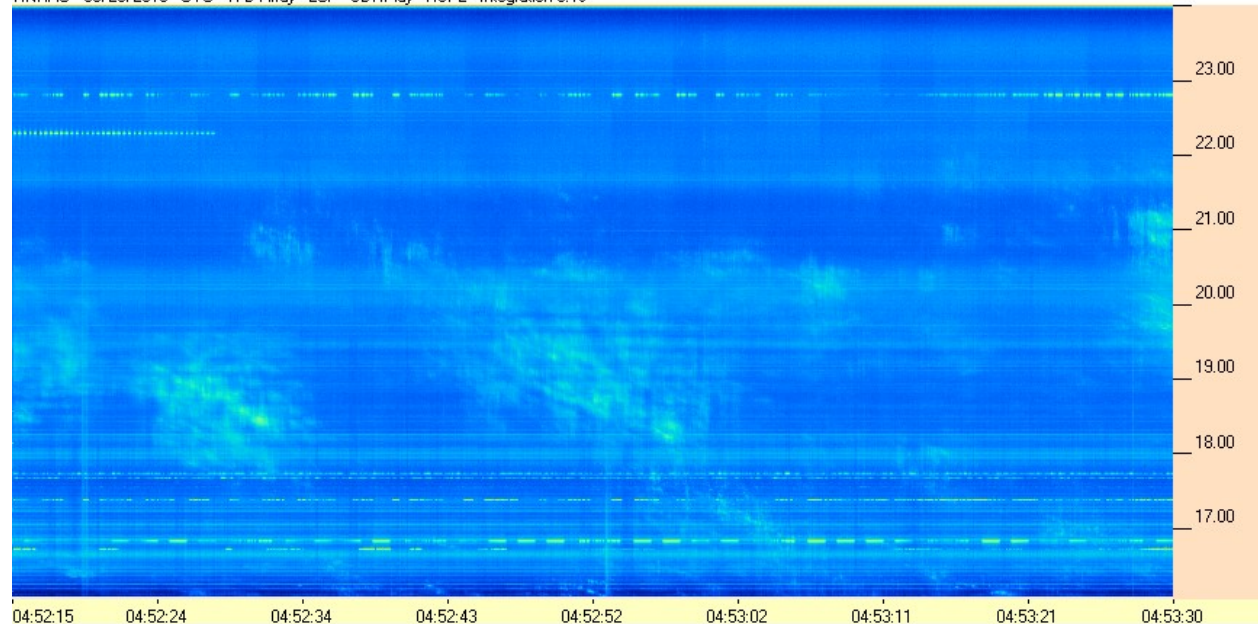
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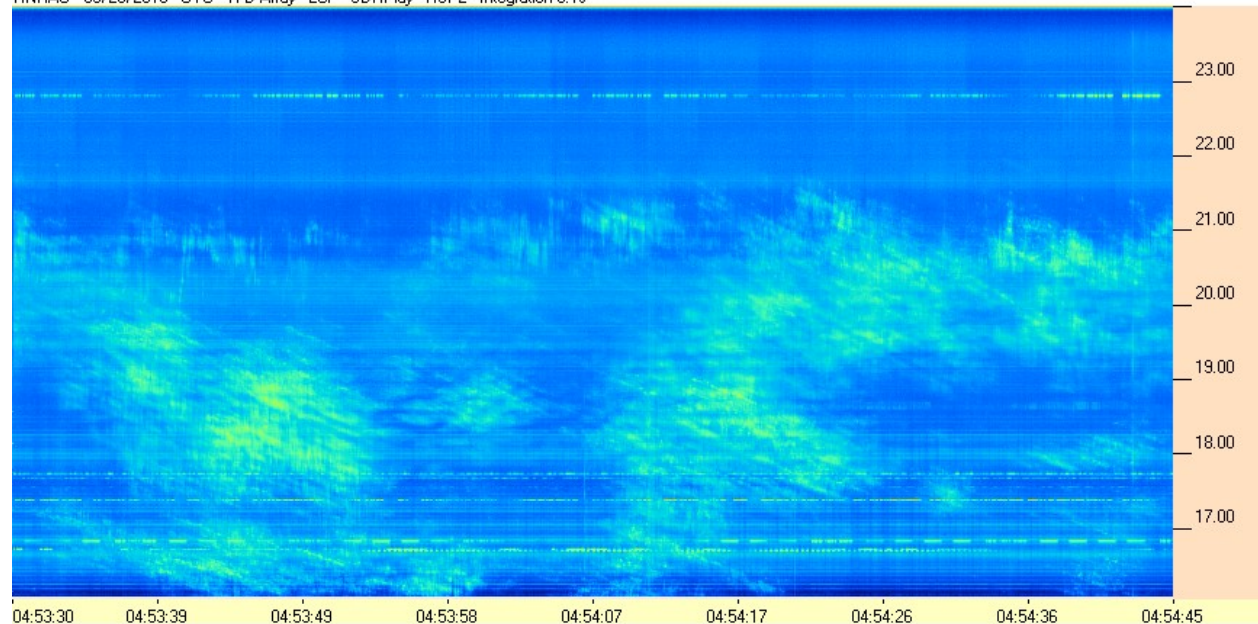
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