HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

Date: 7 April 2017

Object: Jupiter – Io-A

Observer: JB

Start of pass:	**0141 UT**	**Planetary K-index:**	**3**
Jupiter Altitude:	**20.2 degrees**	**Jupiter Azimuth:**	**117.1 degrees**
Jupiter CML:	**188.48**	**Jupiter Io Phase:**	**248.78**
Jupiter RA:	**13:10**	**Jupiter Dec:**	**-05:42**
Hour Angle:	**-03:49**	**Polarization**	**RCP**
Sun Altitude:	**-22.0 degrees**	**Sun Azimuth:**	**299.9 degrees**
Sun RA:	**00:57**	**Sun Dec:**	**06:07**

End of pass:	**0325 UT**		
Jupiter Altitude:	**35.6 degrees**	**Jupiter Azimuth:**	**140.9 degrees**
Jupiter CML:	**251.36**	**Jupiter Io Phase**	**263.59**
Hour Angle:	**-02:04**		
Sun Altitude:	**-36.6 degrees**	**Sun Azimuth:**	**324.5 degrees**

Observations made using:

1. FSX-8S fed by the TFD array
    a. 7.7 dB loss between TFD and Multicouplers.
    b. Connect to array through HNRAO Multicoupler #1 and #2, port 2
        i. HNRAO Multicoupler #1 – TFD/LCP
        ii. HNRAO Multicoupler #2 – TFD/RCP
            1. Port 1 having 10 dB of gain, all other ports have 3 dB gain.
2. FSX-2 fed by the LWA array directly
    a. LWA element configuration – 90 degrees
3. JOVE 2 receiver fed by phased JOVE dipoles @ 10’
    a. 12’ phase cable - phased for 2016-17 season
    b. Calibrated 6 March 2017
    c. Connected to dipoles through HNRAO Multicoupler #3, port 1.
        i. 3.165 dB loss between Multicoupler and dipoles.
4. Icom R75 receiver fed by experimental DDRR antenna directly.
    a. Calibrated 6 March 2017
5. SDRPlay
    a. RSP1 (2) and RSP2 (1)

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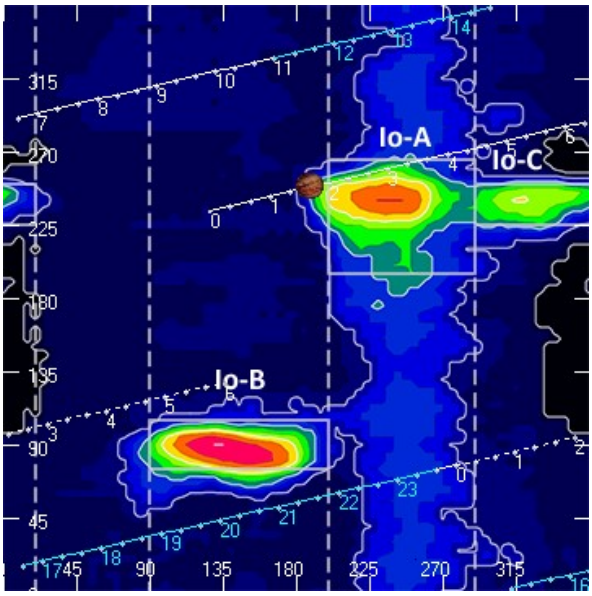
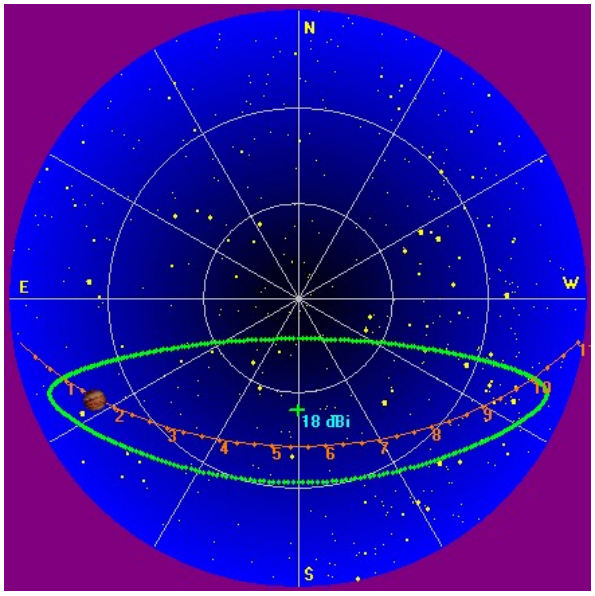
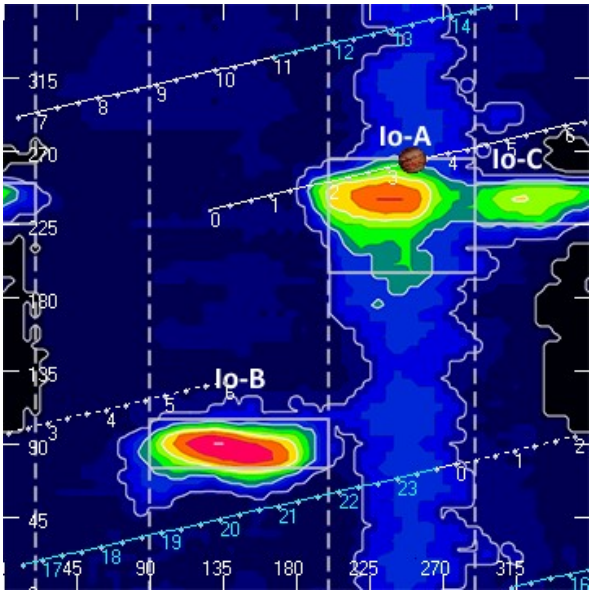
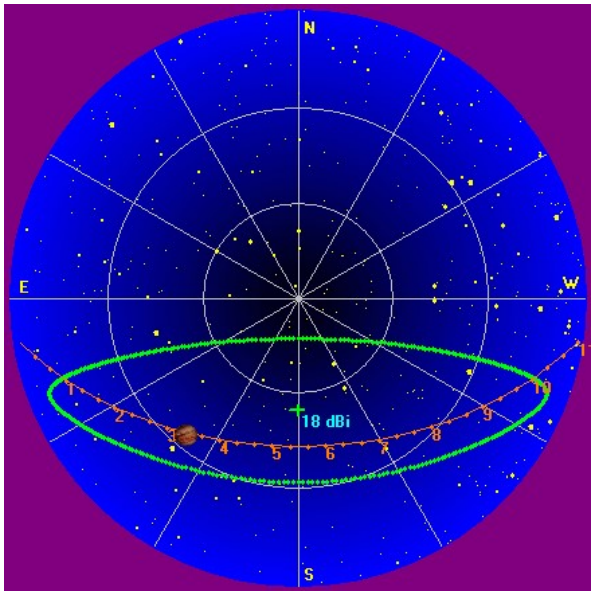




Beginning of Pass





End of Pass

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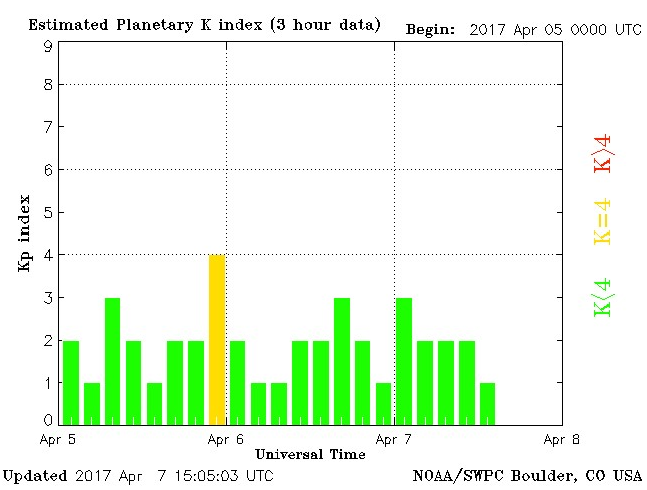

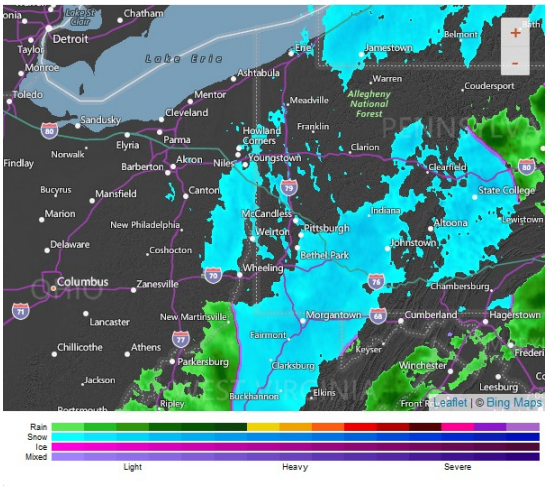

An Io-A pass beginning 3 hours and 50 minutes before transit and ended 2 hours before tansit. Snow shower generated precipitation static during the observation period had a moderate impact on conditions. Dominated by negative drift L-bursts with no S-bursts detected. Negative drift modulation lanes were also present. Emissions show a high frequency reached at 22 MHz, and a low frequency observed here at 12 MHz. The SDRPlay RSP2 recorded the entire pass, and the SDRPlay RSP1 was adjusted to a lower frequency span later in the pass at 0225 UT to observe the emisions down to 12 MHz. It's unknown if these emissions were also present earlier than 0225 UT.

Several features of note were the sudden dissaperance of emissions in what can be described as "erasures" between 0217 UT and 0218 UT. And at 0219 UT, what appear to be stacked N-events which failed to develop and have a "wavy" appearance to them.

Both the FSX-2/LWA pair and FSX-8S/TFD pair also recorded the emissions but without the detail seen with the SDRPlay RSP1 and RSP2 devices. This is due to the way the data is processed in the SDRPlay devices.

Measured modulation lanes ranged from a low of -45 kHz/sec to a high of -93 kHz/sec with an average of –68 kHz/sec. Cross hatched modulation lanes appeared briefly at 0202 UT with one modulation lane measured with a drift rate of positive 822 kHz/sec. There was no apparent corolation in modulation drift rates and time of pass.

One L-burst was recorded by the RadioJove/Jove Dipole pair at 0217 UT.

