

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: August 16, 2019

Object: Jupiter – Io-B

Observer: Unattended / JB

Start - Time UT:	0042:10	Planetary K-index:	
Jupiter Altitude (deg):	27.2	Jupiter Azimuth (deg):	181.3
Jupiter CML:	106.38	Jupiter Io Phase:	067.72
Jupiter RA (hr/min):	16:52	Jupiter Dec (hr/min):	-22:08
Hour Angle (hr/min):	00:05	Polarization	RCP
Sun Altitude (deg):	-05.6	Sun Azimuth (deg):	294.6
Sun RA (hr/min):	09:34	Sun Dec (hr/min):	14:30

End – Time UT:	0240:30	De:	-2.6
Jupiter Altitude (deg):	20.9	Jupiter Azimuth (deg):	210.6
Jupiter CML:	177.91	Jupiter Io Phase	084.30
Hour Angle (hr/min):	02:04	Duration (min):	122
Sun Altitude (deg):	-23.8	Sun Azimuth (deg):	317.6
Max Frequency MHz	24	Min Frequency MHz	16

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	7/19/2019

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

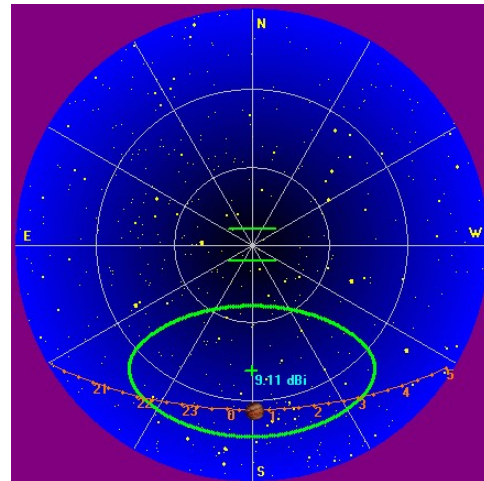
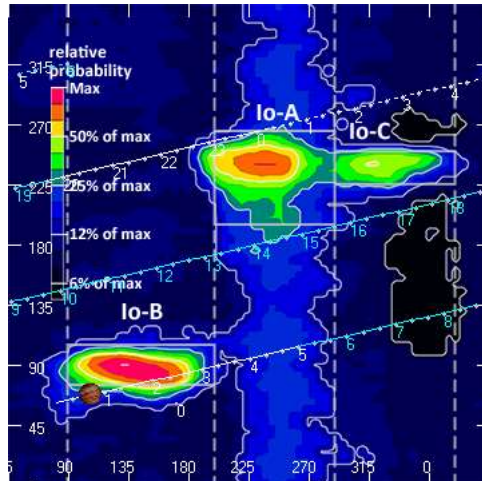
Radio-SkyPipe software version 2.7.33

Radio-Jupiter Pro software version 3.8.2

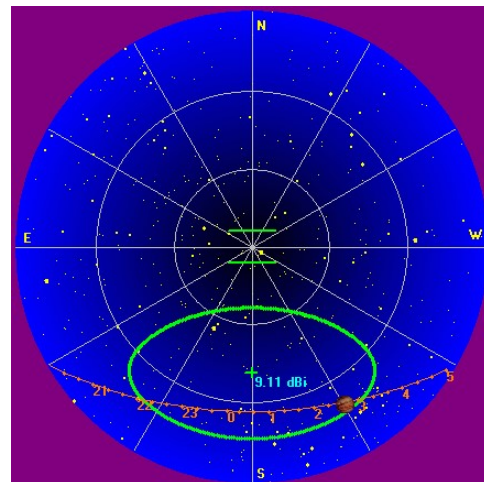
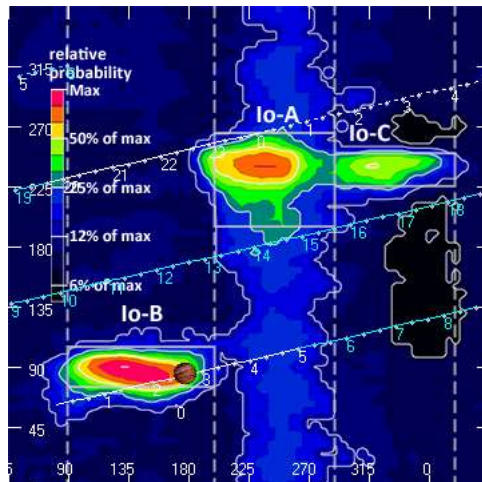
Network Time Server GpsNtp-Pi, Reeve Engineering

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 antennas functioning normally. No known issues. RFI in spectrographs is moderate. Bright vertical lines are distant lightning discharges and bright horizontal lines / bands are from an unidentified source. Foreign broadcast stations can also be seen through the first half of this storm. RFI from unknown source made the SkyPipe data unusable. Software glitch in RSS 2.9.26 calibration routine, prevented data from being recorded with the FSX-8S and FSX-2 spectrographs.

Emissions began centered around 20 MHz. Storm emissions were S-bursts and L-bursts. Most emissions were at or slightly above GB at observed at this observatory although some S-bursts exceeded several dB above GB.

While they wouldn't be considered N-events, this storm seemed to have several longer and drawn out features, such as those at 0053:45 UT.

At 0054 UT, the end of this emissions group, which appear to be weak S-bursts, ended at approximately 18 MHz. At 0055:30 UT, the next emissions group started at 23 MHz. This group appear to be L-bursts.

At 0120 UT, weaker L-bursts, slightly above GB and centered around 20 MHz.

A stronger grouping of the long and draw out features at 0105:15 UT centered around 23 MHz. These appear to be S-bursts, but positive identification is difficult due to resolution and intensity of the emissions. However, there is a singular burst at 23.06 MHz at 0105:44 UT that strongly suggests it is an S-burst.

Between 0108 UT and 0109:10 UT, at 22 MHz, more of the longer and drawn out emissions group with singularly bright bursts which, again, suggest an S-burst origin. 0110:40 UT through 0111:30 is a repeat of the same centered around 21.5 MHz.

A somewhat larger grouping of bursts from 0112 UT to 0115 UT, and spanning 24 MHz to 16 MHz, is composed of the same time of features described above. This is the widest frequency span of emissions in this storm.

Nearly 5 minutes before the next group of emissions, which are certainly S-bursts, begin at 0121:50 UT and begin at 17 MHz and rise to 18 MHz and level off then rise to nearly 20 MHz at 0123 UT.

