

**HNRAO Observing Log**  
**40.673181 N – 80.437885 W**  
**EN90sq**



**Date: April 10, 2018**

**Object: Jupiter – Io-A**

**Observer: JB**

<b>Start - Time UT:</b>	<b>0401</b>	<b>Planetary K-index:</b>	<b>4</b>
<b>Jupiter Altitude (deg):</b>	<b>15.3</b>	<b>Jupiter Azimuth (deg):</b>	<b>129.3</b>
<b>Jupiter CML:</b>	<b>196.69</b>	<b>Jupiter Io Phase:</b>	<b>238.59</b>
<b>Jupiter RA (hr/min):</b>	<b>15:18</b>	<b>Jupiter Dec (hr/min):</b>	<b>-16:56</b>
<b>Hour Angle (hr/min):</b>	<b>-03:25</b>	<b>Polarization</b>	<b>RCP</b>
<b>Sun Altitude (deg):</b>	<b>-39.1</b>	<b>Sun Azimuth (deg):</b>	<b>335.7</b>
<b>Sun RA (hr/min):</b>	<b>01:08</b>	<b>Sun Dec (hr/min):</b>	<b>07:11</b>

<b>End – Time UT:</b>	<b>0532</b>		
<b>Jupiter Altitude (deg):</b>	<b>26.6</b>	<b>Jupiter Azimuth (deg):</b>	<b>149.3</b>
<b>Jupiter CML:</b>	<b>251.65</b>	<b>Jupiter Io Phase</b>	<b>251.52</b>
<b>Hour Angle (hr/min):</b>	<b>-01:54</b>		
<b>Sun Altitude (deg):</b>	<b>-42.0</b>	<b>Sun Azimuth (deg):</b>	<b>005.3</b>
<b>Max Frequency MHz</b>	<b>23</b>	<b>Min Frequency MHz</b>	<b>16</b>

**Observatory Configuration**

<b>Spectrograph Receiver</b>	<b>Antenna</b>	<b>Polarization</b>	<b>System Loss</b>	<b>Multicoupler</b>	<b>Multicoupler port</b>	<b>Calibrated</b>
FSX-8S	TFD	RCP LCP	-7.95 dB -7.95 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	-7.95 dB	#2 RCP	Port 2 +3dB	Twice daily
SDRPlay RSP2	TFD	LCP	-7.95 dB	#1 LCP	Port 2 +3dB	Twice daily
JOVE 1	TFD	RCP	-7.95 dB	#2 RCP	Port 3 +3 dB	03/08/2018
JOVE 1	TFD	LCP	-7.95 dB	#1 LCP	Port 3 +3 dB	03/08/2018
JOVE II	Jove dipoles	Linear	-3.12 dB	#3 Linear	Port 4 +3 dB	02/20/2018
SDRPlay RSP1	Experimental*					

JOVE dipoles phased @ 32 degrees for 2017-2018 season

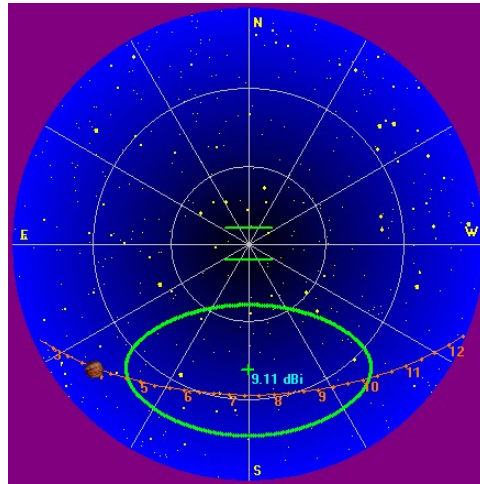
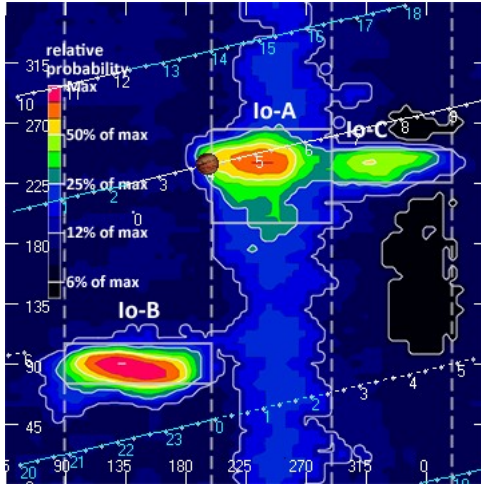
TFD array phased @ 35 degrees for 2017-2018 season

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

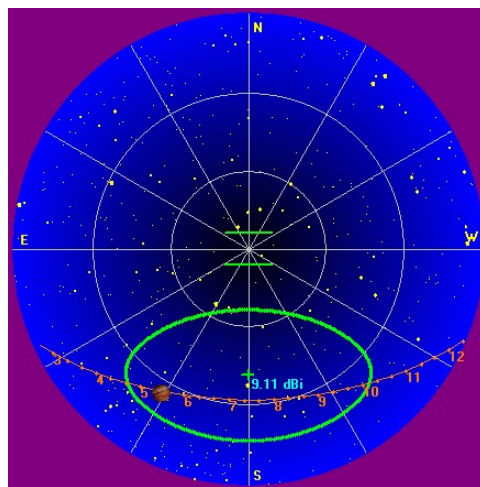
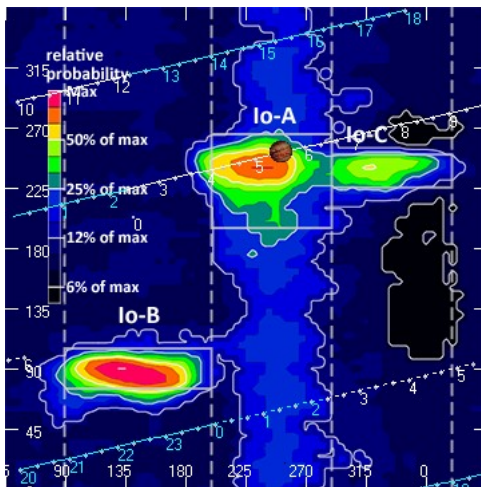
\* Used for testing and evaluating antenna systems

Software Radio Sky Spectrograph 2.8.50

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**Beginning of Pass**



**End of Pass**

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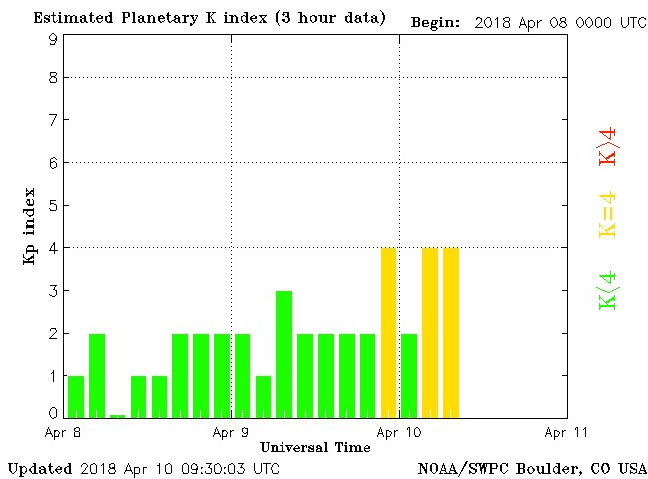


MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360	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-A storm, lasting 91 minutes, that while weak by comparison to last year, is one of the most respectable storms of the 2017-18 season. L-bursts with L4 modulation lanes. No S-bursts detected.

Emissions were not continual but came in groups. Strongest emissions were at 0452 UT through 0454 UT.

Observations with the FSX-8S / TFD array revealed the strongest bursts were just slightly above the noise floor of the spectrograph.

RFI prevented any observations with the FSX-2 / LWA array.

Surprisingly, even though there was activity at 20 MHz, there was no SkyPipe record of bursts. Average GB as shown in the calibrated SkyPipe record was 122 kK suggesting RFI strong enough to obscure any of these L-bursts. This seems to be supported by the record of the FSX-2 / LWA array.