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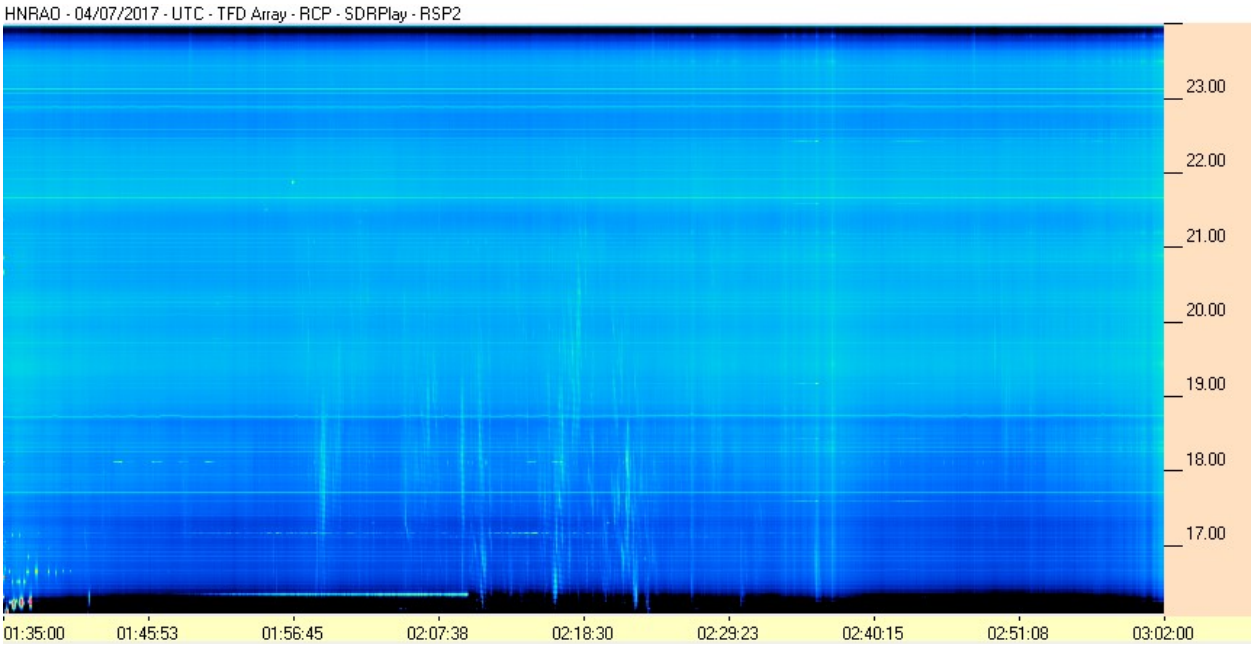
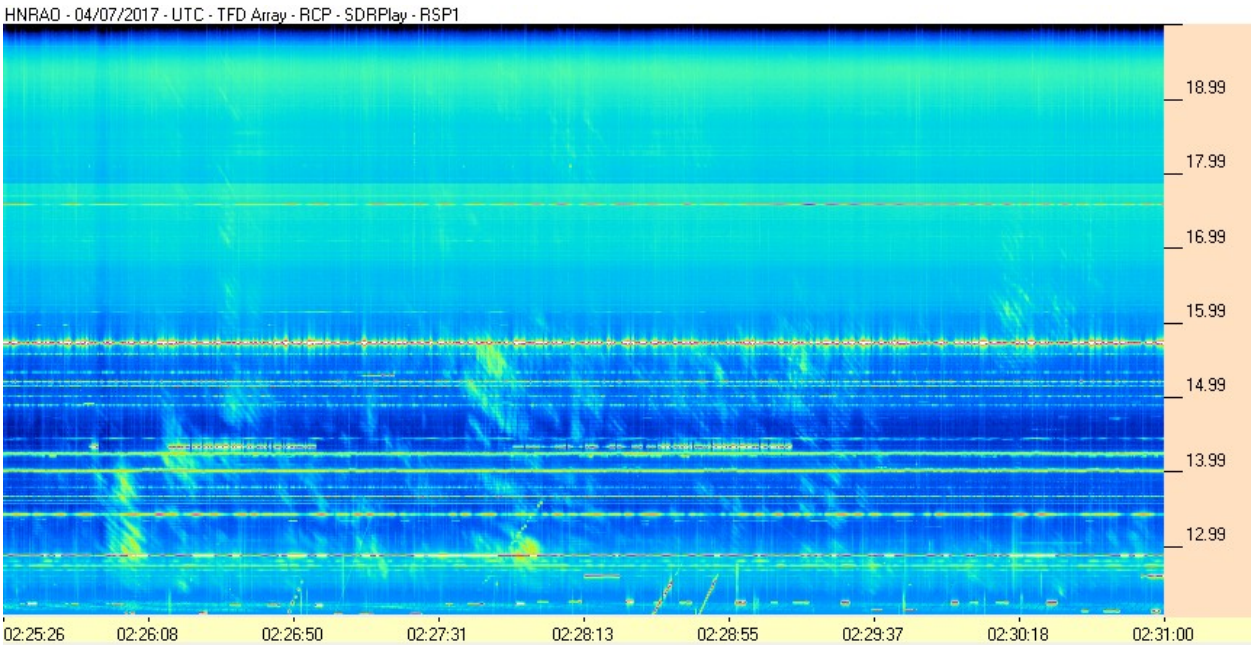
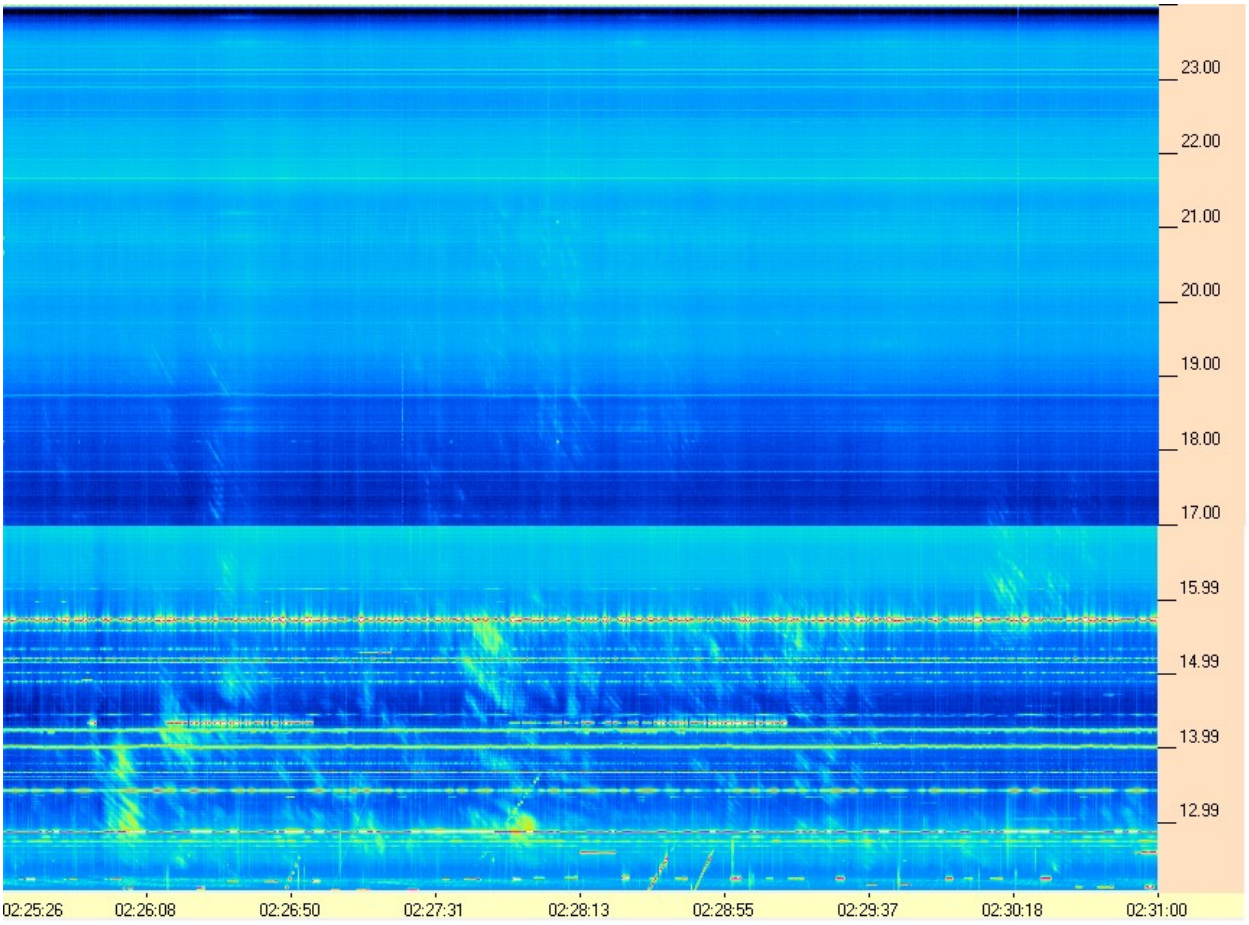
SDRPlay RSP2/TFD Pair



SDRPlay RSP1/TFD Pair



SDRPlay RSP2/RSP1 TFD Pair – Merged



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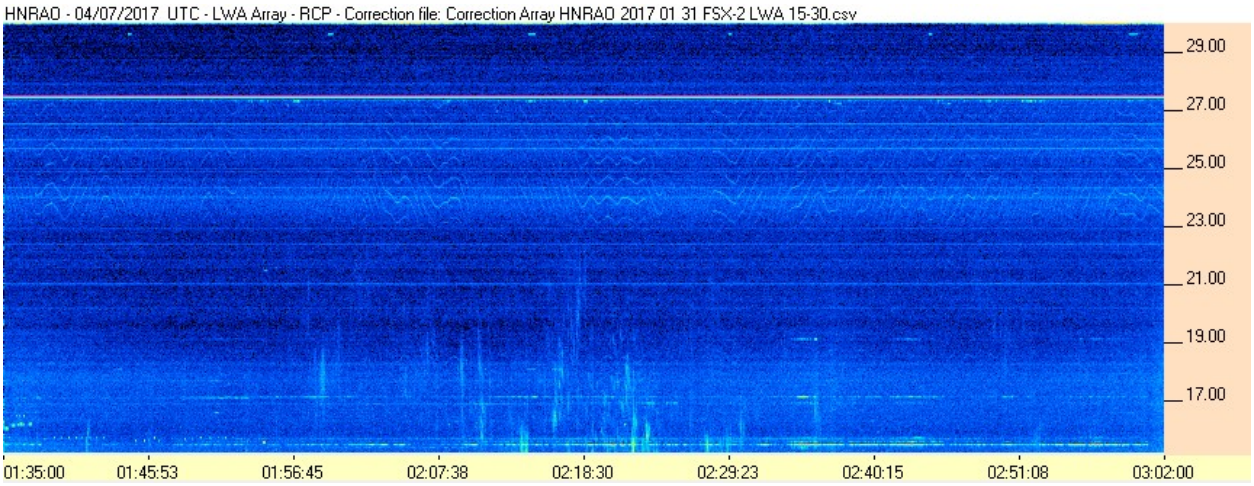
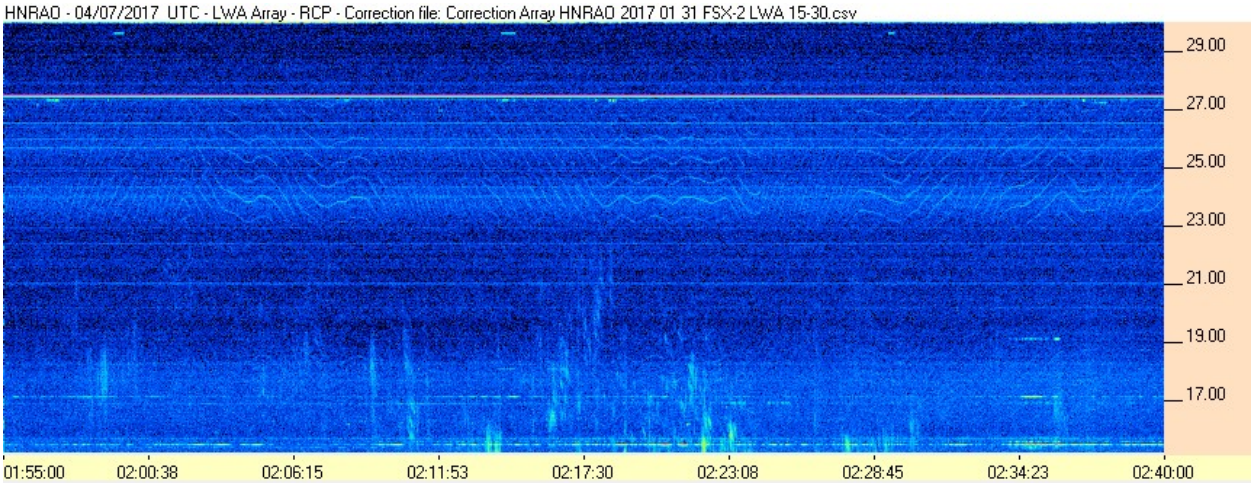
FSX-2/LWA Pair