At 0130 UT, there were a few S-bursts in about a 5 second time span at 21 MHz.

There doesn't appear to be any visible emissions again until, nearly 27 minutes later, at 0157:30 UT when very weak emissions can be seen centered around 10 MHz. They are so weak that a positive identification of S-burst or L-burst isn't possible.

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Nearly another 20 minutes elapse until, between 0219 UT and 0219:20 UT, and between 16 MHz and 17 MHz, a very small cluster of S-bursts are visible.

No other visible emissions can be seen until, at 0226:30 UT when a grouping of S-bursts is seen between 17 MHz and 19 MHz.

Again, no emissions discernable until at 0230:50 UT, another grouping of S-bursts between 17 MHz and 18 MHz. This group ends at 0231:10 UT, and is followed by a much weaker group between 0231:20 UT and 0231:30 UT.

At 0240:20 UT, the last emissions of this storm are a group of S-bursts about 1 MHz wide and centered at 18 MHz.

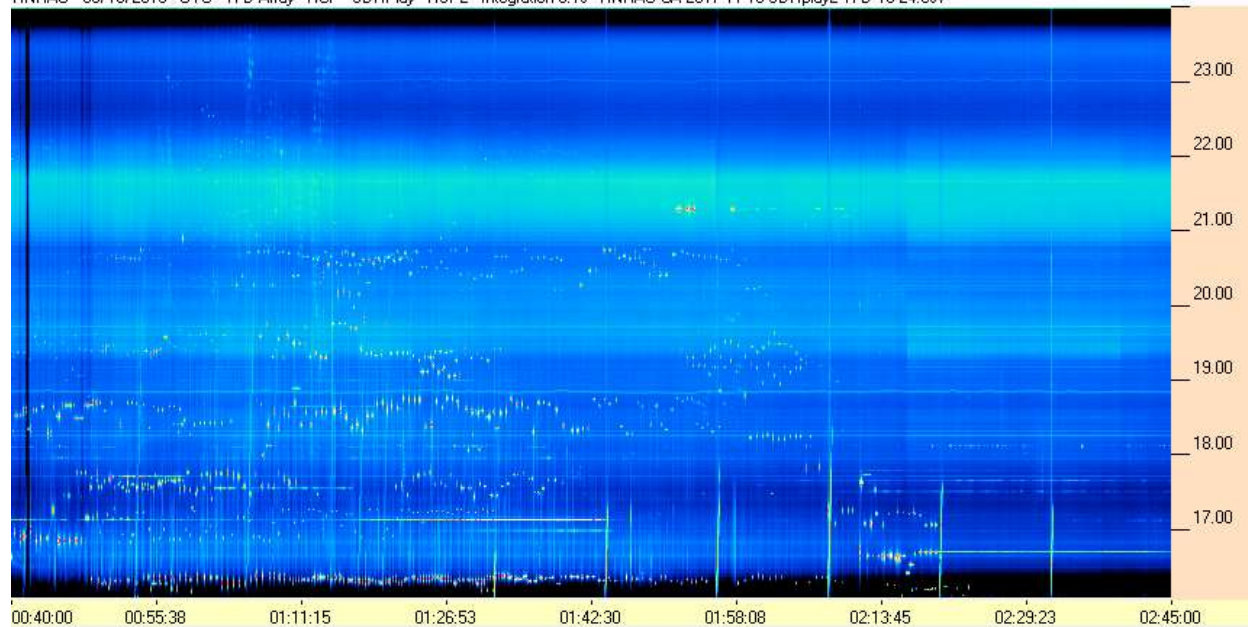
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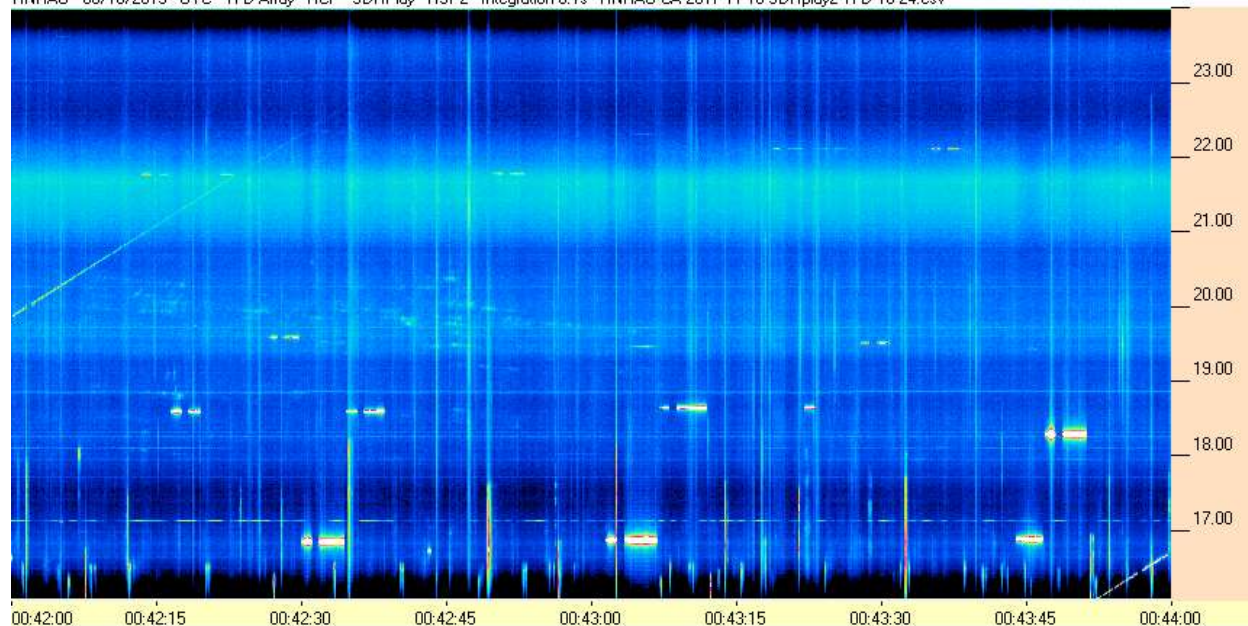


SDRPlay RSP2 / TFD Array

HNRAO - 08/16/2019 - UTC - TFD Array - RCP - SDRPlay - RSP2 - Integration 0.1s - HNRAO CA 2017 11 10 SDRplay2 TFD 16-24.csv



