HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

Date: May 19, 2018

Object: Jupiter – Non-Io-C

Observer: Unattended

Start - Time UT:	**0346**	**Planetary K-index:**	**1**
Jupiter Altitude (deg):	**32.5**	**Jupiter Azimuth (deg):**	**166.2**
Jupiter CML:	**303.7**	**Jupiter Io Phase:**	**257.6**
Jupiter RA (hr/min):	**14:60**	**Jupiter Dec (hr/min):**	**-15:43**
Hour Angle (hr/min):	**-00:48**	**Polarization**	**LCP**
Sun Altitude (deg):	**-26.9**	**Sun Azimuth (deg):**	**337.6**
Sun RA (hr/min):	**03:36**	**Sun Dec (hr/min):**	**19:19**

End – Time UT:	**0443**	**De:**	**-3.3**
Jupiter Altitude (deg):	**33.6**	**Jupiter Azimuth (deg):**	**182.6**
Jupiter CML:	**338.16**	**Jupiter Io Phase**	**265.73**
Hour Angle (hr/min):	**00:09**	**Duration (min):**	**57**
Sun Altitude (deg):	**-29.7**	**Sun Azimuth (deg):**	**352.5**
Max Frequency MHz	**21**	**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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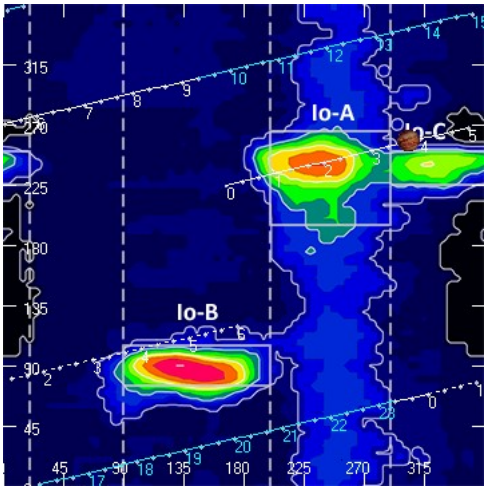
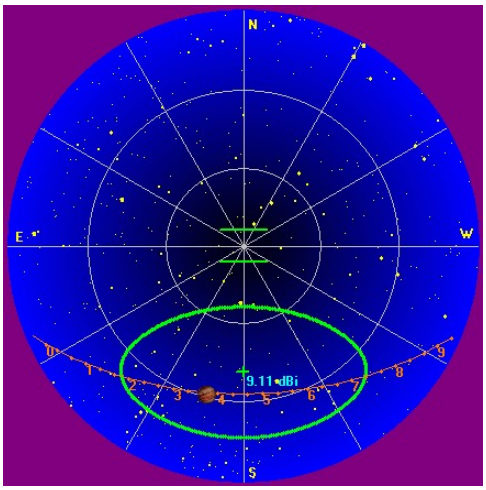
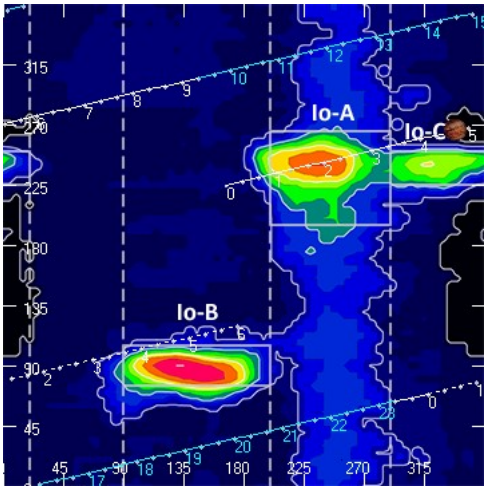
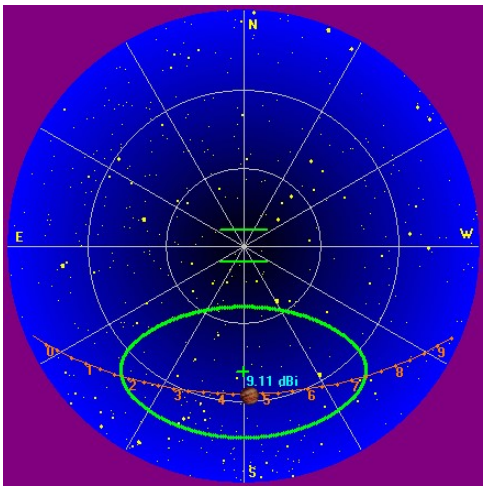


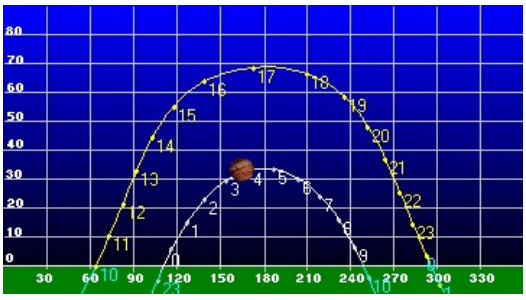


Beginning of Pass





End of Pass



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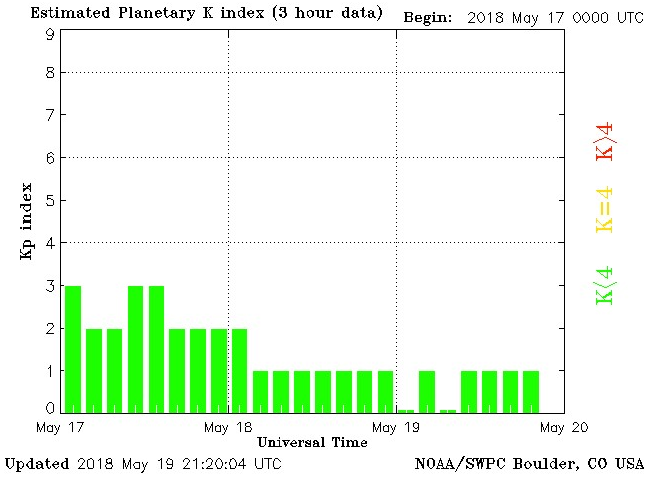
MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360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



Observed with both the FSX-8S/TFD array and the SDRPlay RSP2/TFD array, this LCP non-Io-C storm consisted of L-bursts and S-bursts. Numerous N-events start at 0358 UT and persist through the entirety of the emission period. Parallel N-events, or N-like events are seen throughout the storm.

There were two SDRPlay RSP2 spectrographs taking data during the storm. Both were being fed from the TFD array and Multicoupler #1. The first RSP2 was set with an integration time of 0.1s and the other set at 0.01s. The 2nd RSP2 provided greater detail in the emissions than the 1st RSP2. In the images below, identification of integration time is shown in the banners.

Distinguishing between S4 and L4 modulation lanes were difficult to make and the slopes were not taken because of uncertainty which category they were.

No emissions were confirmed with the JOVE II receive and the JOVE dual dipoles.