Only one interesting feature of note. At 0520:15 UT there were a series of bursts between 19.5 MHz and 20.5 MHz resembling upside down "U"s.

EOR

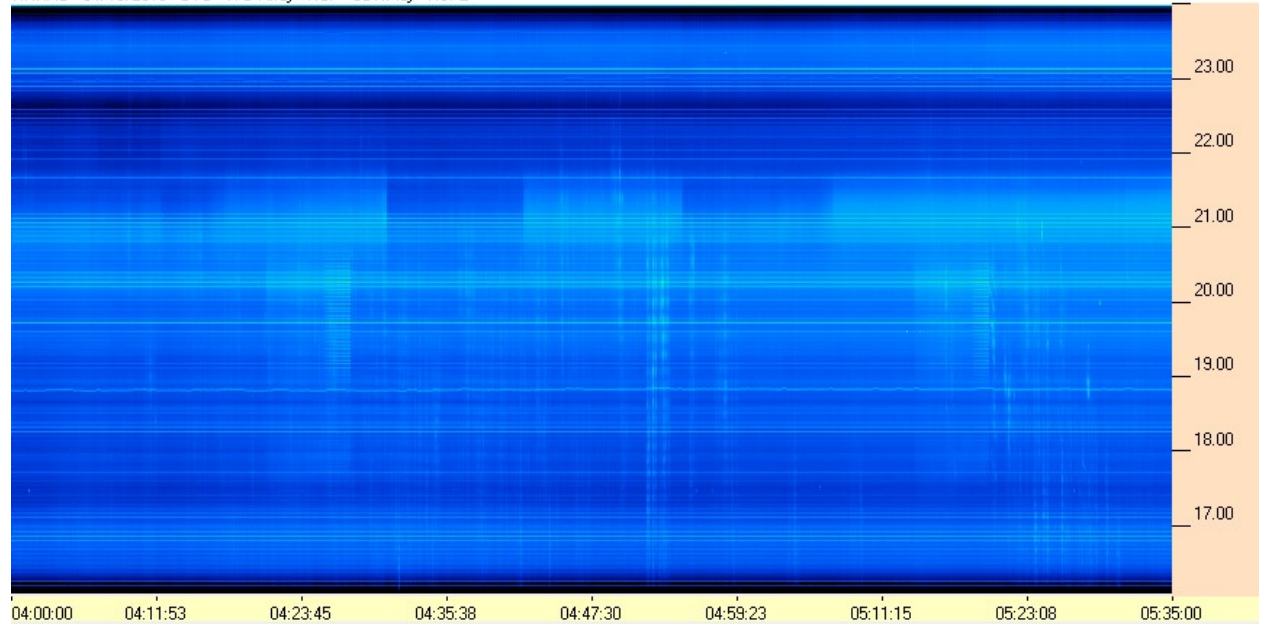


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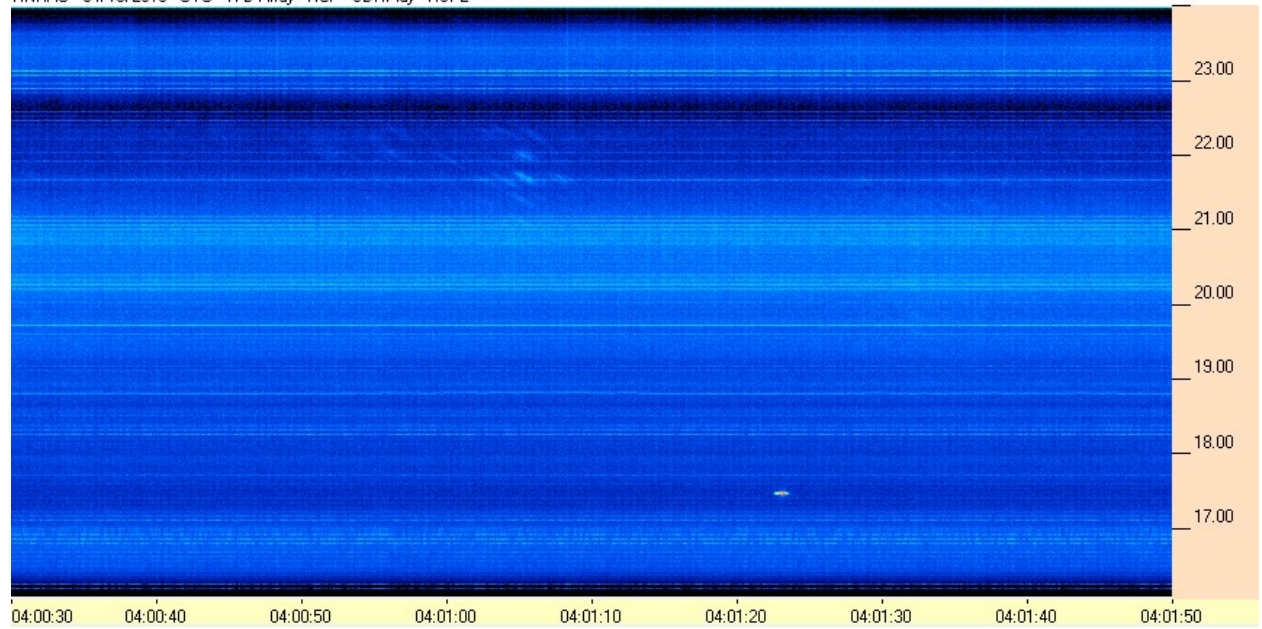


**SDRPlay RSP2 / TFD Array**

HNRAO - 04/10/2018 - UTC - TFD Array - RCP - SDRPlay - RSP2



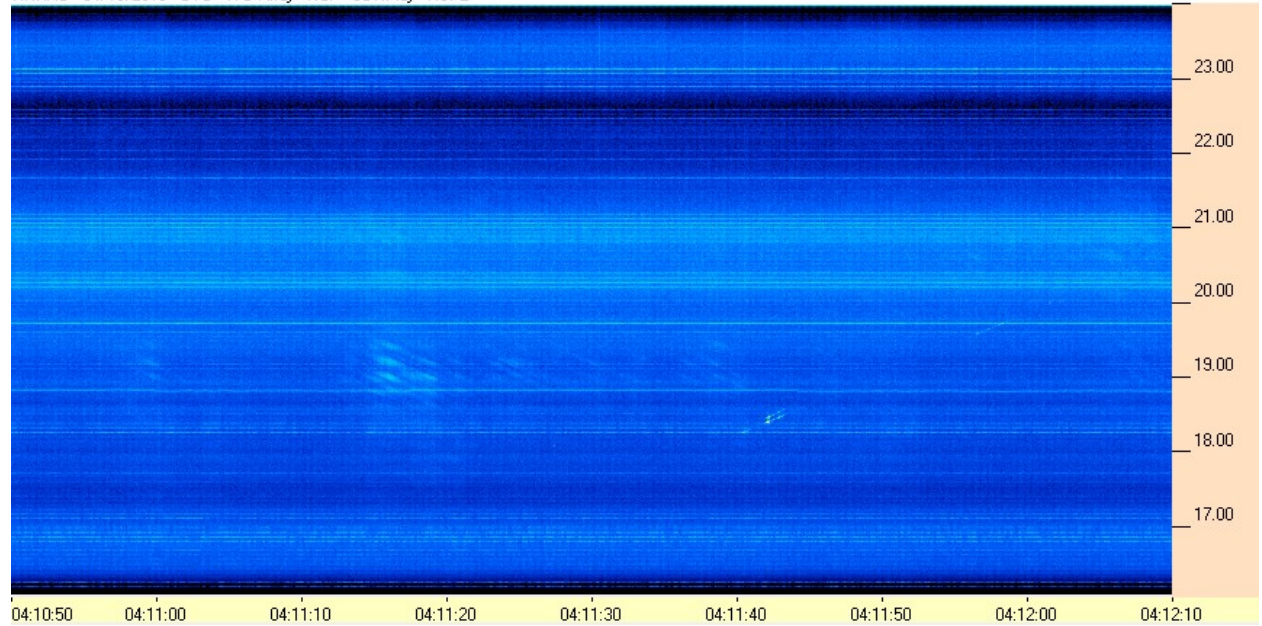
HNRAO - 04/10/2018 - UTC - TFD Array - RCP - SDRPlay - RSP2