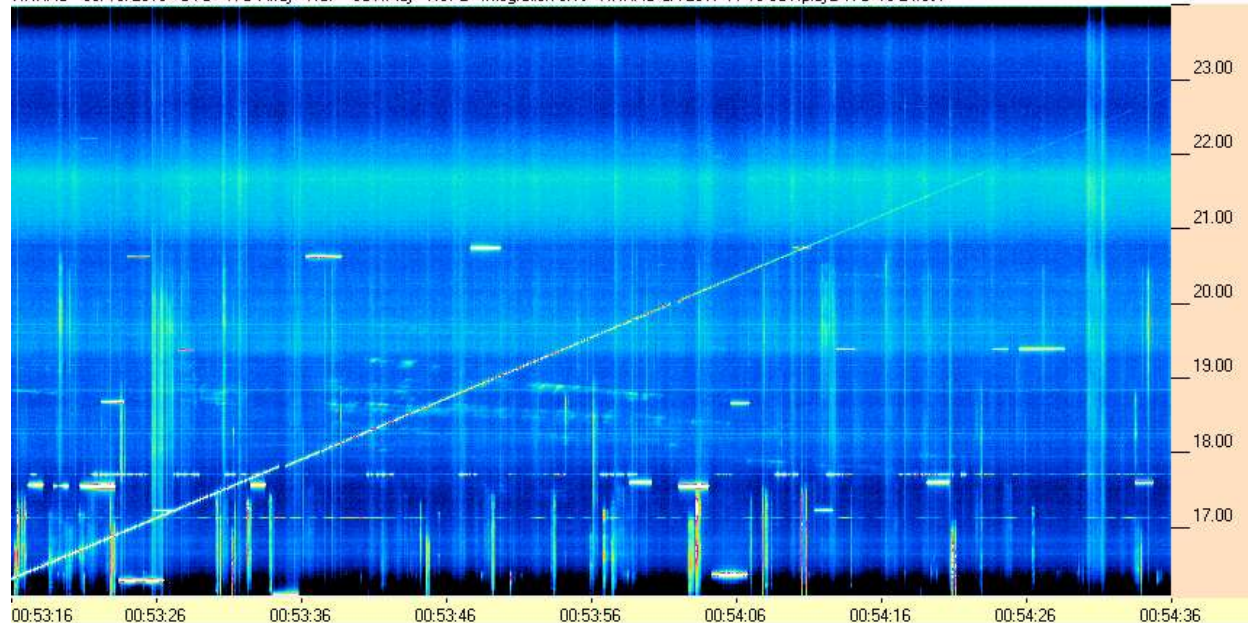
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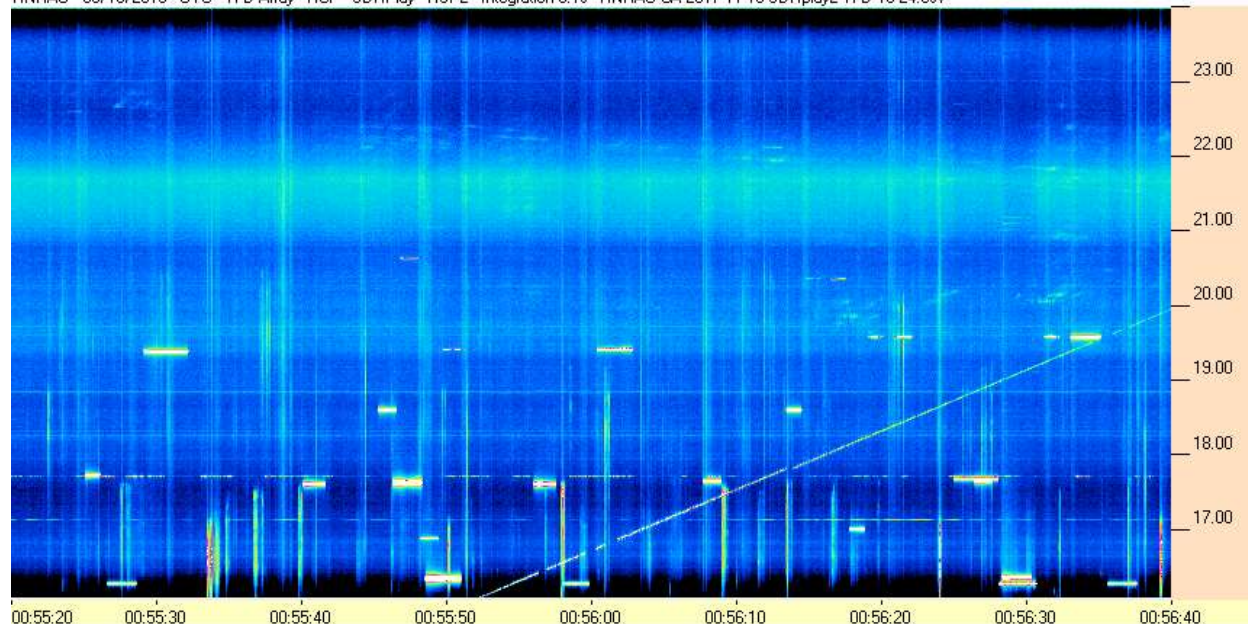
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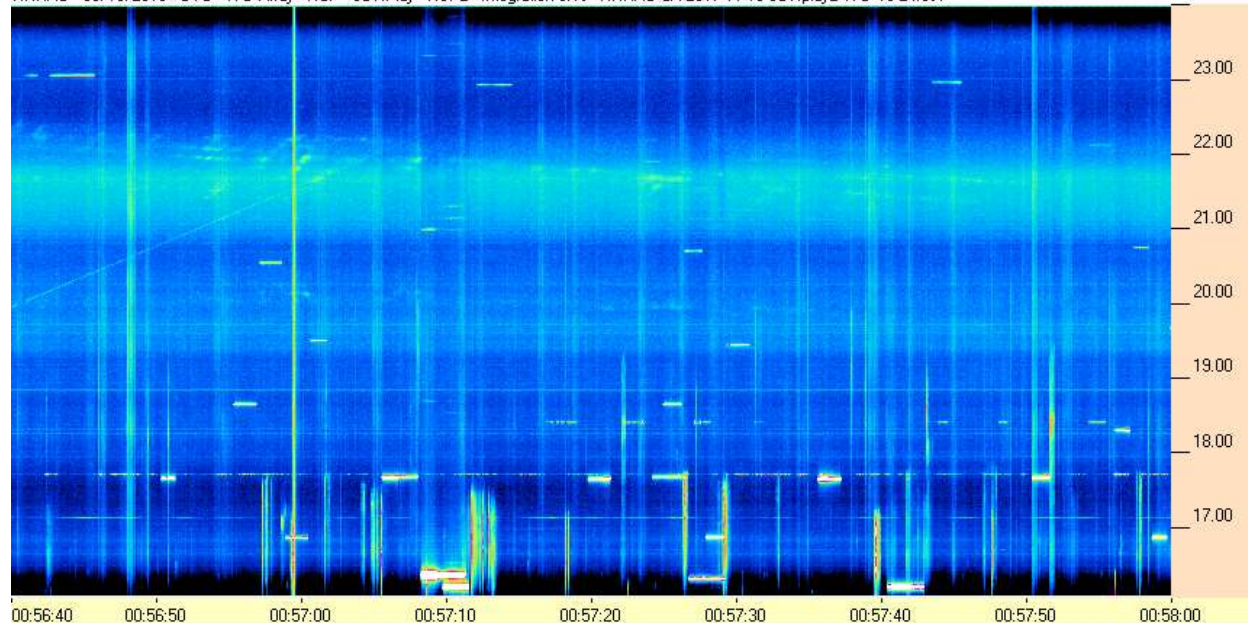
