HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

Date: 24 April 2017

Object: Jupiter – Non-Io-A

Observer: Unattended

Start of pass:	**0120 UT**	**Planetary K-index:**	**4**
Jupiter Altitude:	**29.4 degrees**	**Jupiter Azimuth:**	**127.9 degrees**
Jupiter CML:	**216.84**	**Jupiter Io Phase:**	**106.58**
Jupiter RA:	**13:02**	**Jupiter Dec:**	**-04:54**
Hour Angle:	**-02:55**	**Polarization**	**RCP**
Sun Altitude:	**-14.6 degrees**	**Sun Azimuth:**	**300.9 degrees**
Sun RA:	**02:00**	**Sun Dec:**	**12:14**

End of pass:	**0317 UT**		
Jupiter Altitude:	**42.6 degrees**	**Jupiter Azimuth:**	**160.5 degrees**
Jupiter CML:	**287.58**	**Jupiter Io Phase**	**123.10**
Hour Angle:	**-00:57**		
Sun Altitude:	**-30.7 degrees**	**Sun Azimuth:**	**326.7 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 @ 13’
    a. 12’ 6” phase cable - phased for 2016-17 season
    b. Calibrated 19 April 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 19 April 2017
5. SDRPlay
    a. RSP1 (2) and RSP2 (1)

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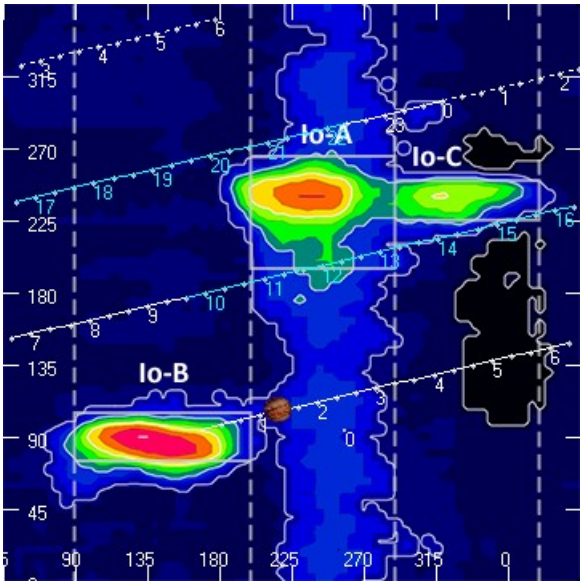
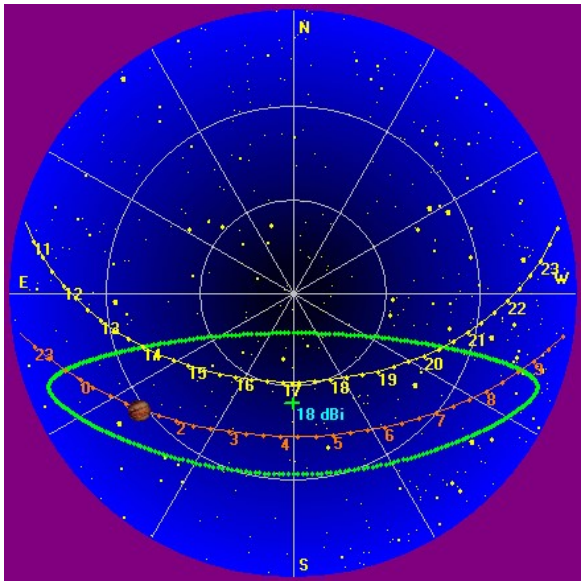
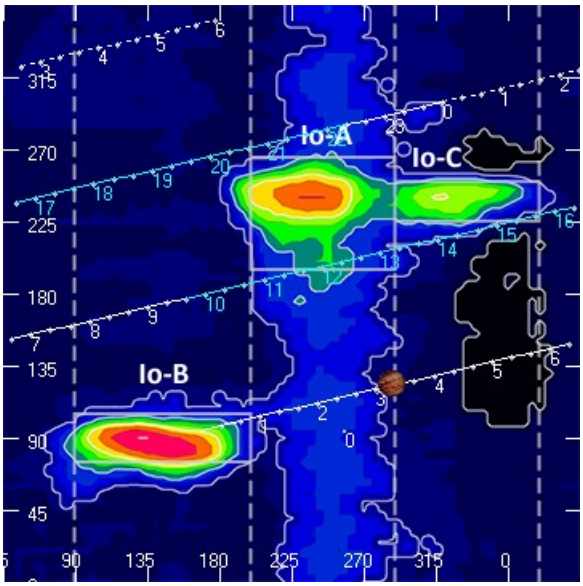
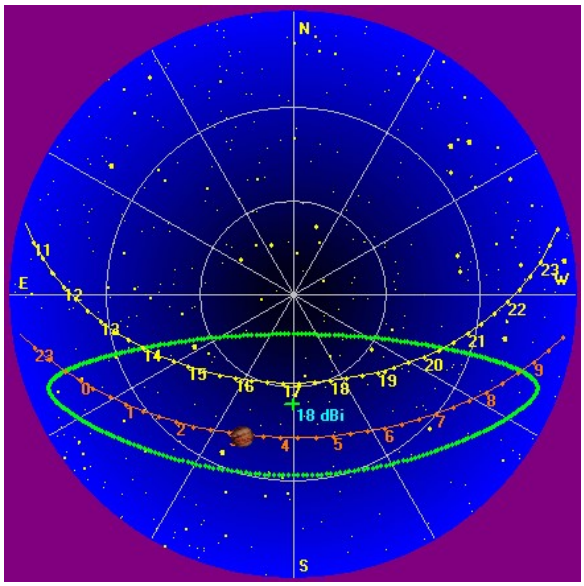




Beginning of Pass





End of Pass

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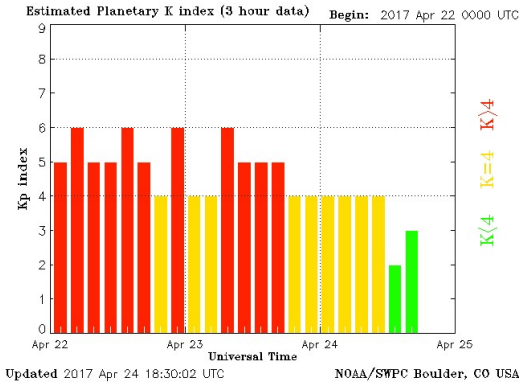

MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360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

A Non-Io-A storm spanning 28 MHz to 15 MHz. Negative drift L-bursts with negative drift modulation lanes.

Given the proximity in time to sunset, and the RSP units being so sensitive, the ionosphere had yet to quiet down and so the RSP unit was still heavily affected by shortwave broadcast stations below 15 MHz. The FSX-2 and FSX-8S spectrographs were not affected.

Negative drift modulation lanes were visible through the storm. Higher drift rates at the higher frequencies. Measured drift rates ranged from a high of -141 kHz/sec at 23 MHz to a low of -83 kHz/sec at 18 MHz.

An LCP Non-Io-C storm began during this RCP Non-Io-A storm. Emissions started at 0224 UT and ended at 0414 UT.