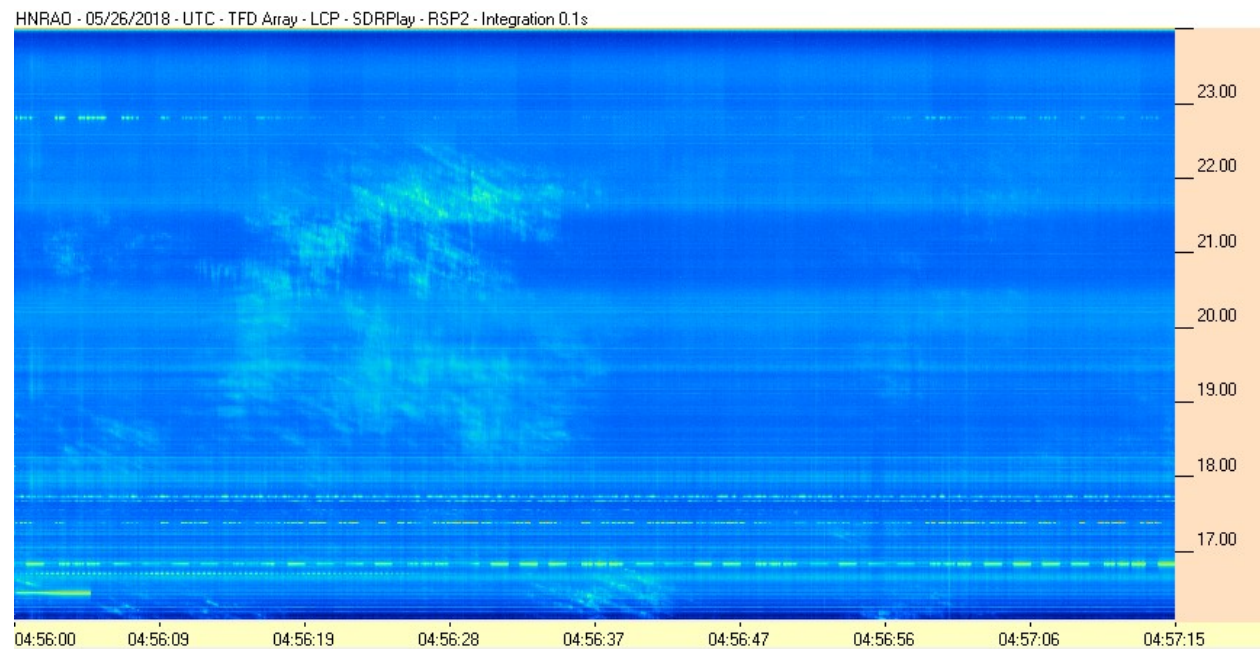
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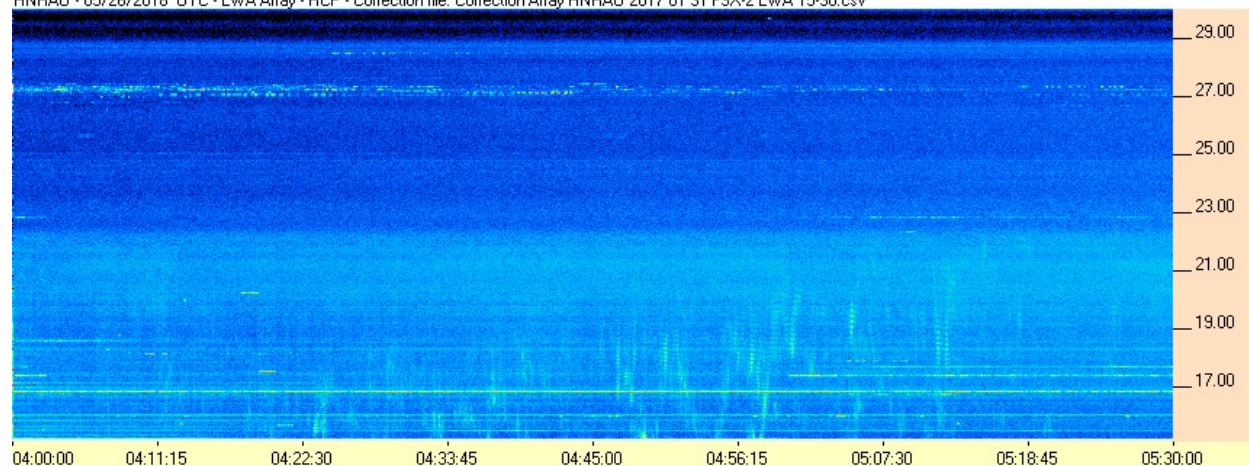


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