HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

Date: March 14, 2020

Object: Jupiter Io-C

Observer: Unattended

Start - Time UT:	**1413:52**	**Planetary K-index:**	**1**
Jupiter Altitude (deg):	**26.5**	**Jupiter Azimuth (deg):**	**193.0**
Jupiter CML:	**278.95**	**Jupiter Io Phase:**	**240.28**
Jupiter RA (hr/min):	**19:33**	**Jupiter Dec (hr/min):**	**-21:46**
Hour Angle (hr/min):	**00:50**	**Polarization**	**LCP**
Sun Altitude (deg):	**28.6**	**Sun Azimuth (deg):**	**123.1**
Sun RA (hr/min):	**23:33**	**Sun Dec (hr/min):**	**-02:58**

End – Time UT:	**1610**		
Jupiter Altitude (deg):	**16.5**	**Jupiter Azimuth (deg):**	**220.0**
Jupiter CML:	**349.15**	**Jupiter Io Phase**	**256.55**
Hour Angle (hr/min):	**02:46**	**Duration (min):**	**124**
Sun Altitude (deg):	**43.3**	**Sun Azimuth (deg):**	**154.3**
Max Frequency MHz	**23**	**Min Frequency MHz**	**16**
J/S Angular Separation	**060.6**	**De:**	**-1.6**

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	3/12/2020

Radio JOVE dipoles phased @ 32 degrees for 2020-2021 season
Typinski AN-TFD-24-4 array phased @ 35 degrees for 2020-2021 season
Four LWA antenna array phased @ 35 degrees and orientation for observation: 45 degrees
Radio Sky Spectrograph software version 2.9.30
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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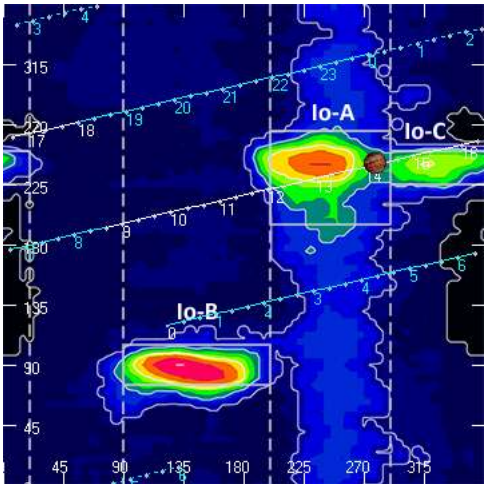
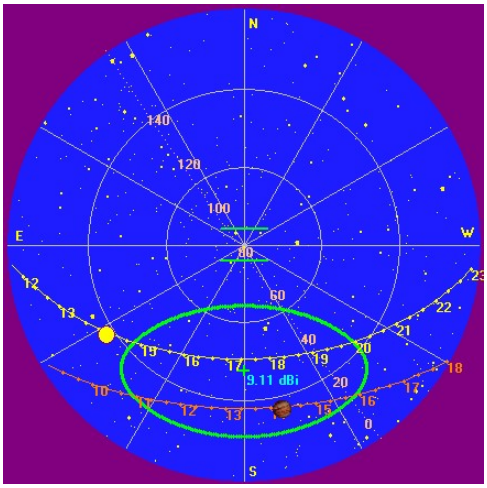
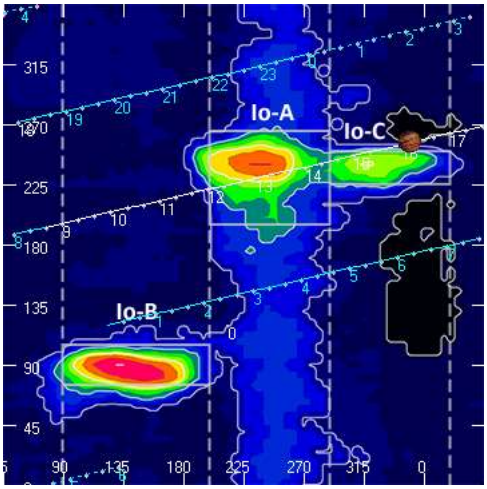
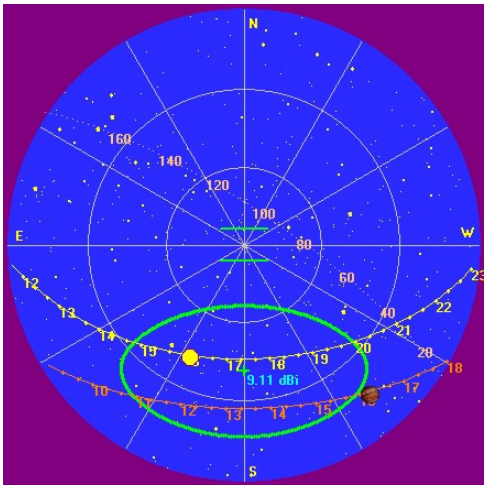


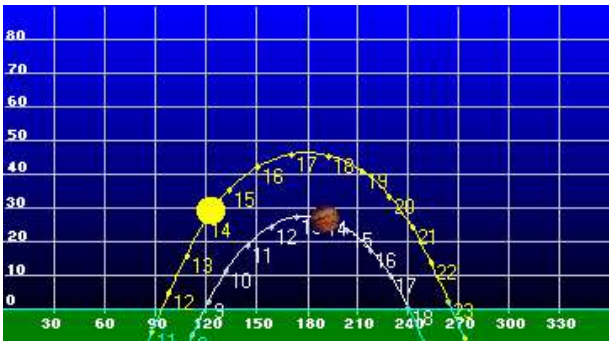


Beginning of Pass





End of Pass



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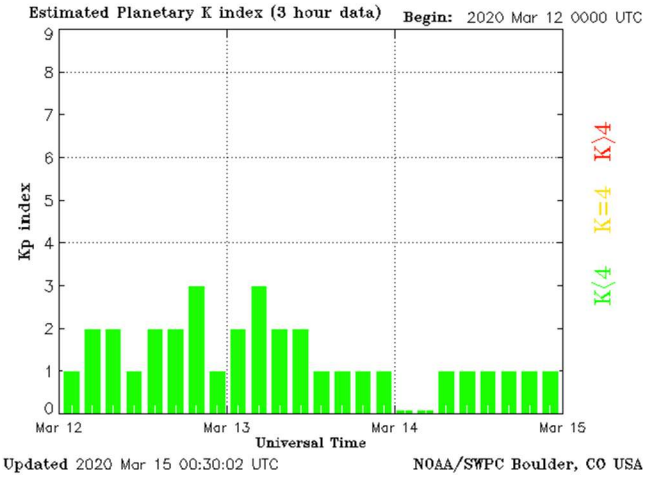

MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360	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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Weather at observatory:

Clear. High of 44 deg F at time of observation.

Status of observatory equipment:

All equipment functioning normally. RFI prevented any useable data from the Radio JOVE telescope.

RFI:

RFI is evident in the spectrographs. Strong foreign broadcast stations as bright horizontal lines, primarily from 18 MHz and down past 16 MHz. Bright horizontal bands centered at 19.5 MHz is possibly from a heat pump in proximity to the antennas, but remains unknown as to the source.

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First observed sign of LCP L-burst emissions were at 1414 UT between 16 MHz and 17 MHz. Negative slope modulation lanes were clearly visible at 1414 UT.