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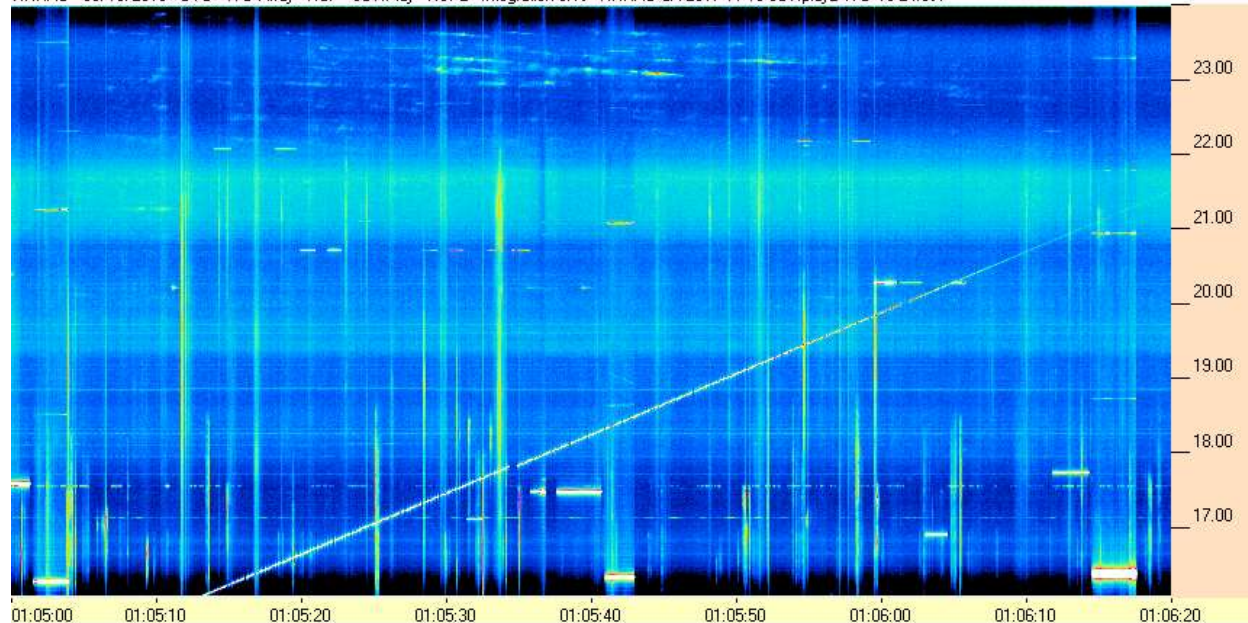
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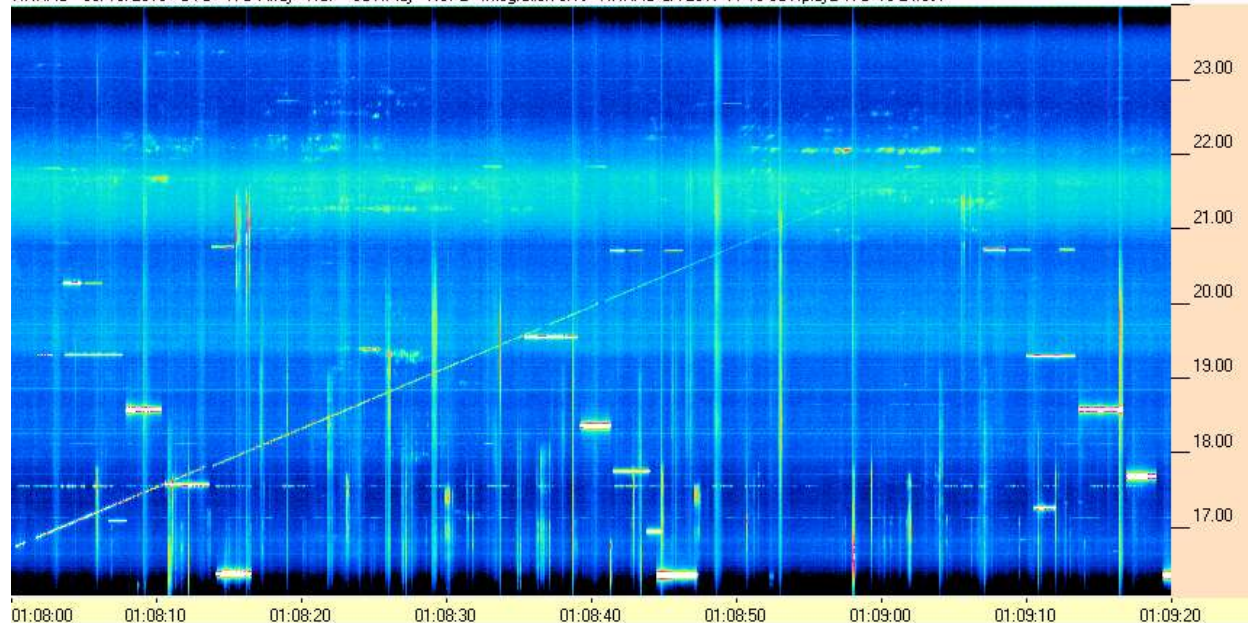
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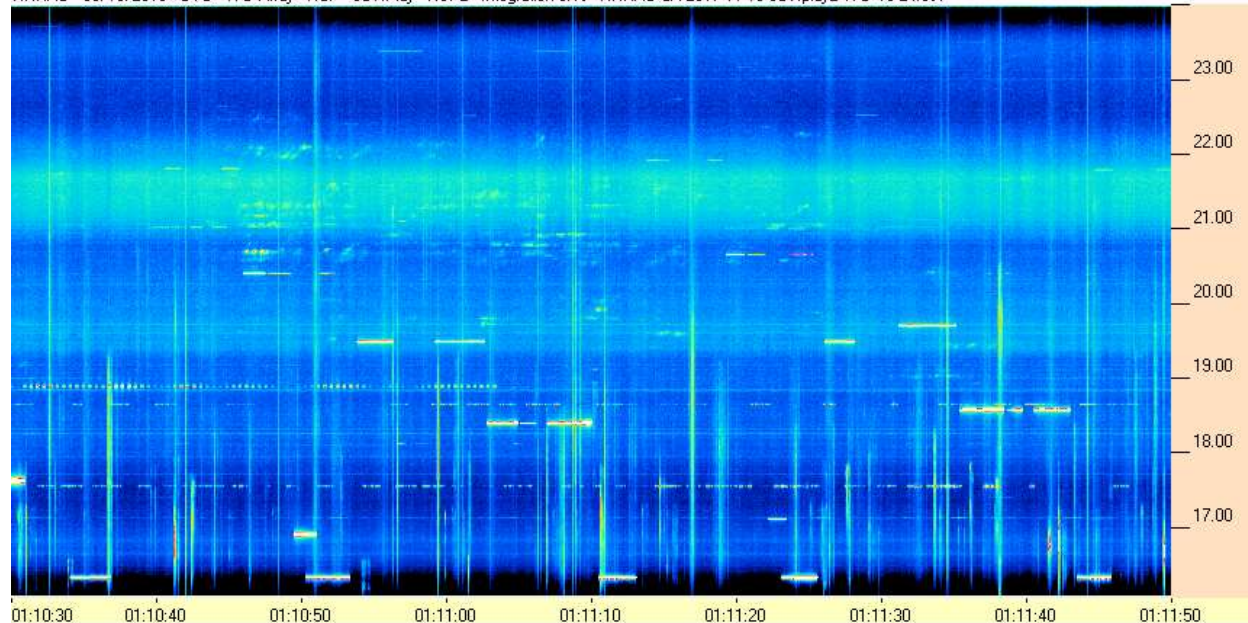