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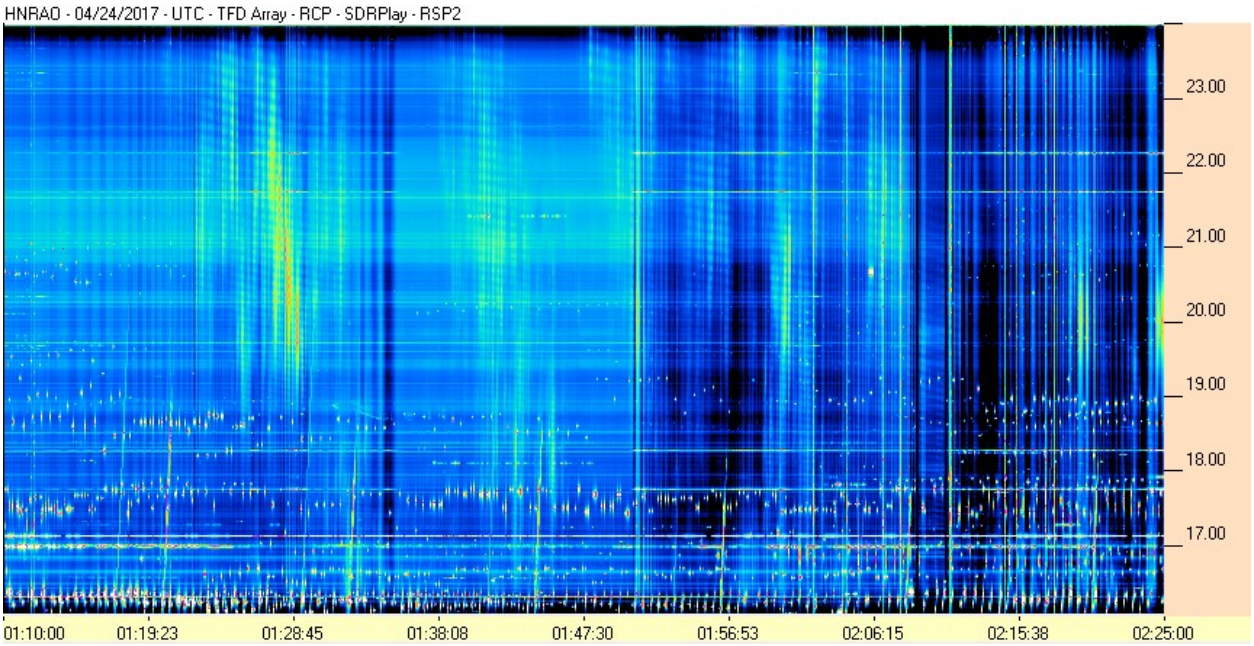
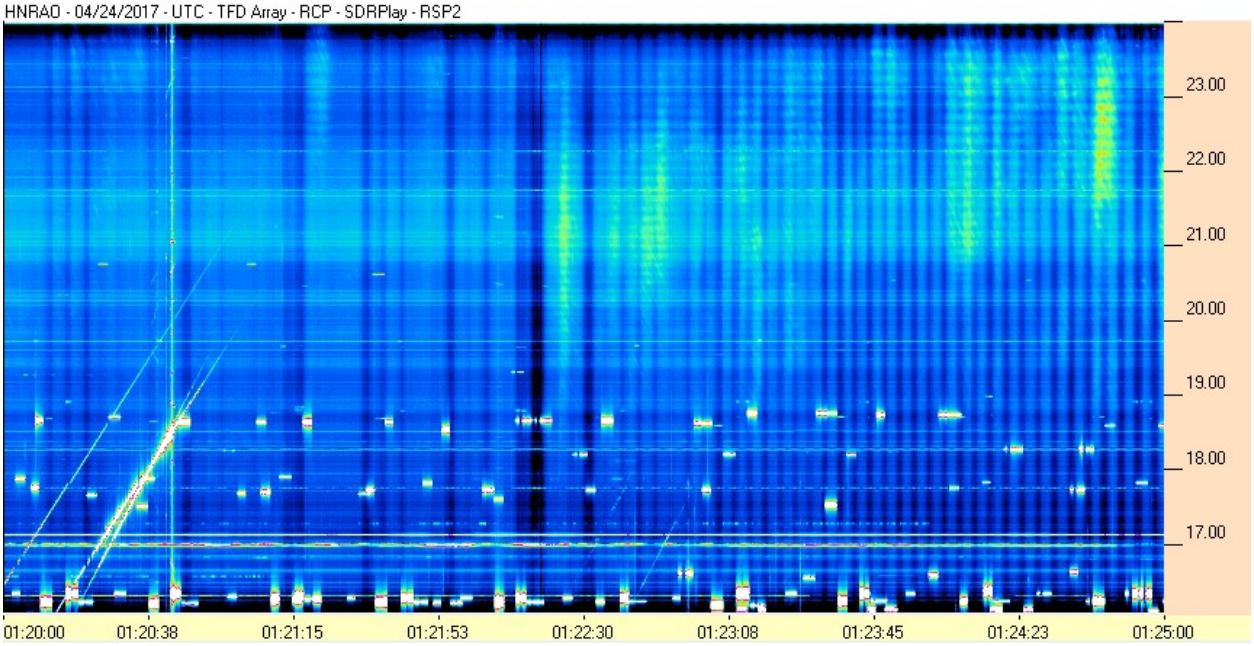
SDRPlay RSP2/TFD Pair





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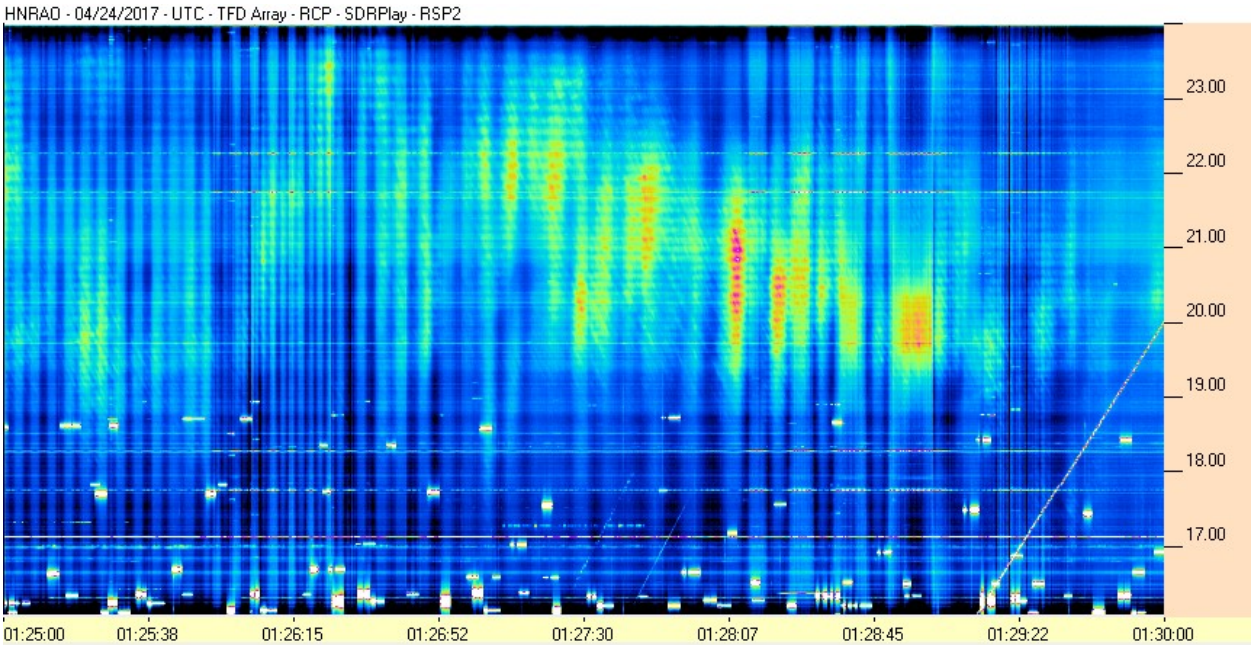

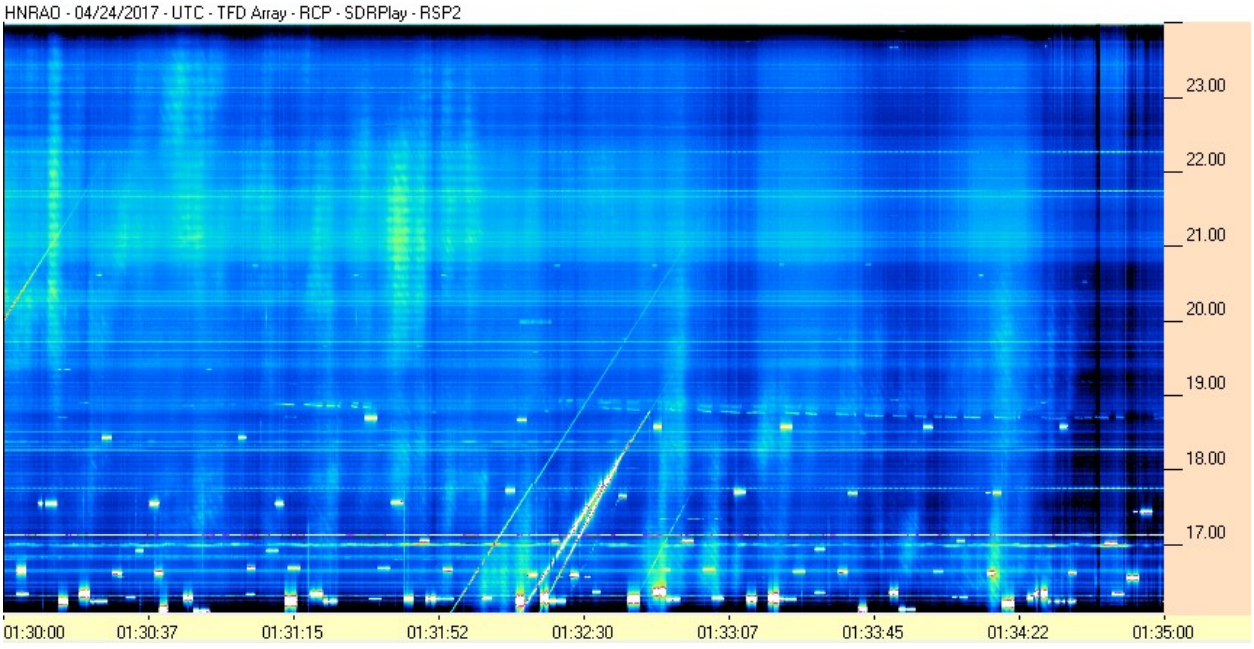

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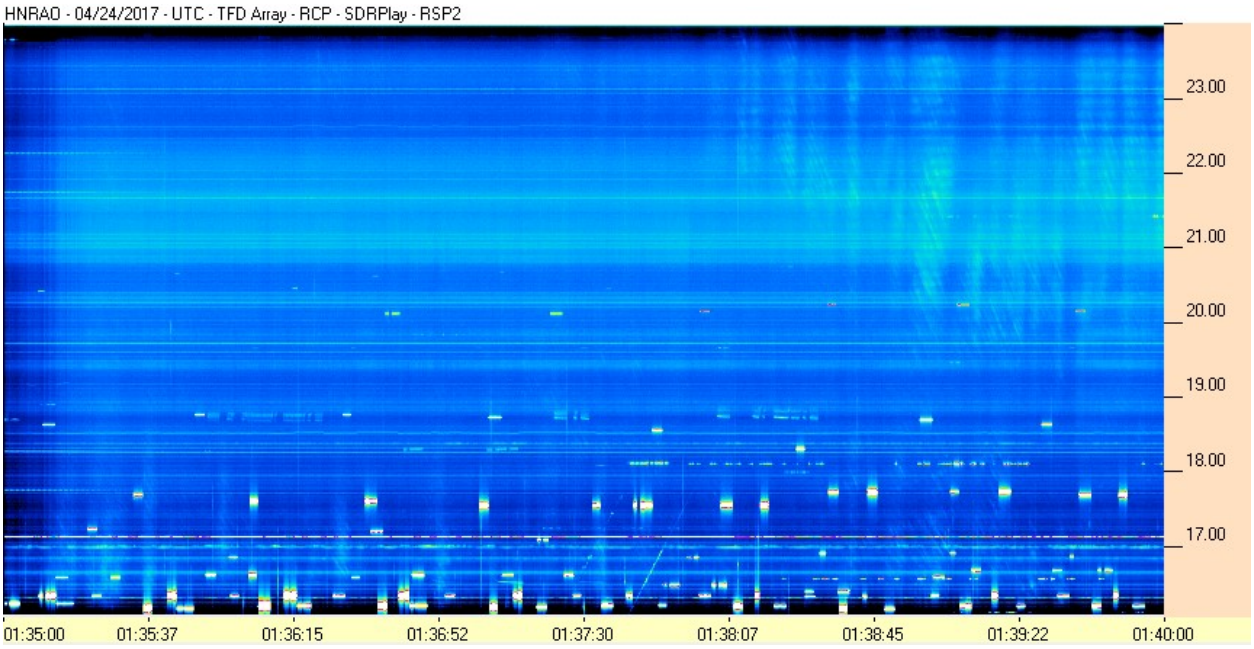