While emissions reached as high as 23 MHz, emissions were primarily between 16 MHz and 18 MHz. Negative slope modulation lanes were visible through nearly the entire storm. The storm was comprised of L-bursts, but there were several instances that might have been small clusters of S-bursts based on the singular intensity of the group such as at 1414 UT.

Emission intensity ranged from slightly above GB to (estimation) +6 dB above GB.

Nothing else of note.

EOR

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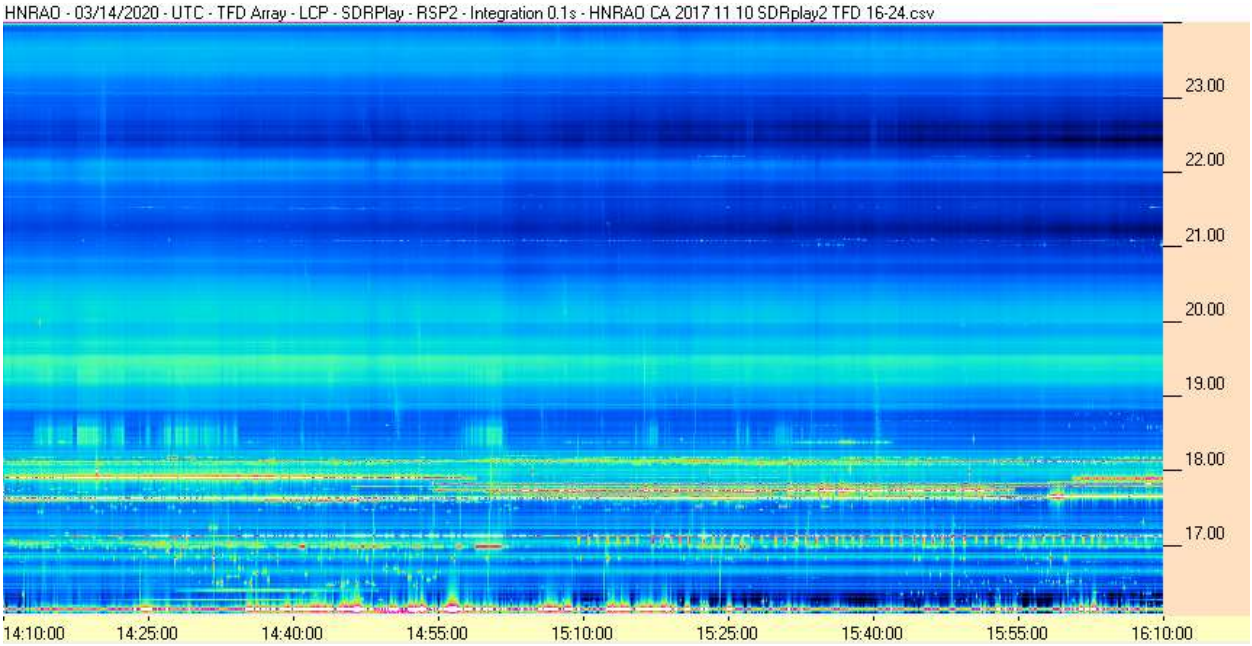
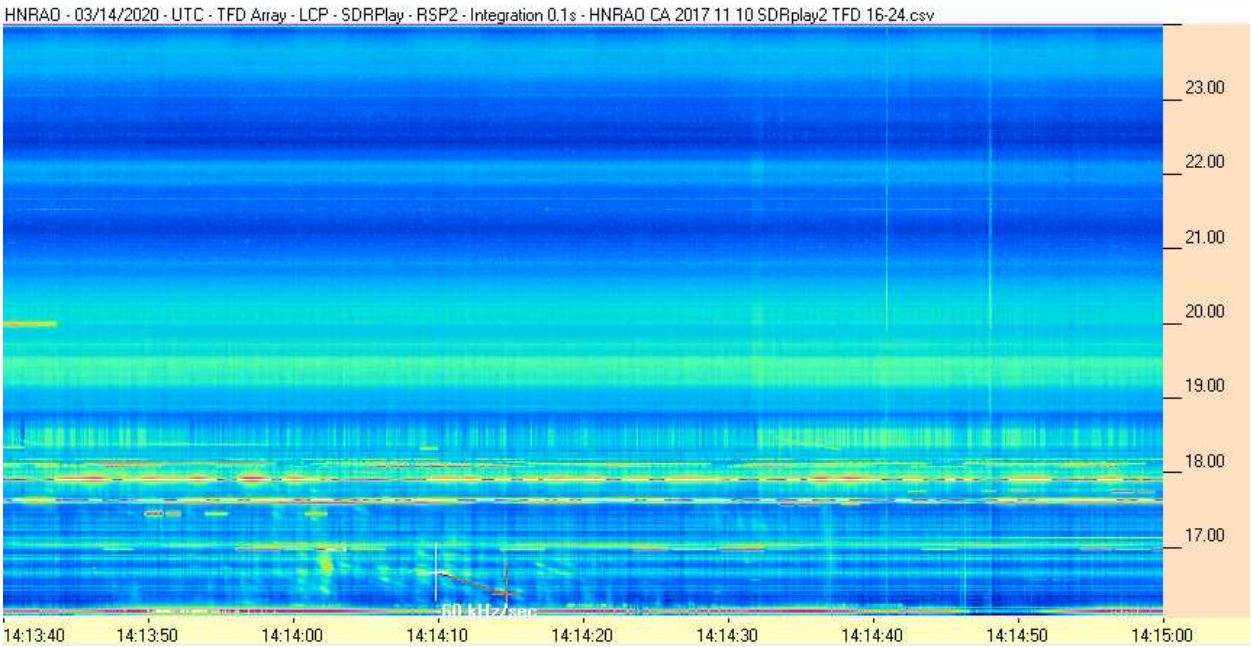
SDRPlay RSP2 / TFD Array