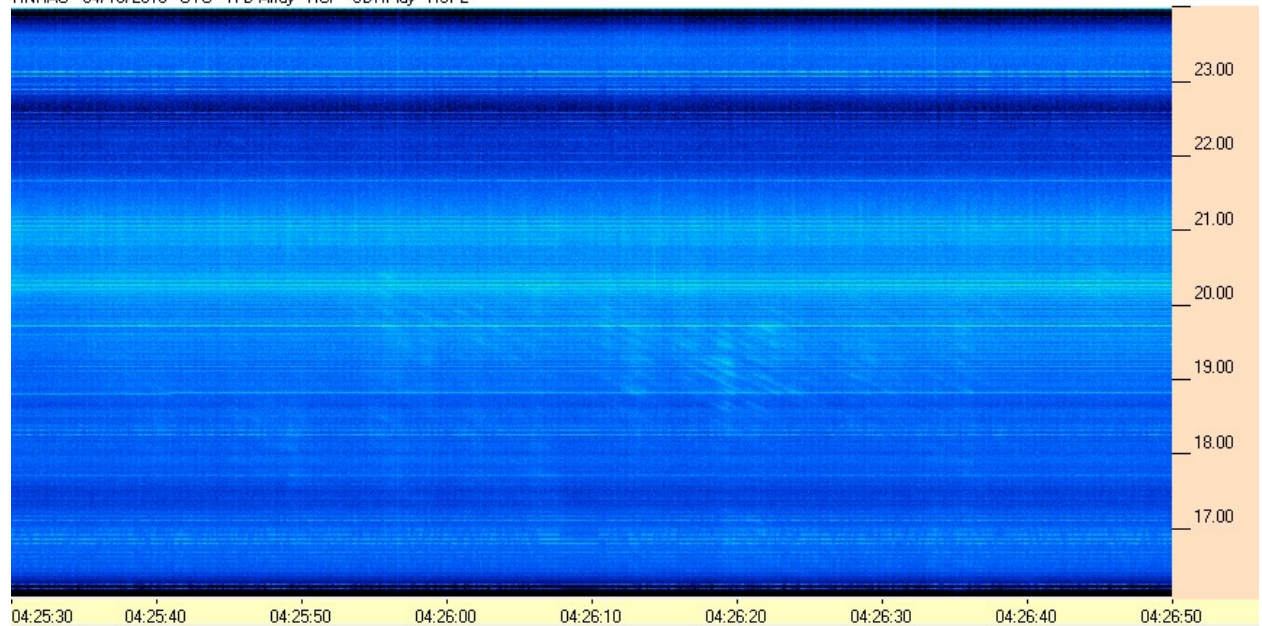
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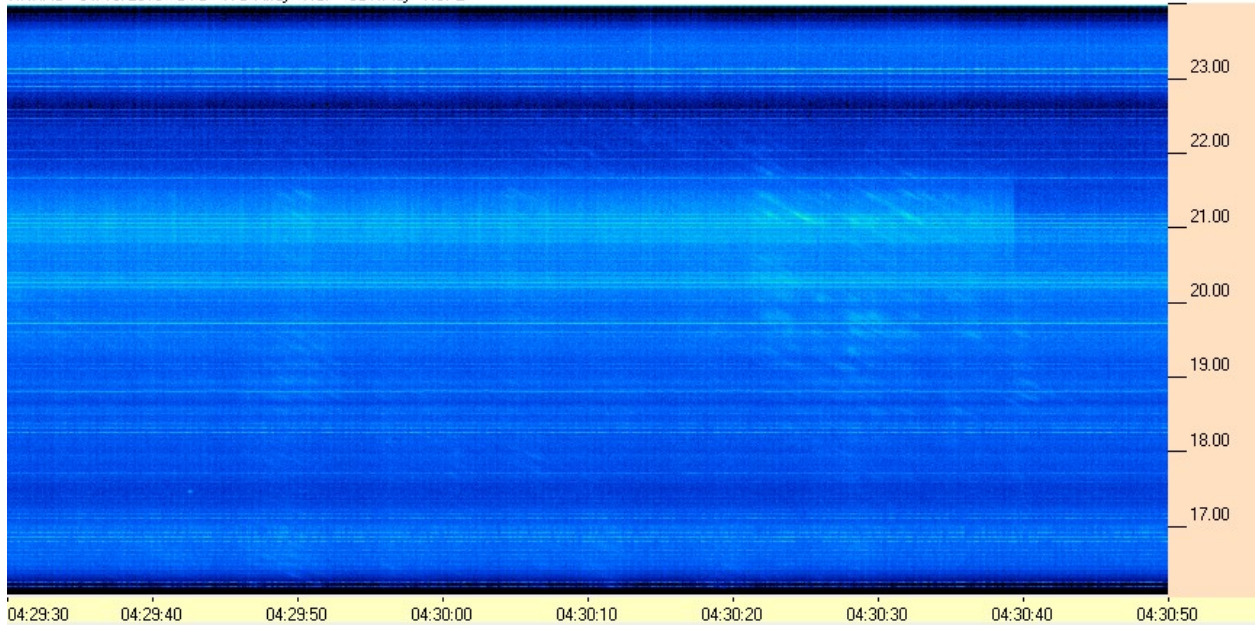