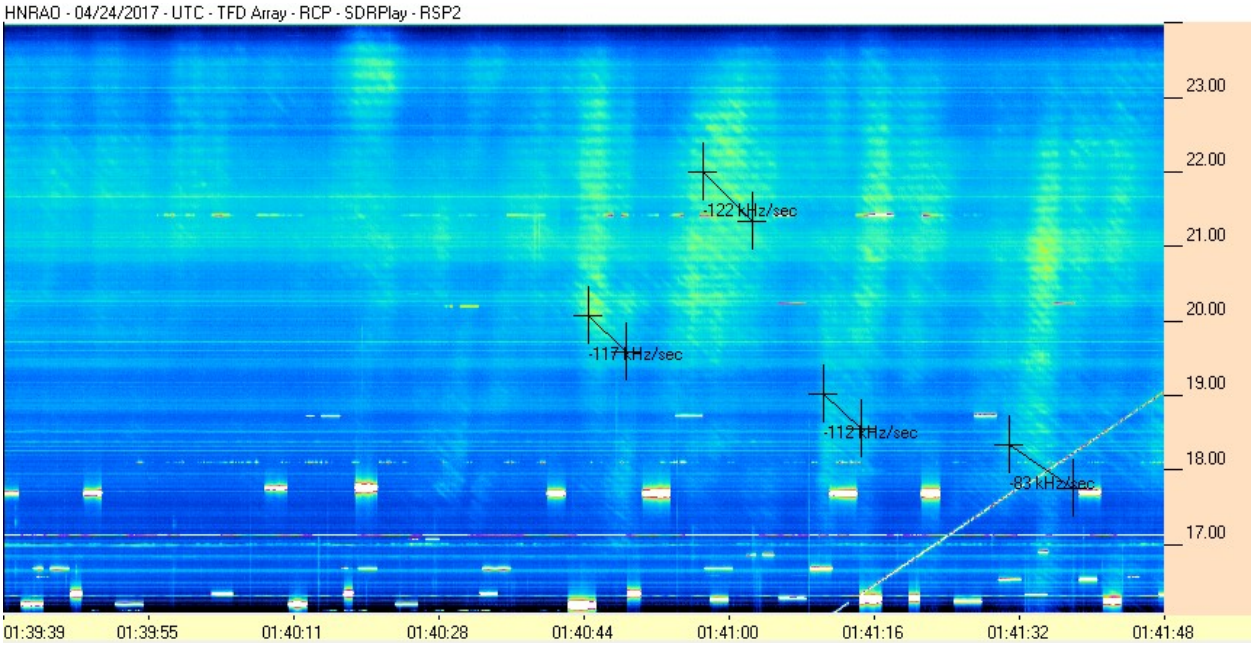

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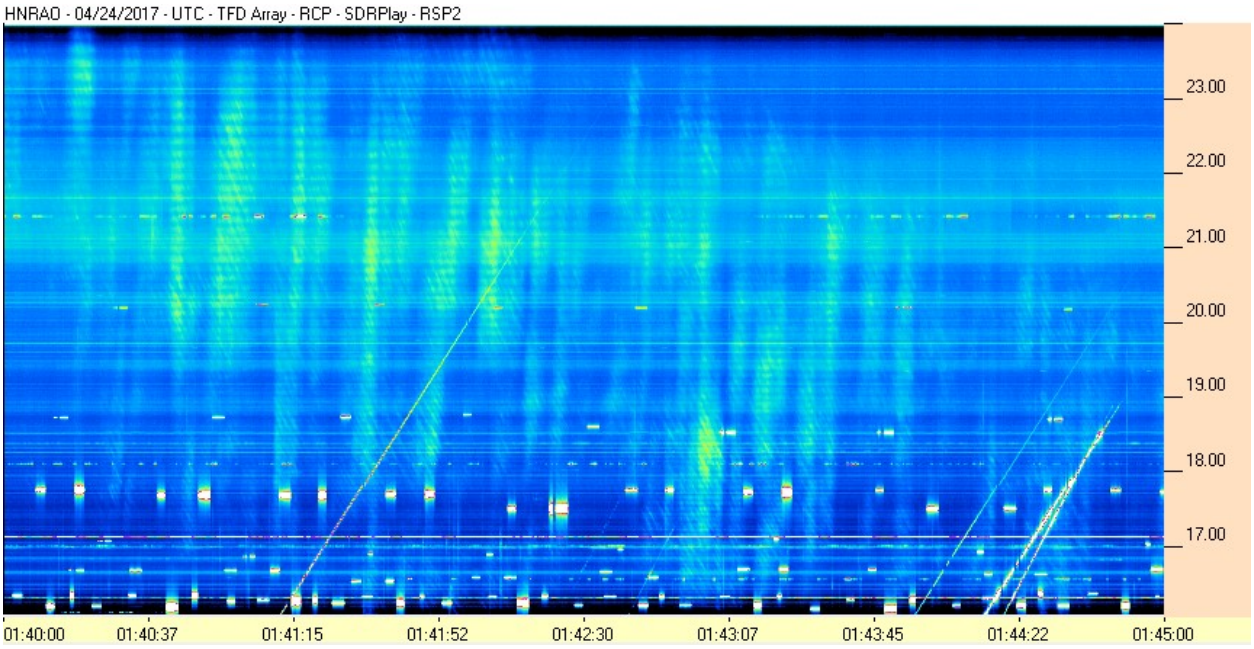