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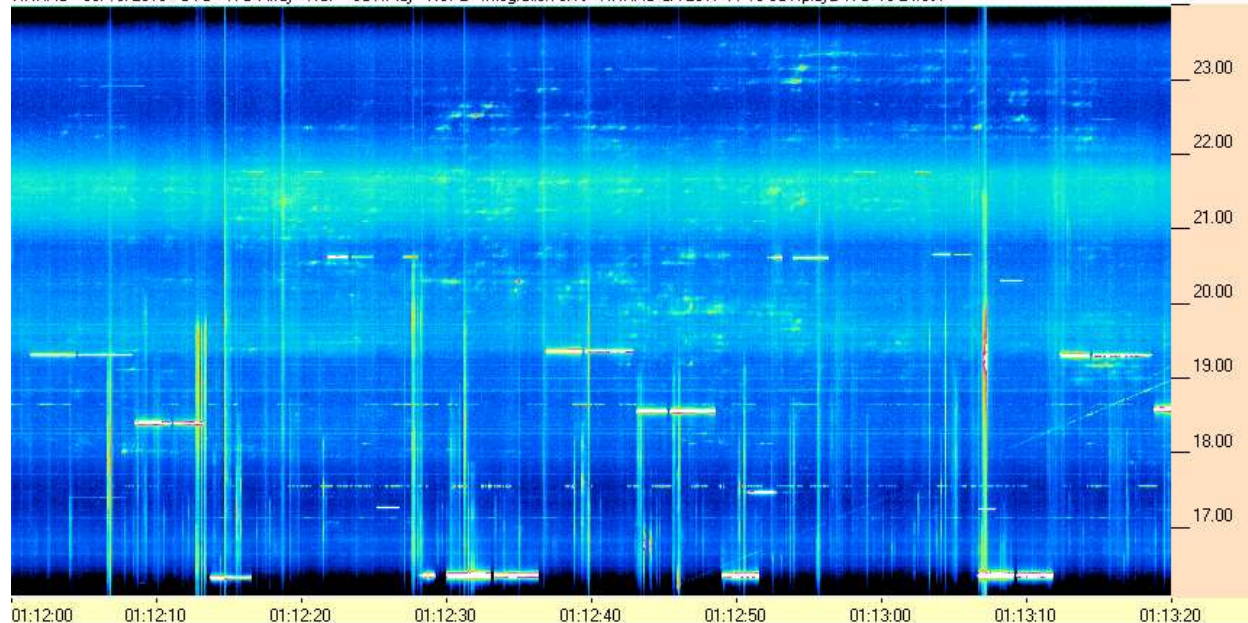
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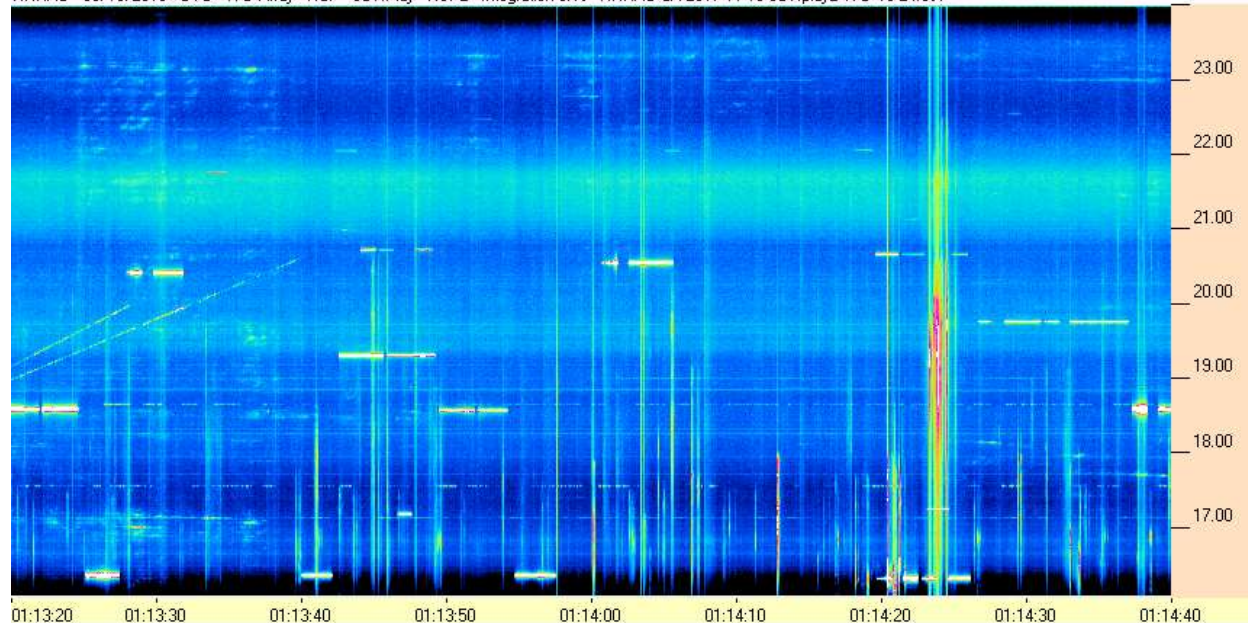