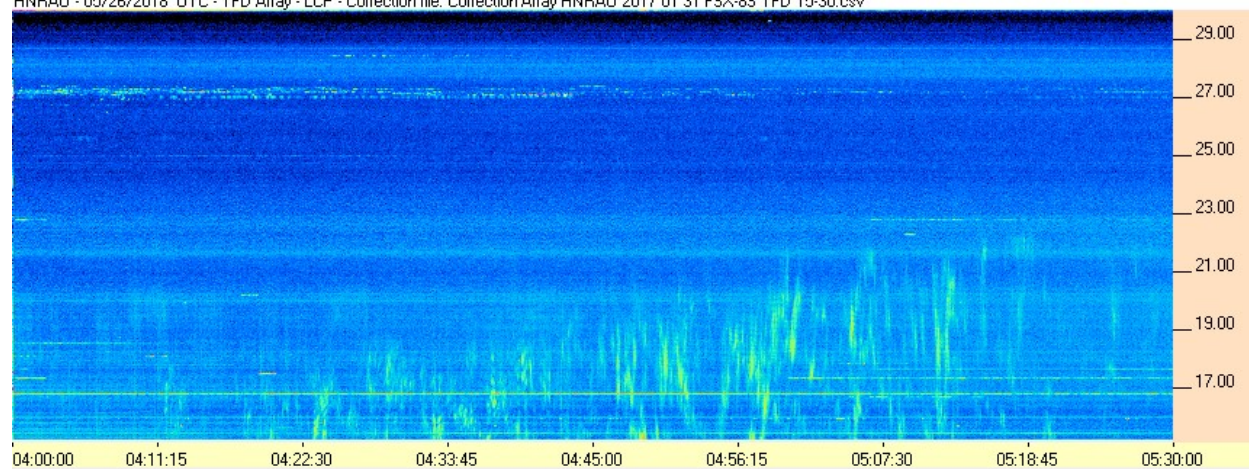


FSX-8S / TFD Array

HNRAO - 05/26/2018 UTC - LWA Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-2 LWA 15-30.csv



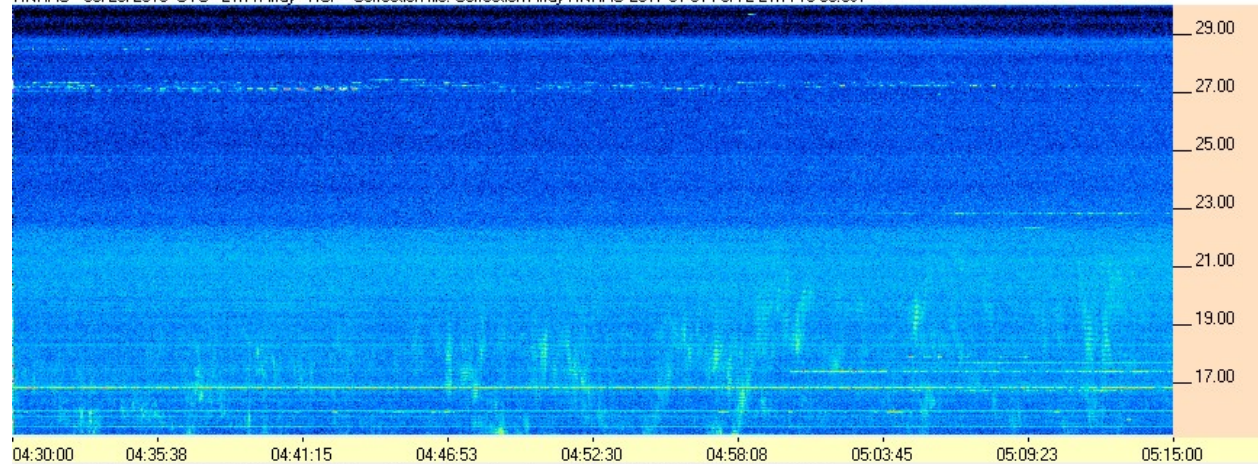