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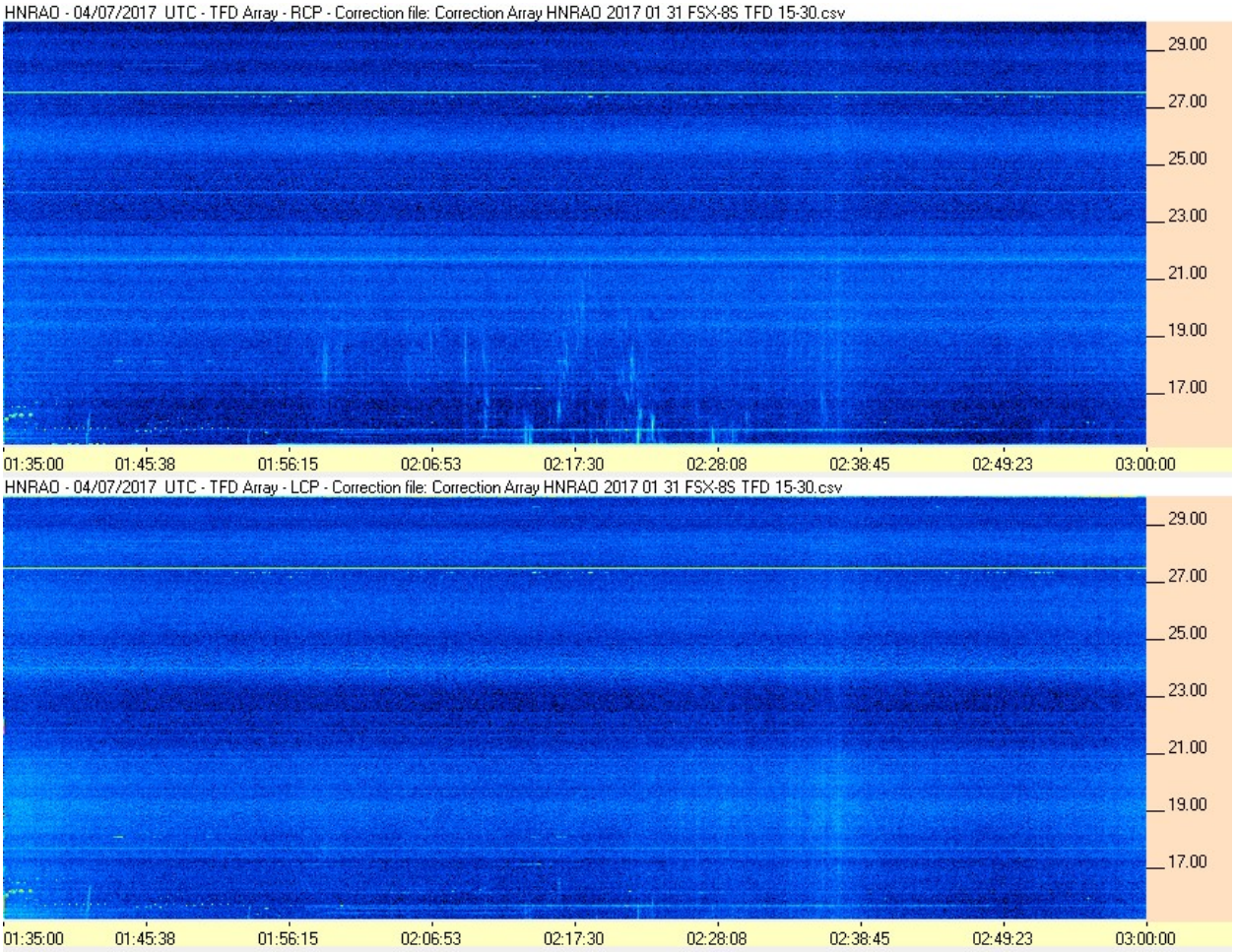
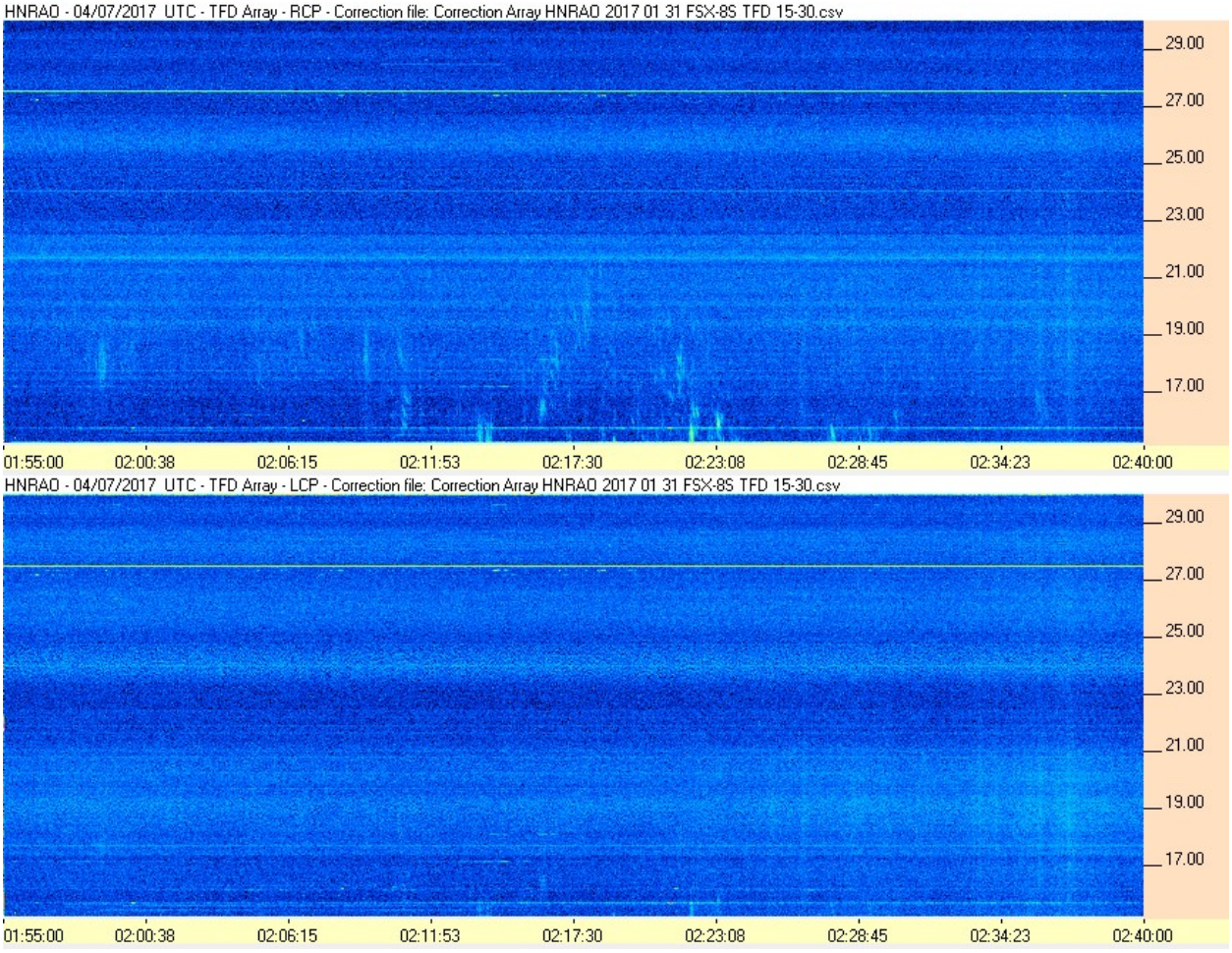
FSX-8S/TFD Pair




HNRAO - 04/07/2017 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
01:55:00
02:00:38
02:06:15
02:11:53
02:17:30
02:23:08
02:28:45
02:34:23
02:40:00
HNRAO - 04/07/2017 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
01:55:00
02:00:38
02:06:15
02:11:53
02:17:30
02:23:08
02:28:45
02:34:23
02:40:00

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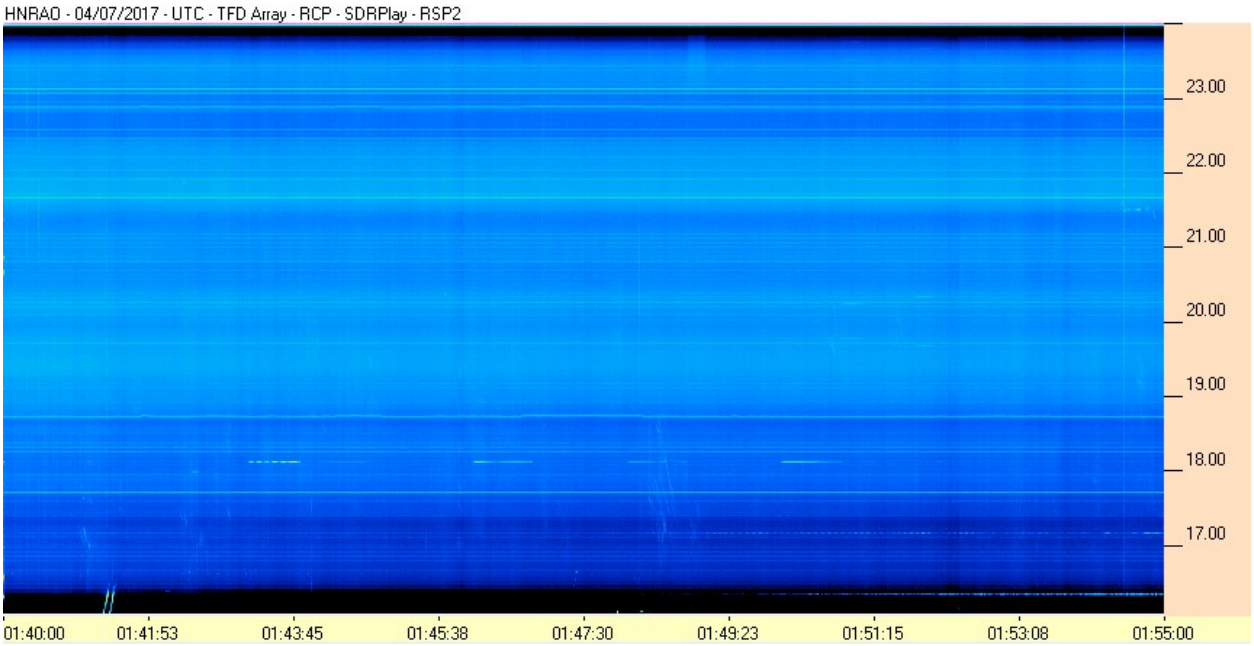
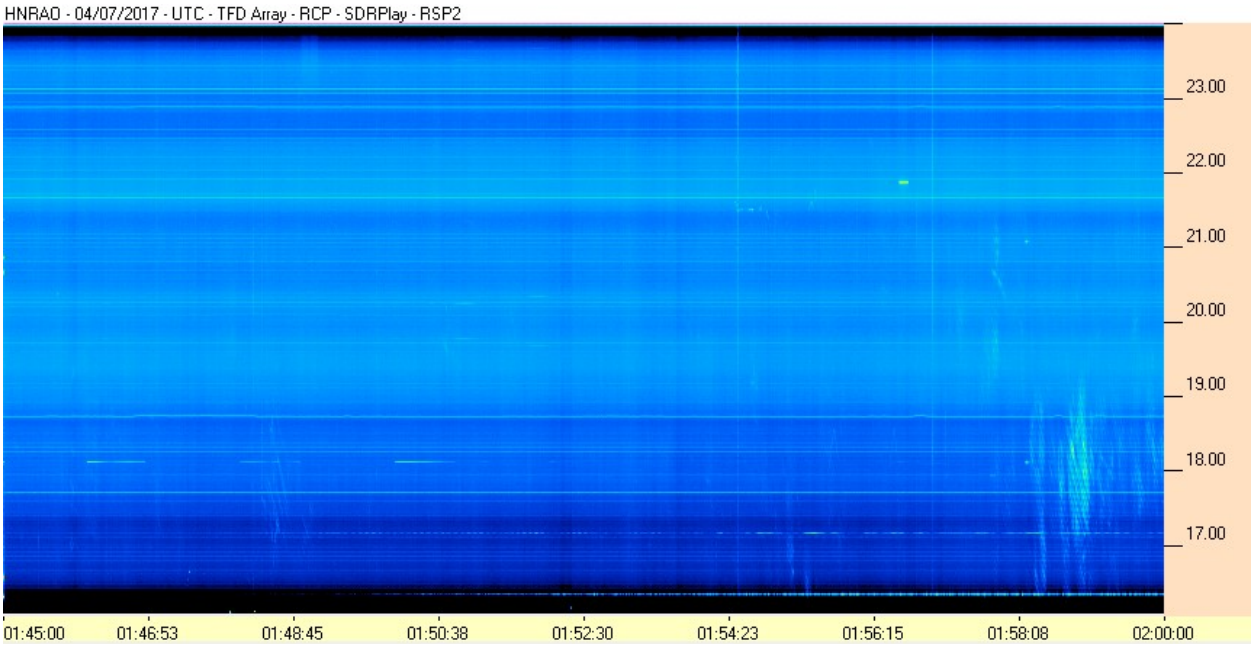
SDRPlay RSP2/TFD Pair