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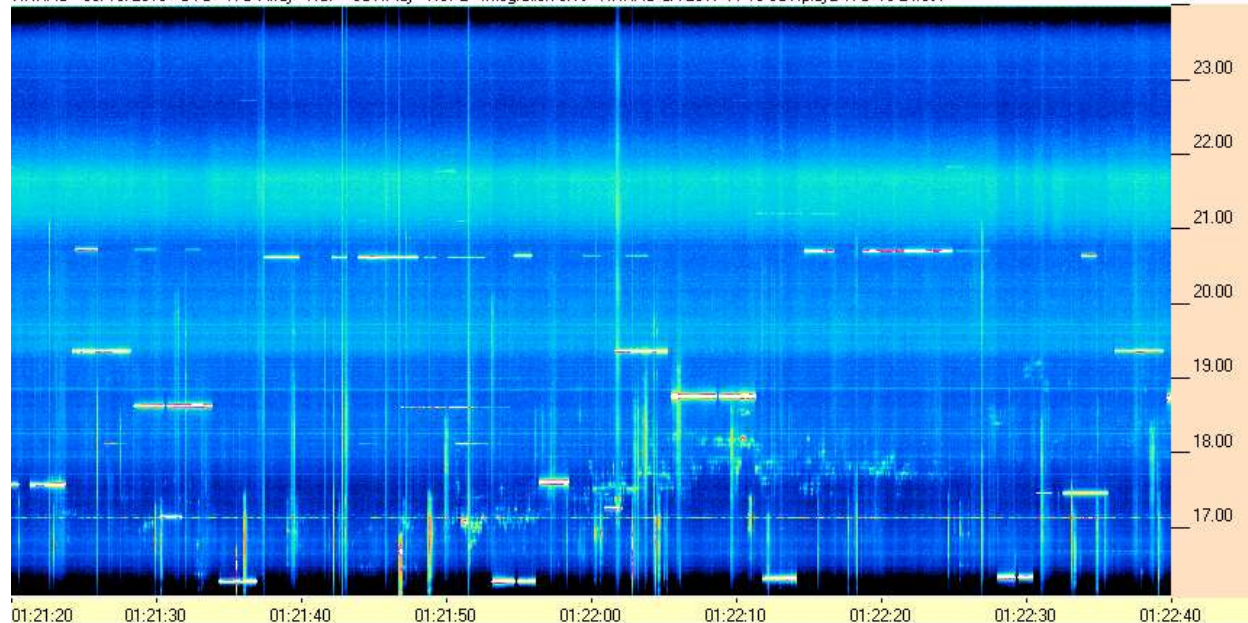
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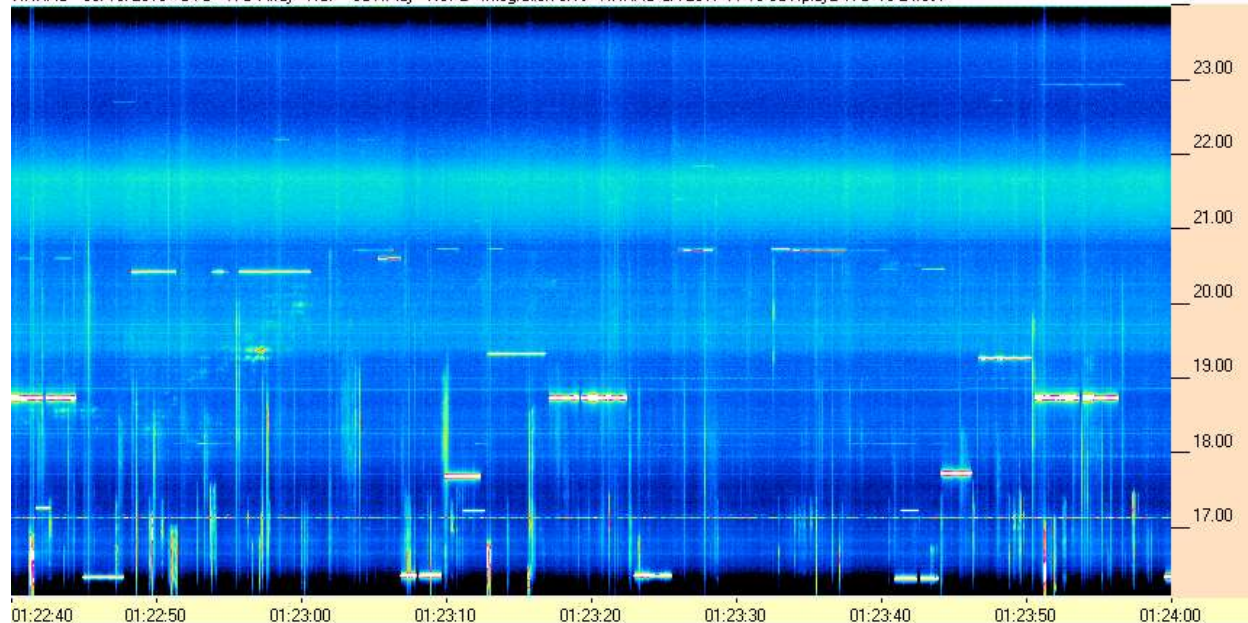
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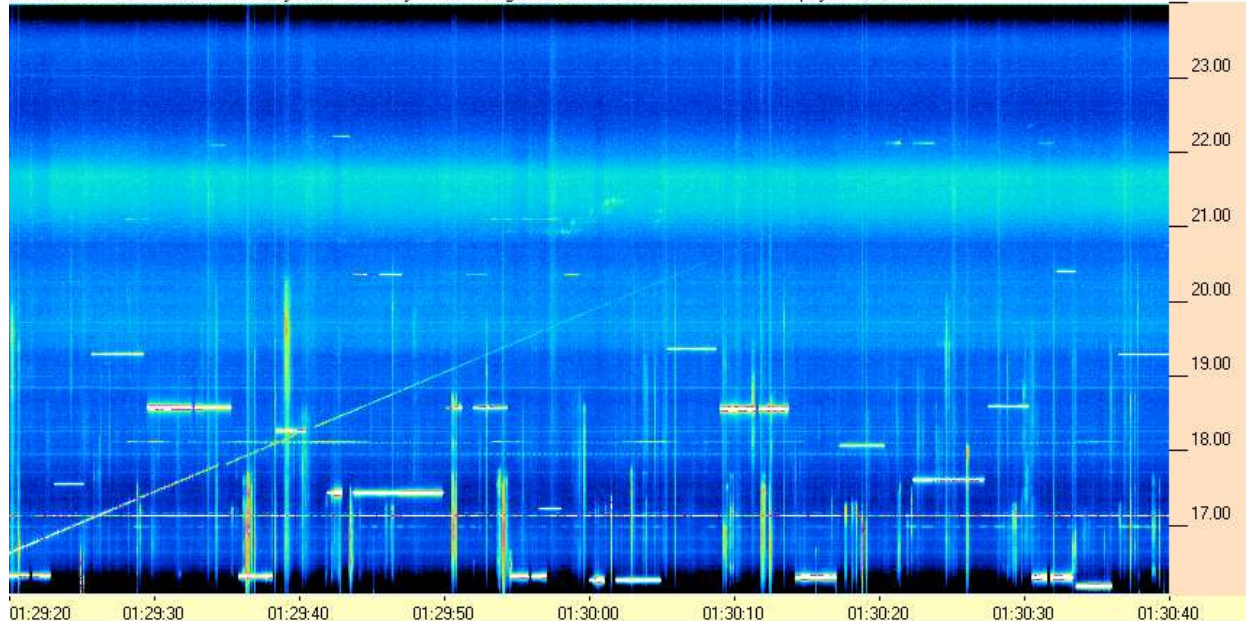