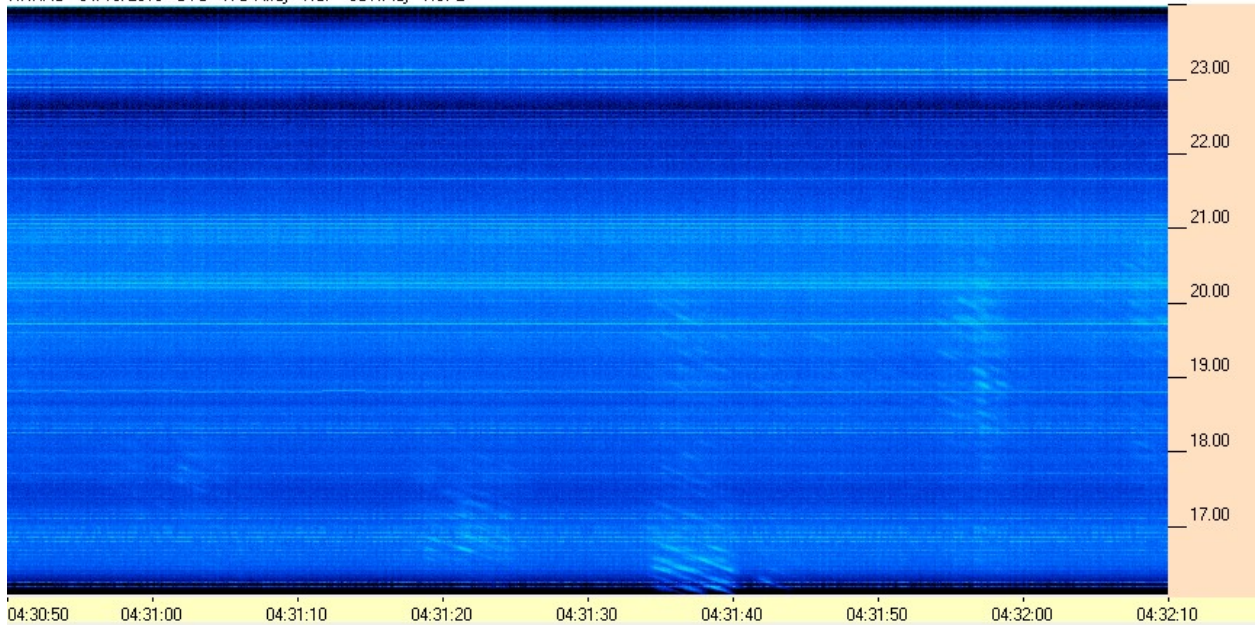
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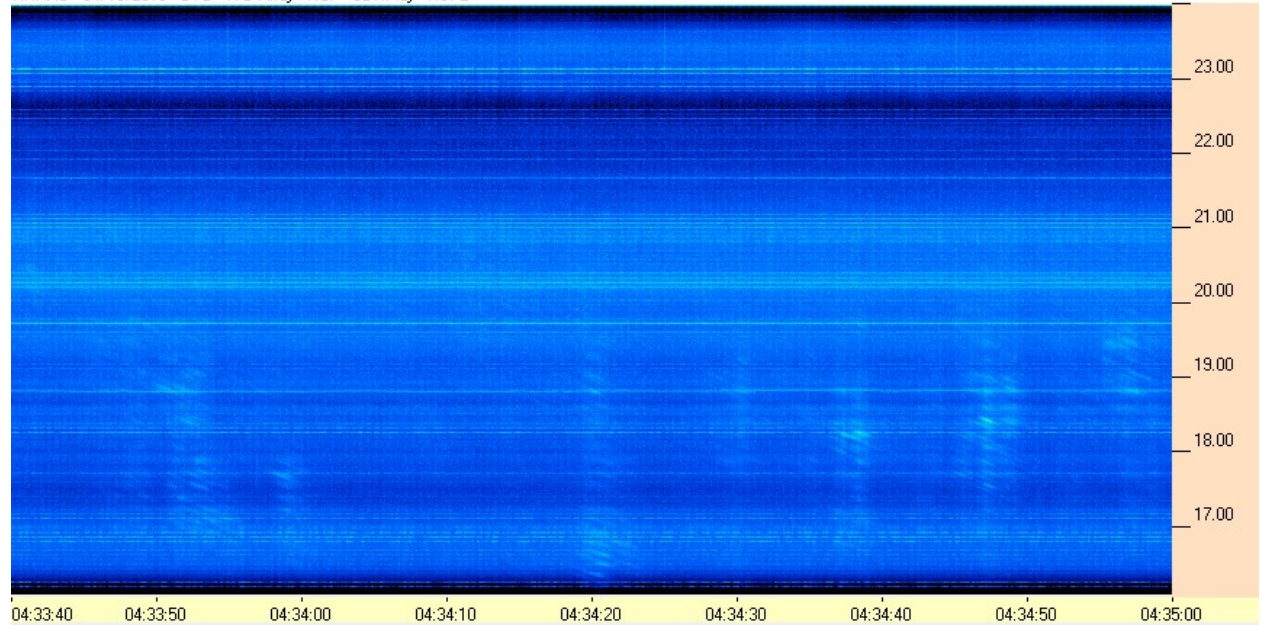




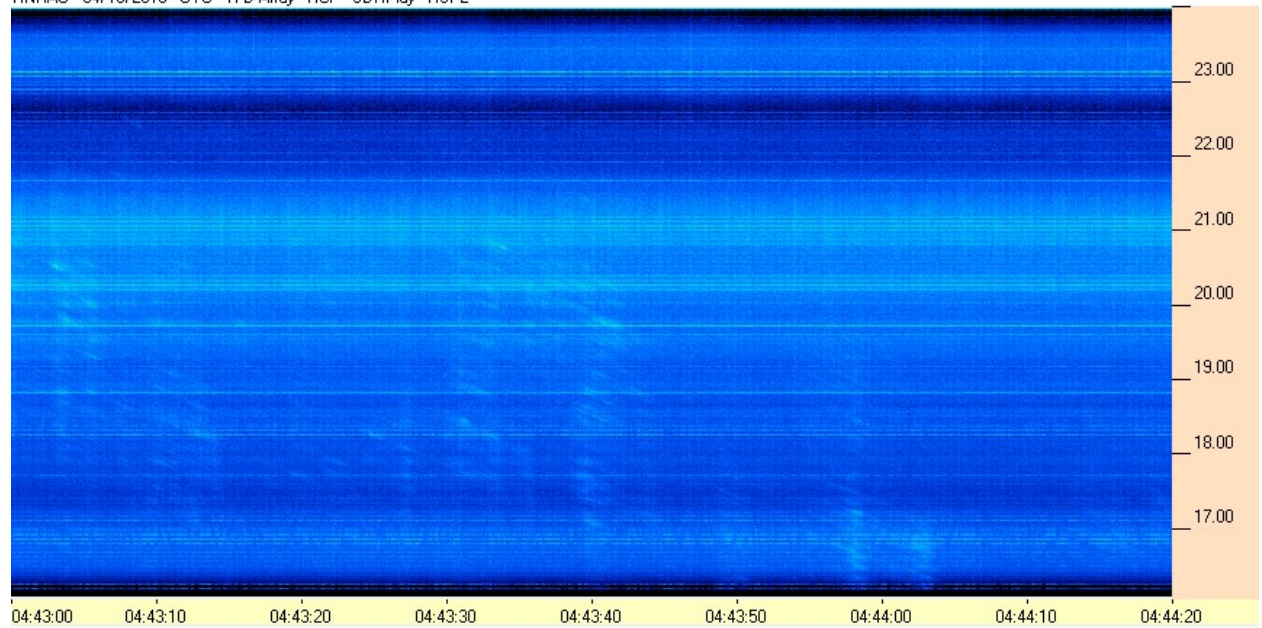
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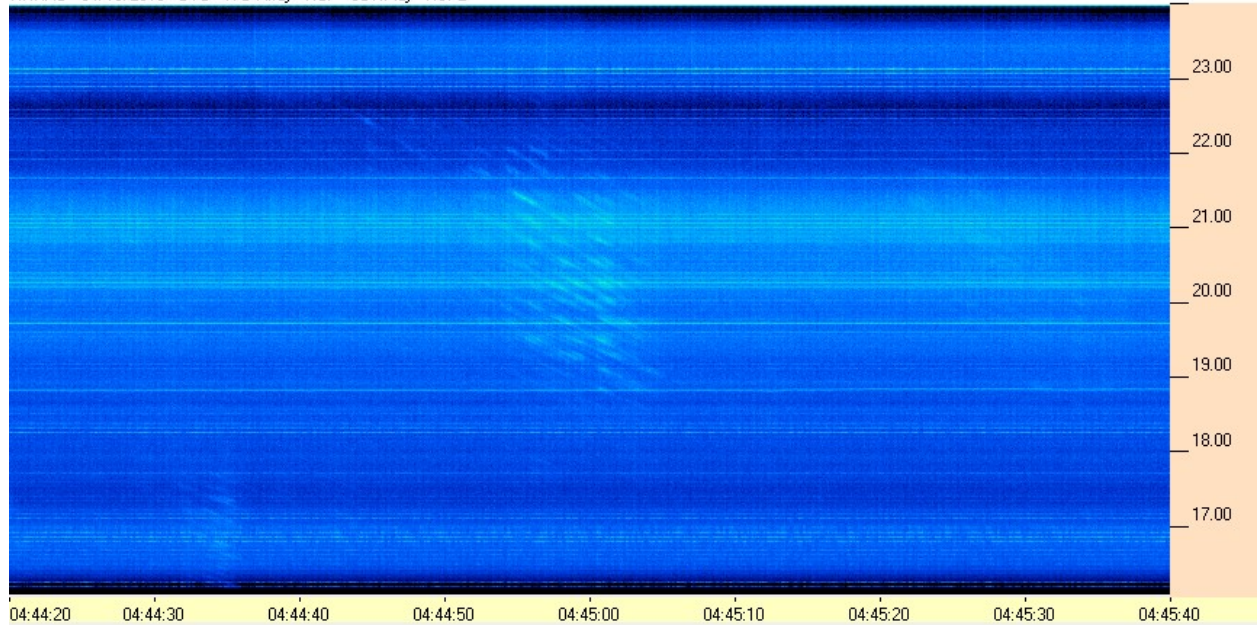