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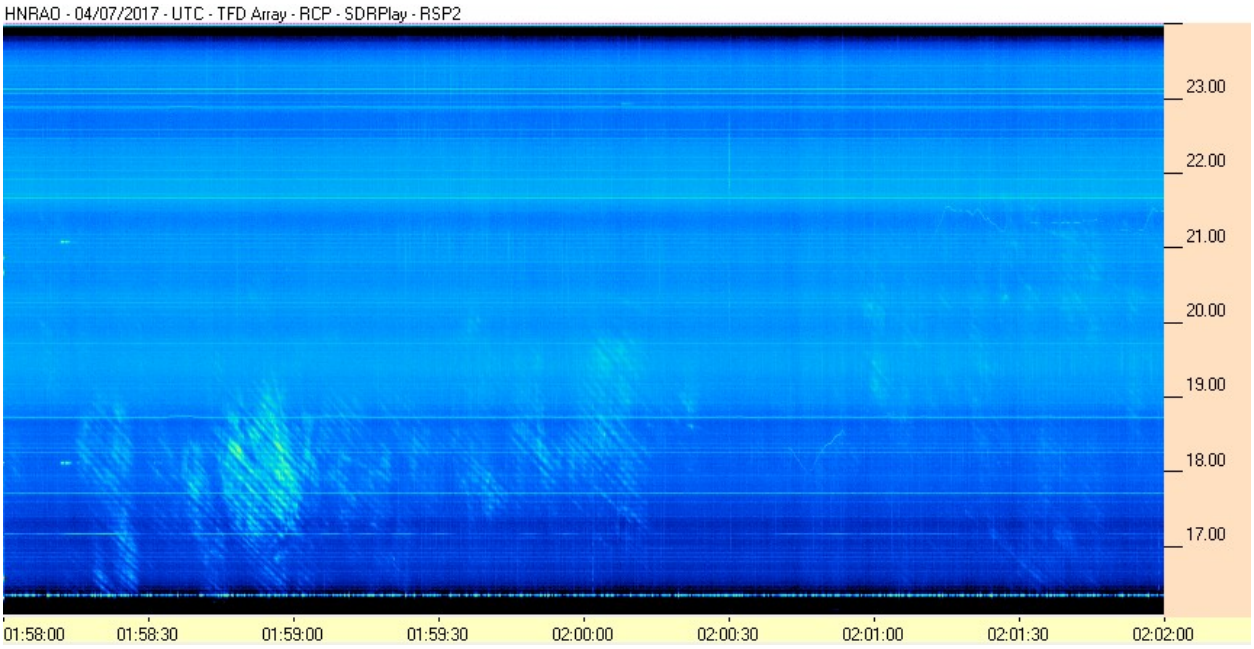

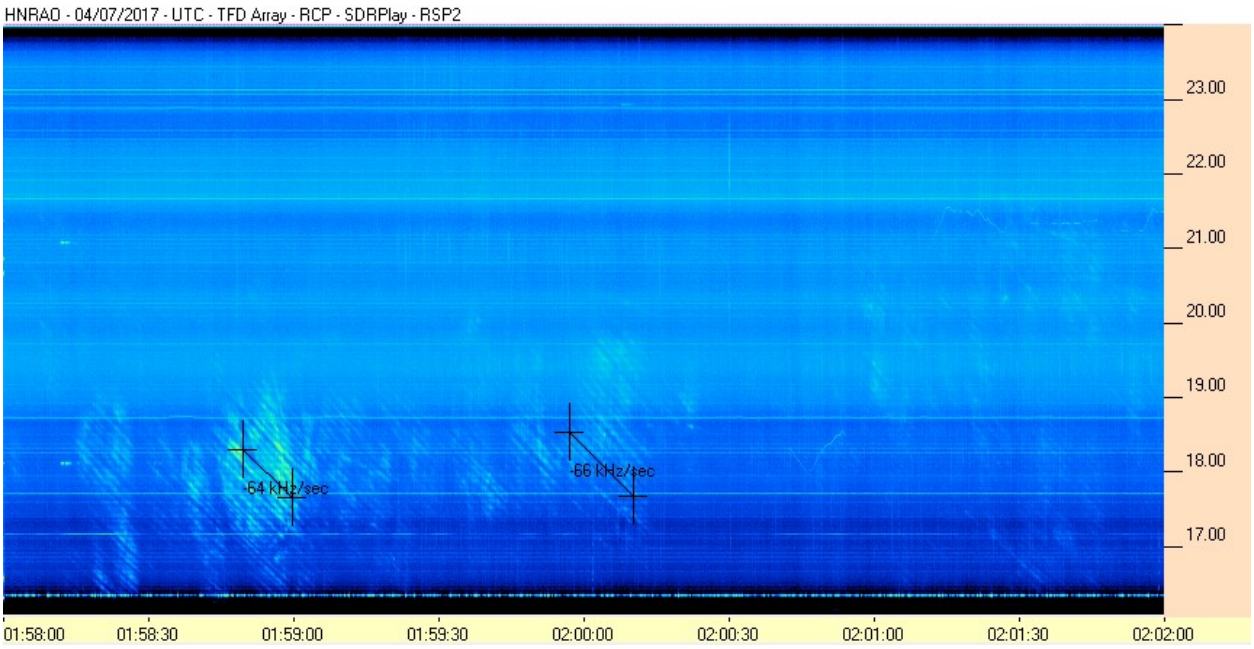

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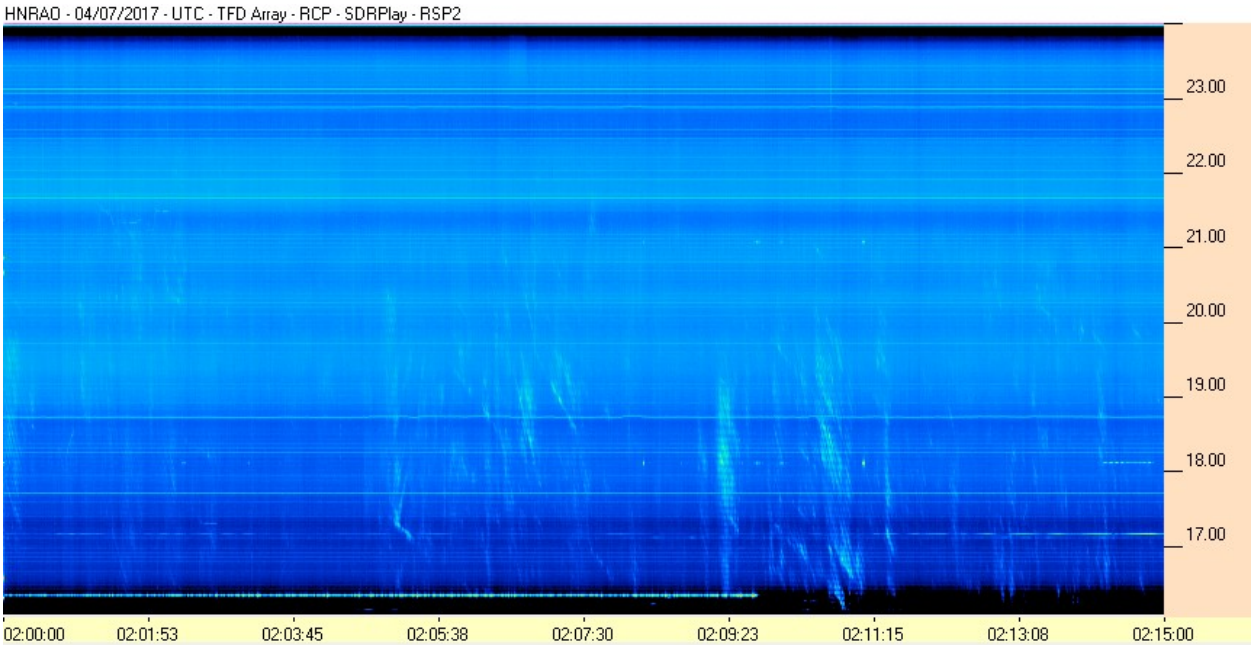