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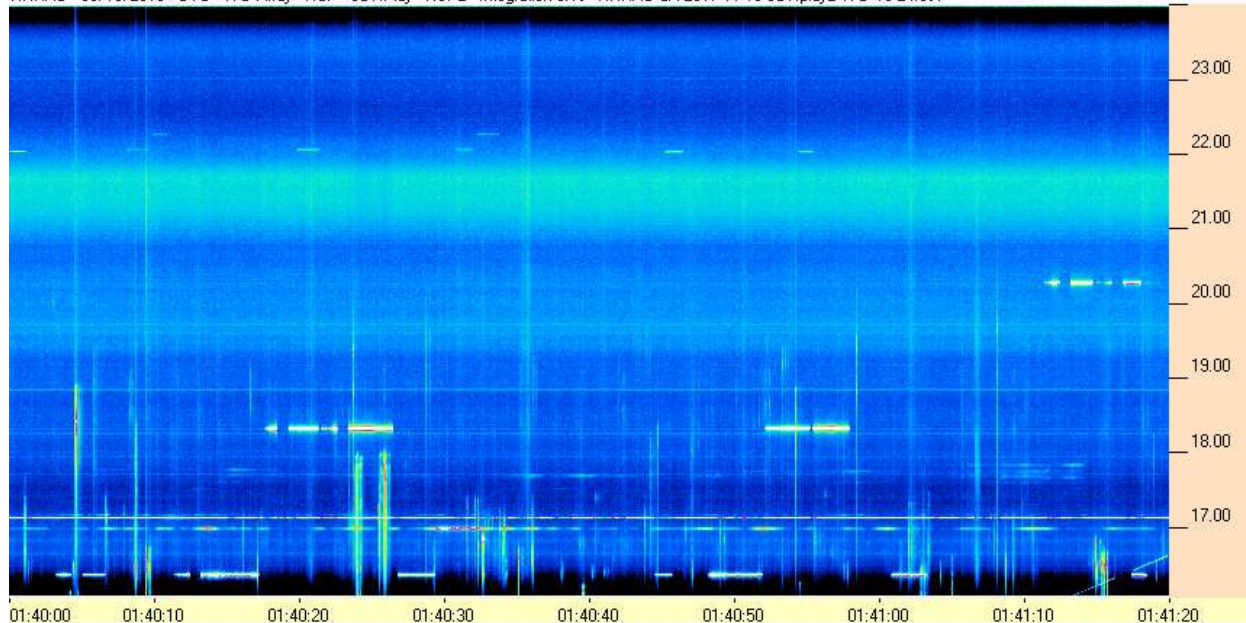
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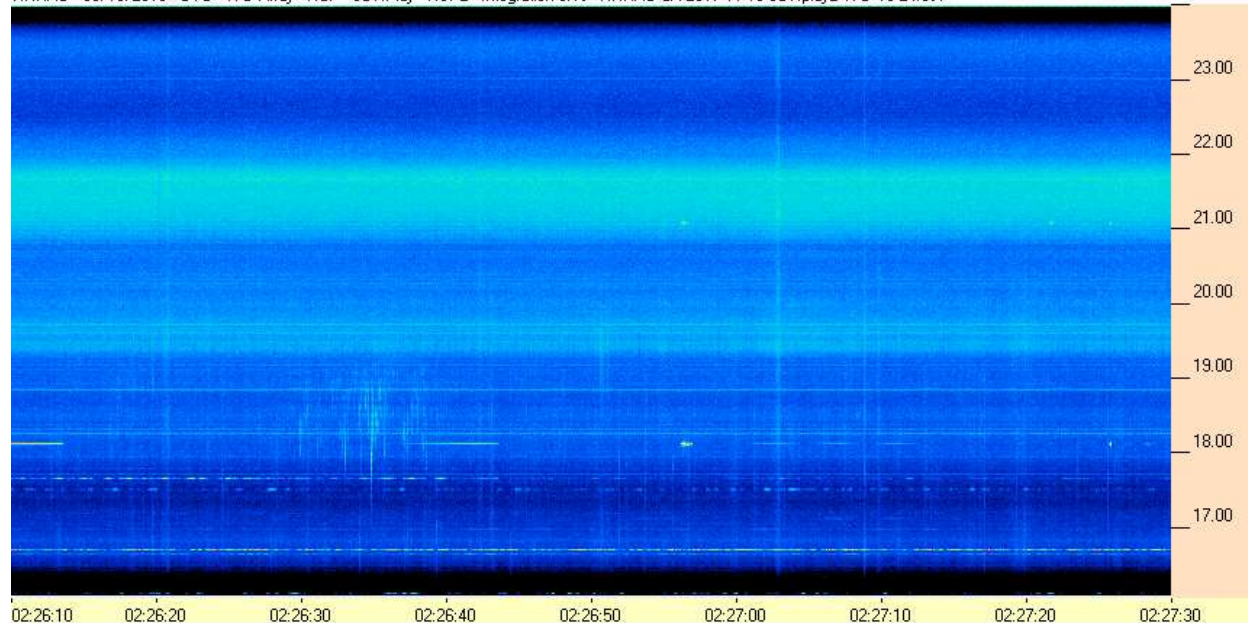