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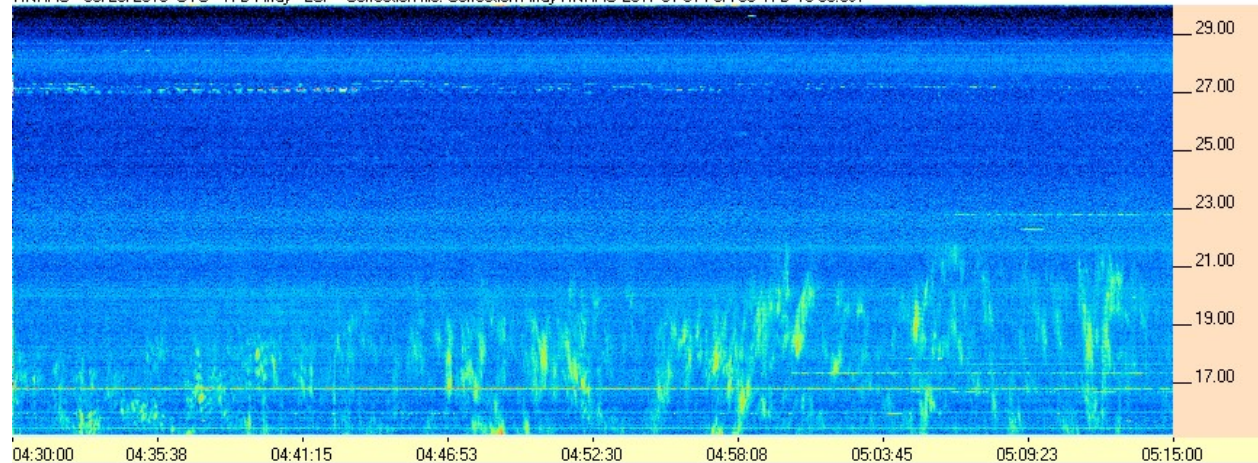
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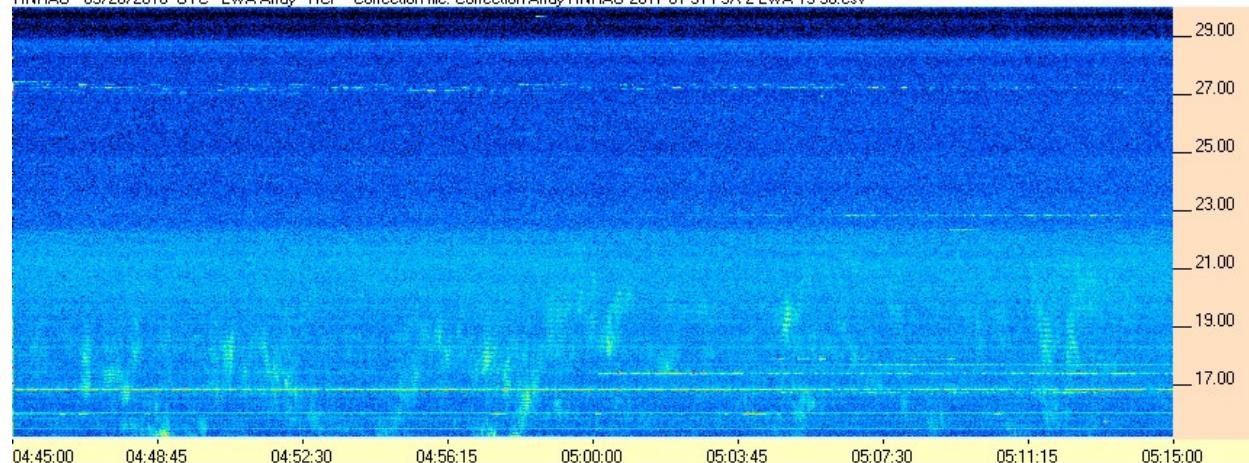