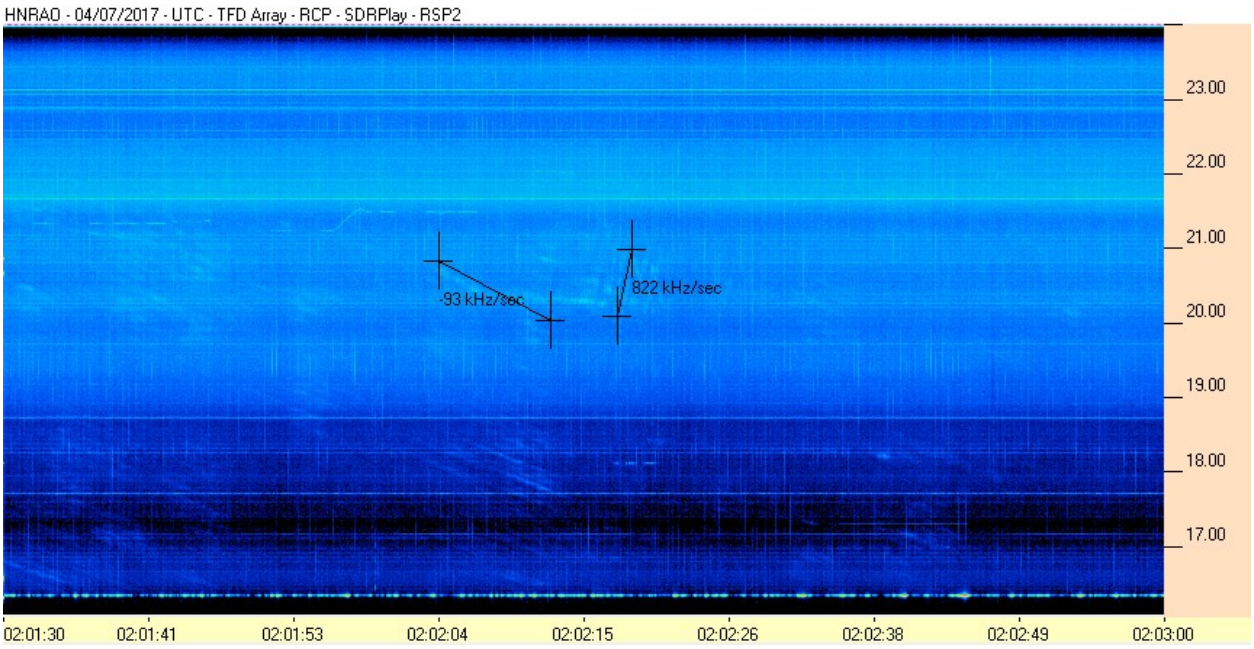

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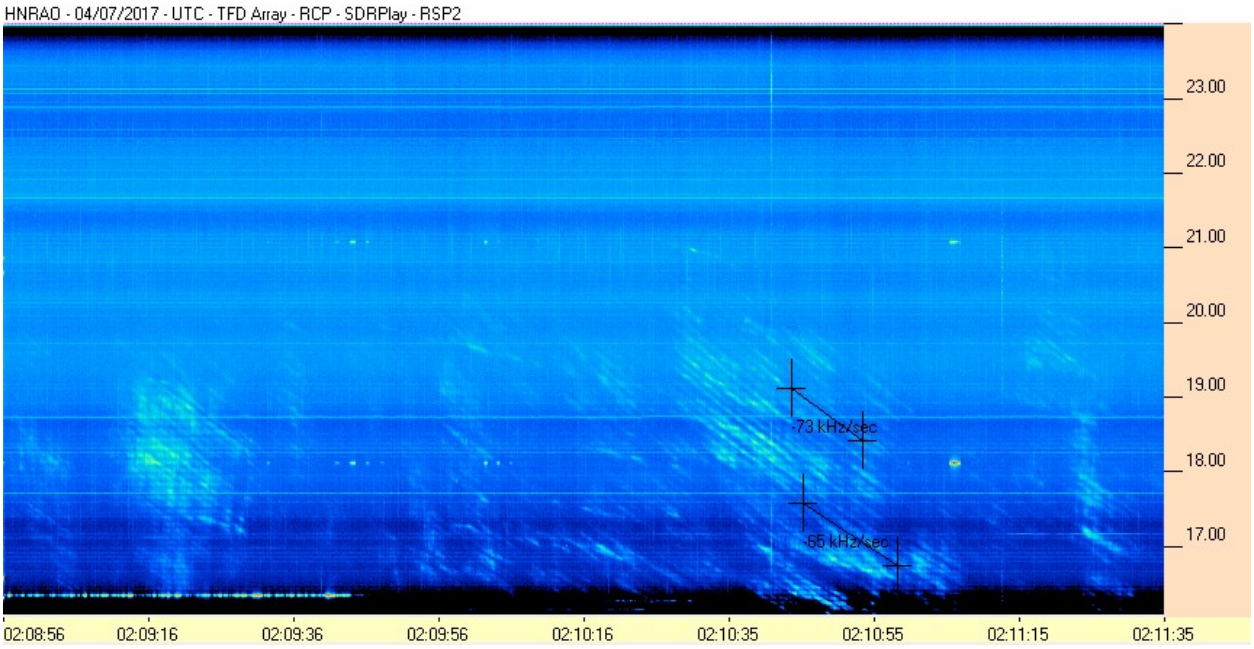
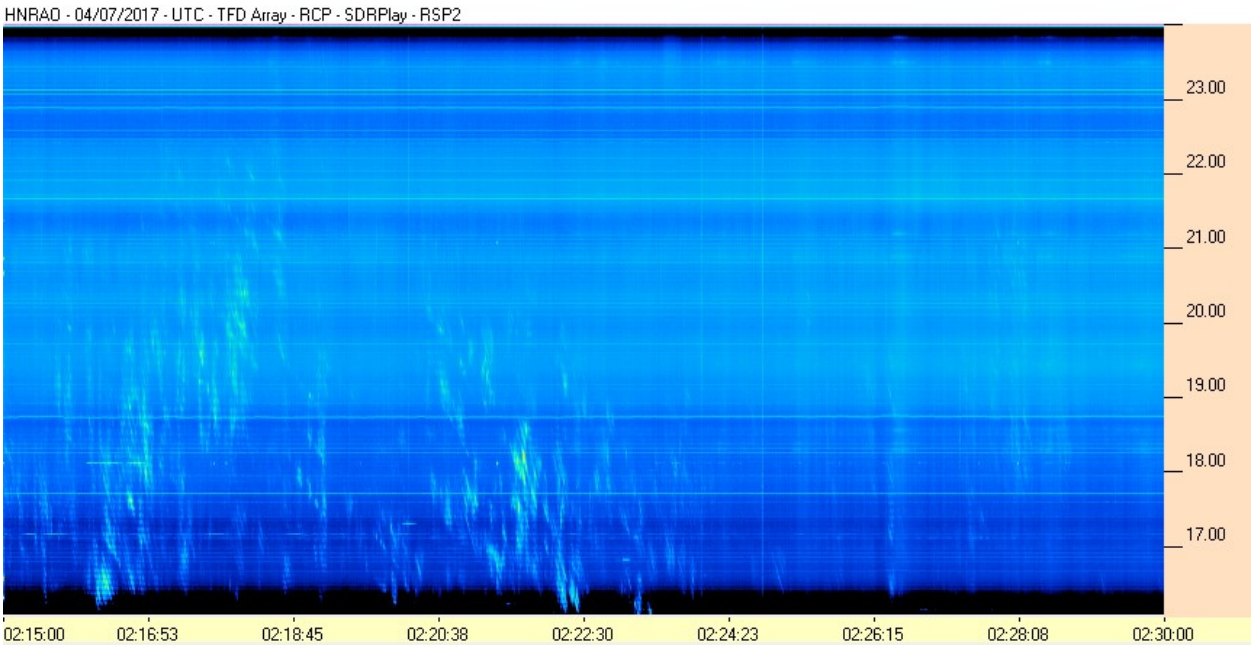
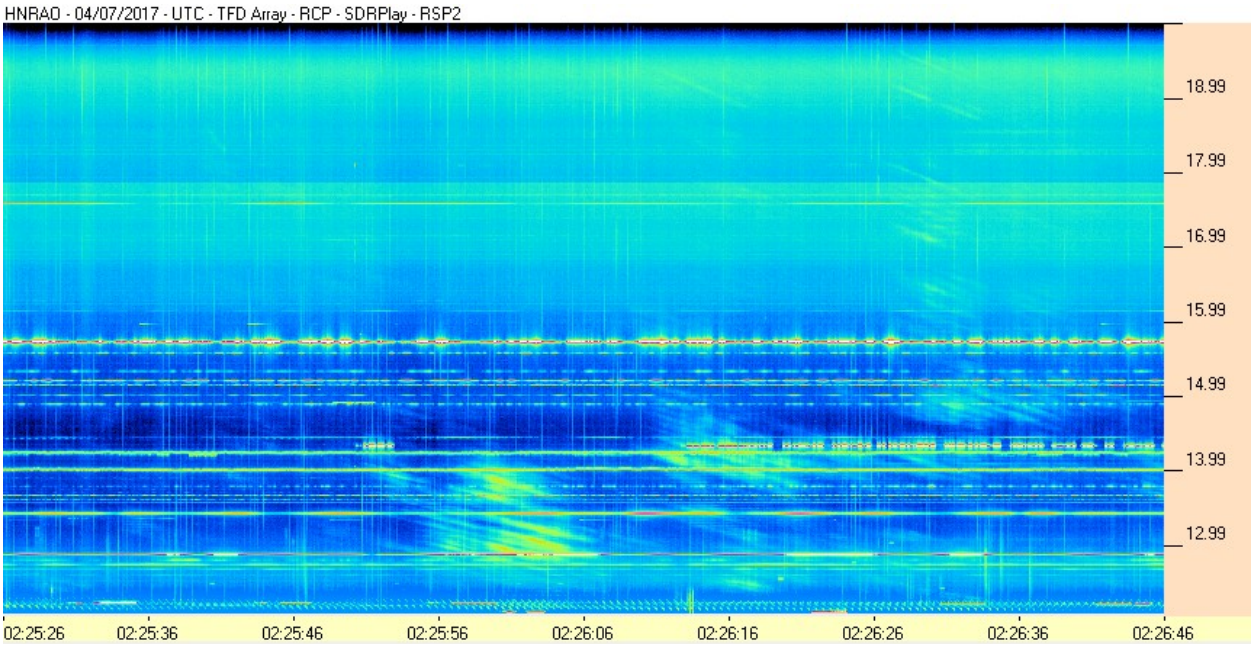
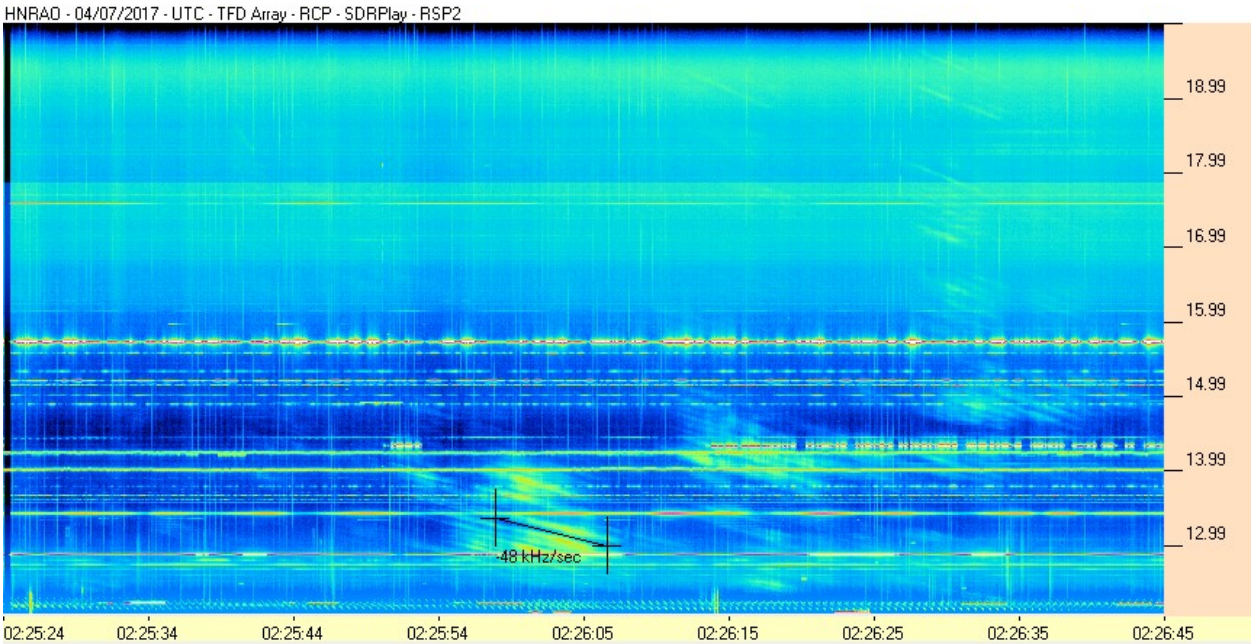