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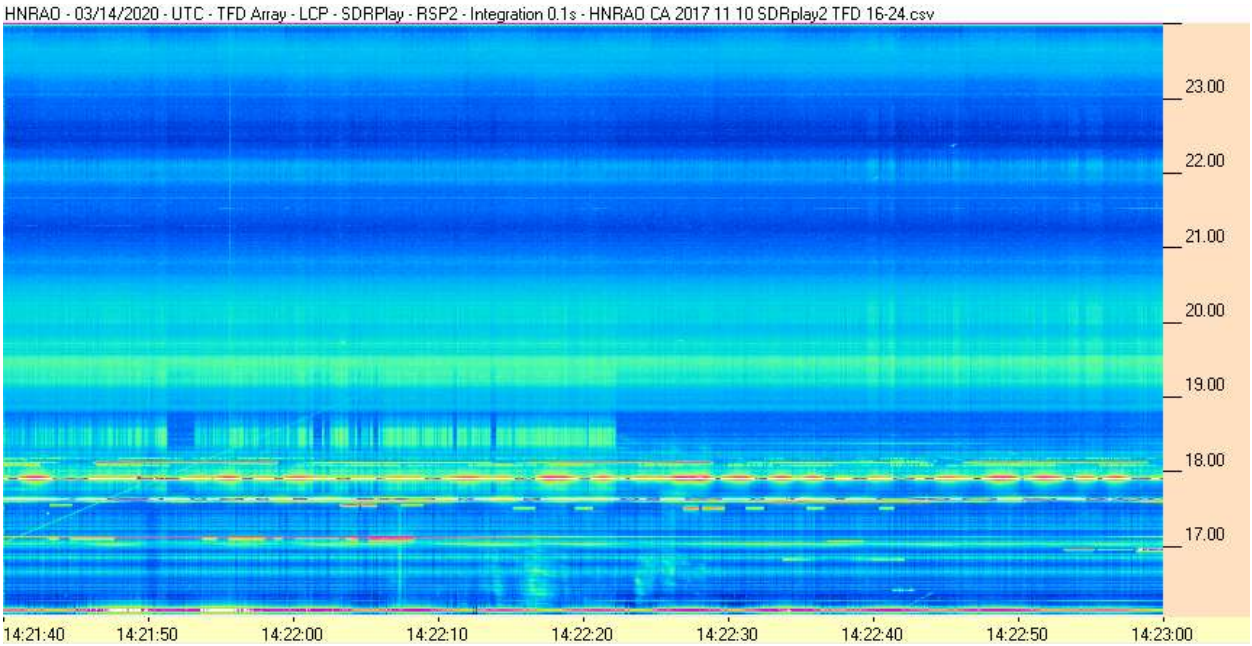
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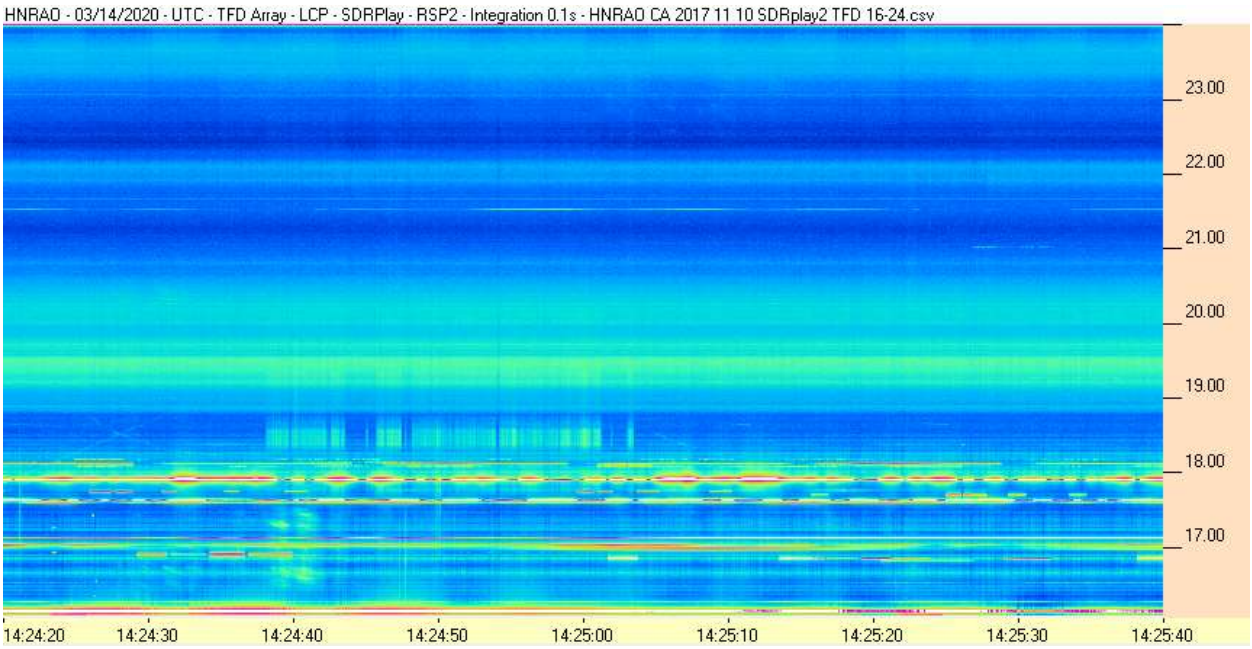
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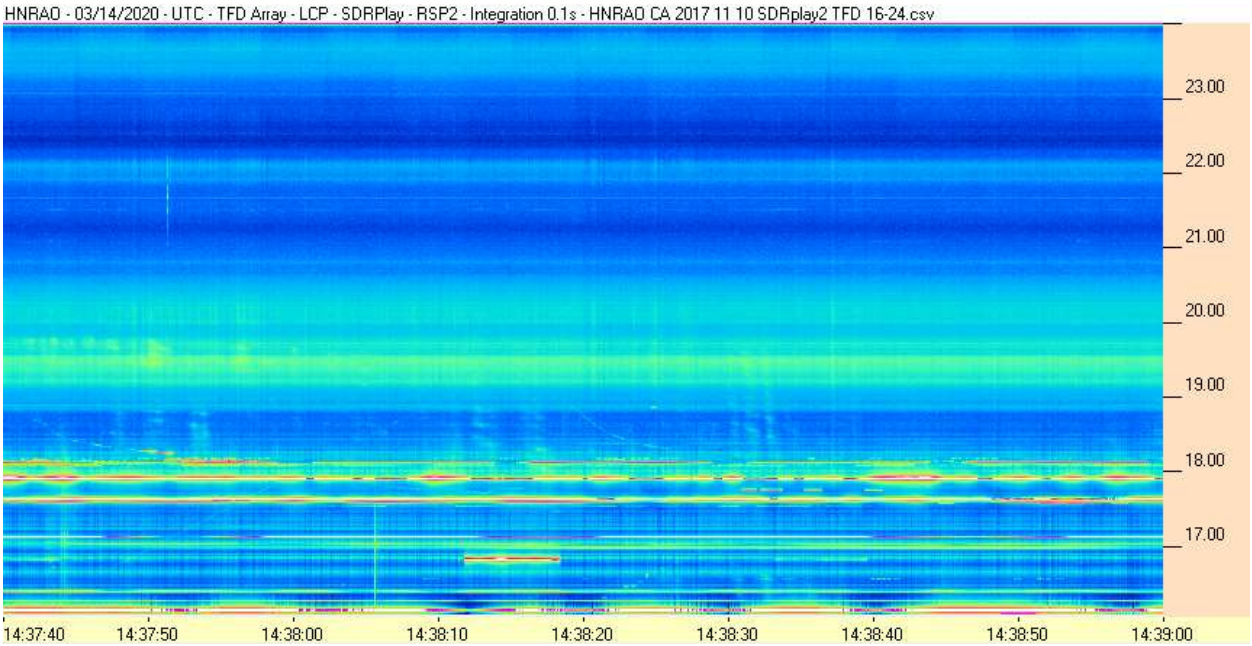