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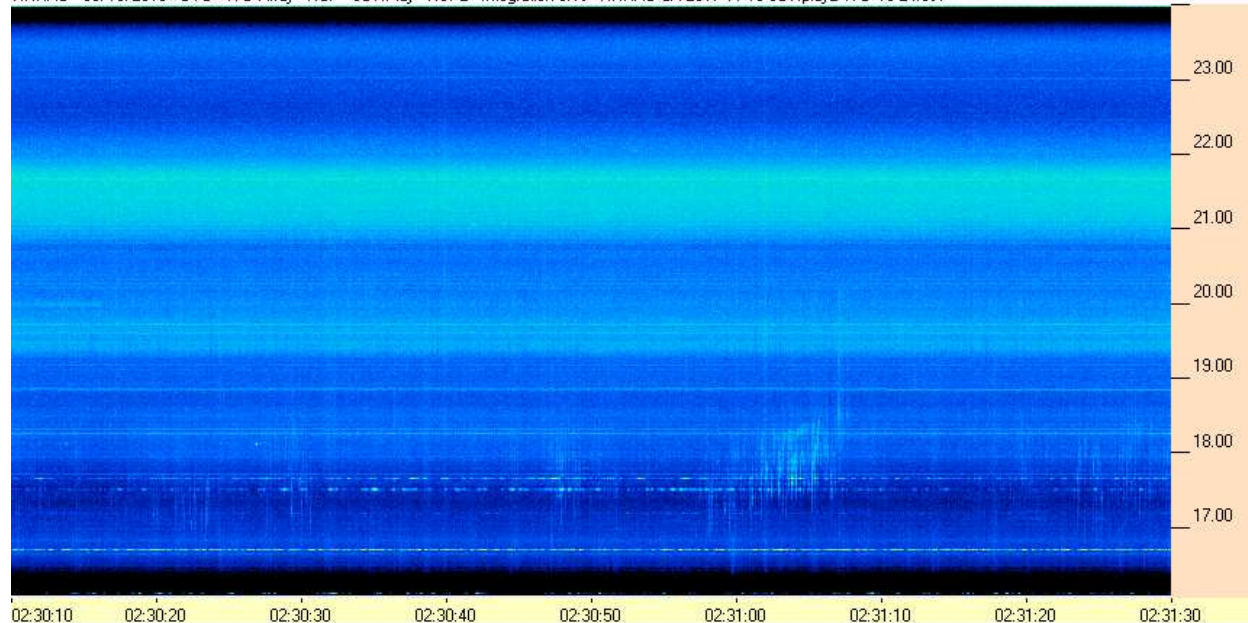
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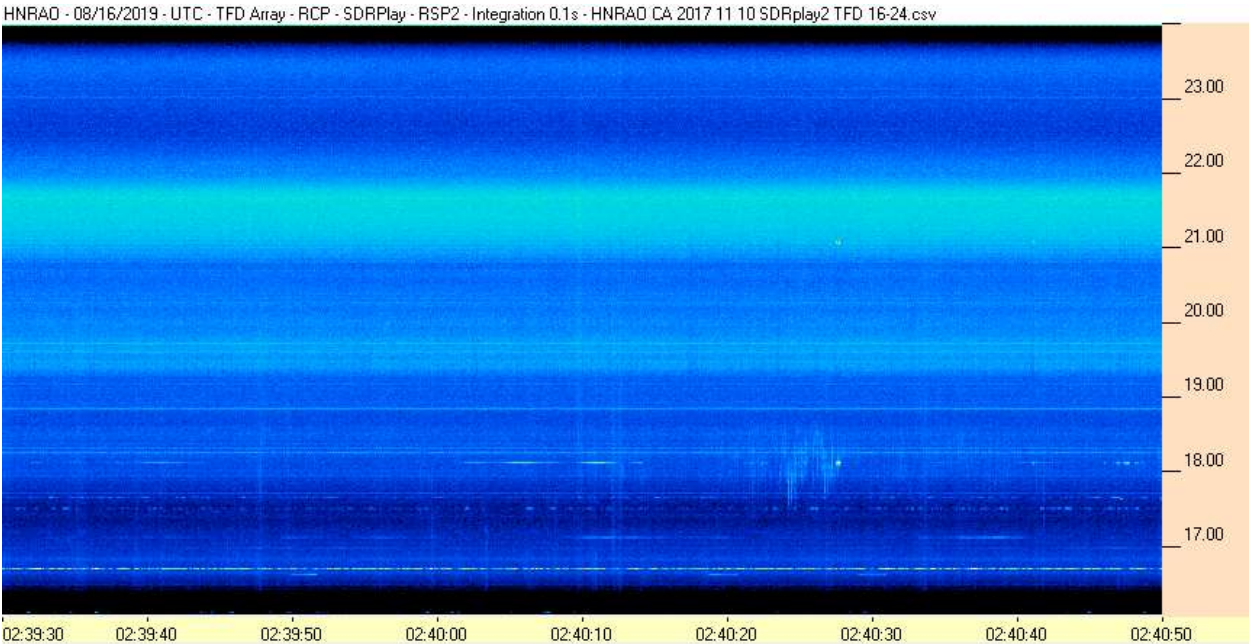
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JOVE II / JOVE Dipole Array