EOR

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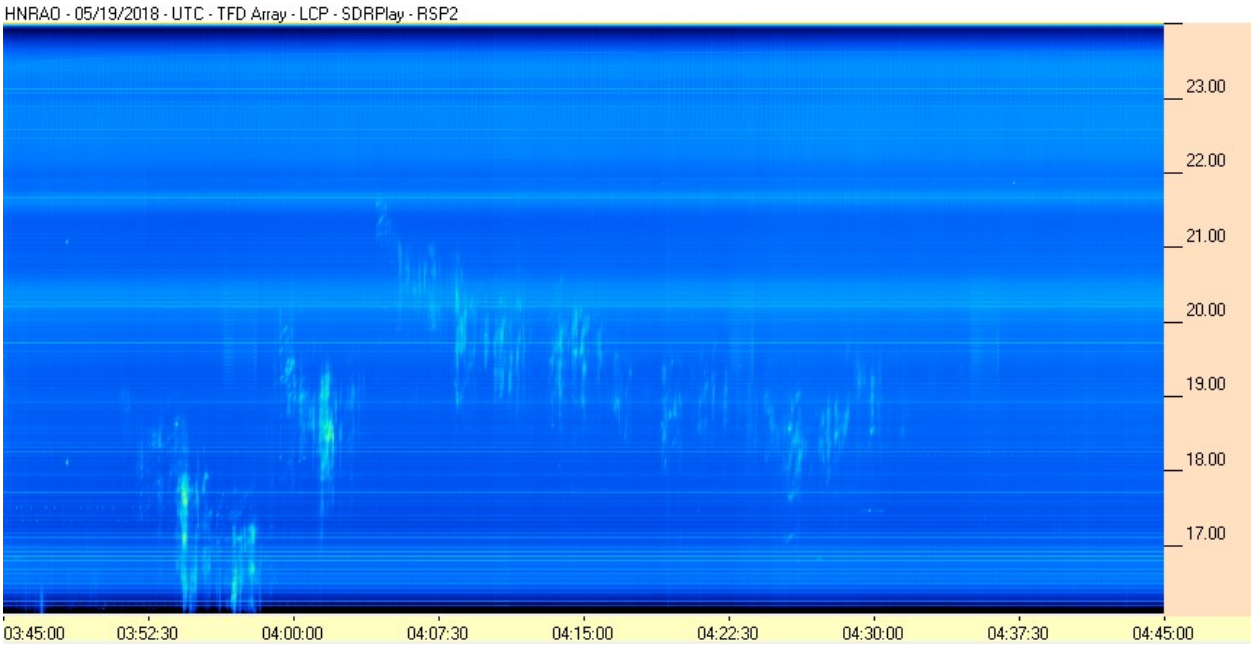
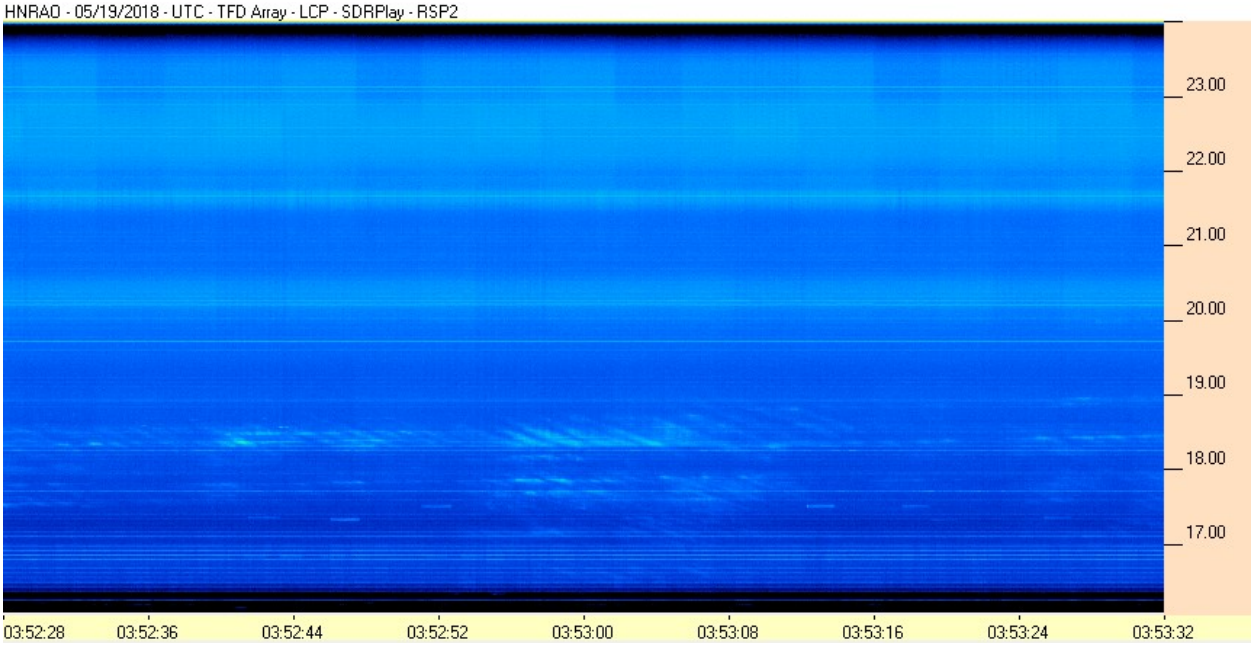
SDRPlay RSP2 / TFD Array





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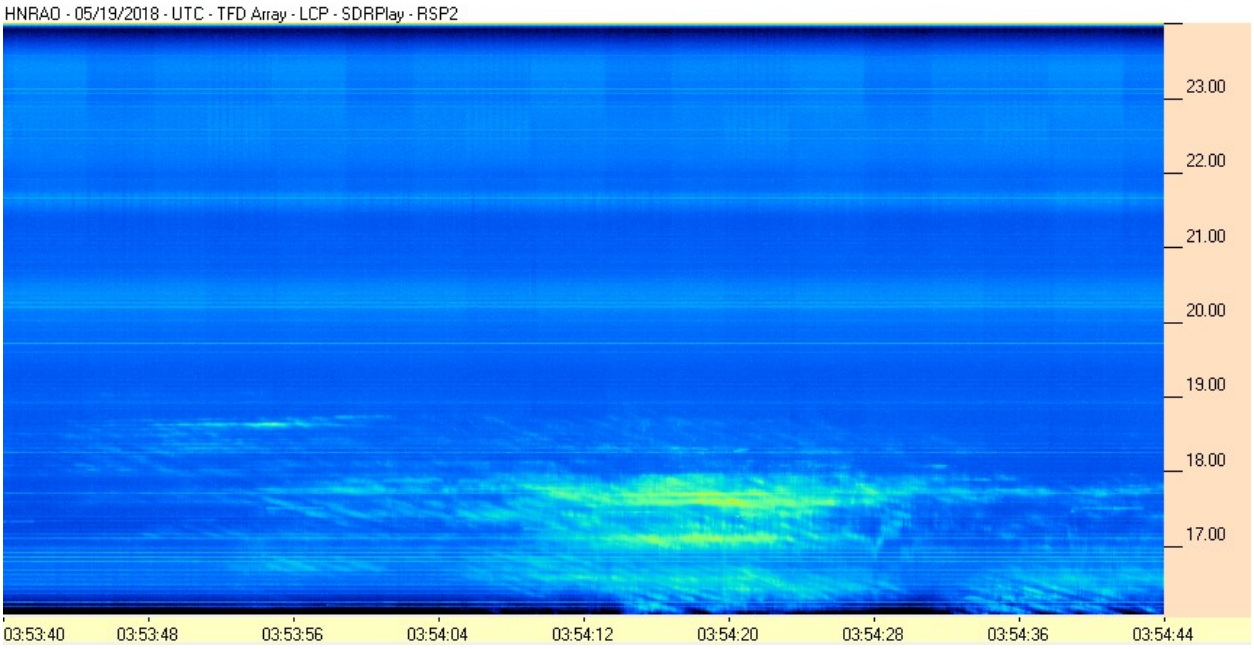