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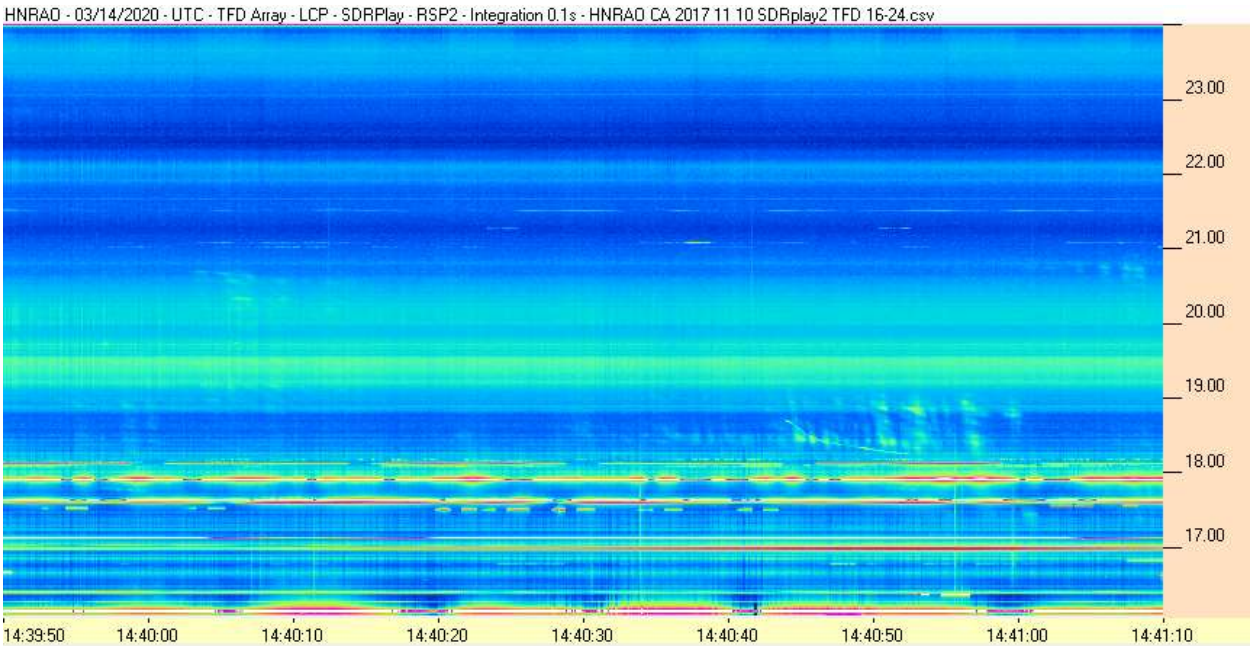
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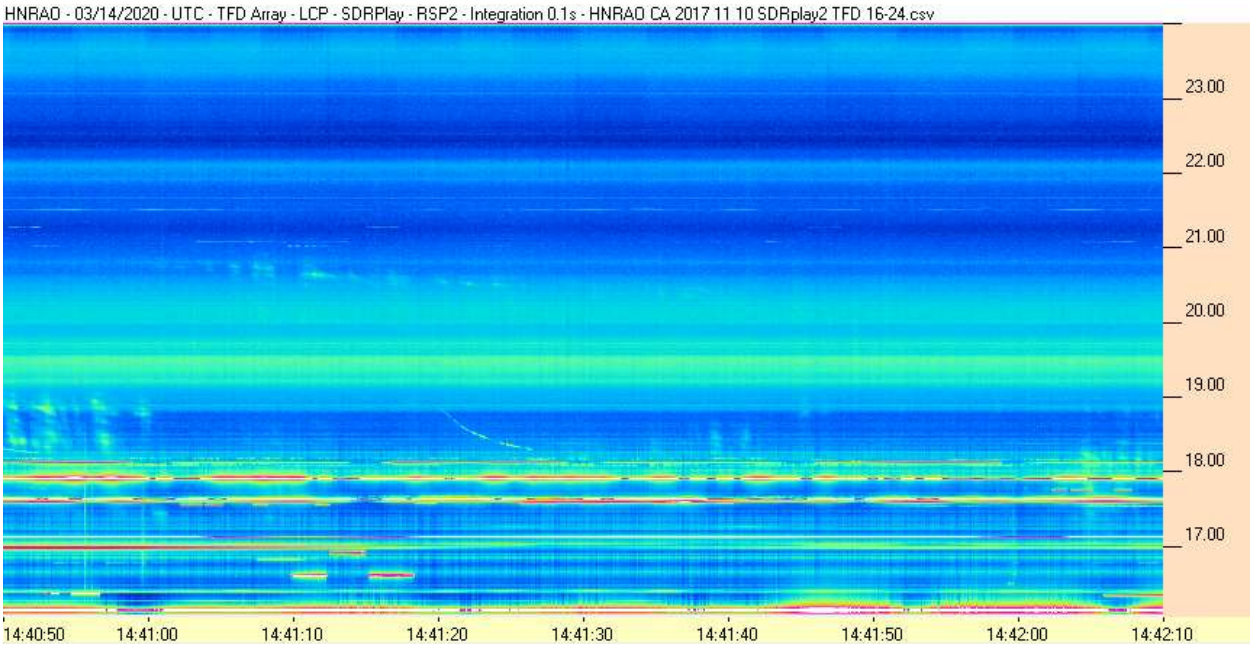
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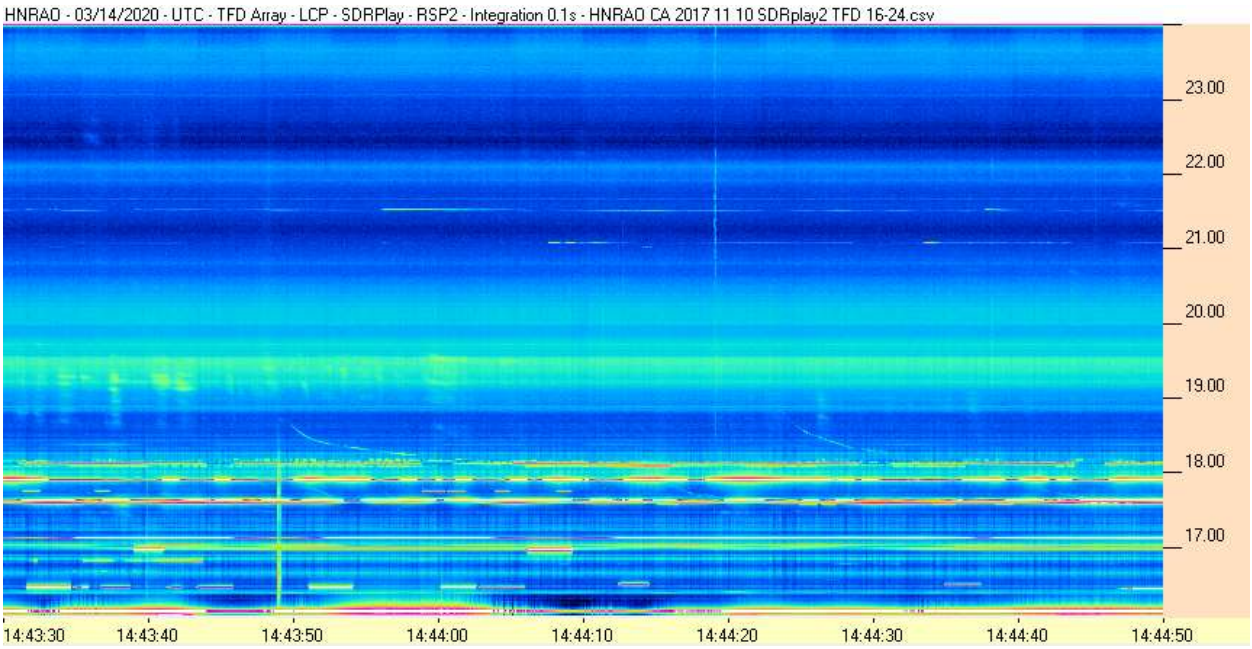