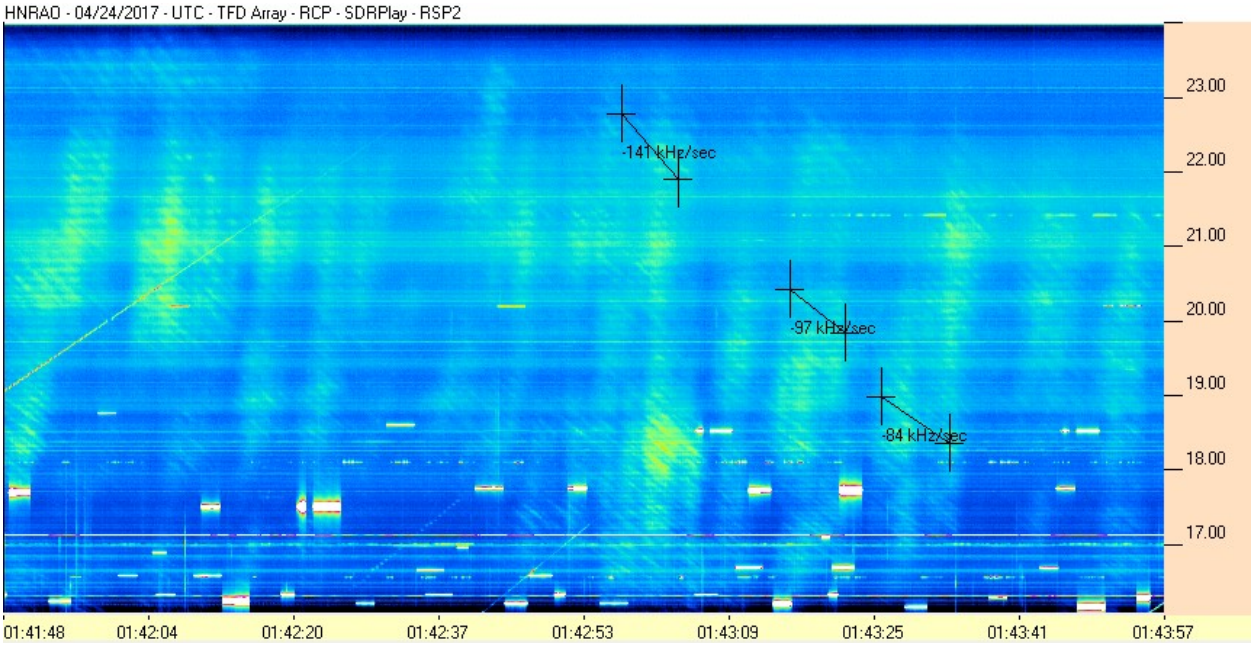

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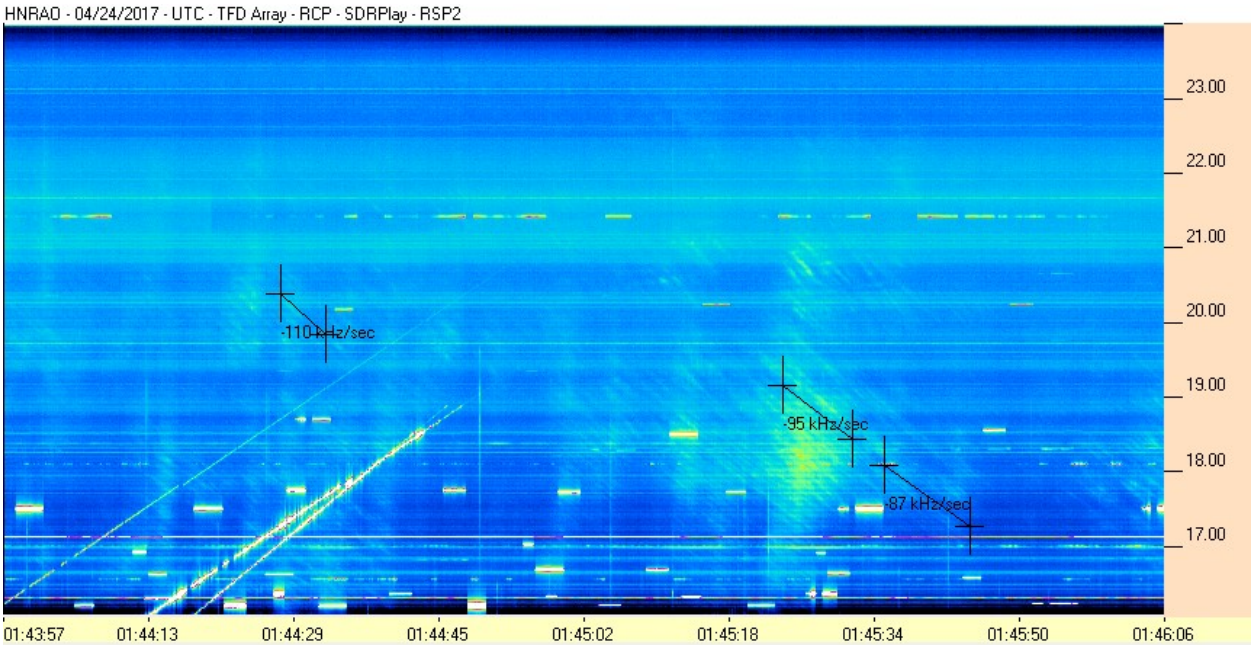

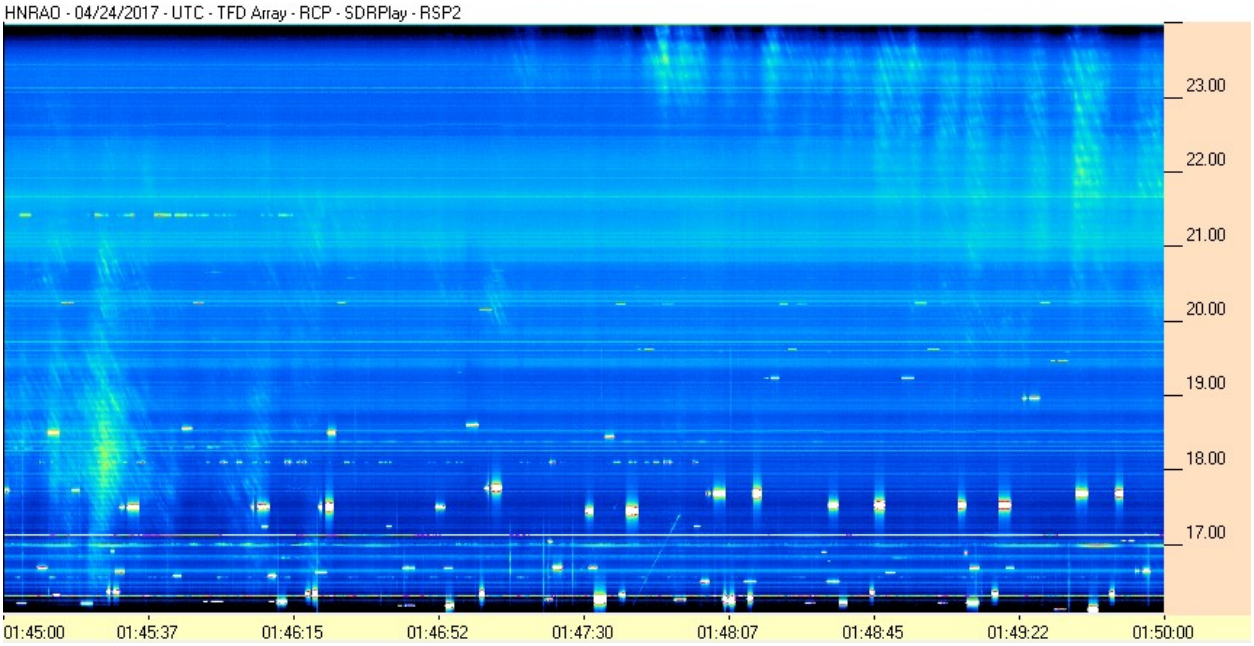

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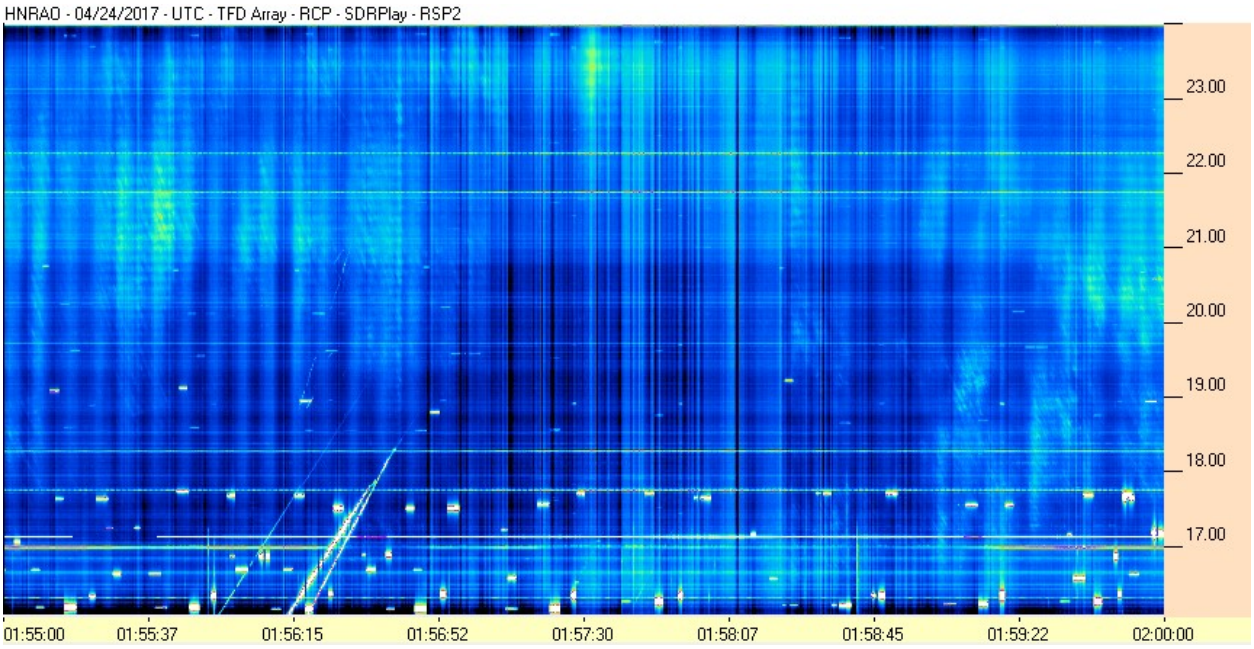