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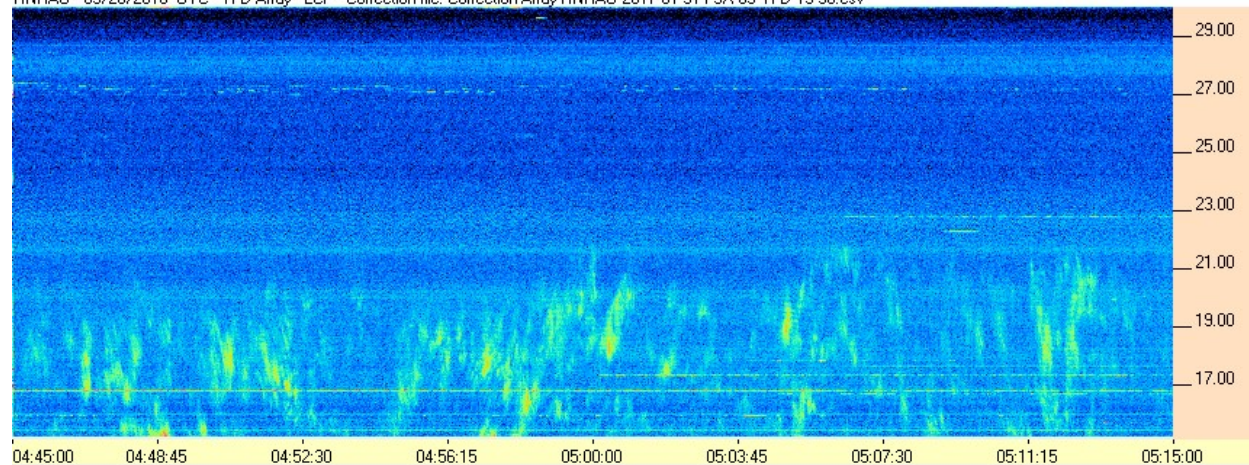
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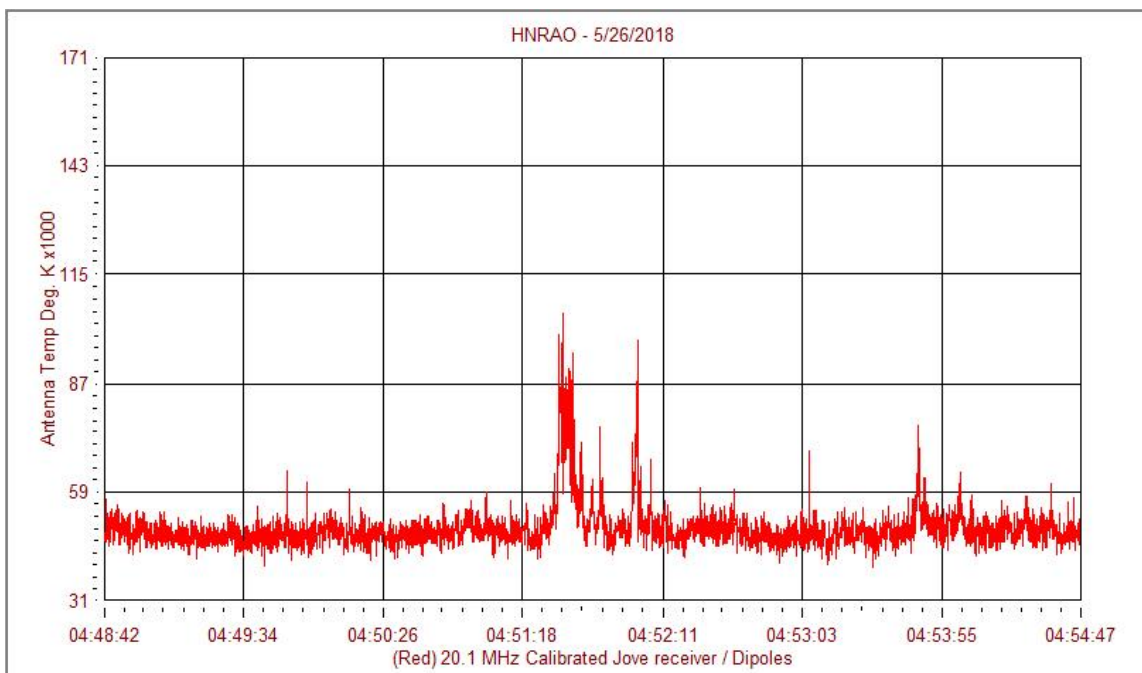