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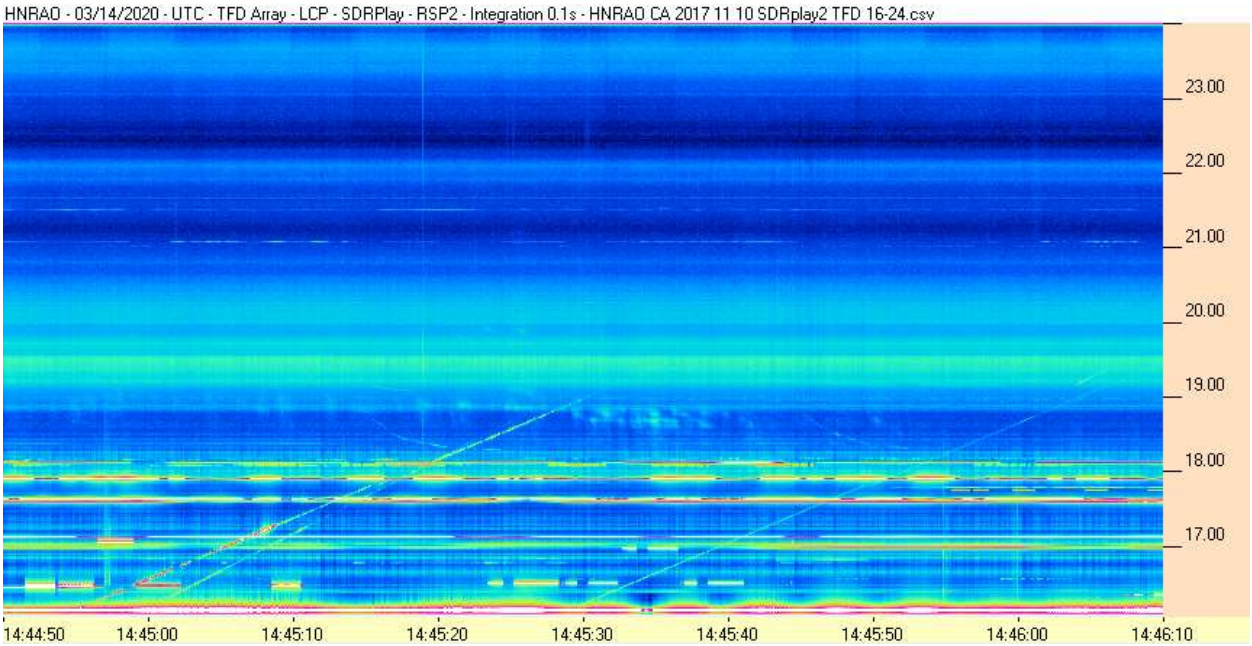
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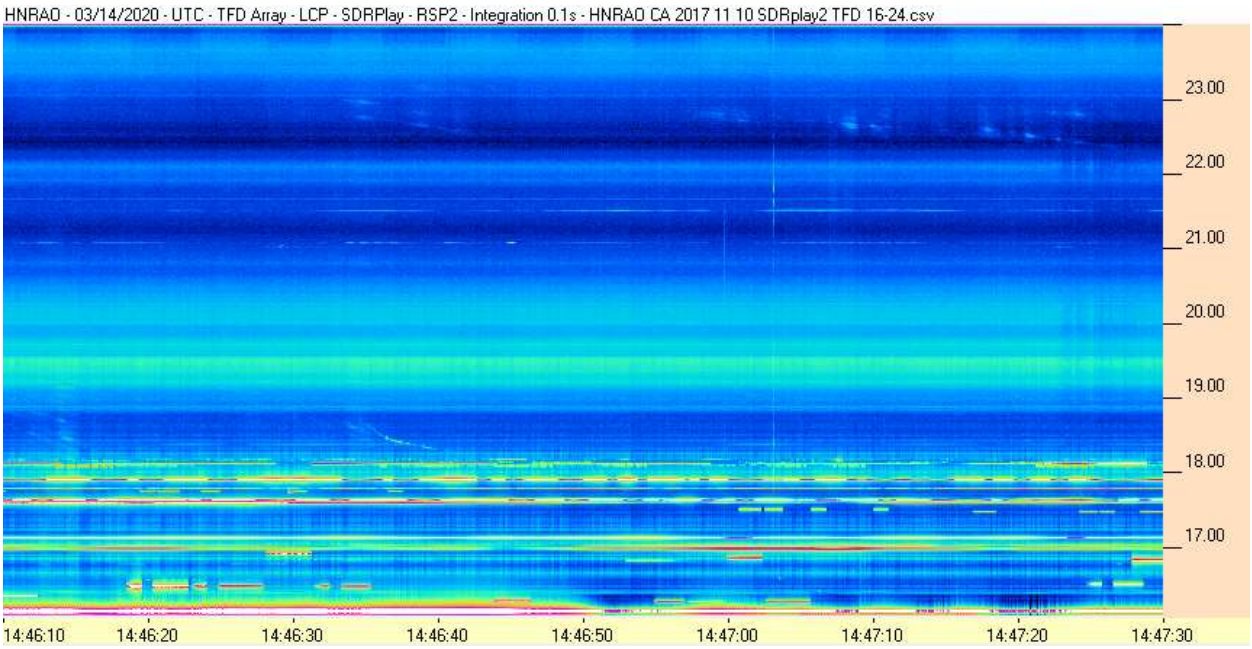
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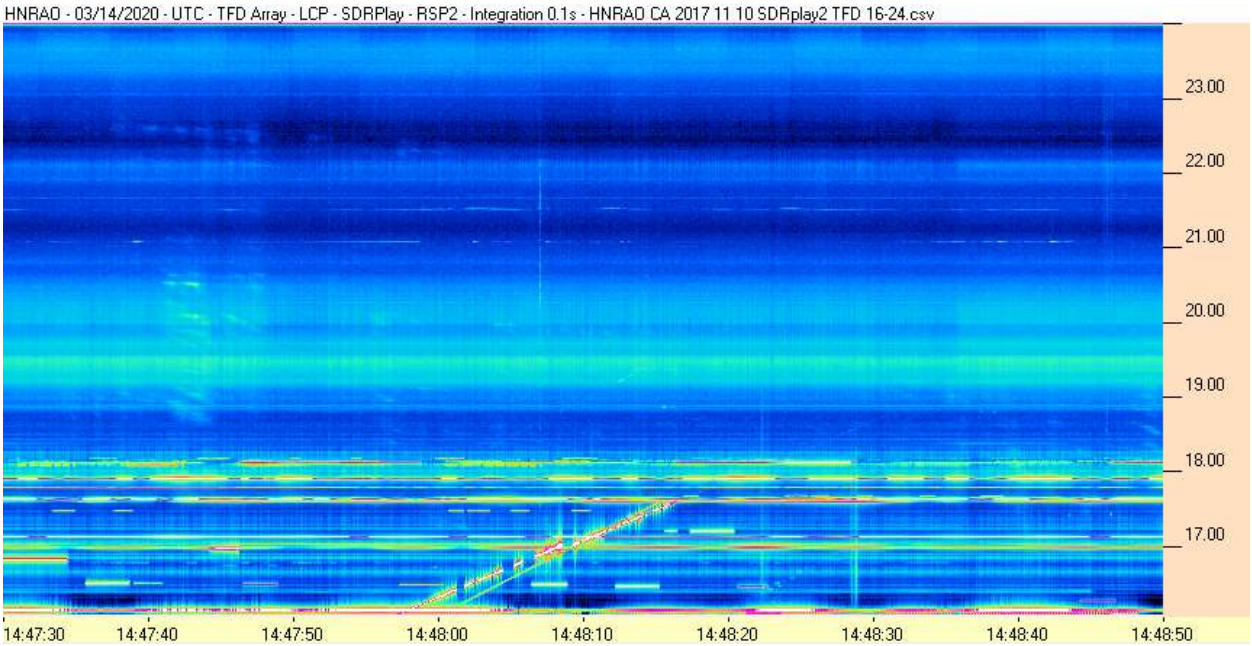