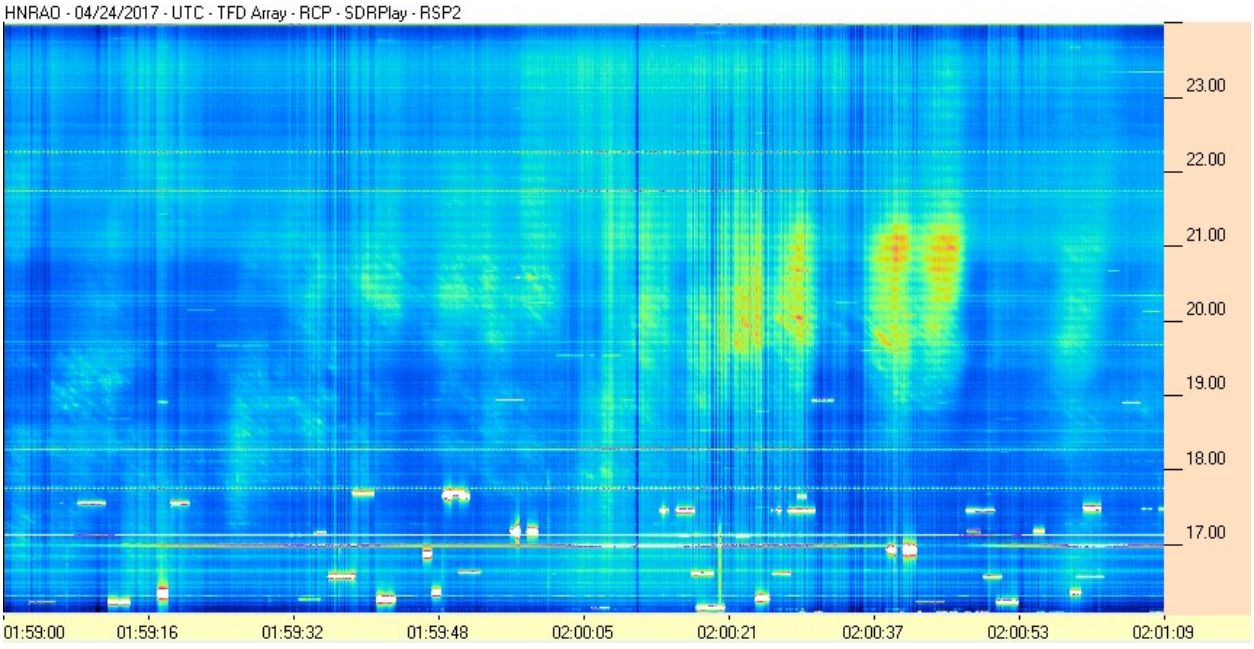

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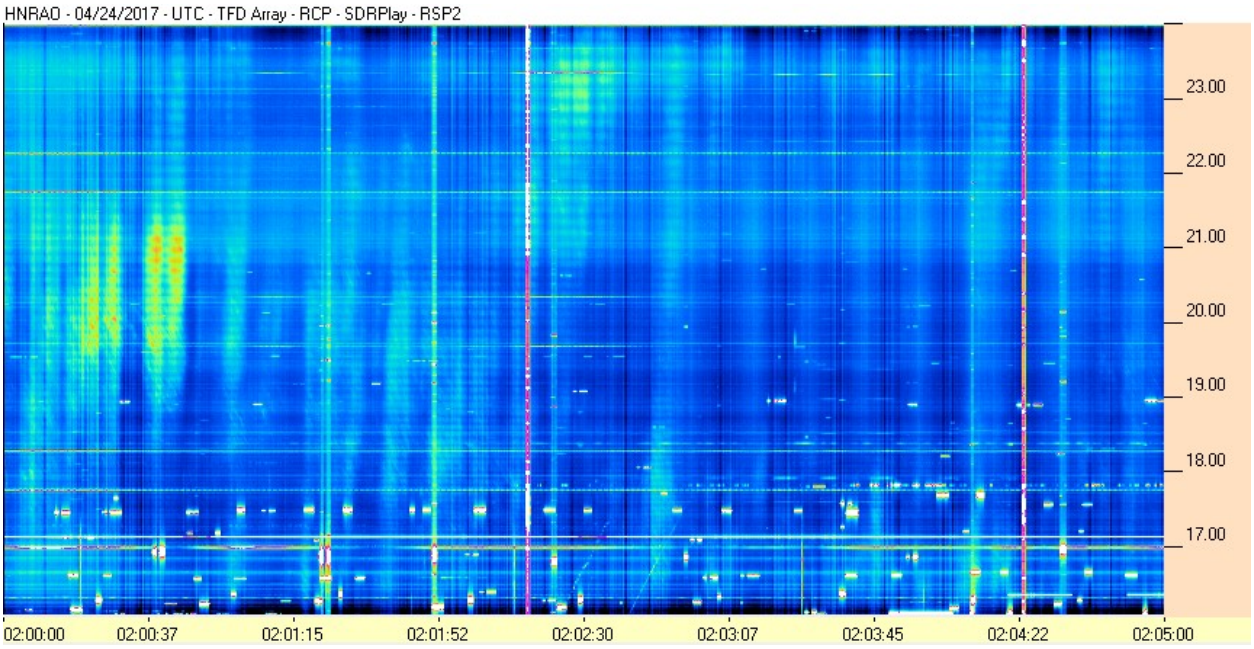

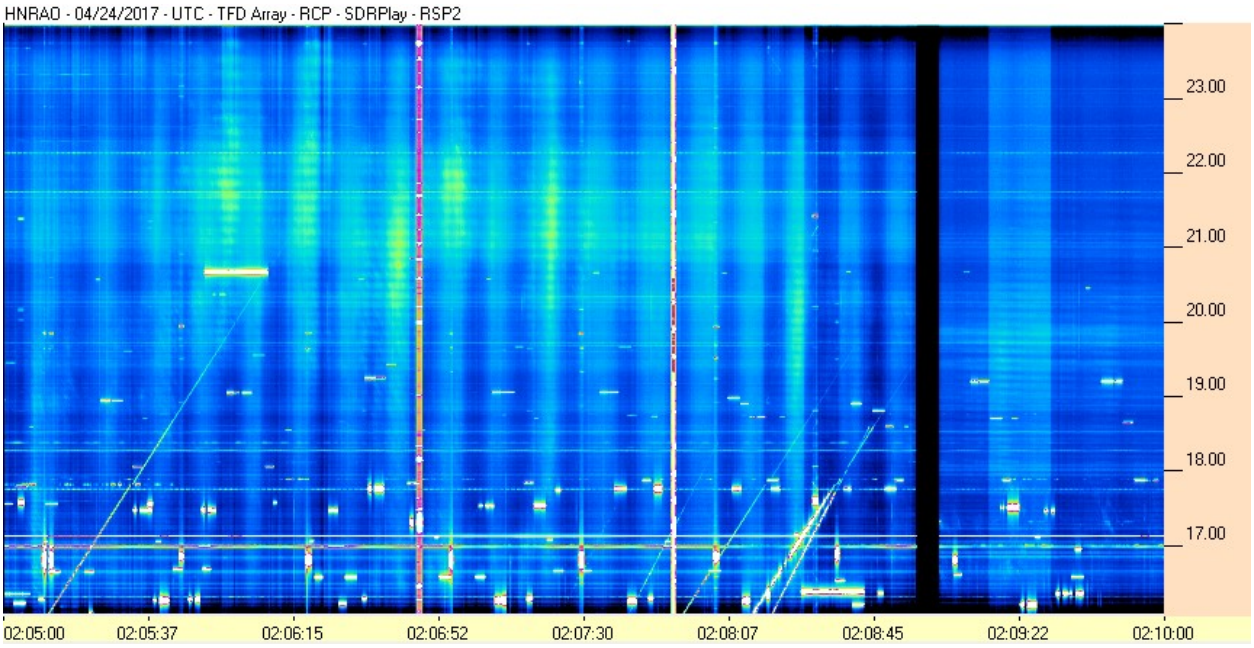

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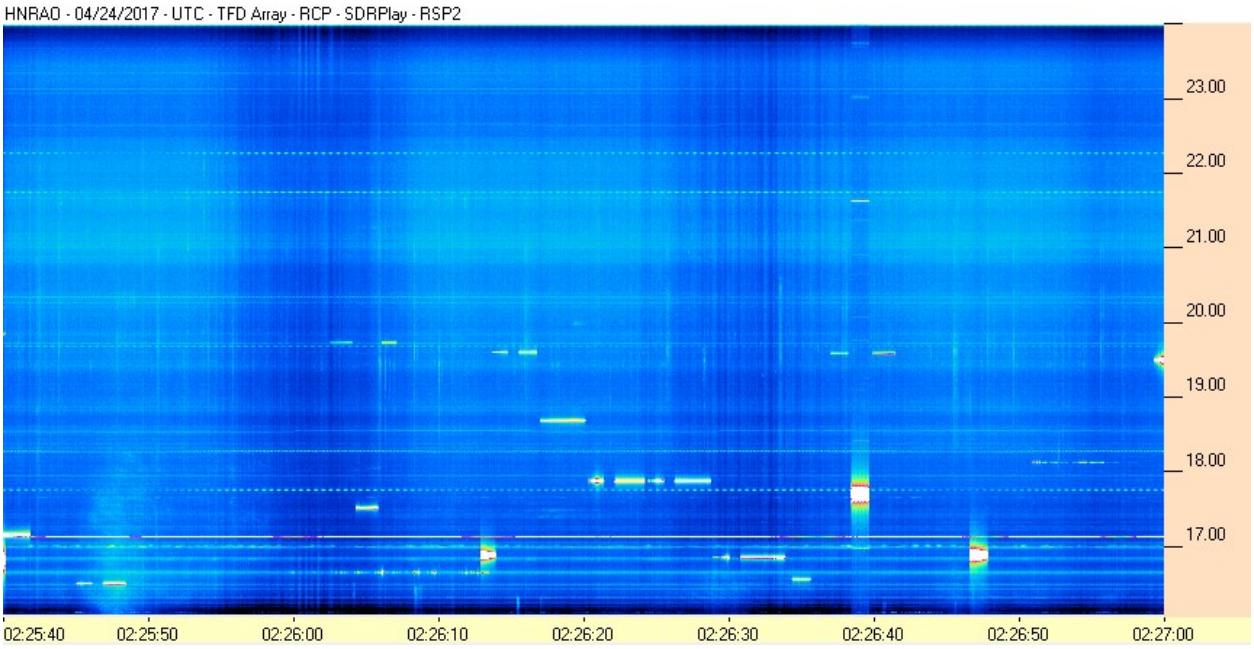