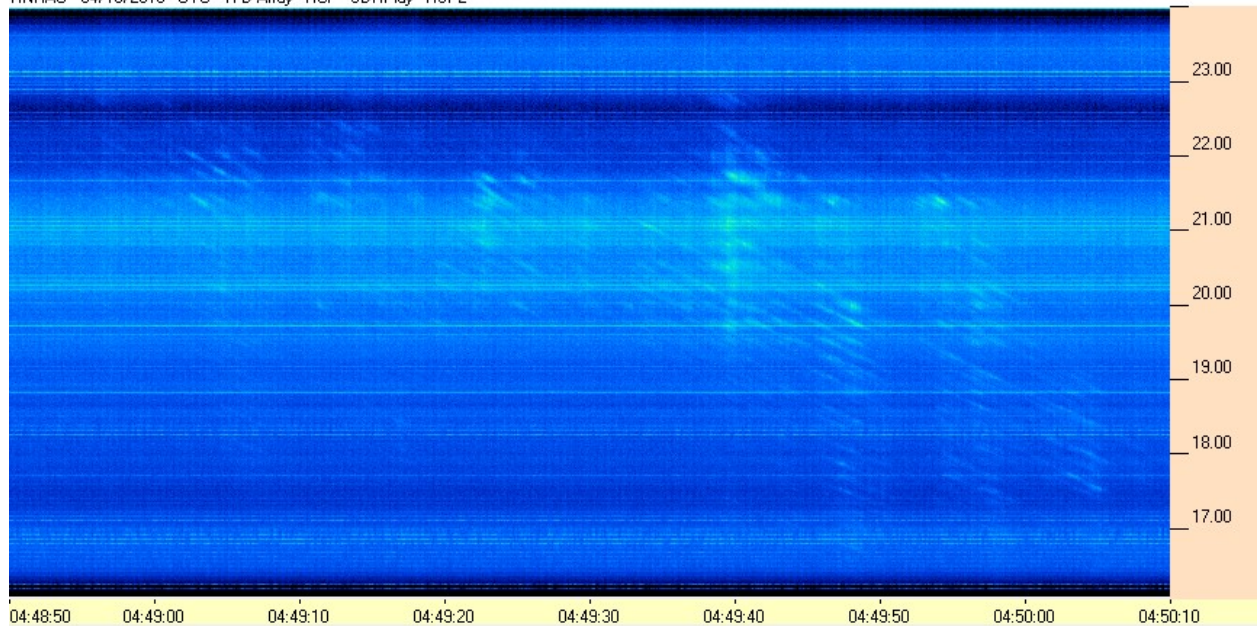
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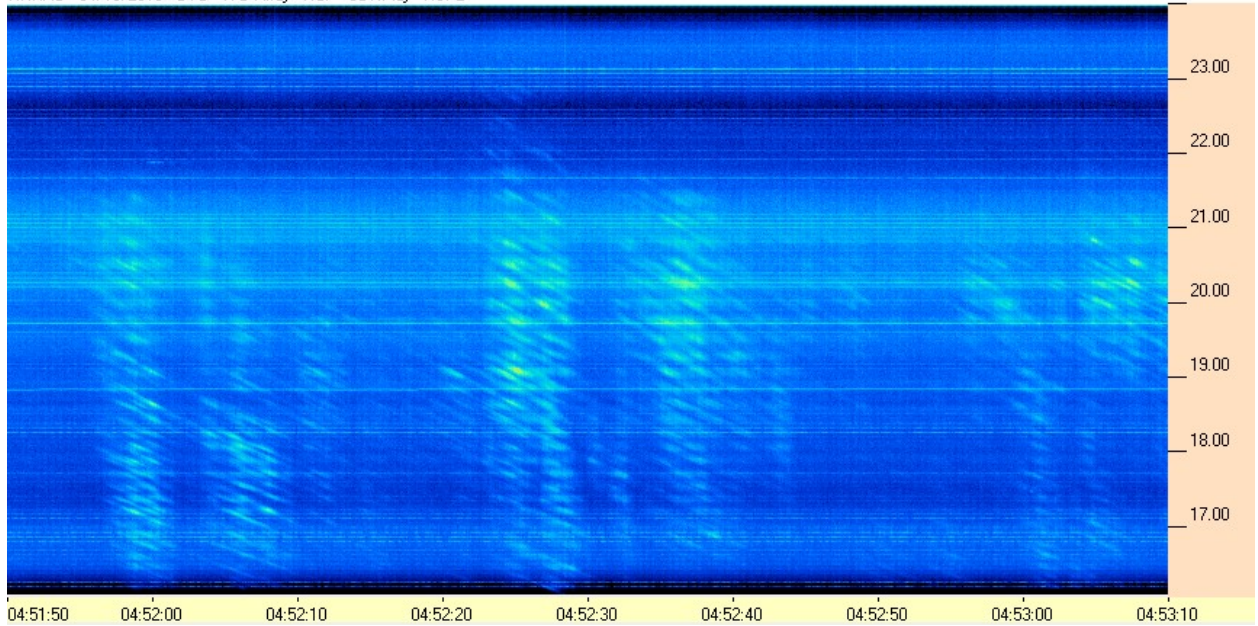




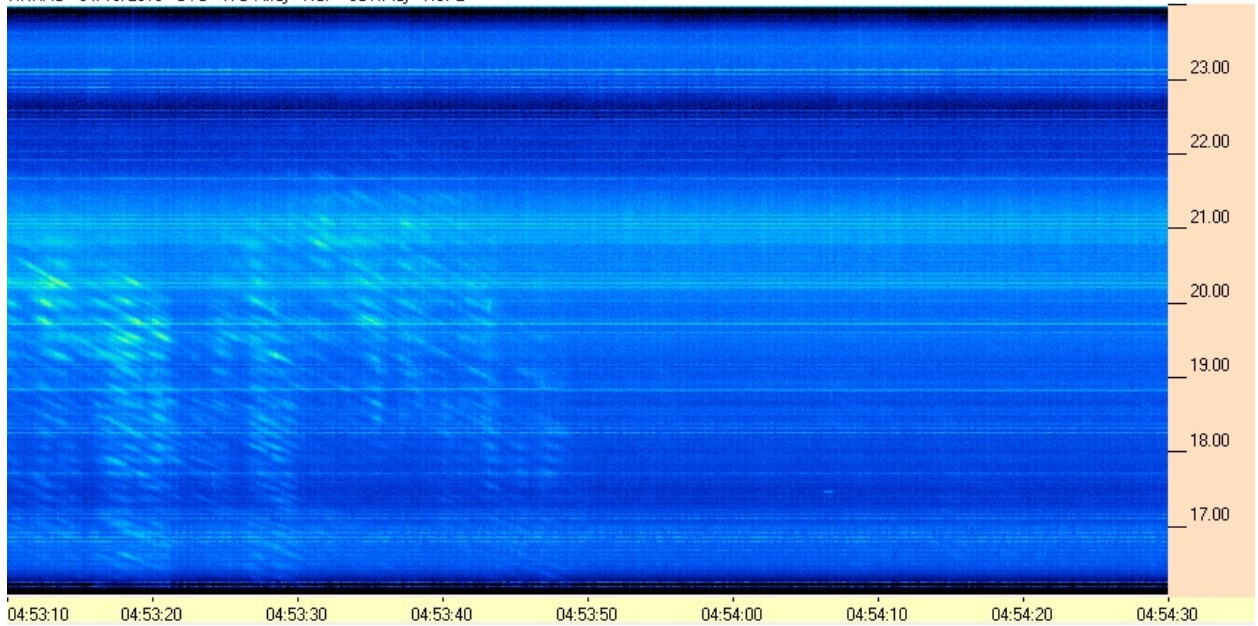
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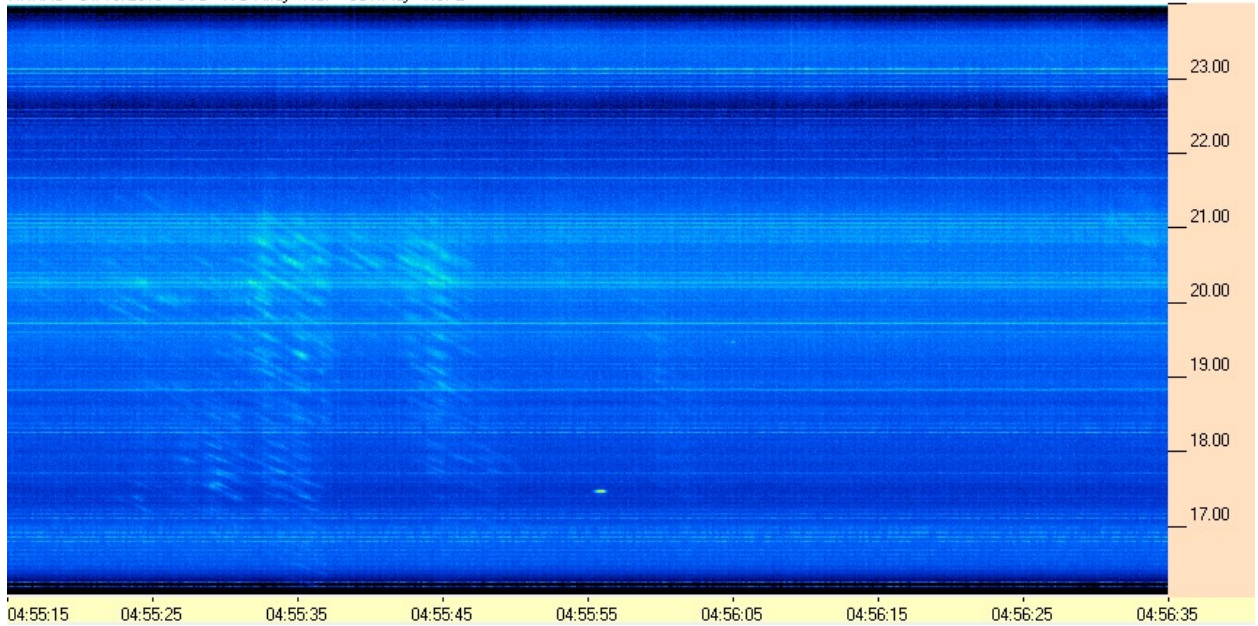