SDRPlay RSP1/TFD Pair





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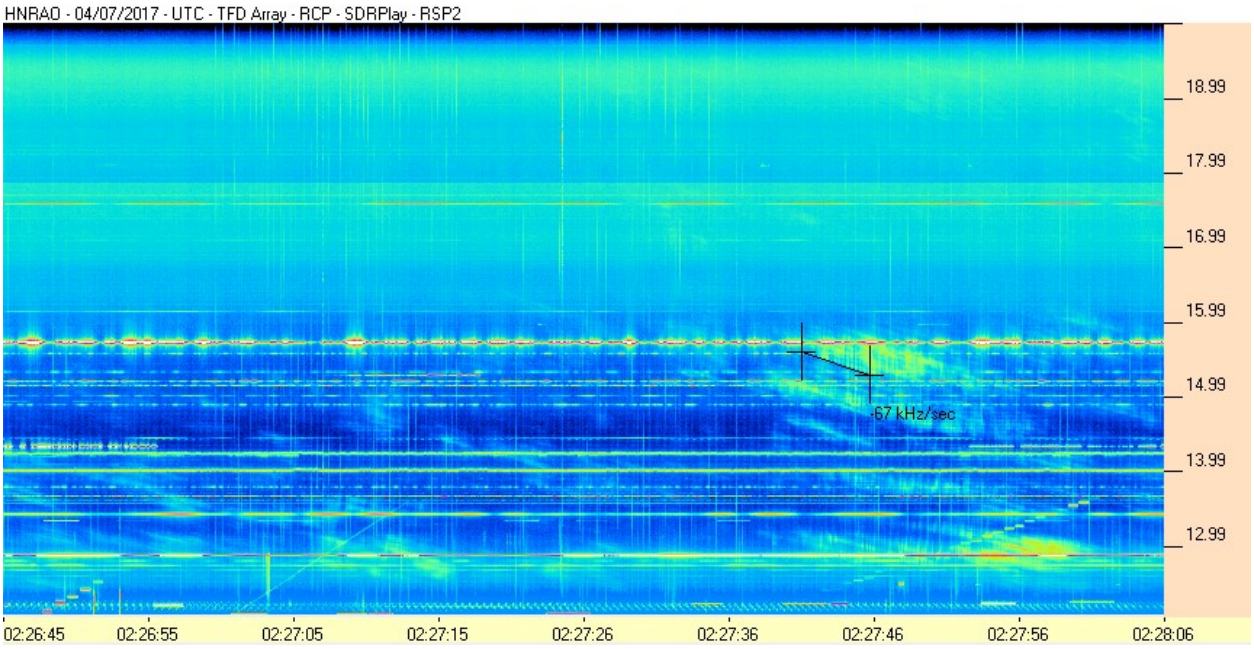

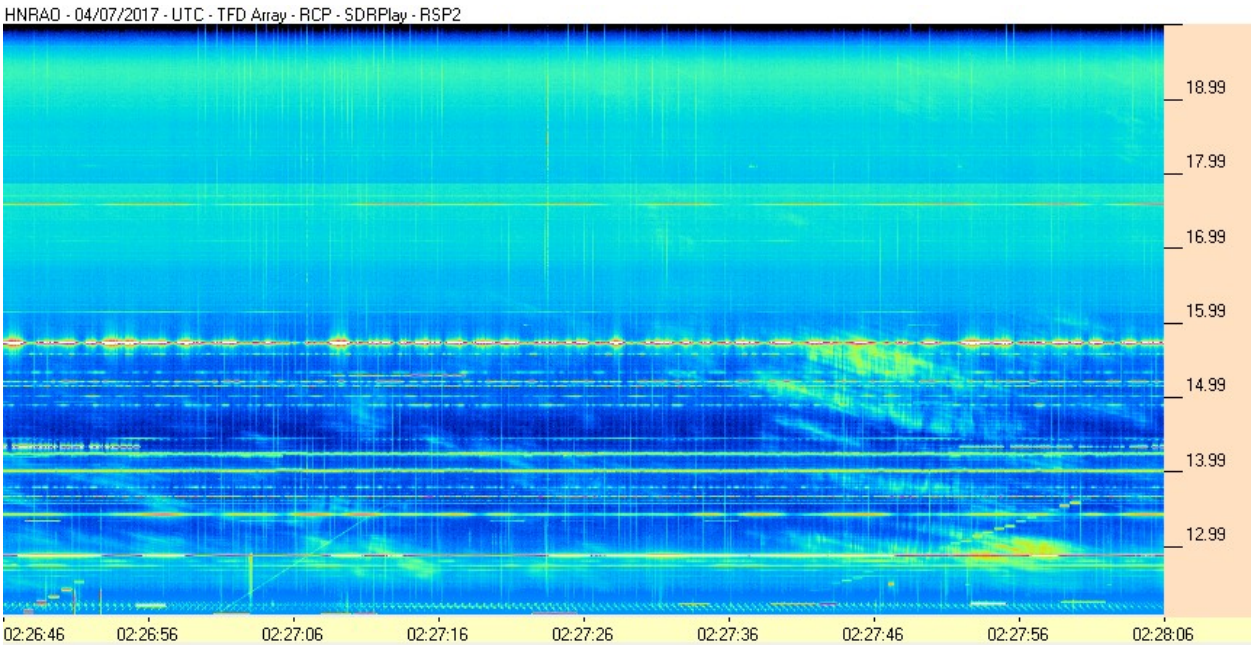

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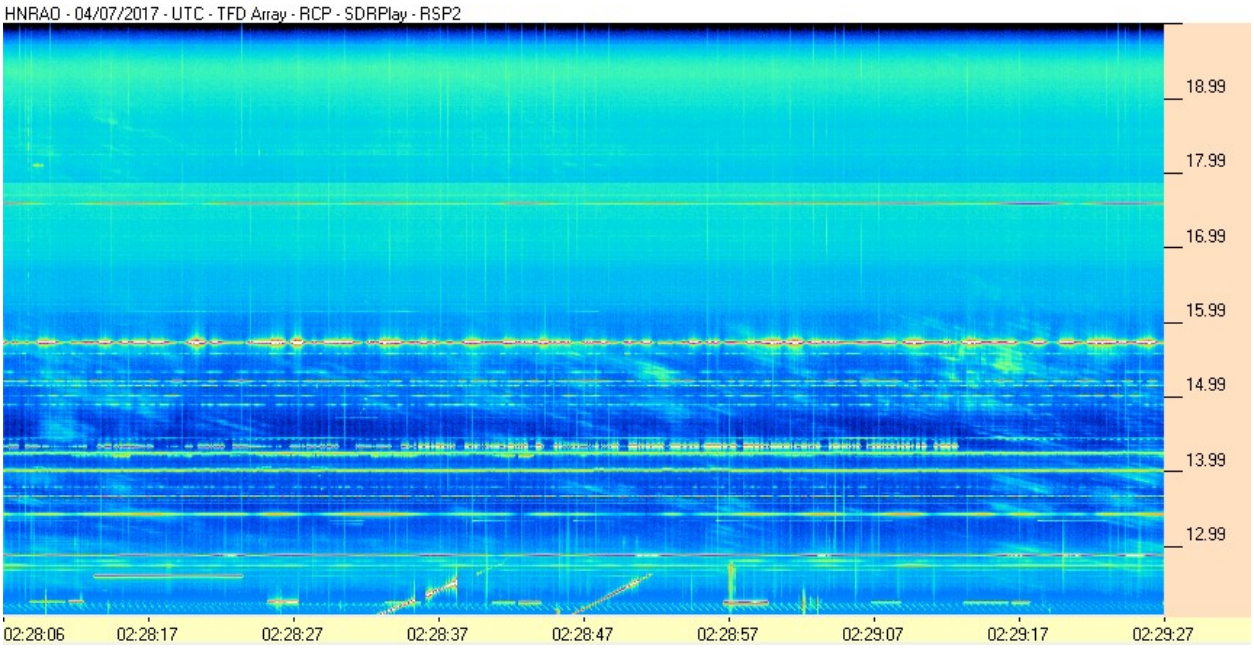
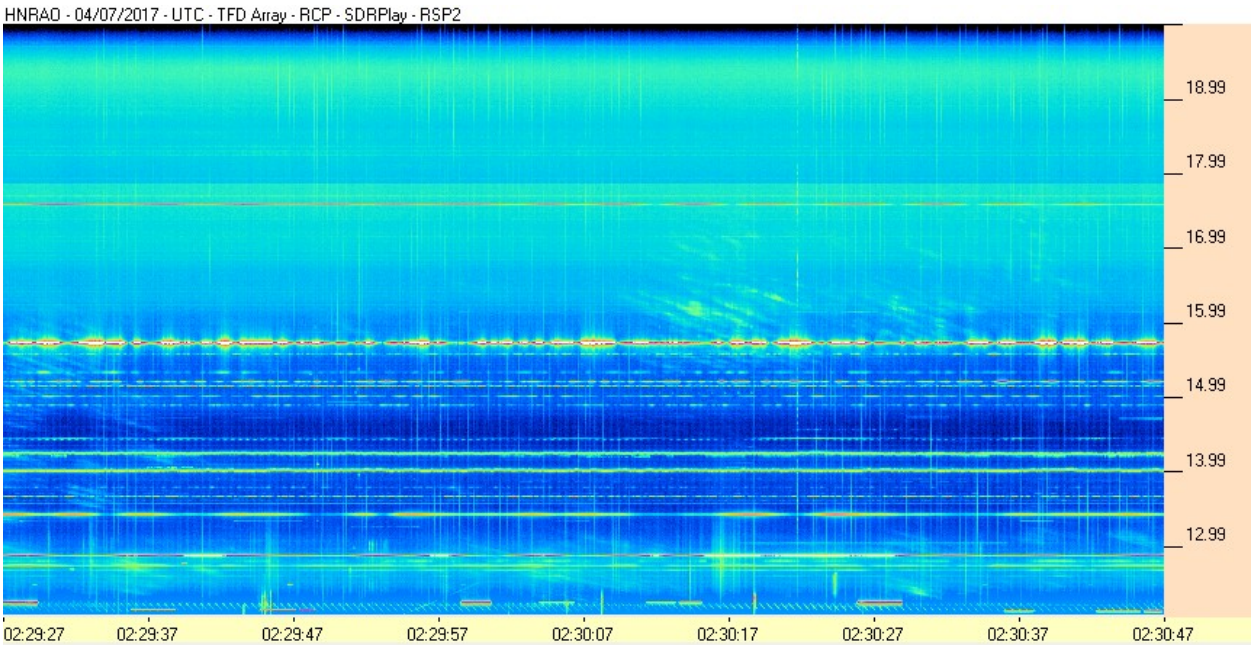
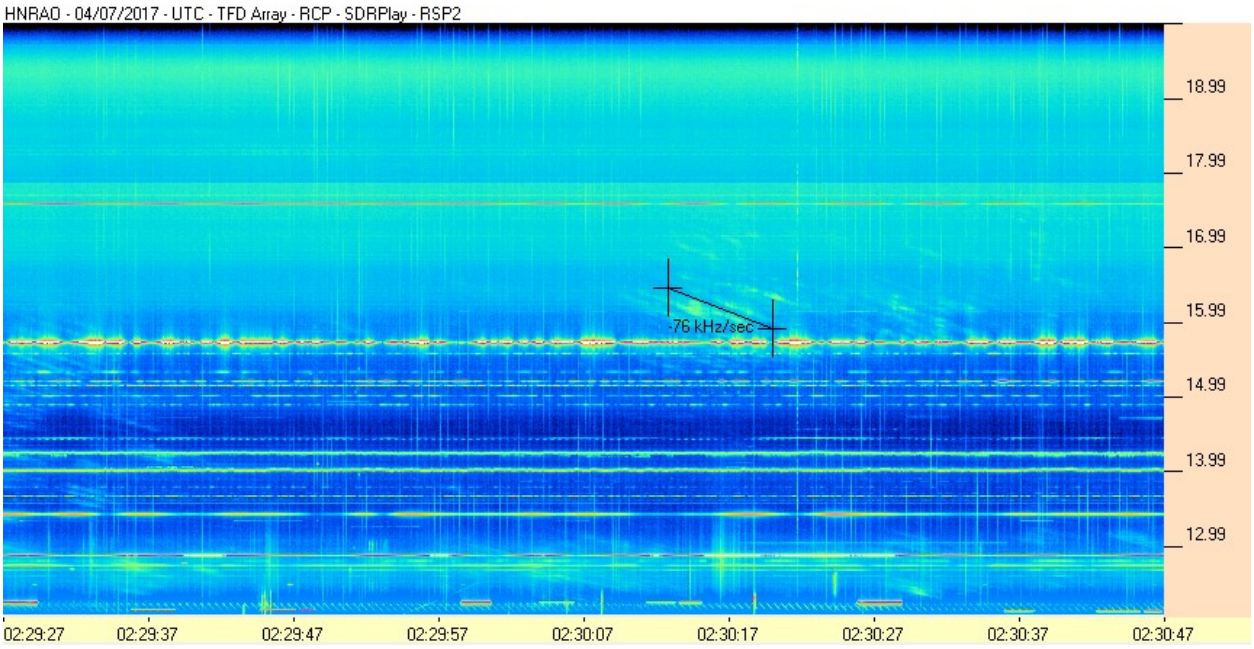
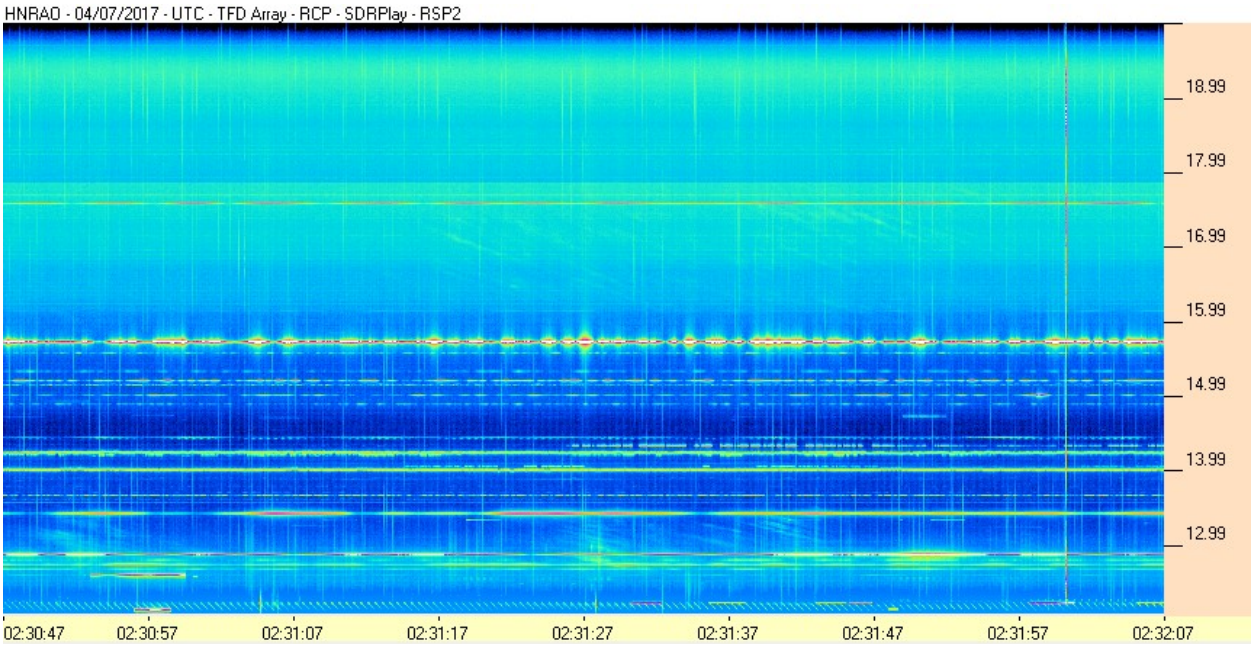