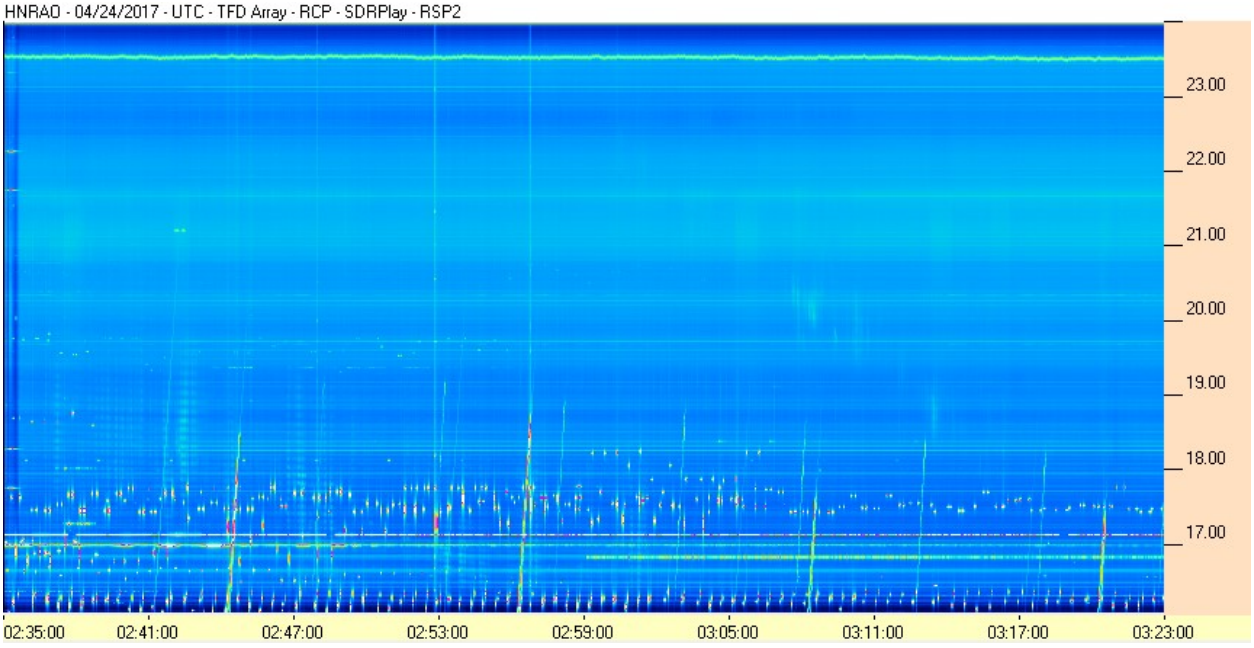

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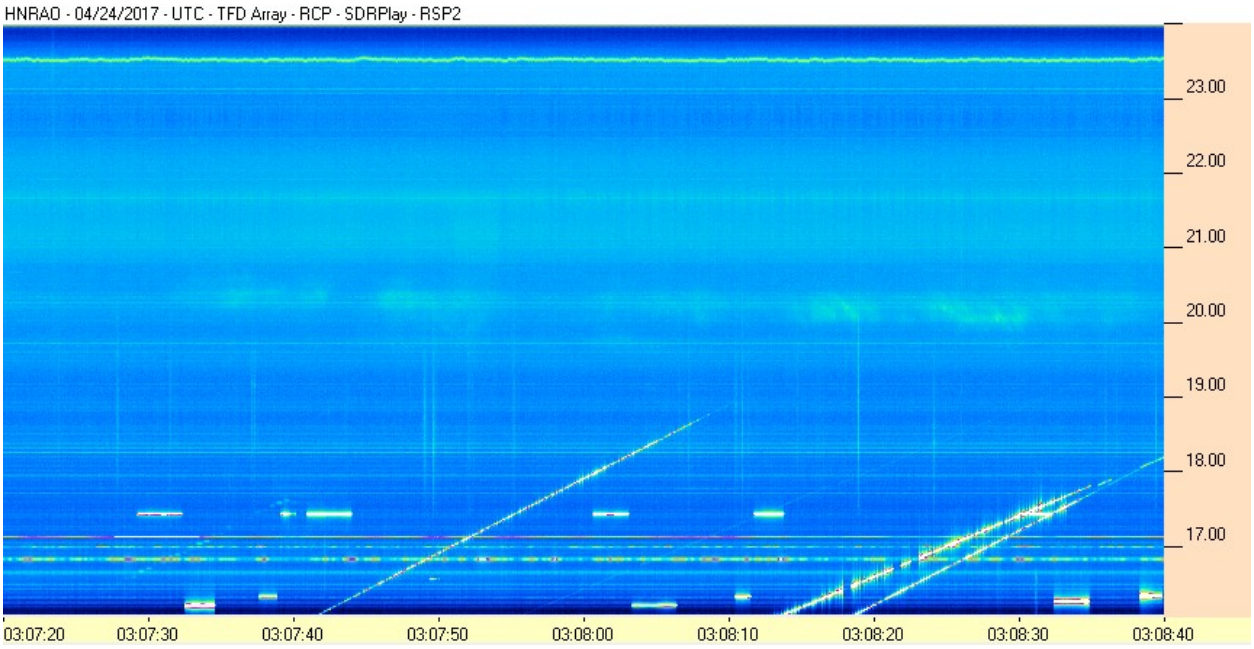

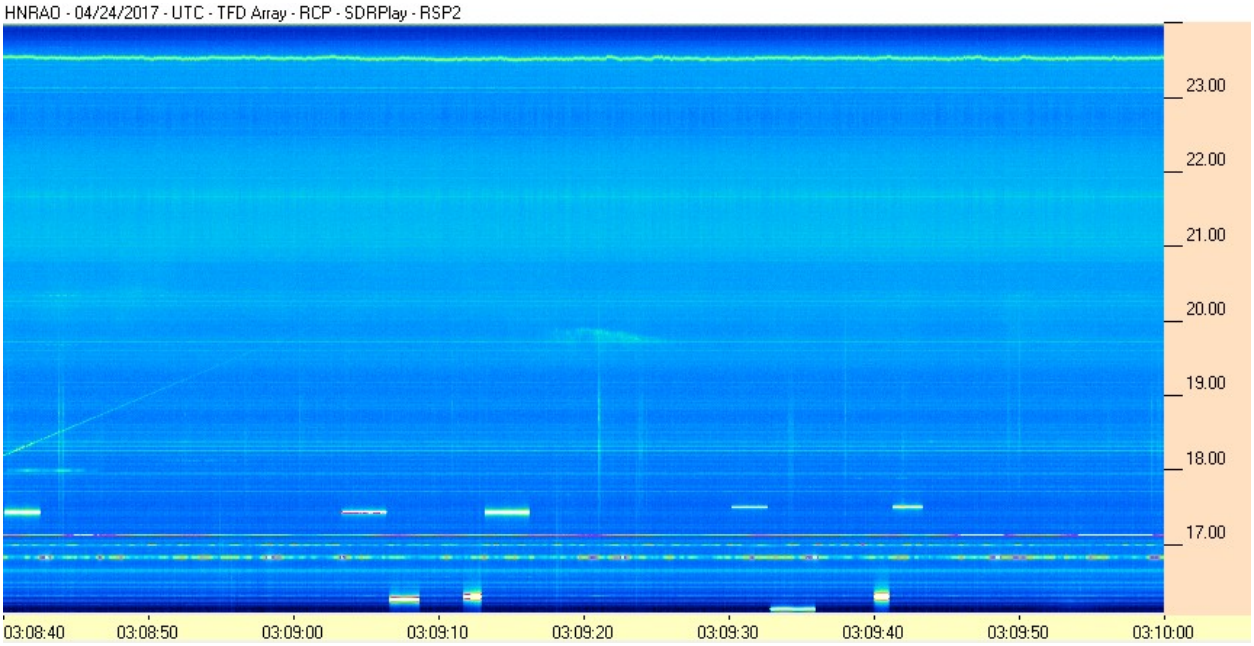

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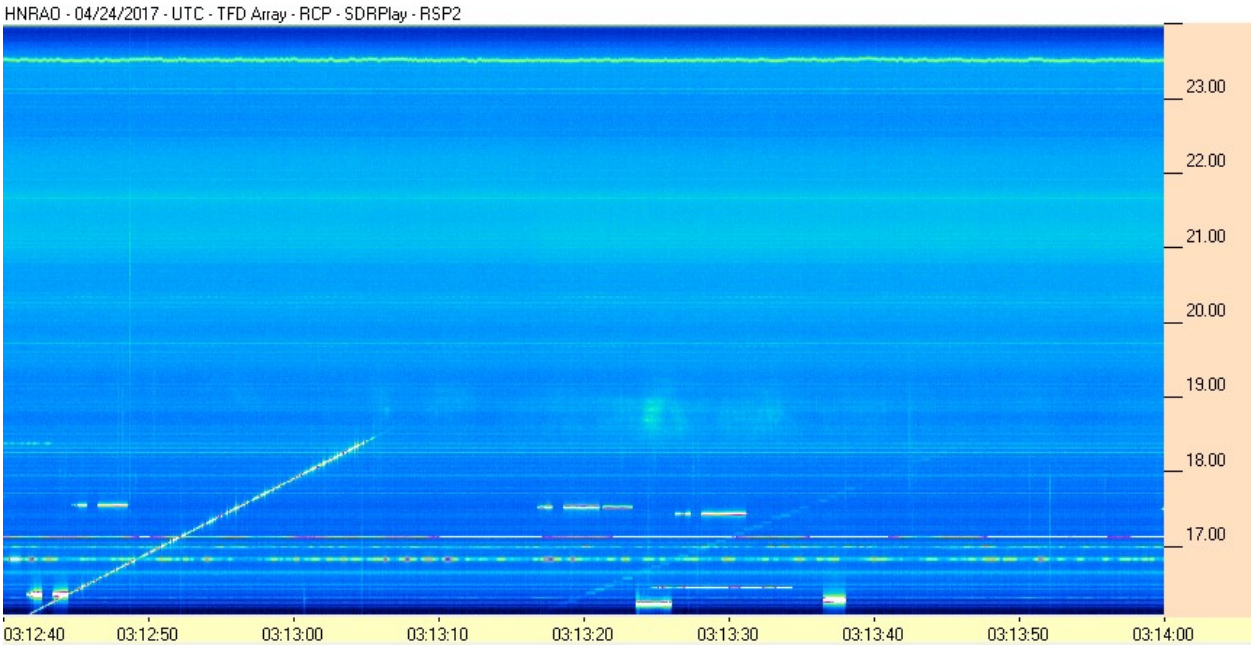