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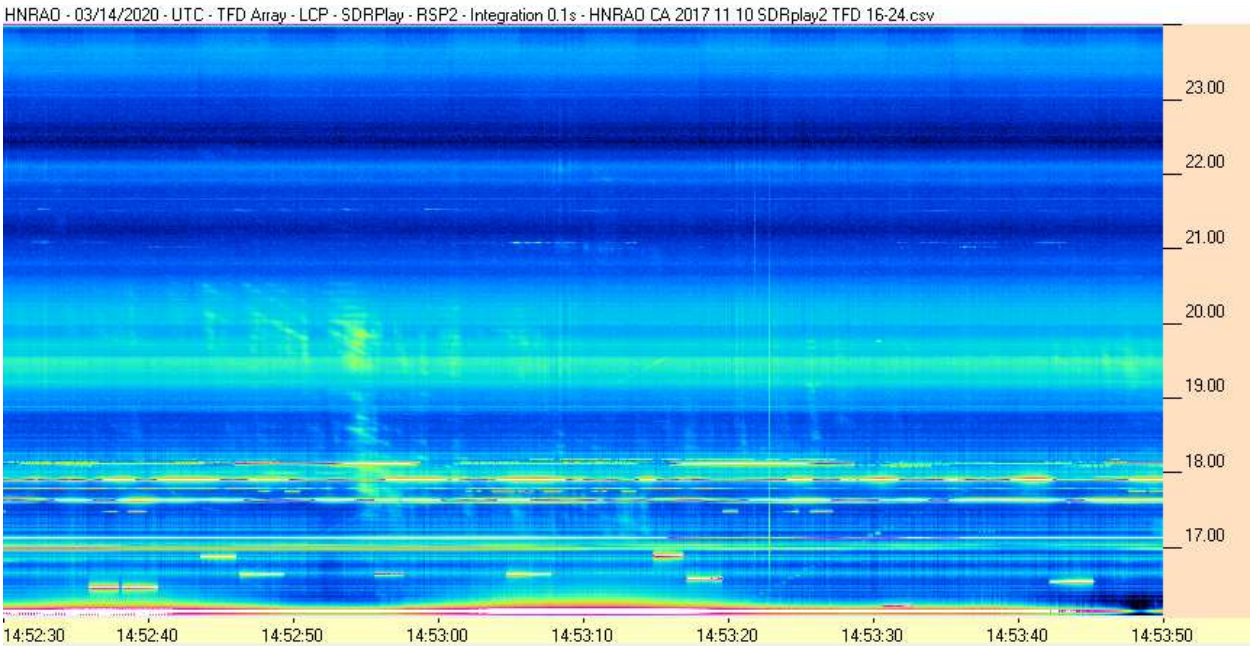
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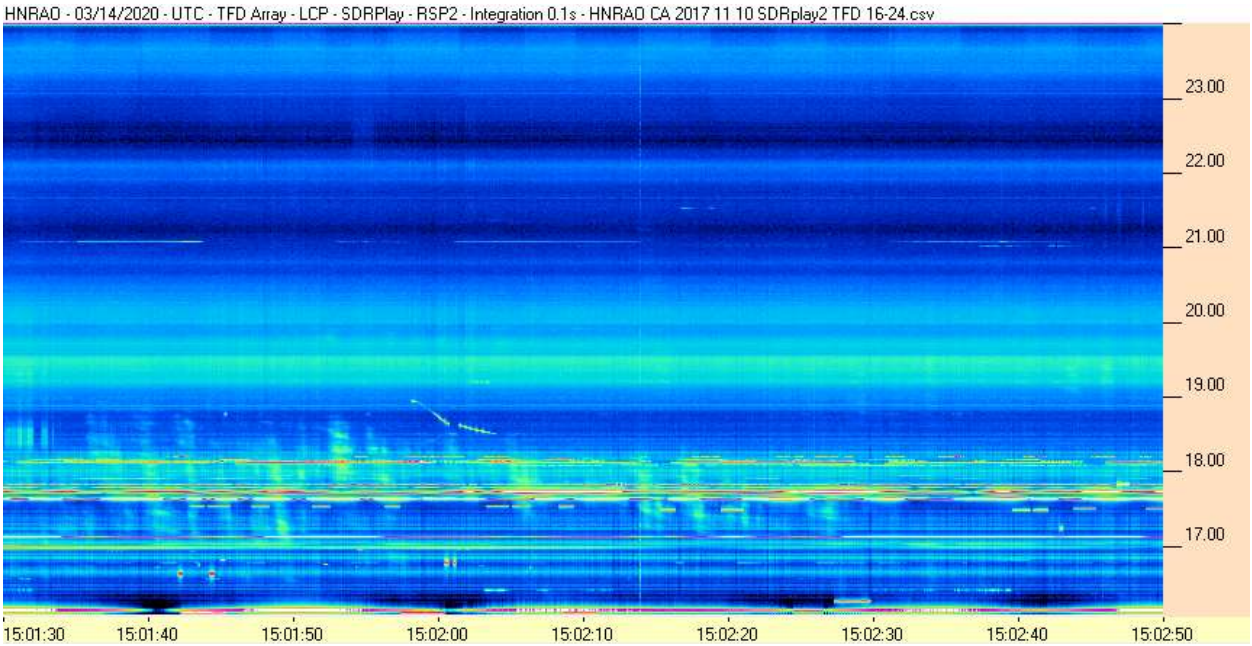
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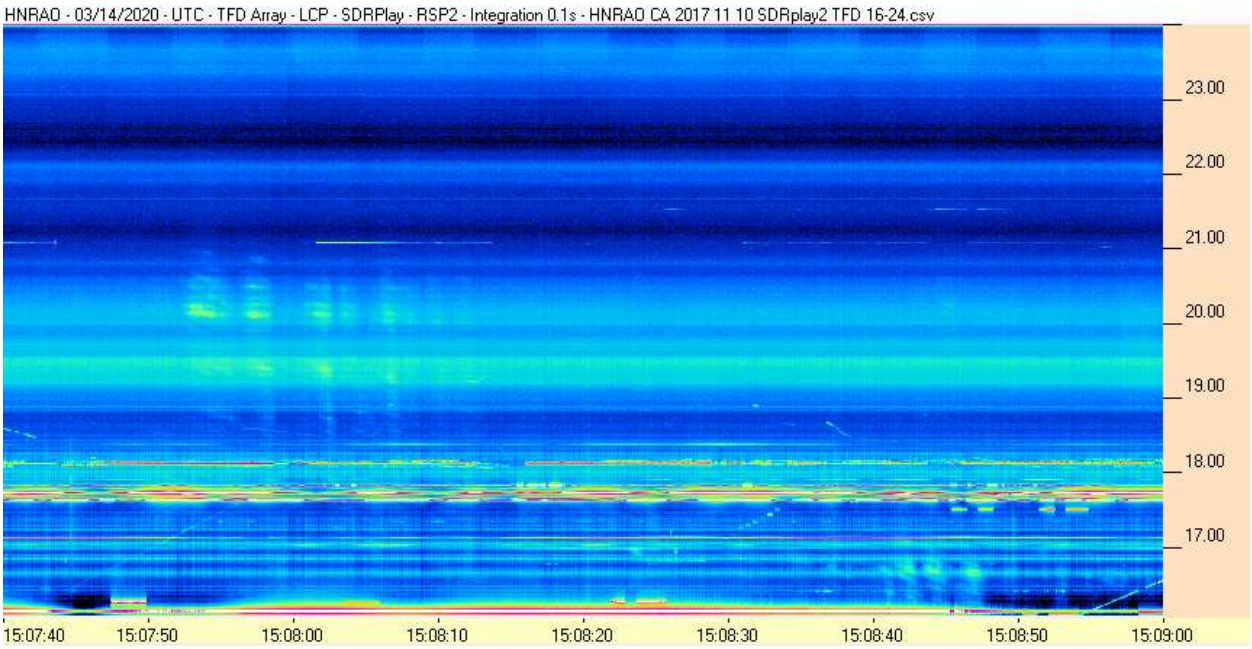