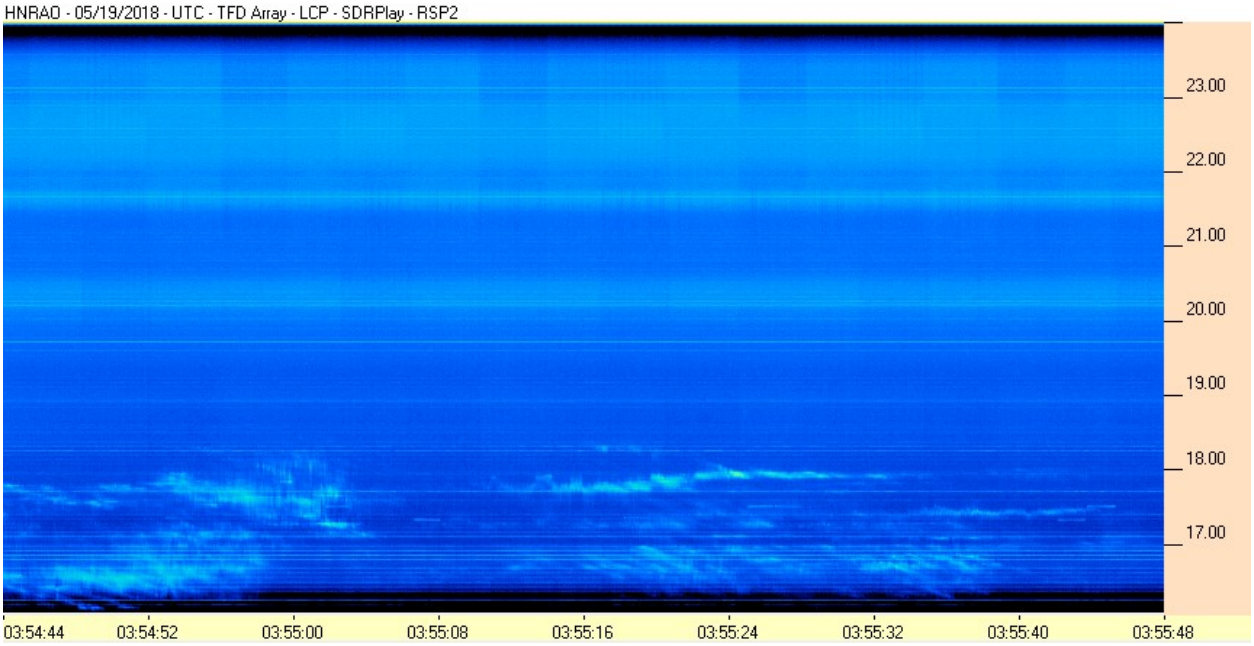

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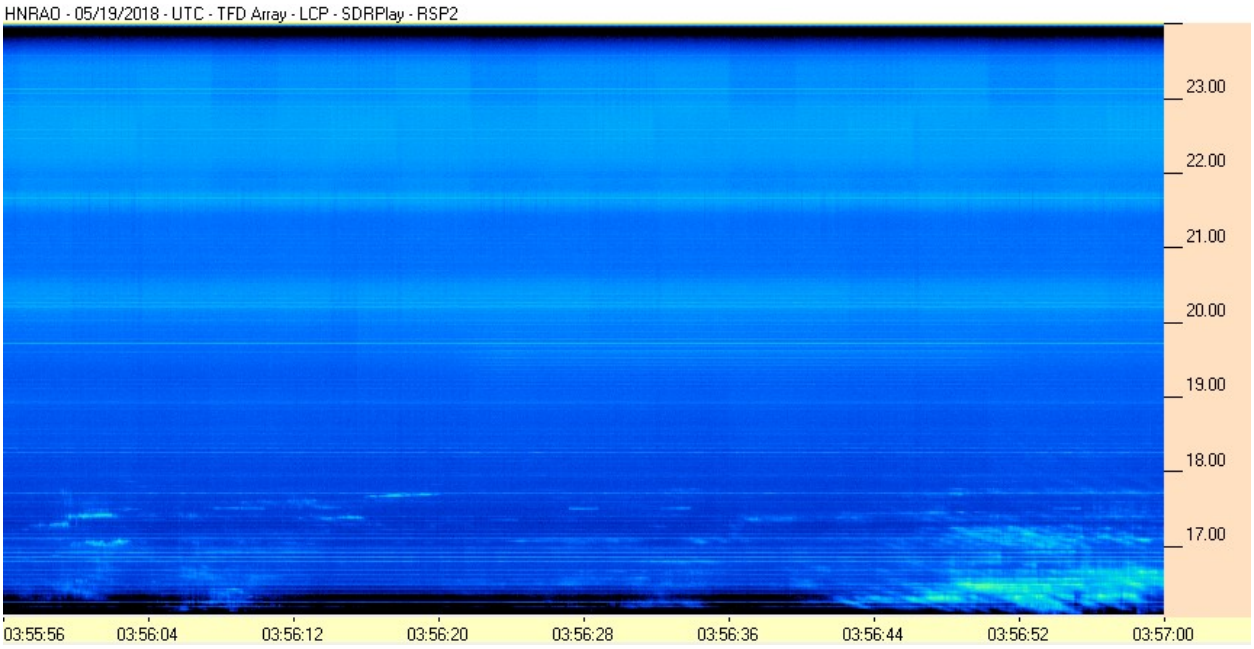

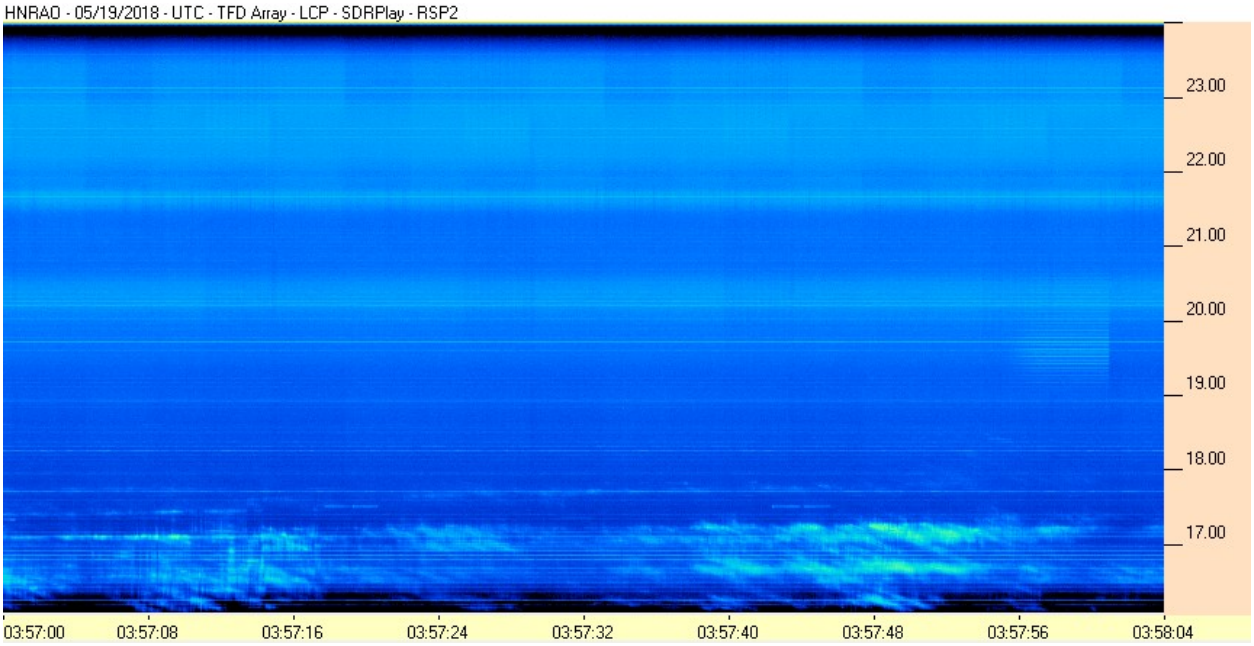

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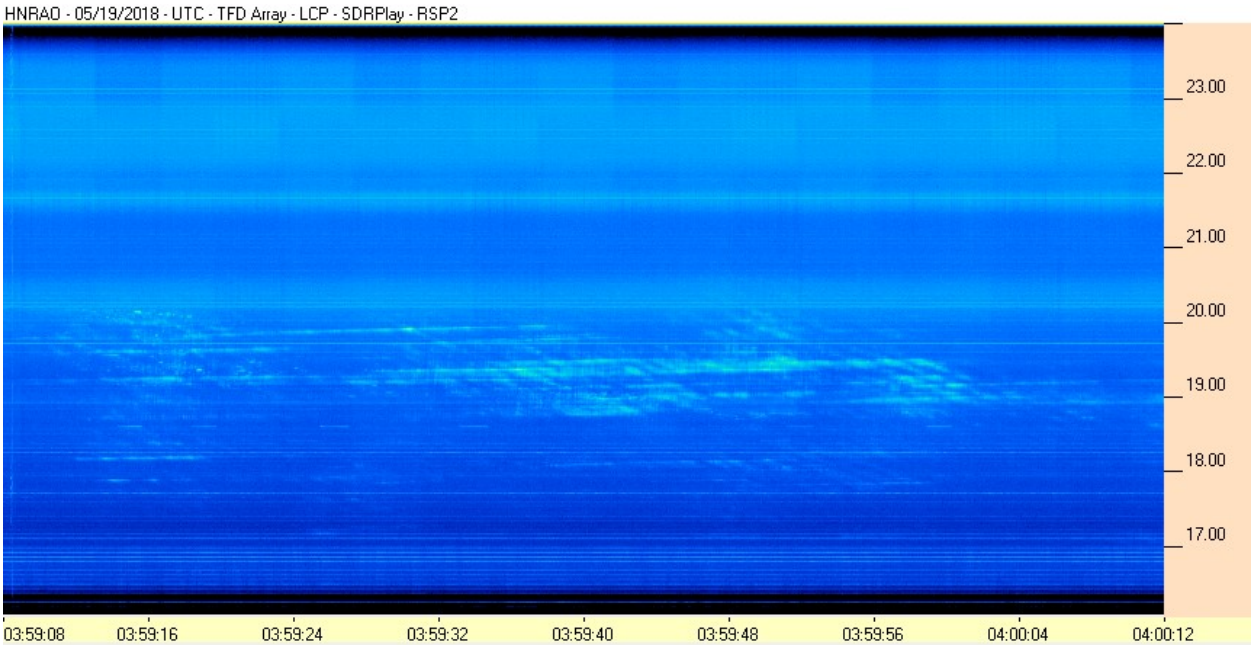