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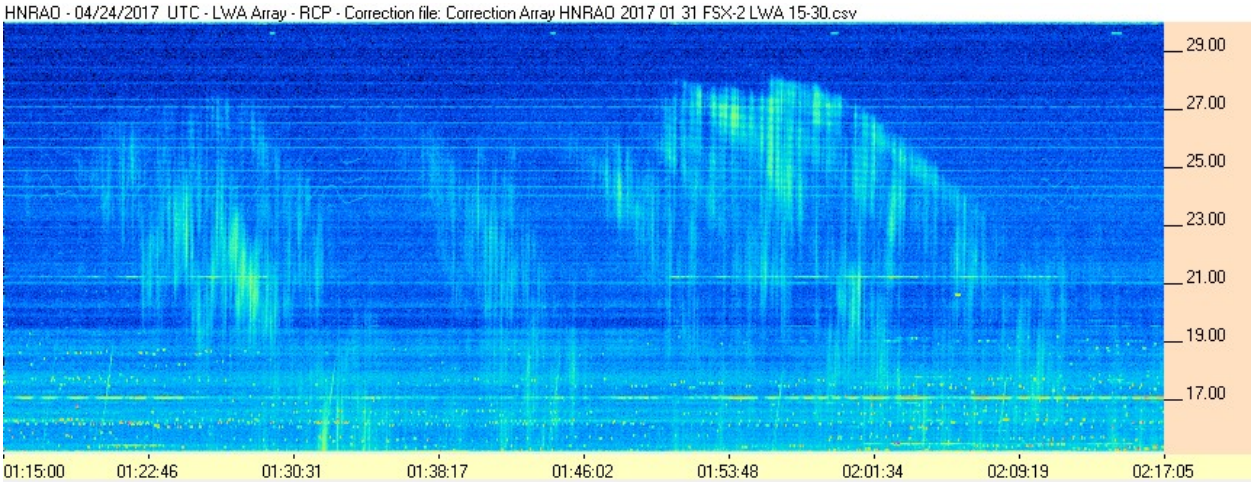
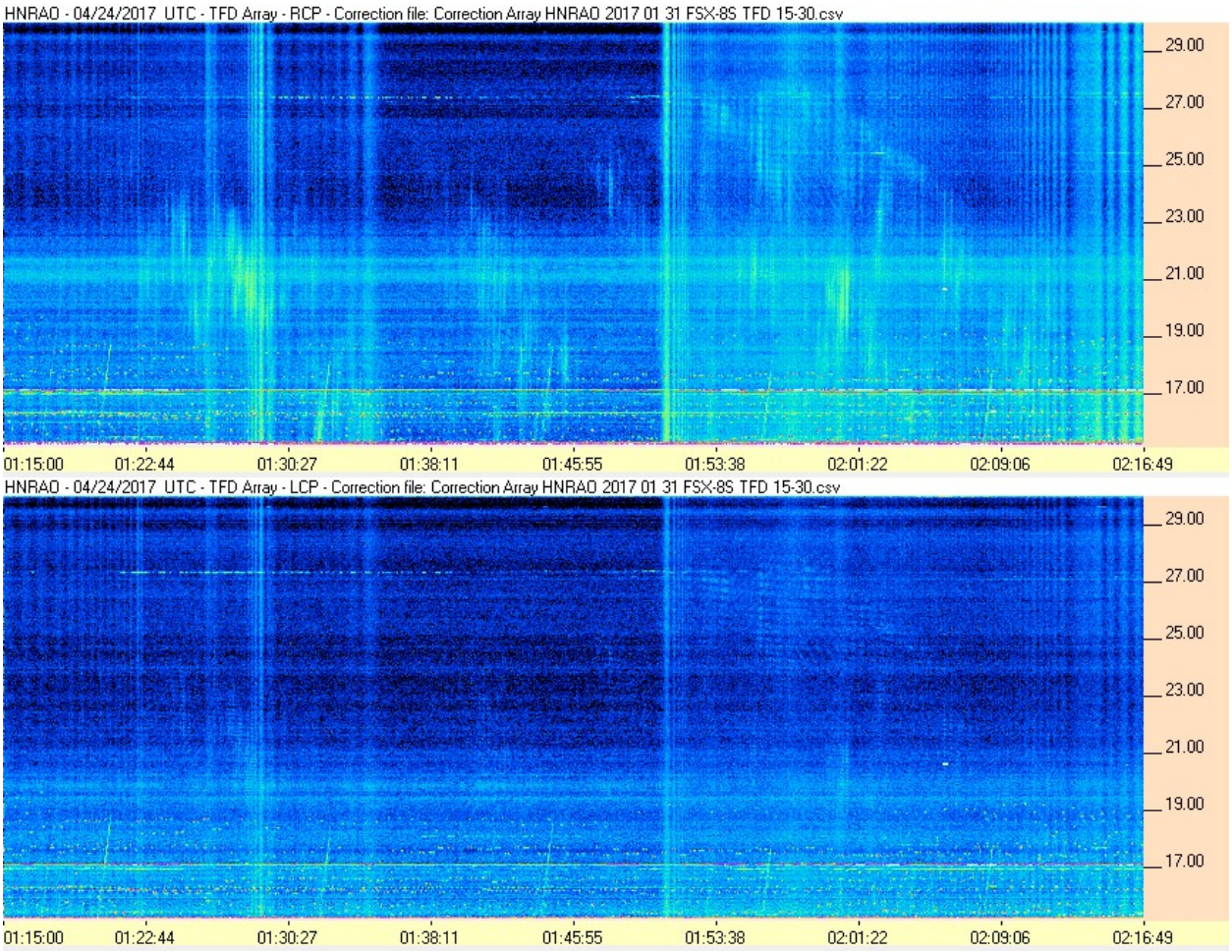
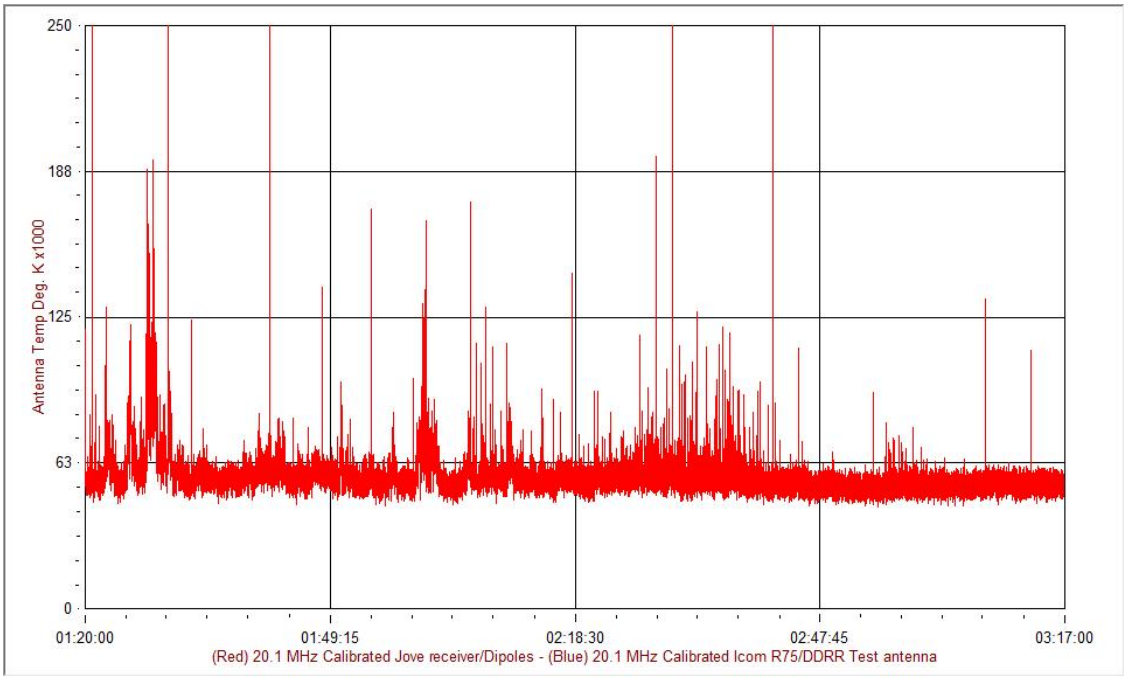
FSX-2/LWA Pair