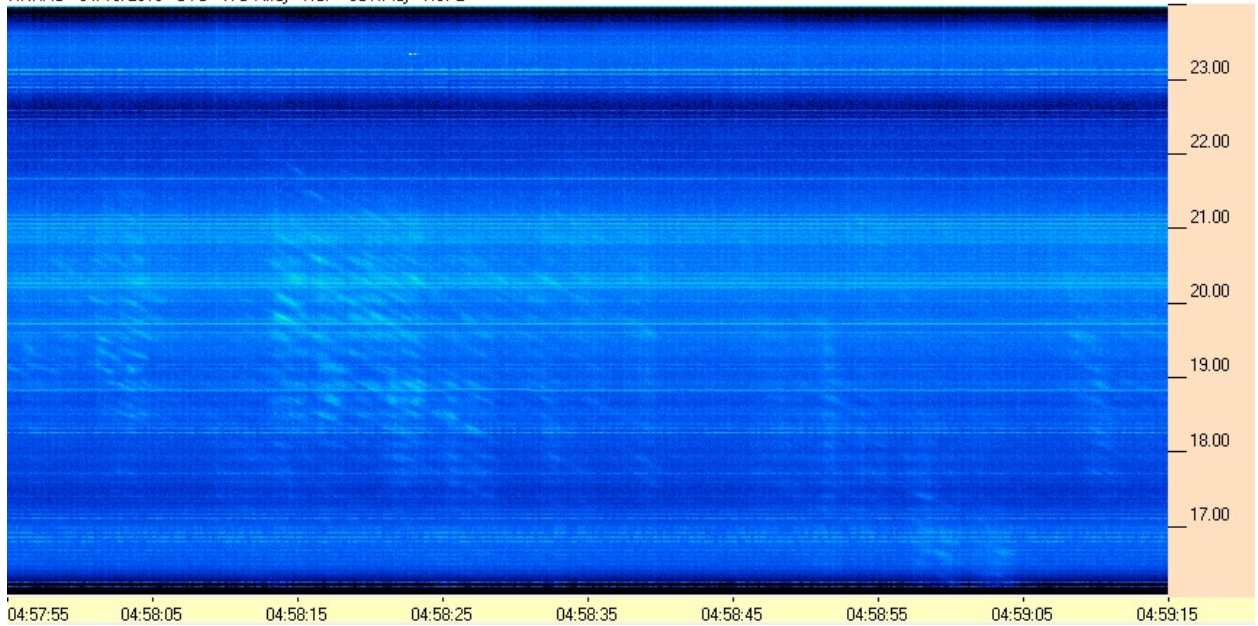
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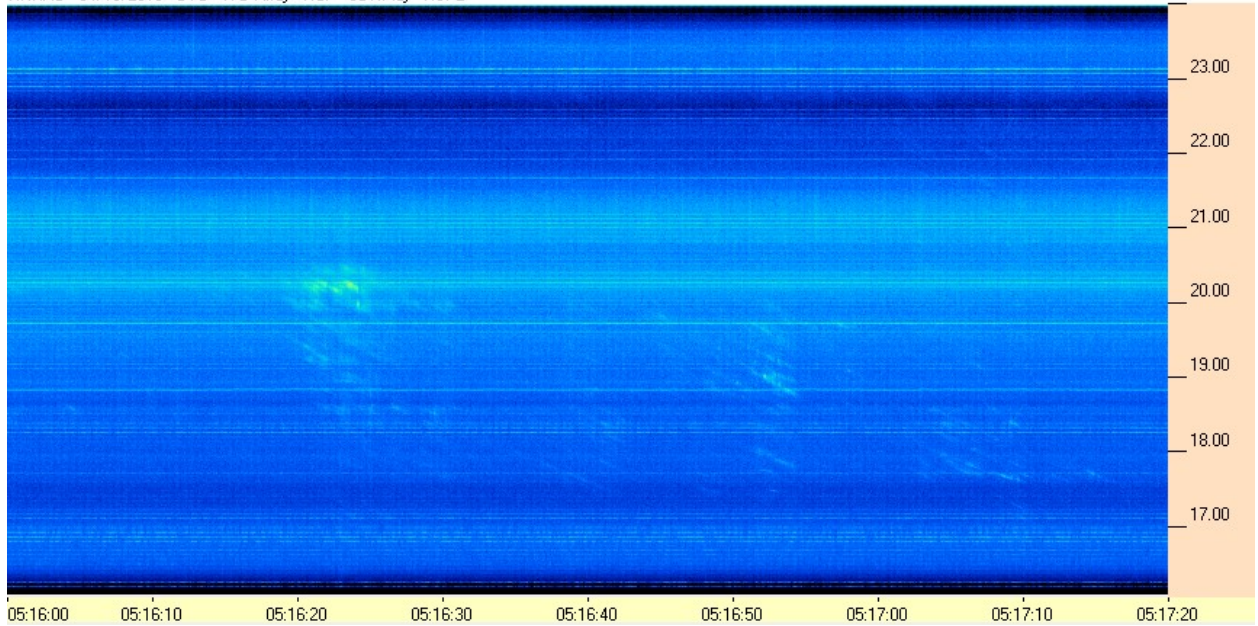