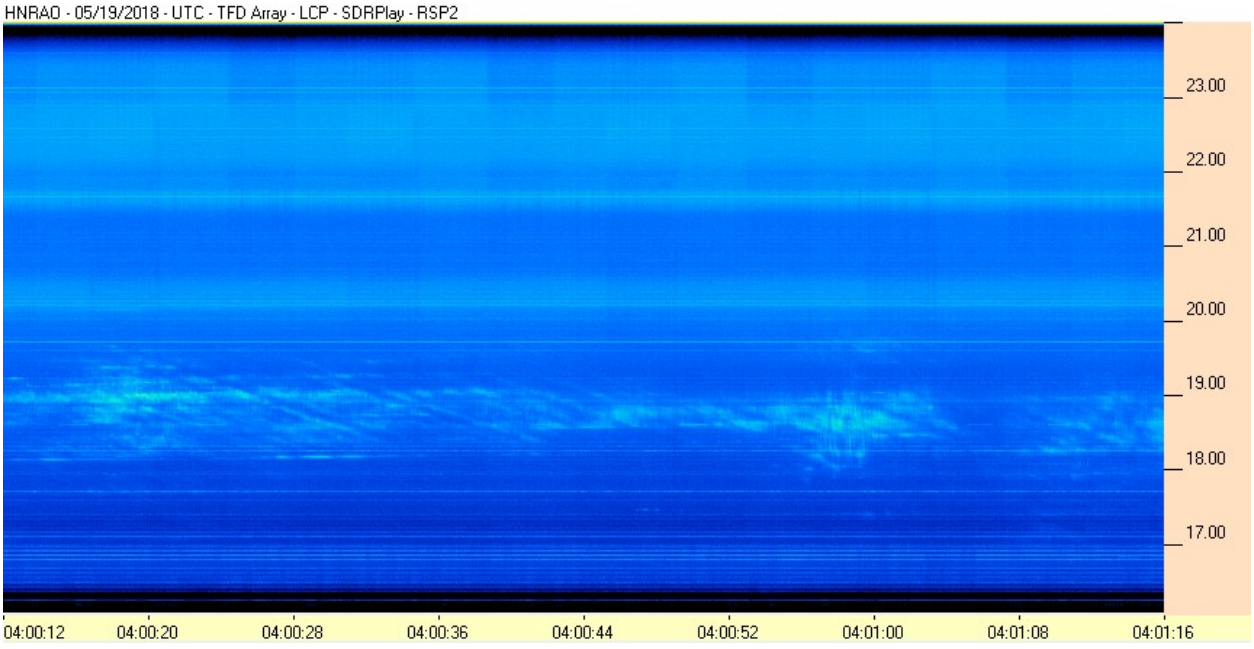

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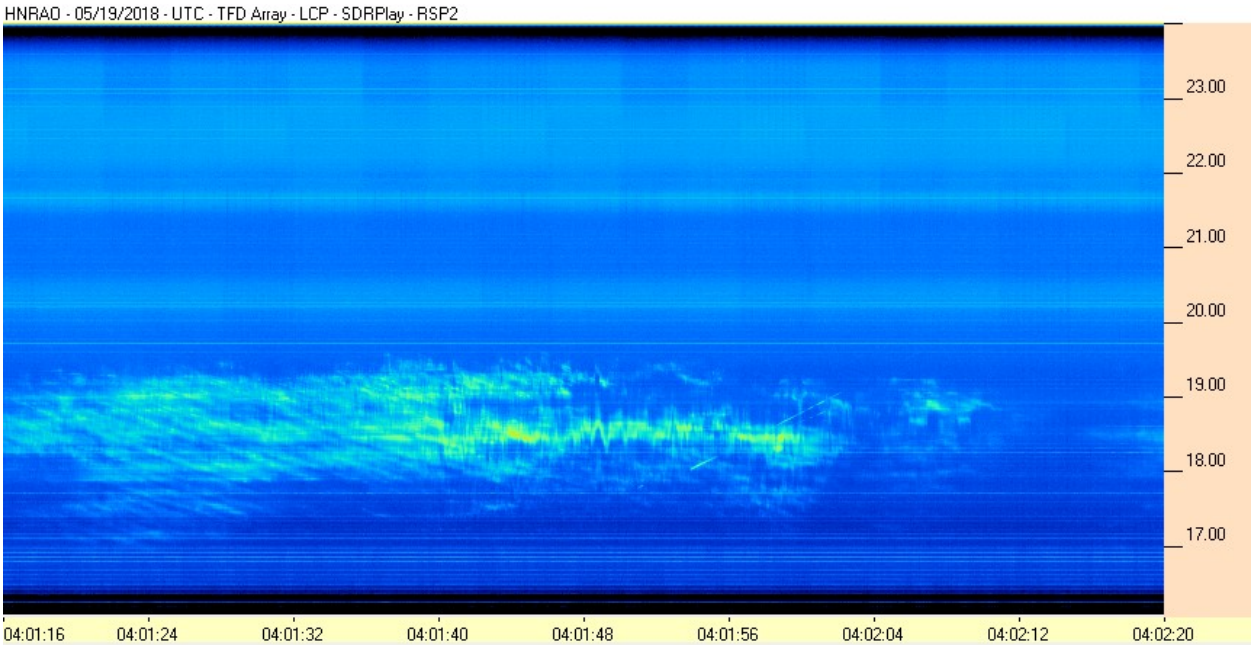