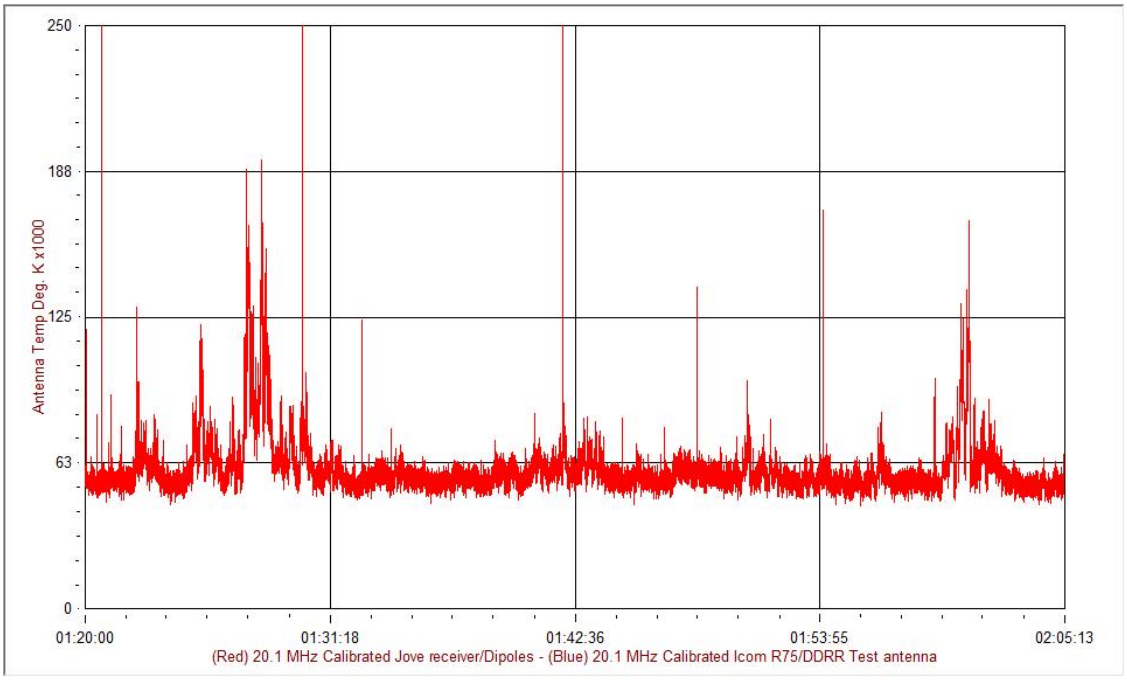


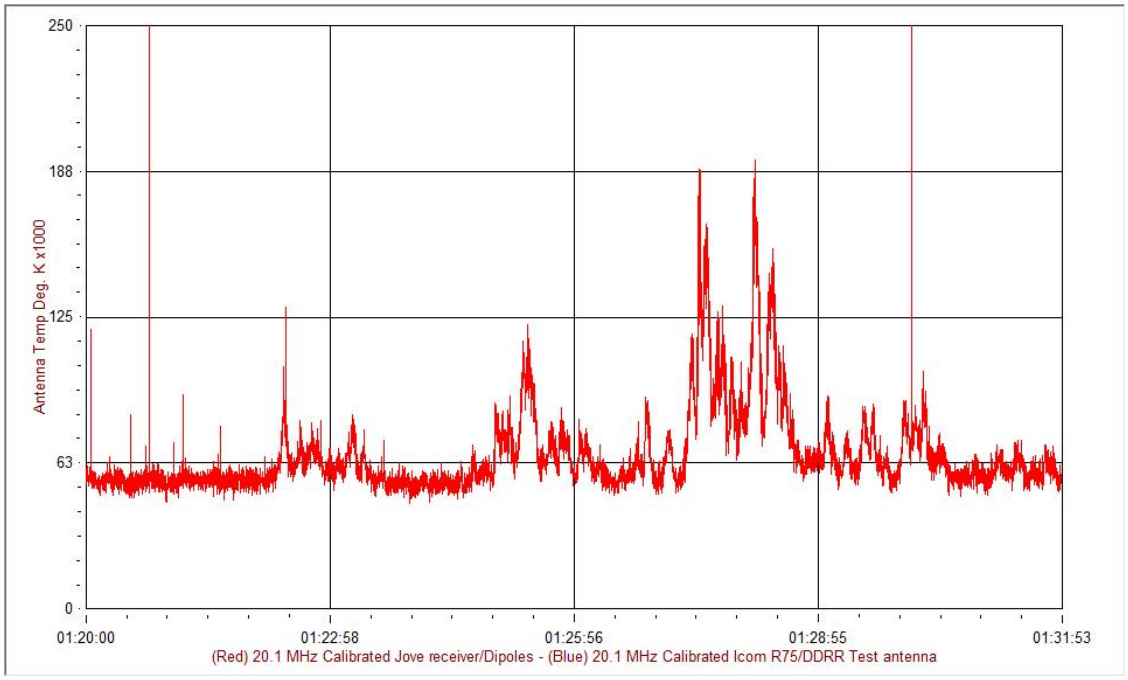
FSX-8S/TFD Pair

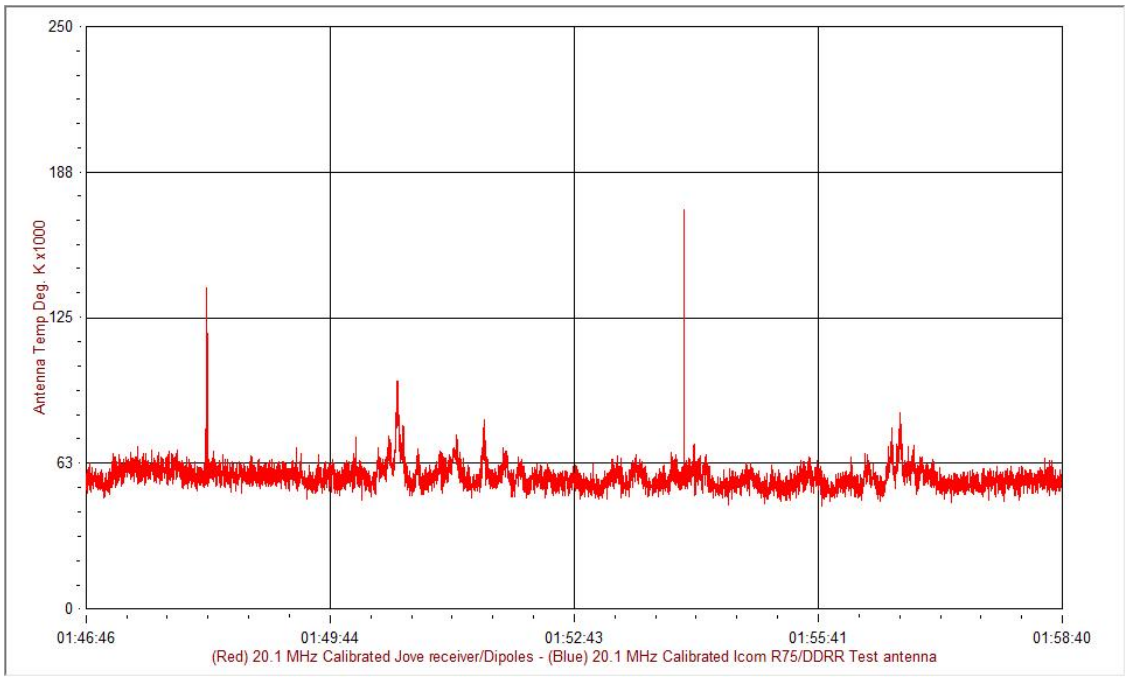


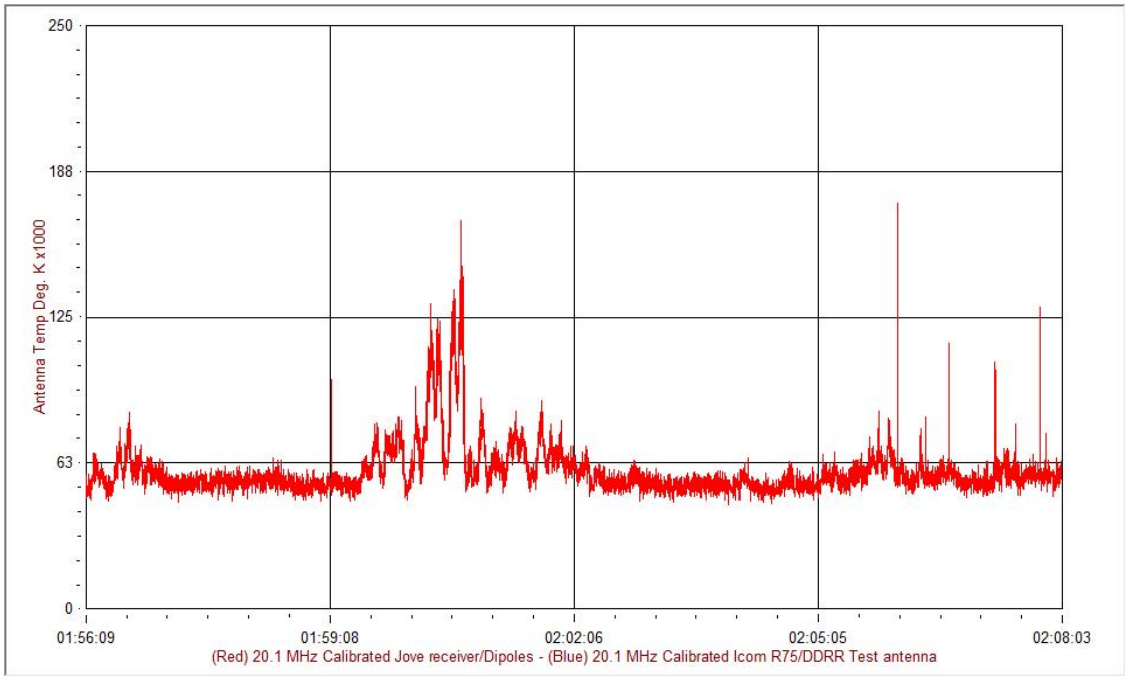
JOVE II Receiver/JOVE Dipoles Pair






250
188
125
63
0
Antenna Temp Deg. K x1000
01:20:00
01:22:58
01:25:56
01:28:55
01:31:53
(Red) 20.1 MHz Calibrated Jove receiver/Dipoles - (Blue) 20.1 MHz Calibrated Icom R75/DDRR Test antenna


250
188
125
63
0
Antenna Temp Deg. K x1000
01:46:46
01:49:44
01:52:43
01:55:41
01:58:40
(Red) 20.1 MHz Calibrated Jove receiver/Dipoles - (Blue) 20.1 MHz Calibrated Icom R75/DDRR Test antenna


250
188
125
63
0
Antenna Temp Deg. K x1000
01:56:09
01:59:08
02:02:06
02:05:05
02:08:03
(Red) 20.1 MHz Calibrated Jove receiver/Dipoles - (Blue) 20.1 MHz Calibrated Icom R75/DDRR Test antenna