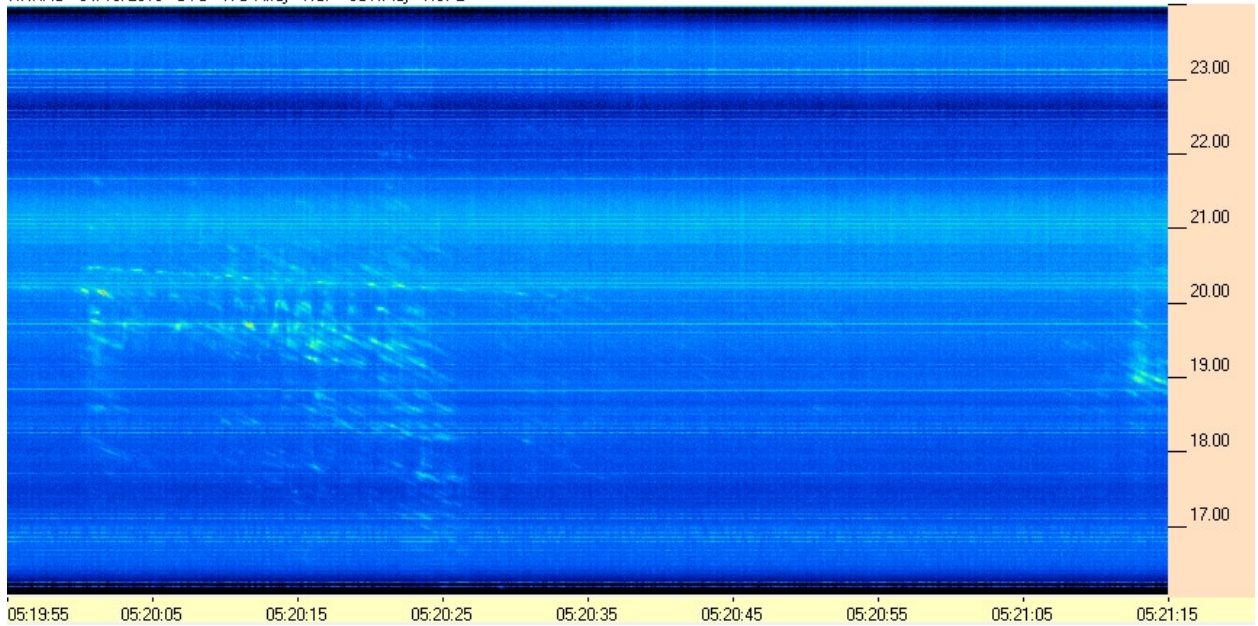
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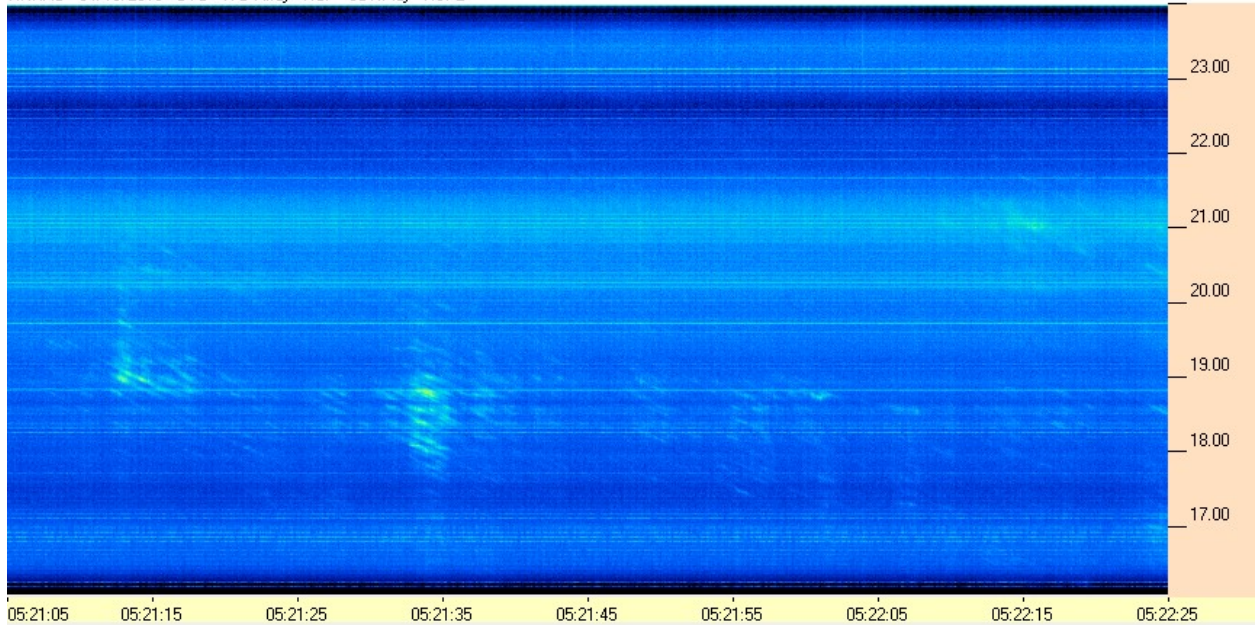




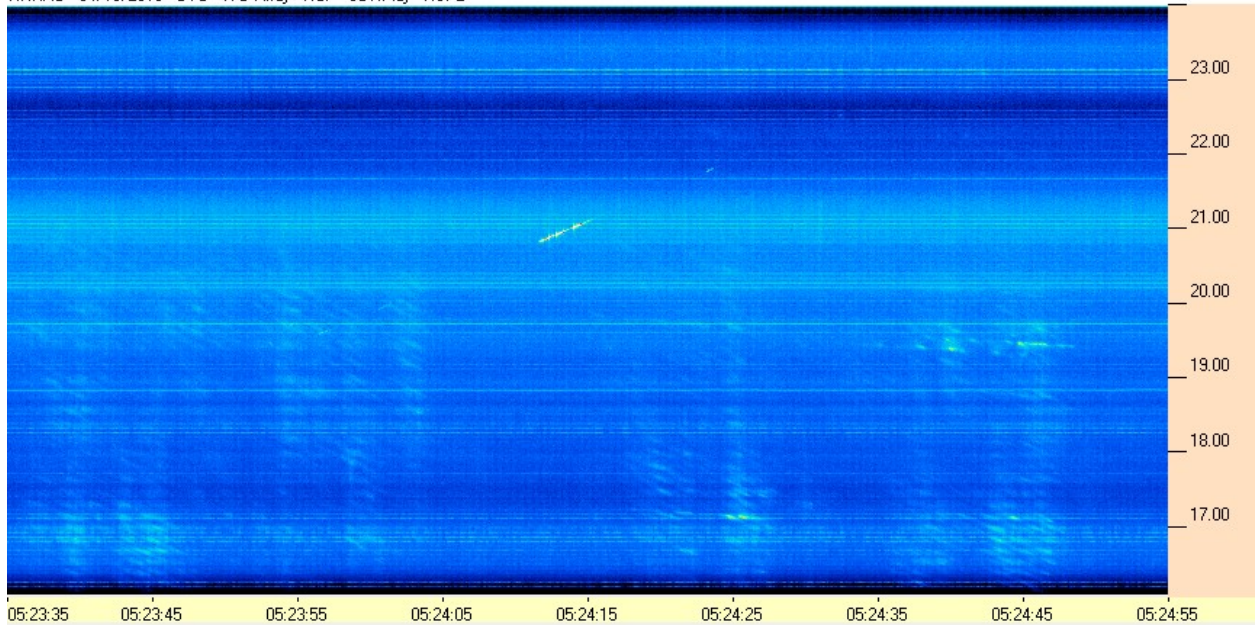
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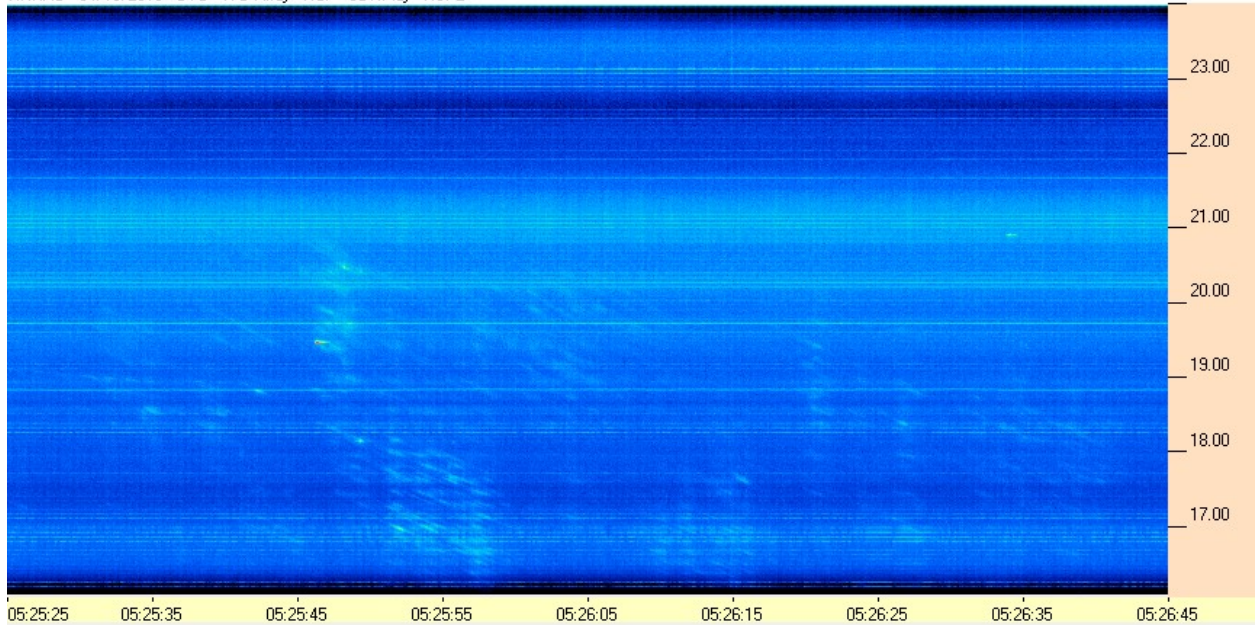