HNRAO - 04/07/2017 - UTC - TFD Array - RCP - SDRPlay - RSP2
-76 kHz/sec
18.99
17.99
16.99
15.99
14.99
13.99
12.99
02:29:27
02:29:37
02:29:47
02:29:57
02:30:07
02:30:17
02:30:27
02:30:37
02:30:47


HNRAO - 04/07/2017 - UTC - TFD Array - RCP - SDRPlay - RSP2
18.99
17.99
16.99
15.99
14.99
13.99
12.99
02:30:47
02:30:57
02:31:07
02:31:17
02:31:27
02:31:37
02:31:47
02:31:57
02:32:07

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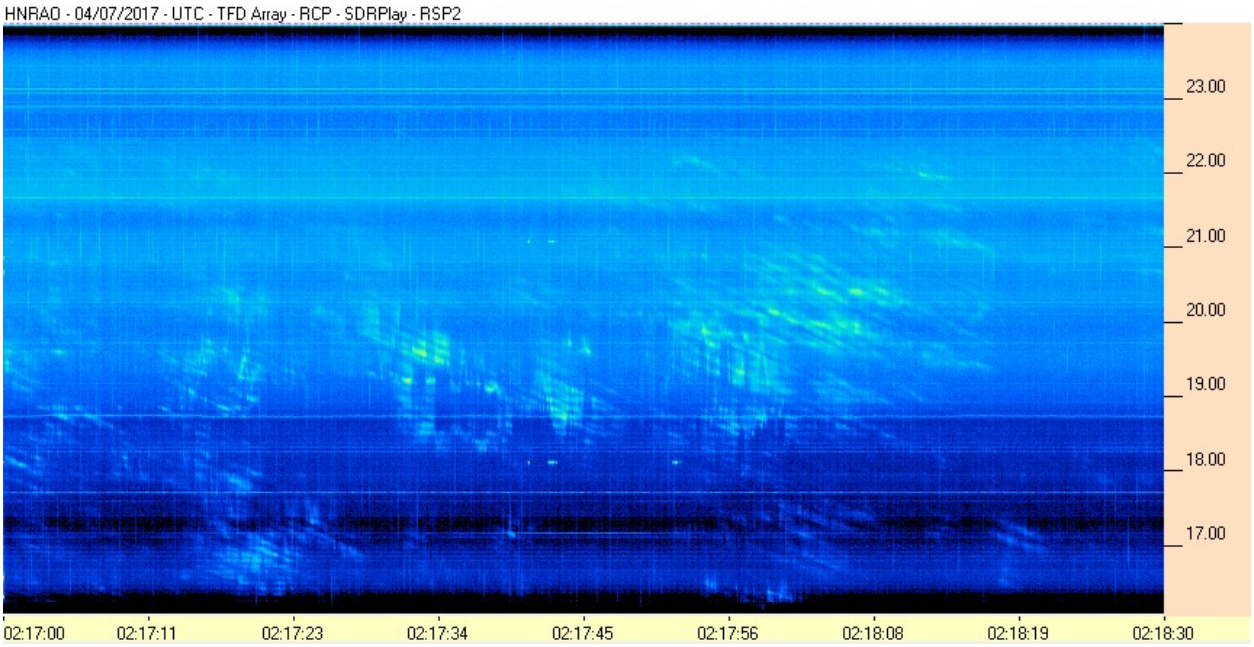