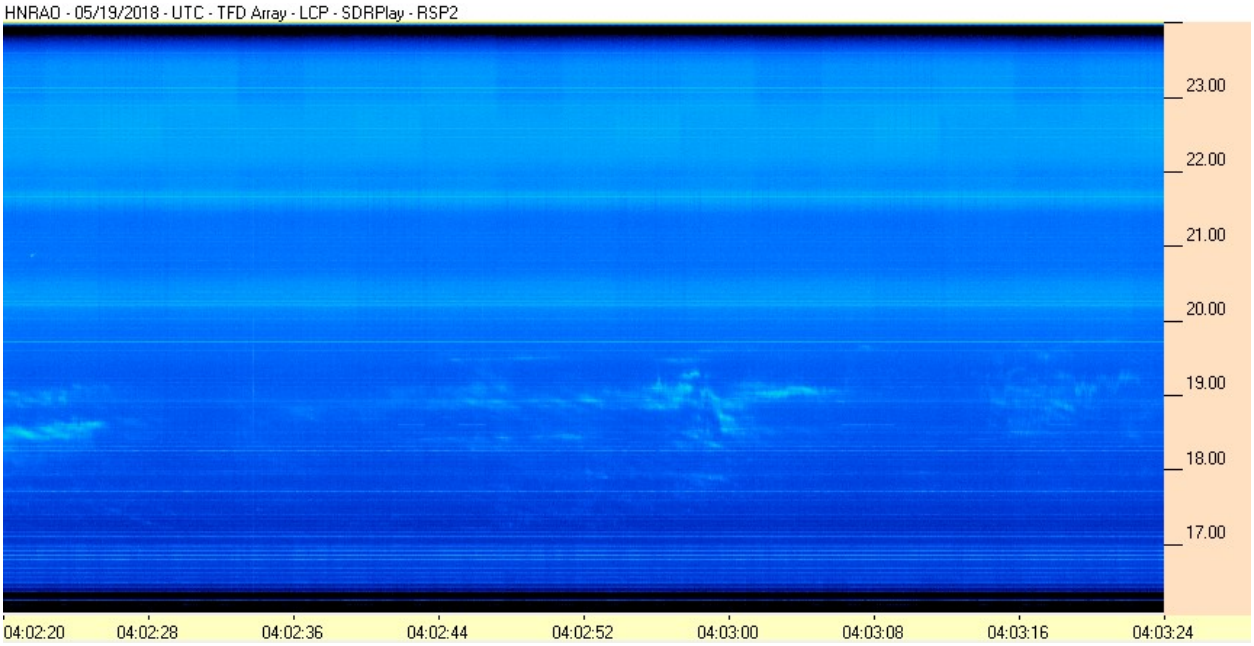

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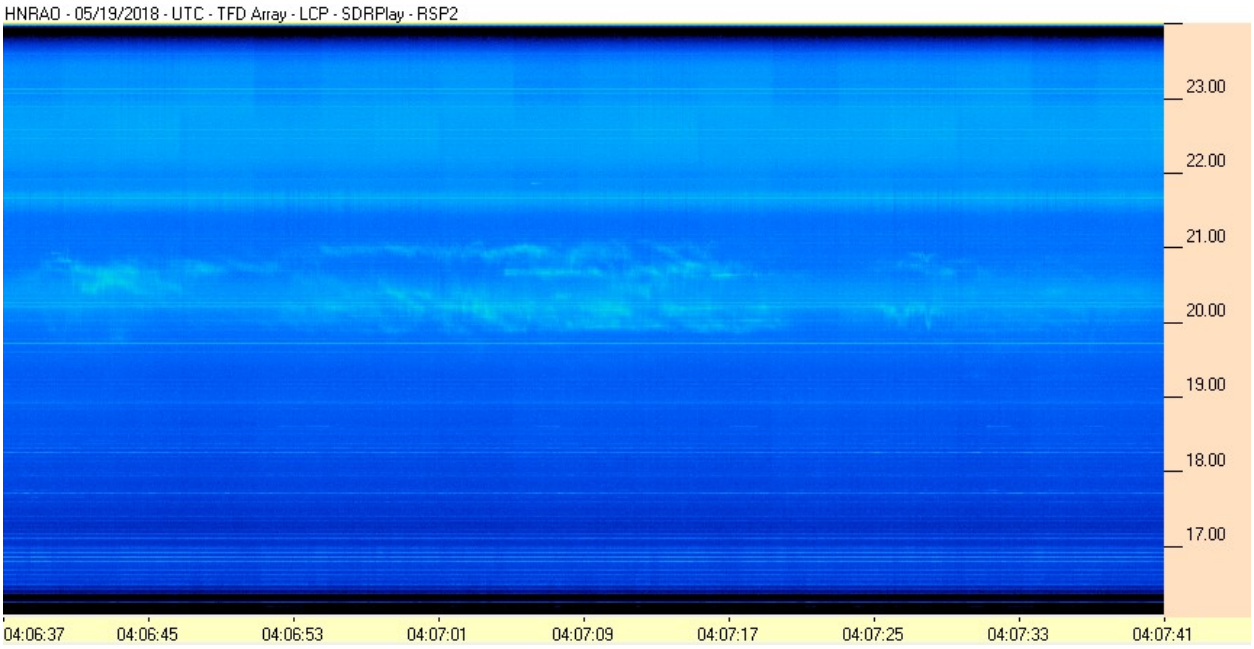

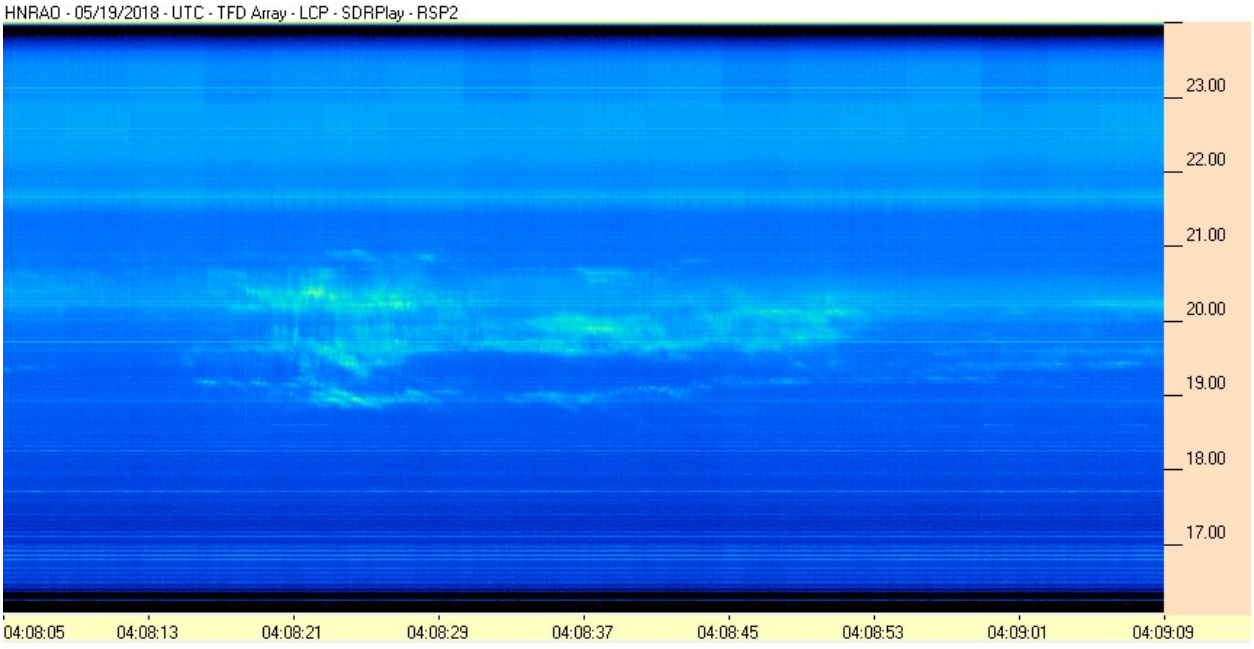

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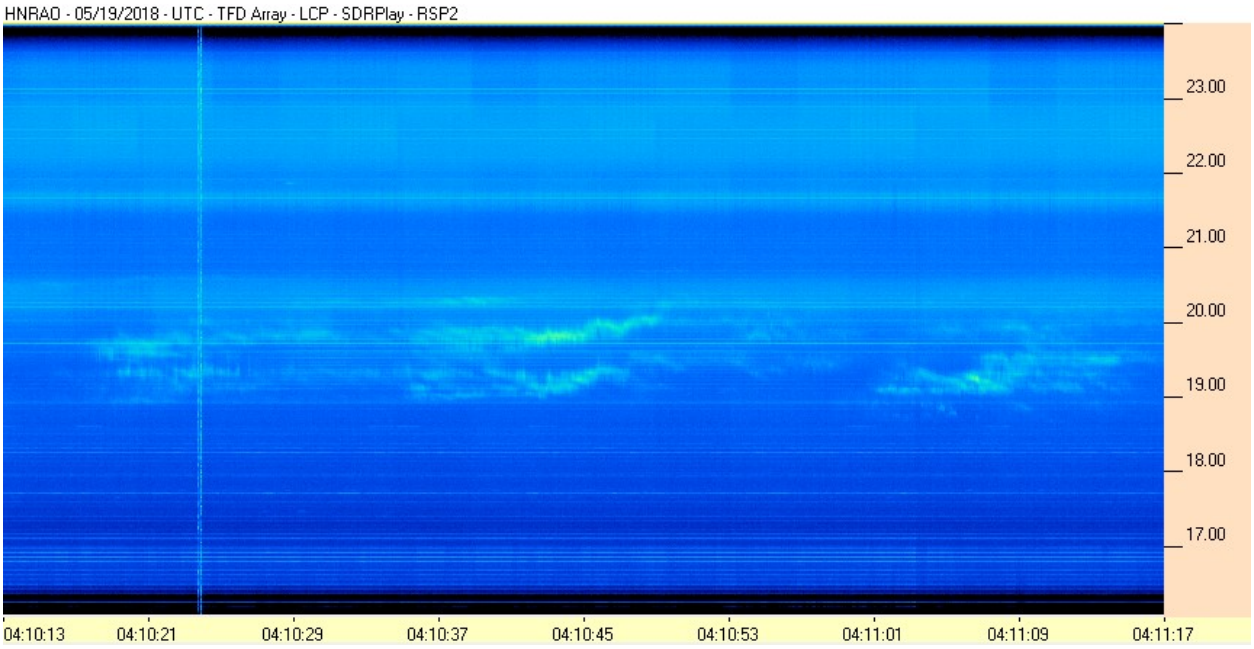