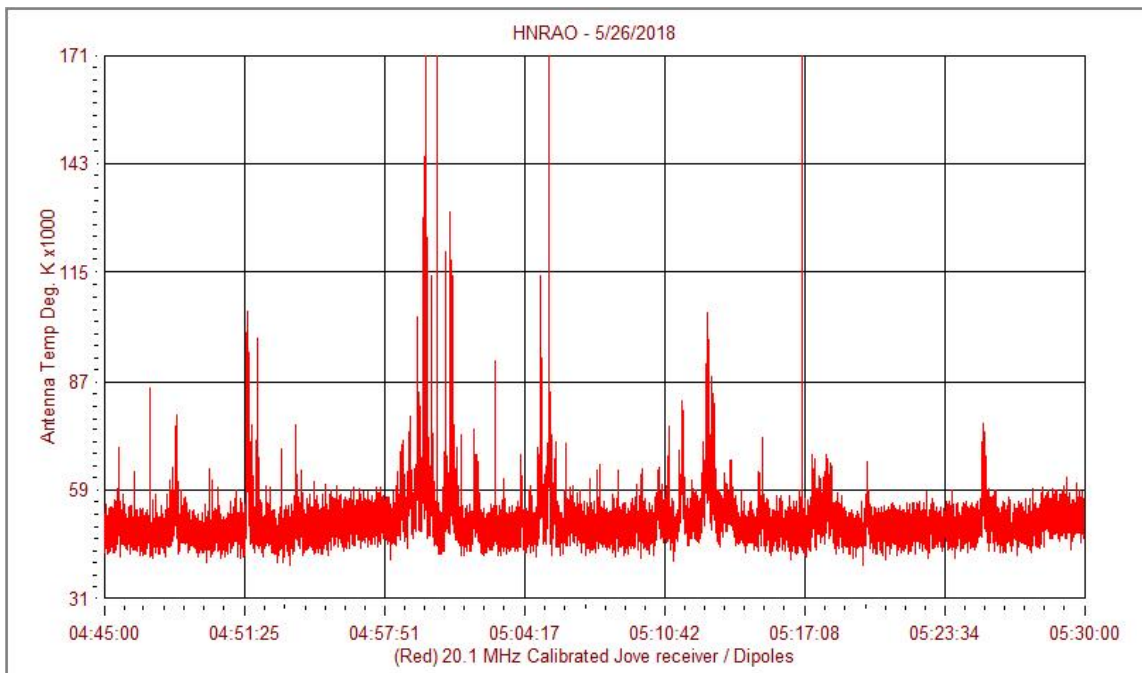
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JOVE II Receiver / JOVE dual dipoles



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