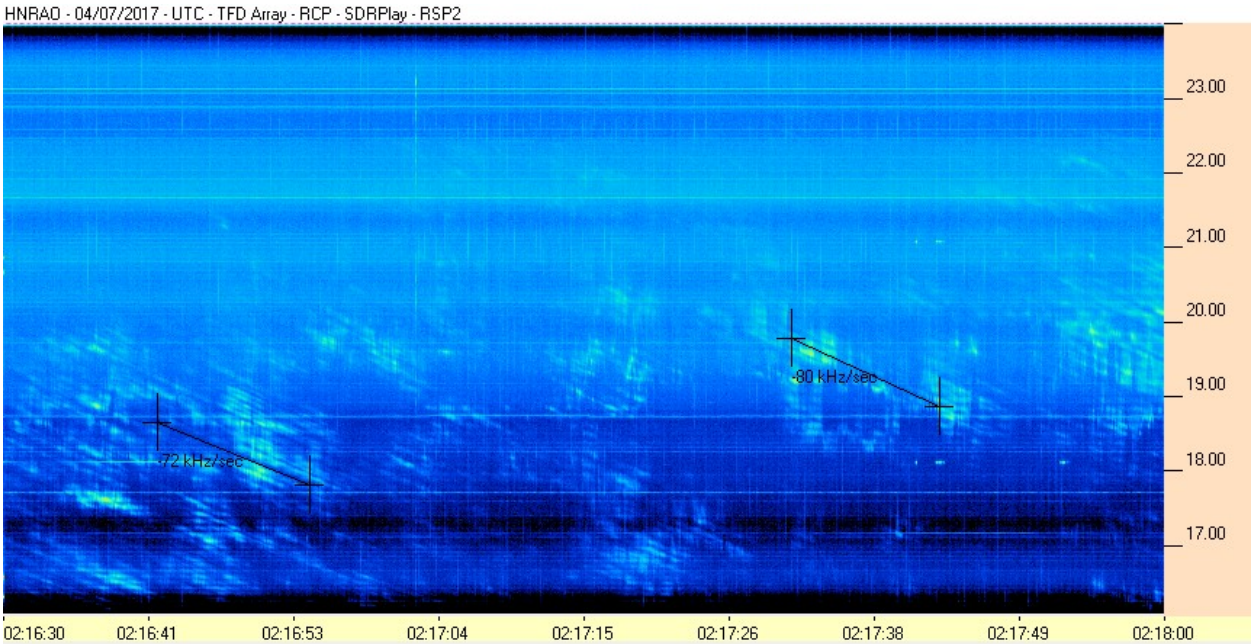

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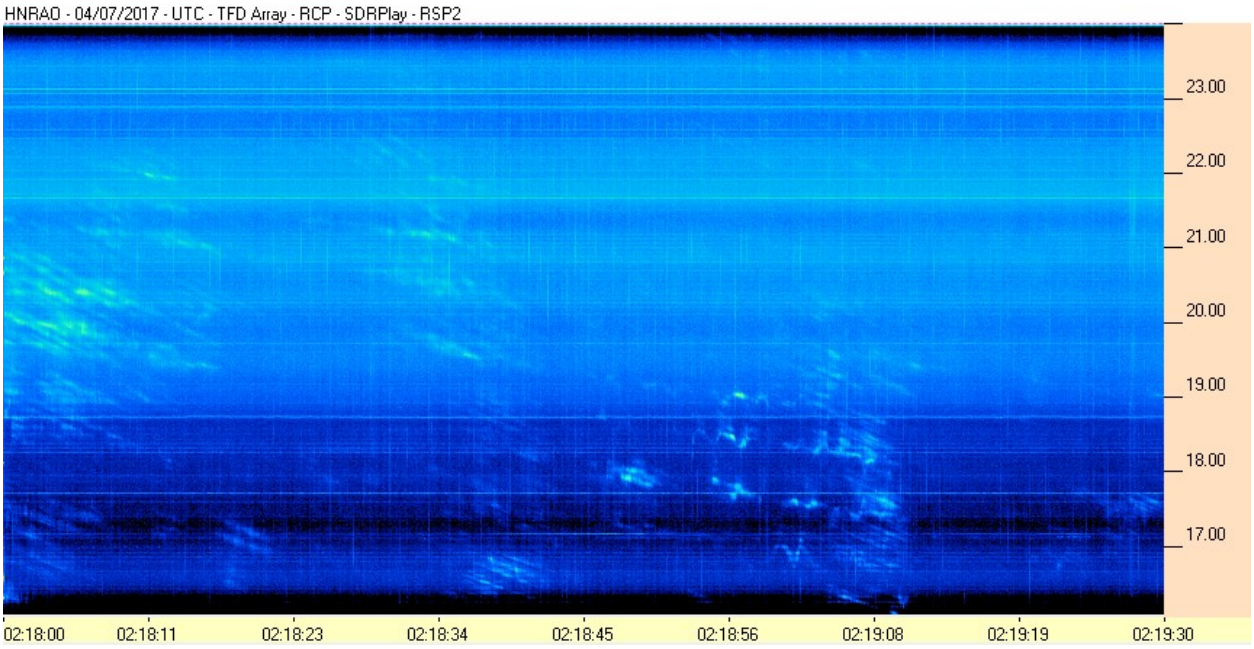
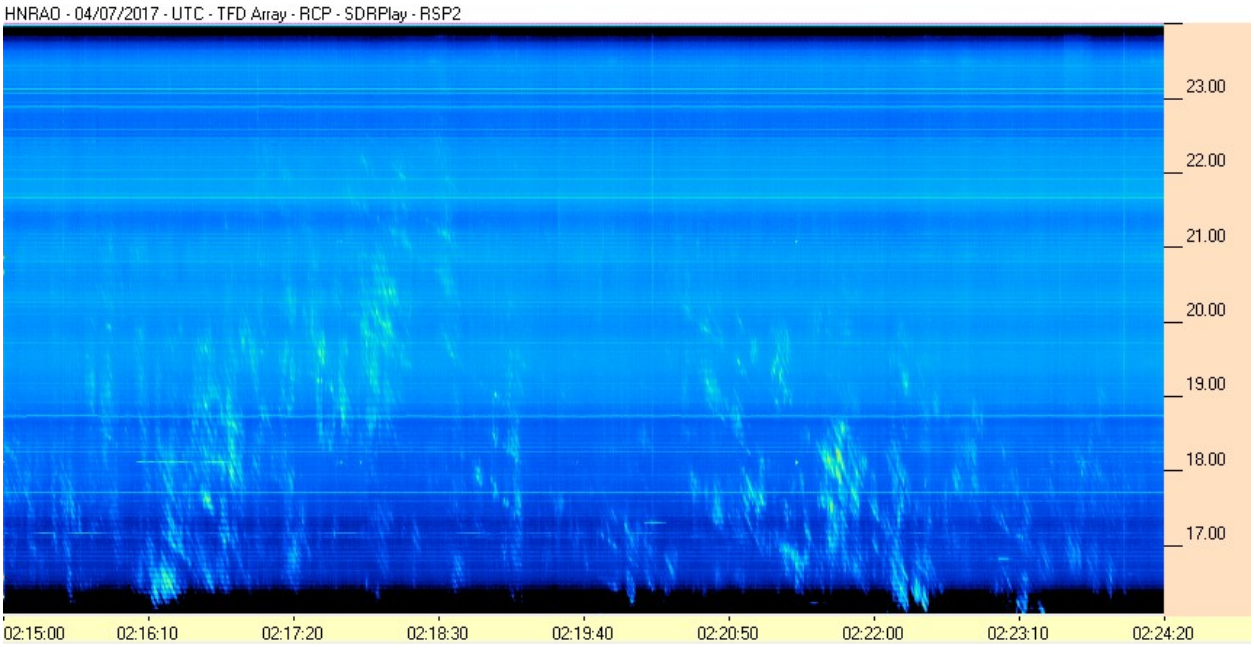
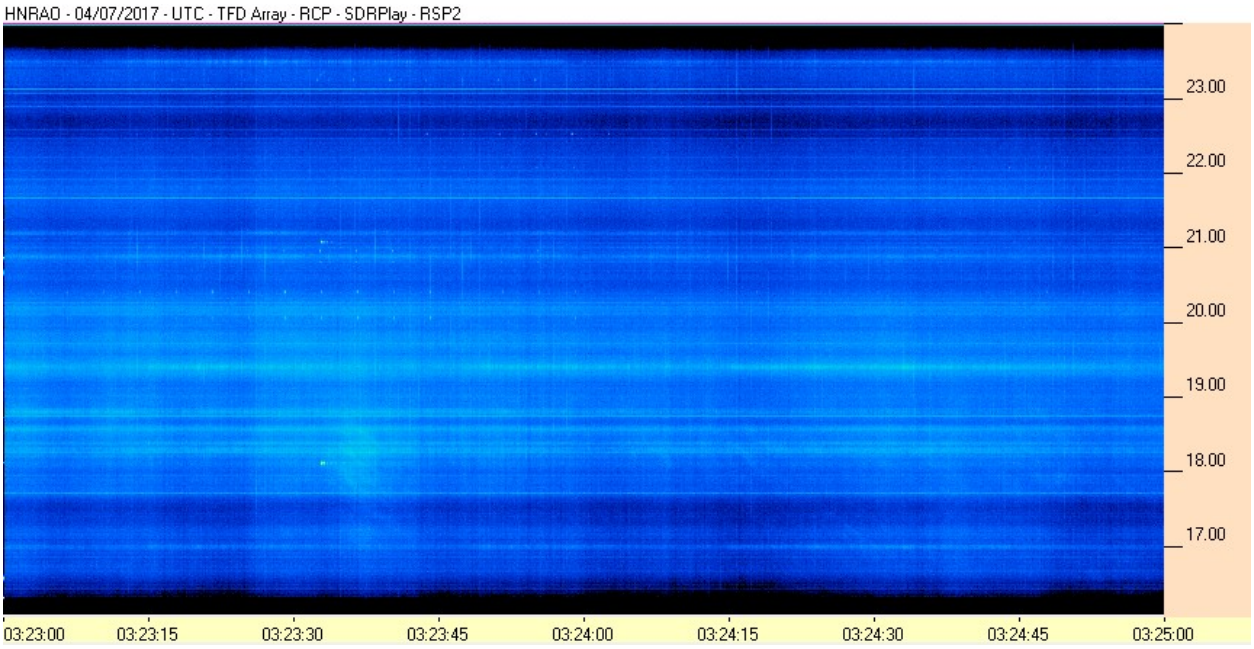
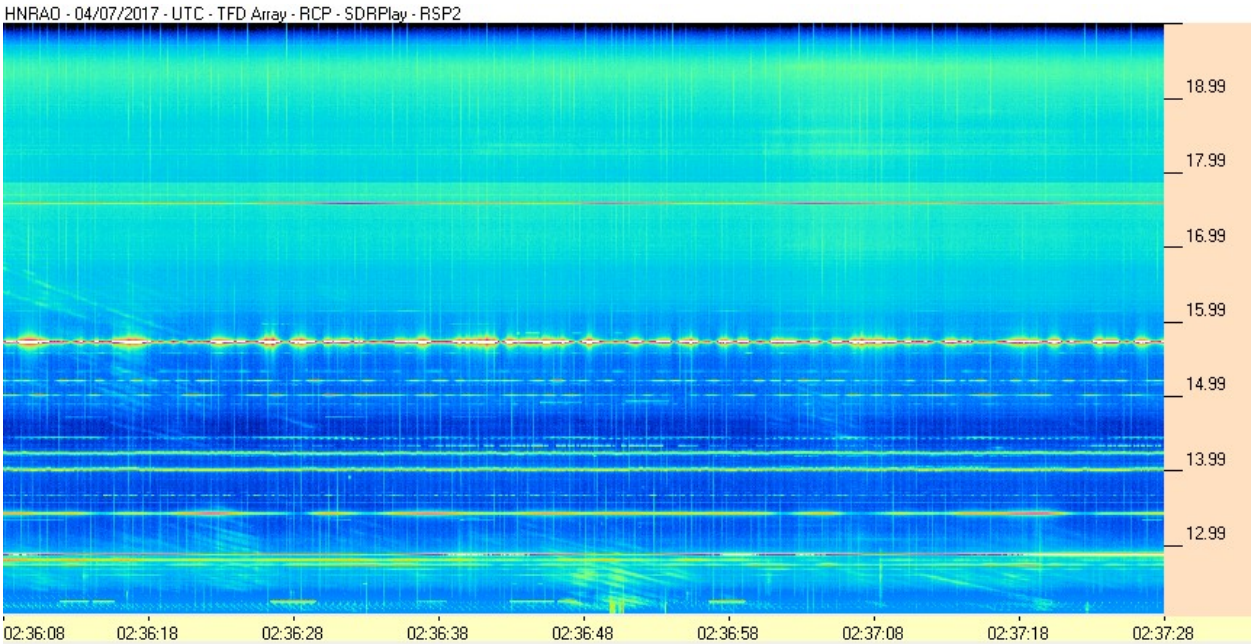
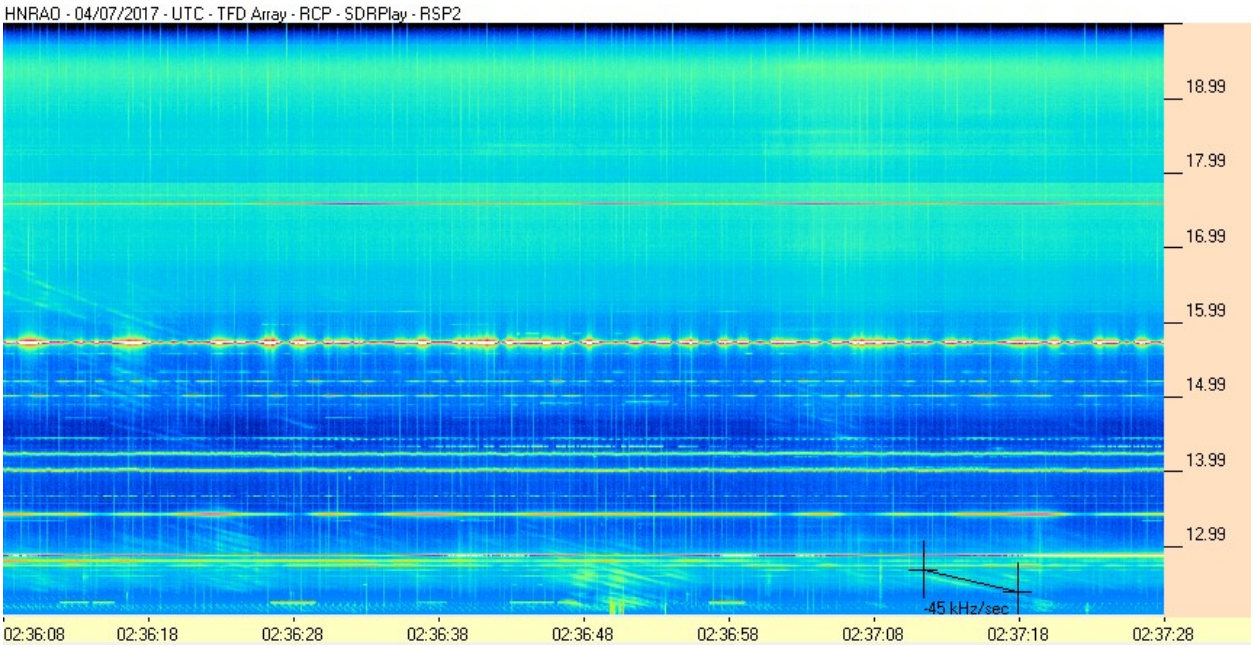






SDRPlay RSP1/TFD Pair




HNRAO - 04/07/2017 - UTC - TFD Array - RCP - SDRPlay - RSP2
18.99
17.99
16.99
15.99
14.99
13.99
12.99
-45 kHz/sec
02:36:08
02:36:18
02:36:28
02:36:38
02:36:48
02:36:58
02:37:08
02:37:18
02:37:28

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Radio JOVE/JOVE Dipoles/Pair