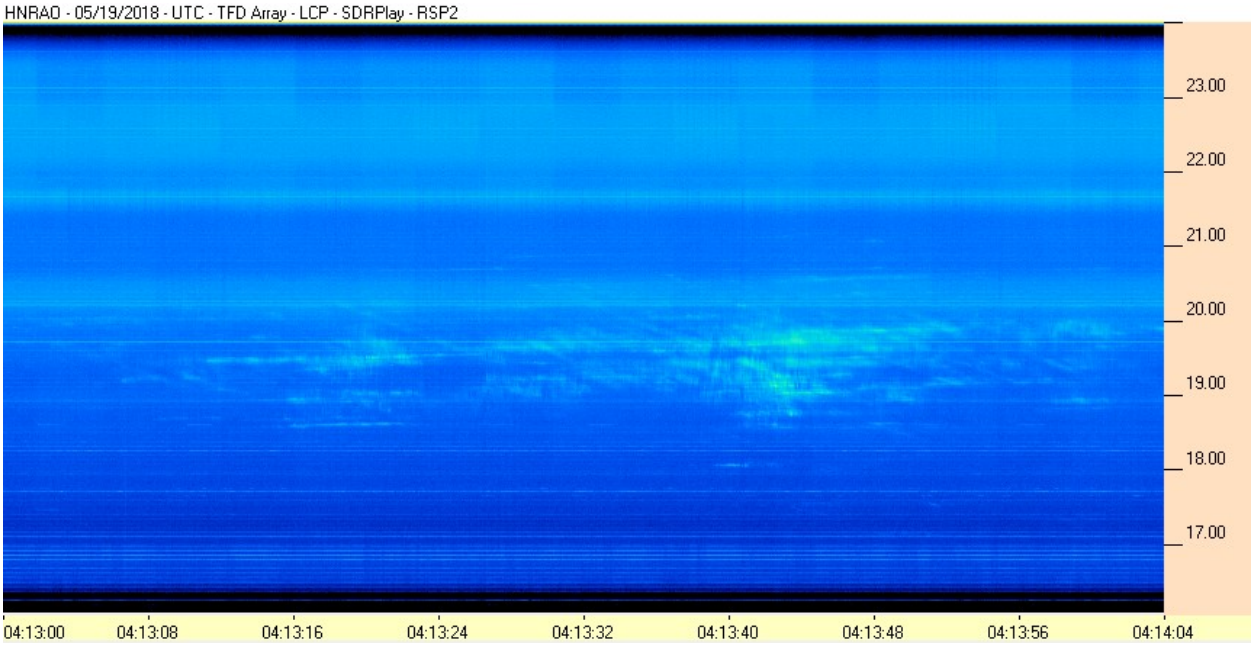

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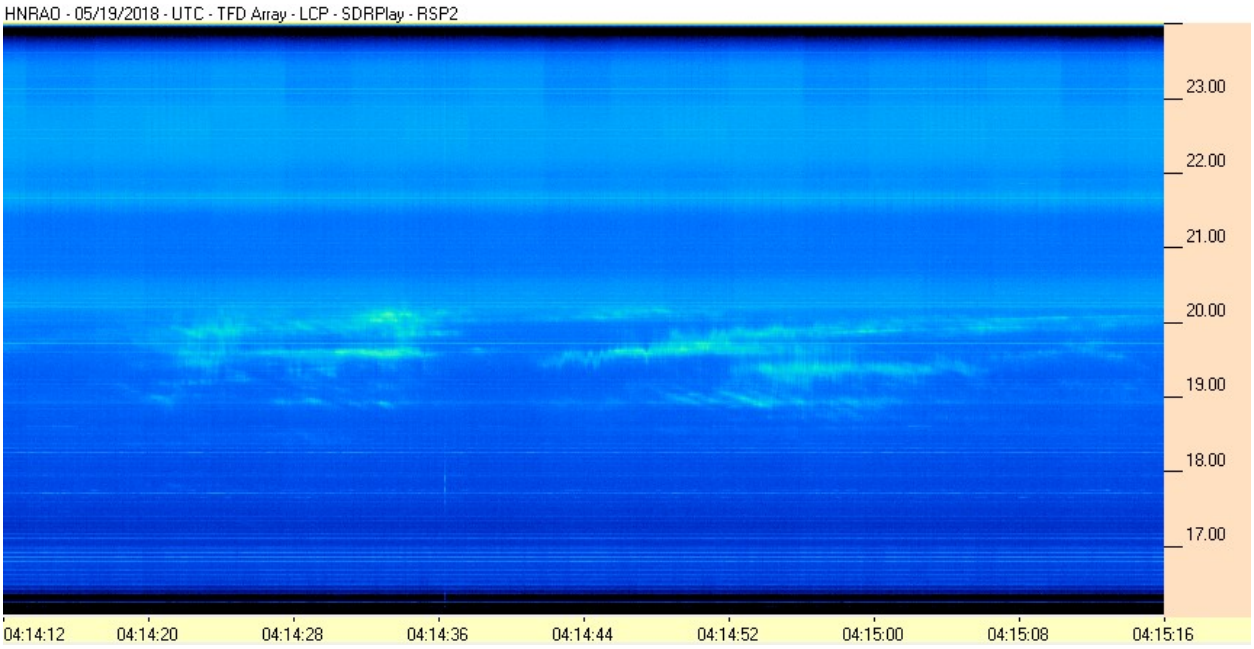
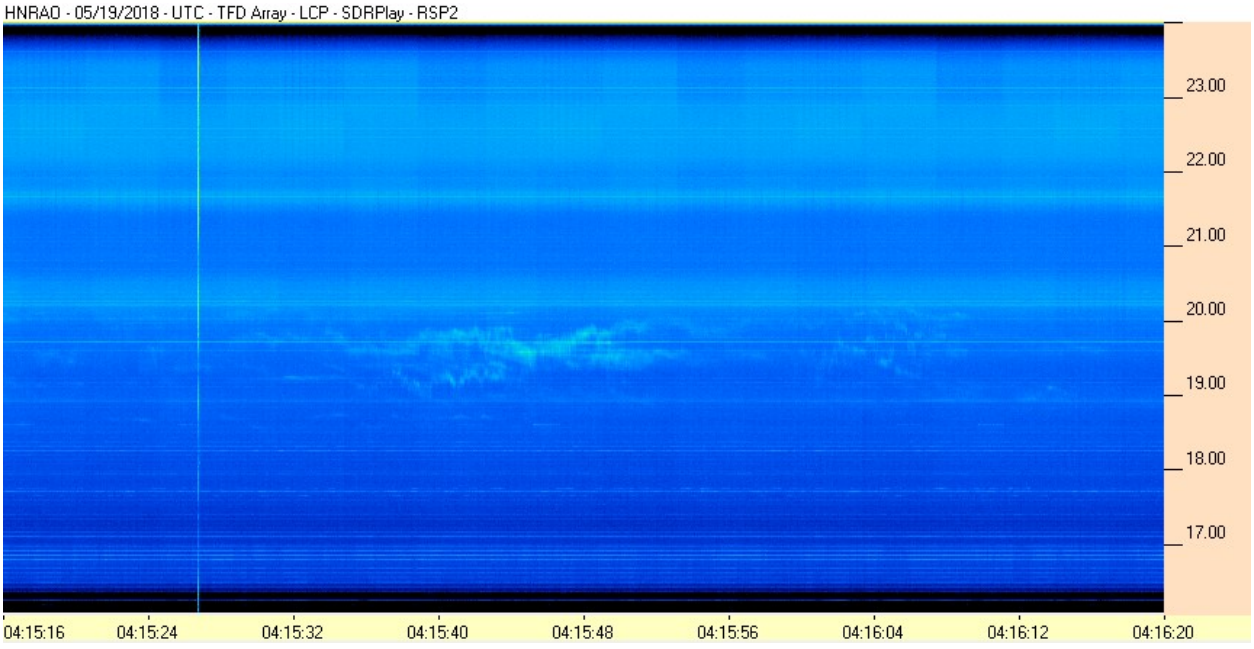
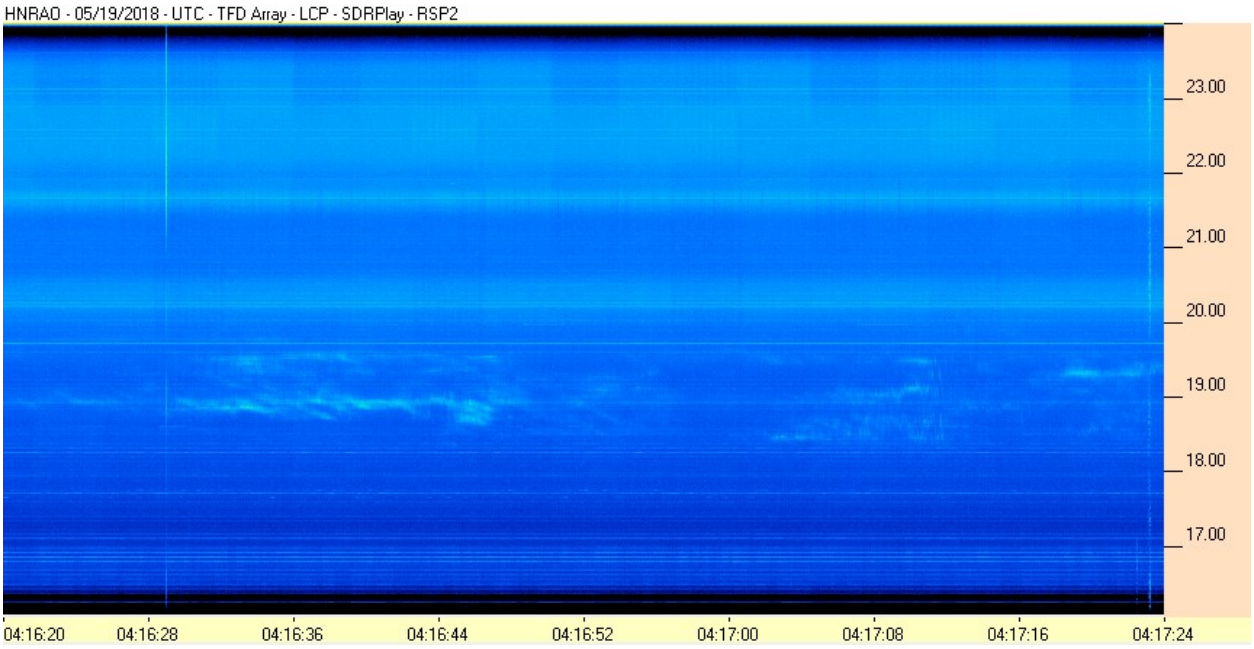
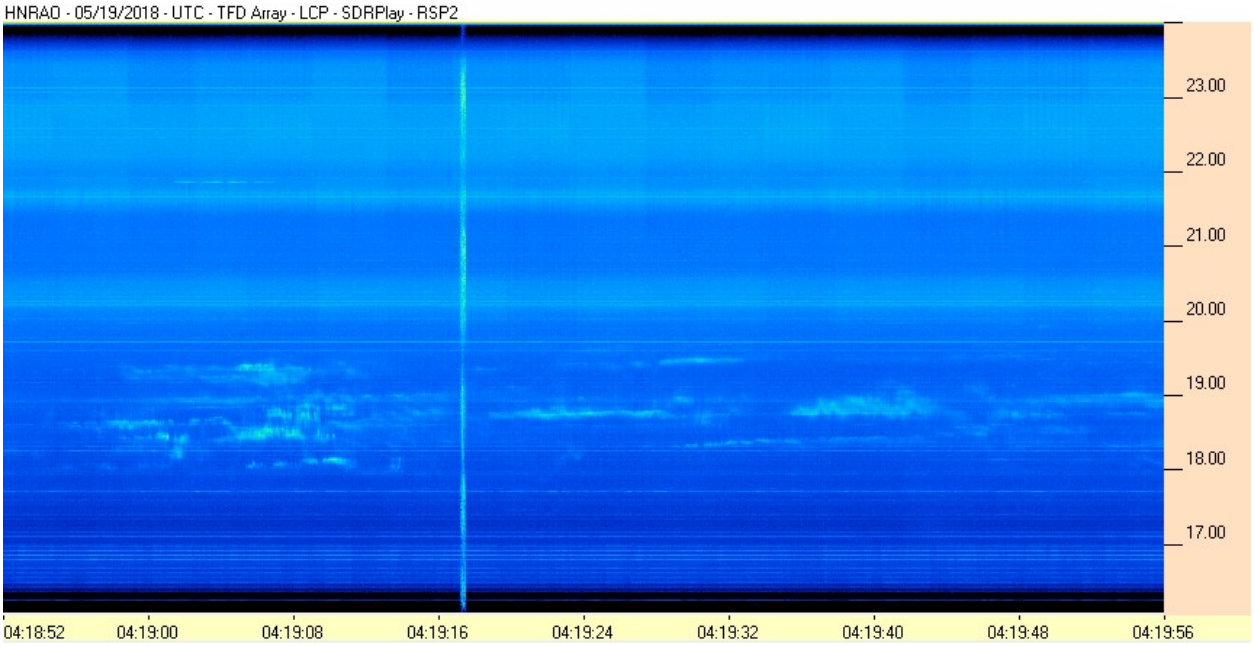





HNRAO - 05/19/2018 - UTC - TFD Array - LCP - SDRPlay - RSP2
23.00
22.00
21.00
20.00
19.00
18.00
17.00
04:16:20
04:16:28
04:16:36
04:16:44
04:16:52
04:17:00
04:17:08
04:17:16
04:17:24


HNRAO - 05/19/2018 - UTC - TFD Array - LCP - SDRPlay - RSP2
23.00
22.00
21.00
20.00
19.00
18.00
17.00
04:18:52
04:19:00
04:19:08
04:19:16
04:19:24
04:19:32
04:19:40
04:19:48
04:19:56