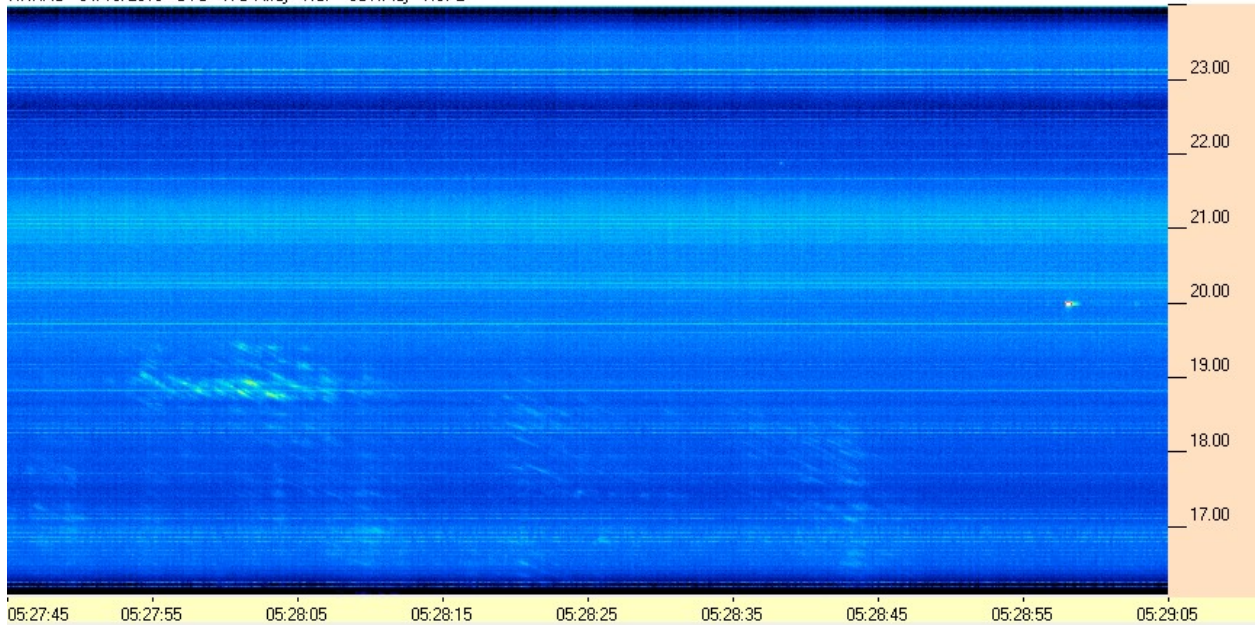
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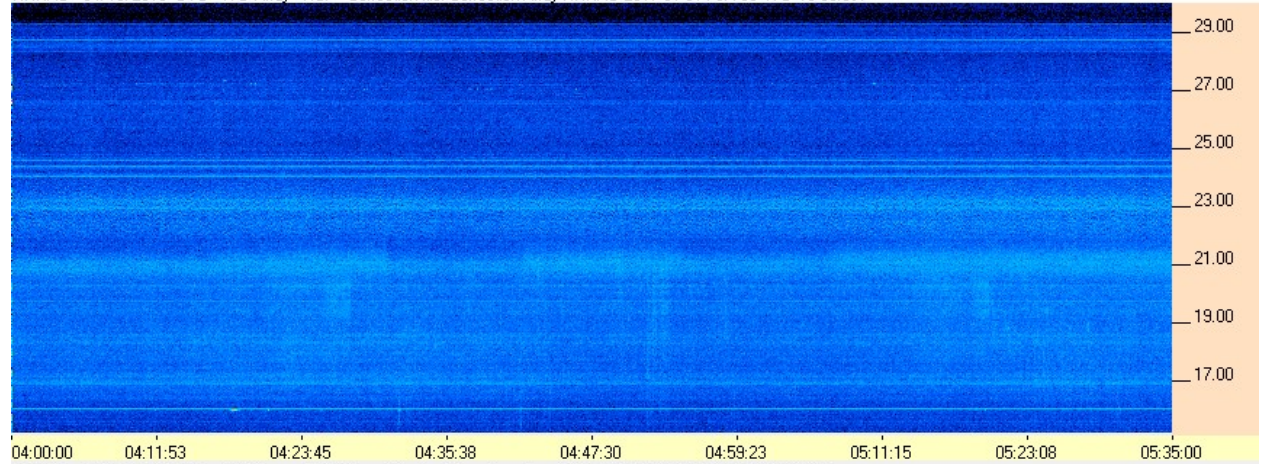


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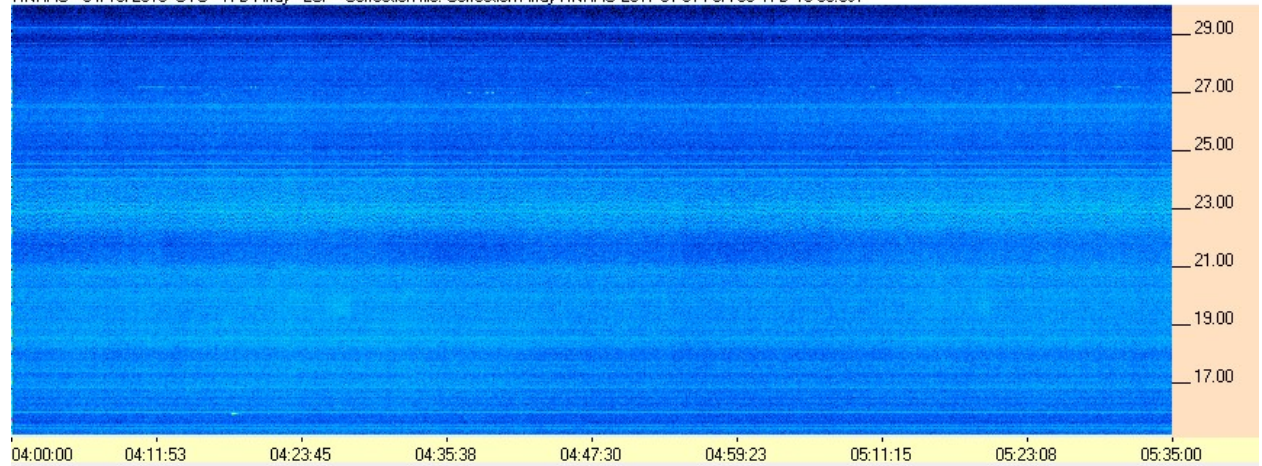


**FSX-8S / TFD Array**

HNRAO - 04/10/2018 UTC - TFD Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv



HNRAO - 04/10/2018 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 - 04/10/2018 UTC - LWA Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-2 LWA 15-30.csv