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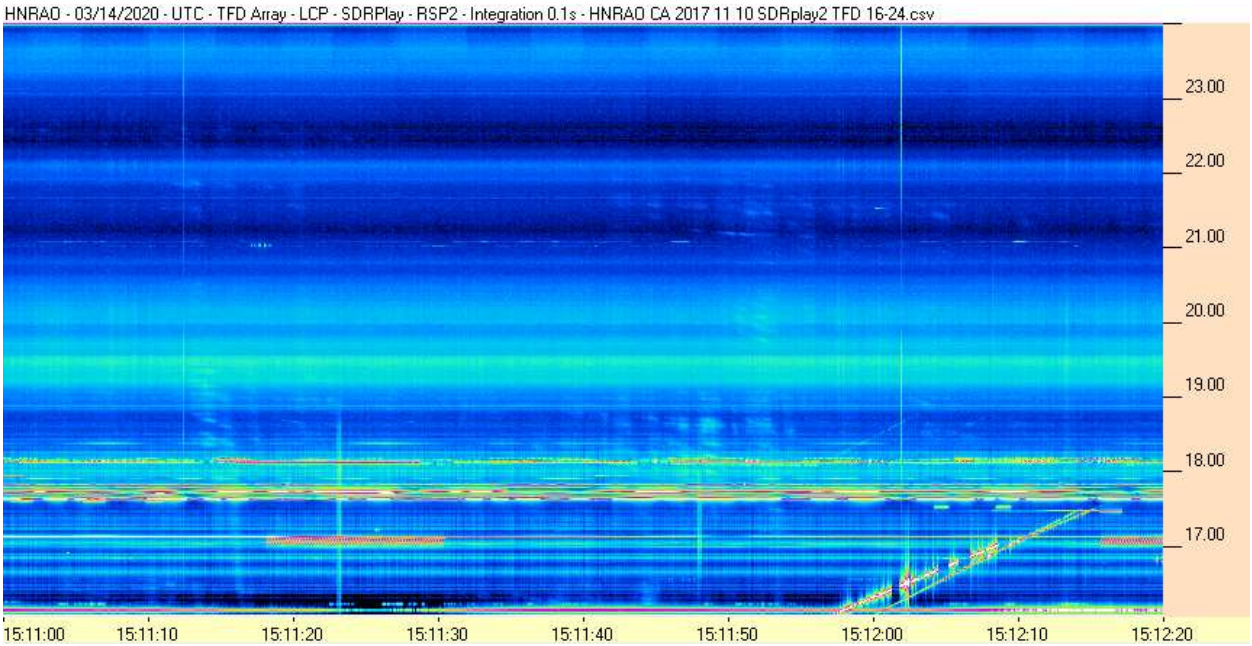
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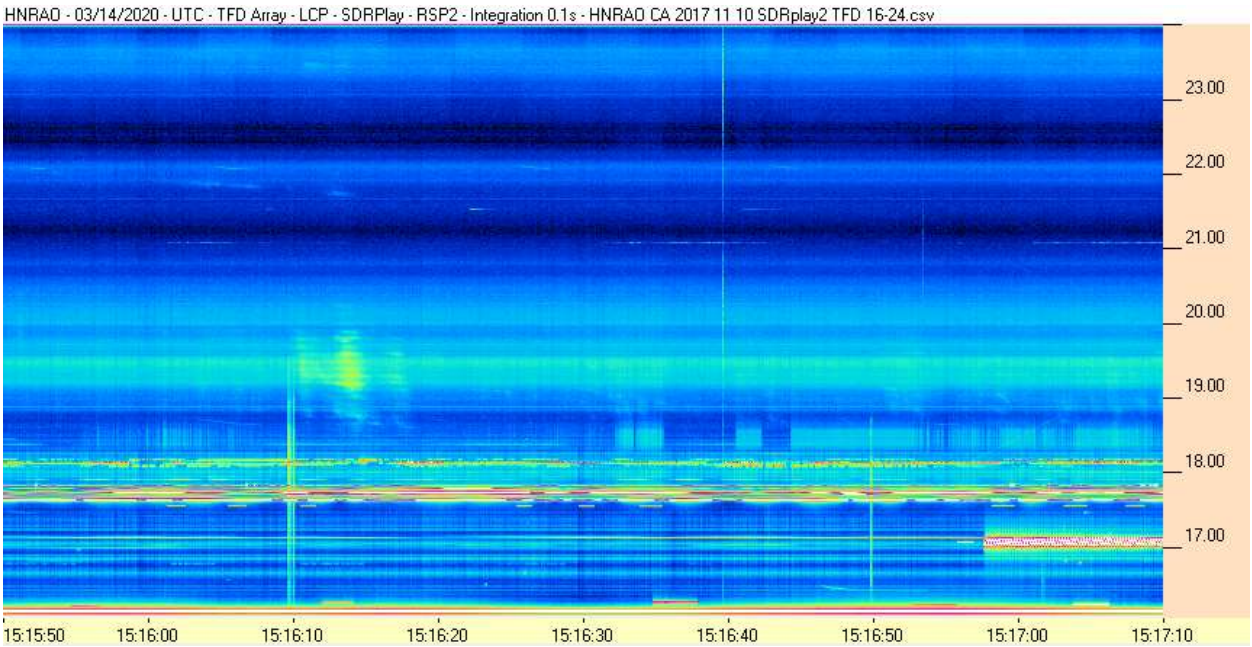
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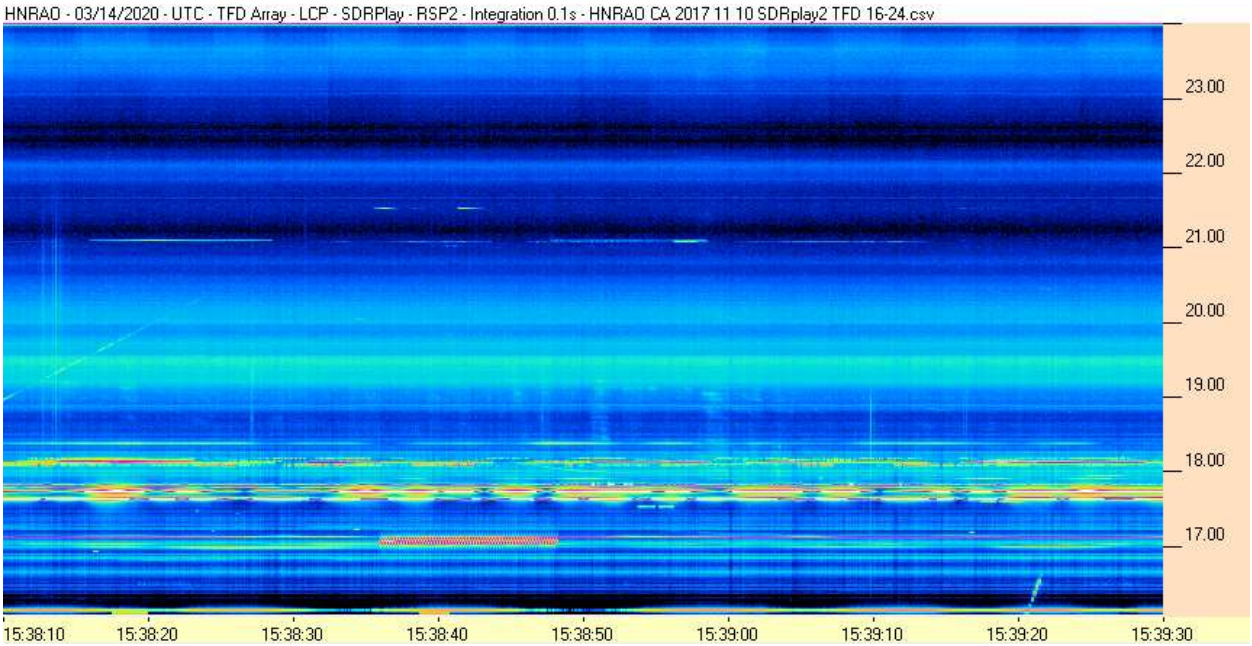