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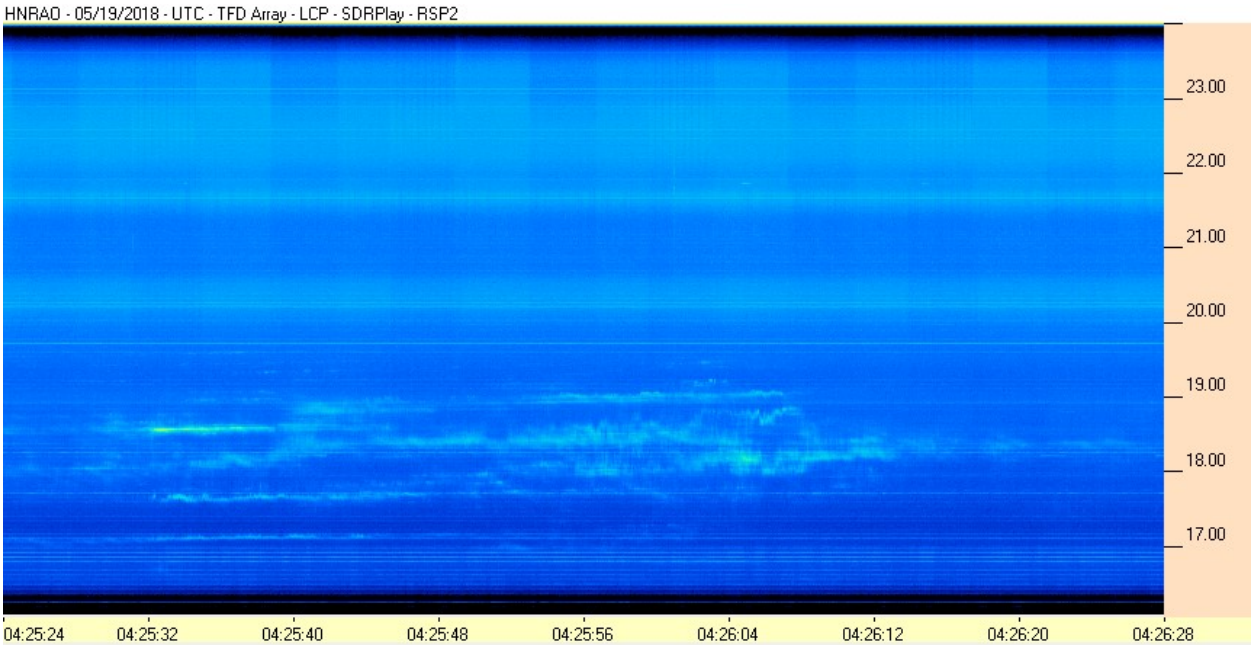
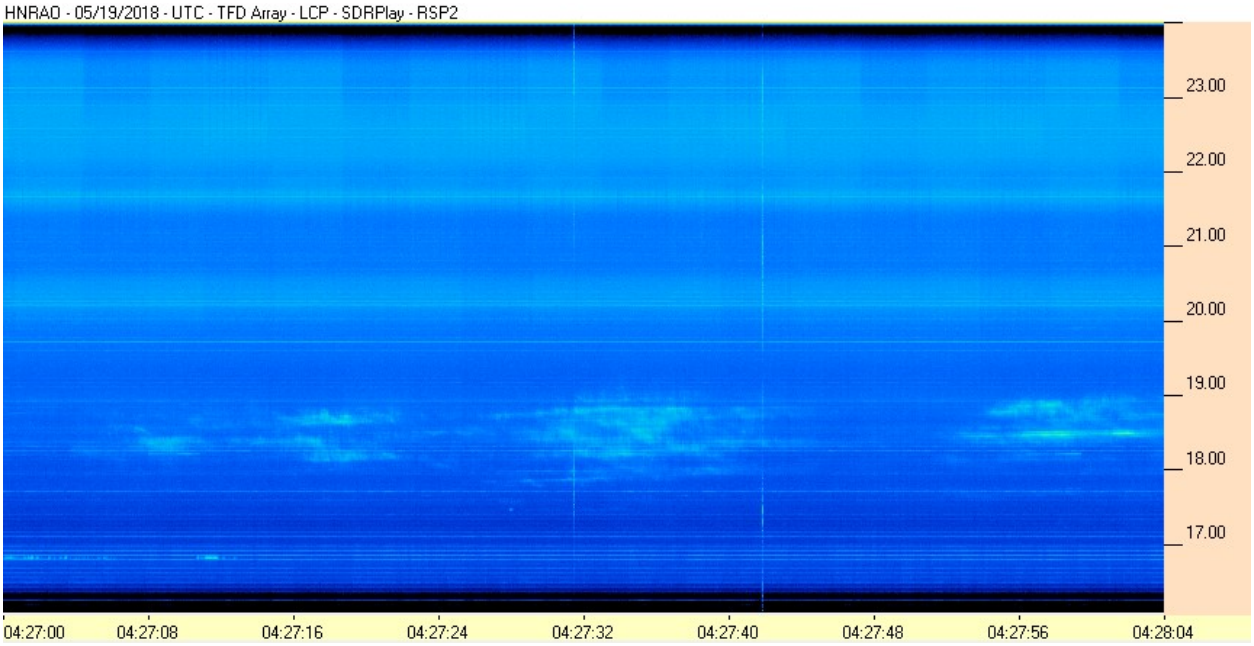
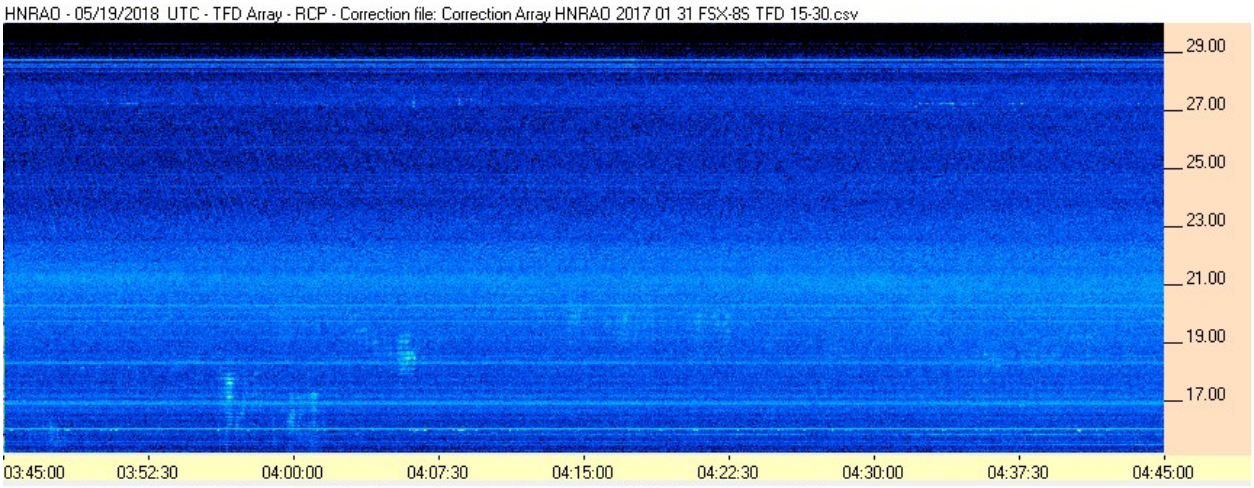
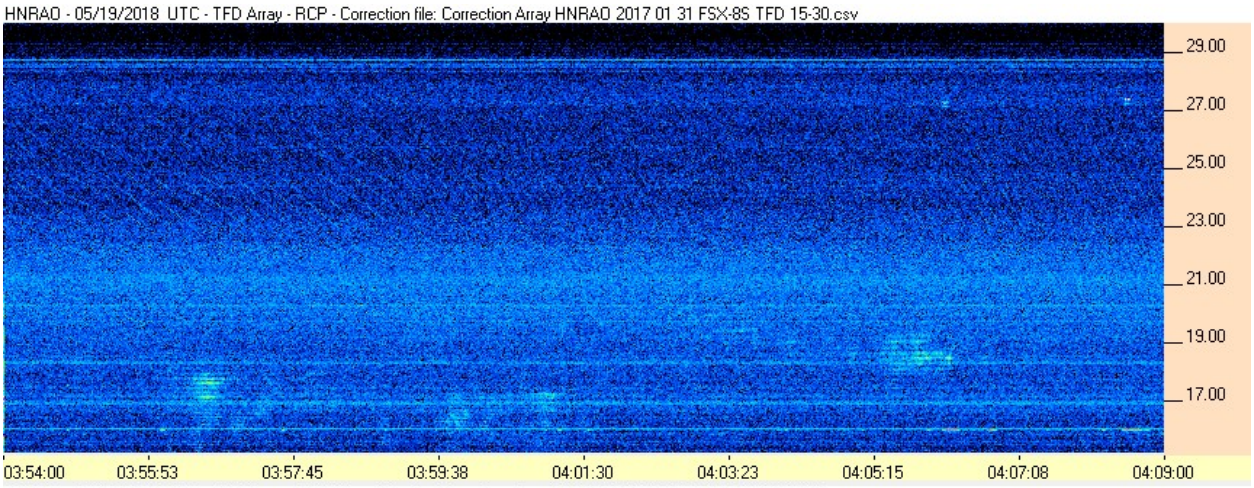




FSX-8S / TFD Array




HNRAO - 05/19/2018 UTC - TFD Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv
29.00
27.00
25.00
23.00
21.00
19.00
17.00
03:54:00
03:55:53
03:57:45
03:59:38
04:01:30
04:03:23
04:05:15
04:07:08
04:09:00
HNRAO - 05/19/2018 UTC - TFD Array - LCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv
29.00
27.00
25.00
23.00
21.00
19.00
17.00
03:54:00
03:55:53
03:57:45
03:59:38
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04:05:15
04:07:08
04:09:00