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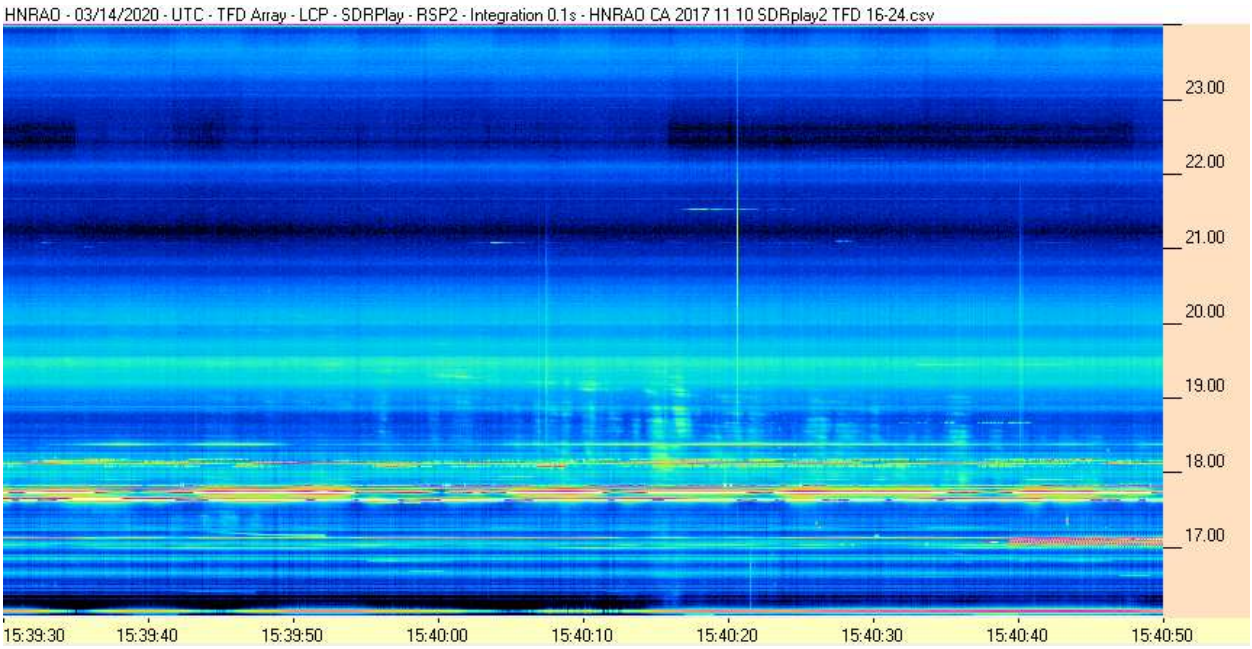
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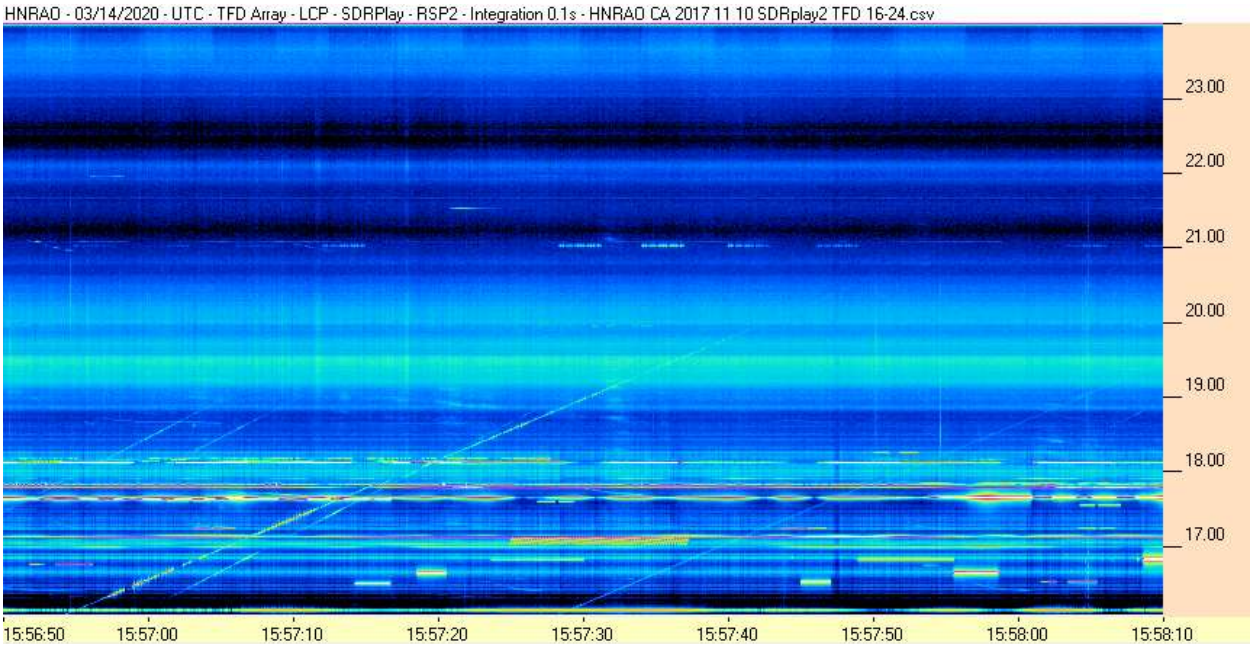
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