HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

Date: June 2, 2018

Object: Jupiter – Io-A

Observer: Unattended

Start - Time UT:	**0223**	**Planetary K-index:**	**3**
Jupiter Altitude (deg):	**31.7**	**Jupiter Azimuth (deg):**	**160.1**
Jupiter CML:	**202.3**	**Jupiter Io Phase:**	**215.98**
Jupiter RA (hr/min):	**14:53**	**Jupiter Dec (hr/min):**	**-15:17**
Hour Angle (hr/min):	**-01:10**	**Polarization**	**RCP**
Sun Altitude (deg):	**-16.2**	**Sun Azimuth (deg):**	**319.6**
Sun RA (hr/min):	**04:32**	**Sun Dec (hr/min):**	**21:54**

End – Time UT:	**0411**	**De:**	**-3.3**
Jupiter Altitude (deg):	**33.3**	**Jupiter Azimuth (deg):**	**191.1**
Jupiter CML:	**267.59**	**Jupiter Io Phase**	**231.36**
Hour Angle (hr/min):	**00:39**	**Duration (min):**	**188**
Sun Altitude (deg):	**-25.8**	**Sun Azimuth (deg):**	**344.3**
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	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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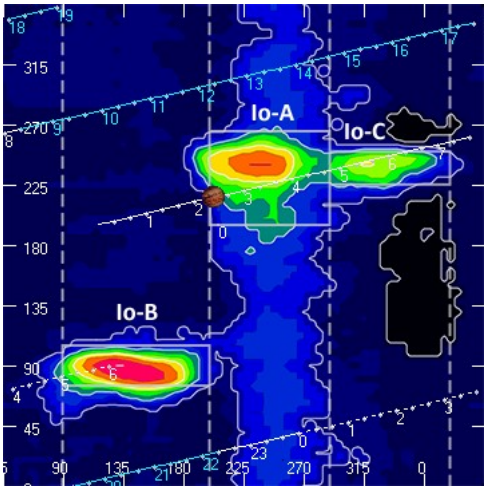
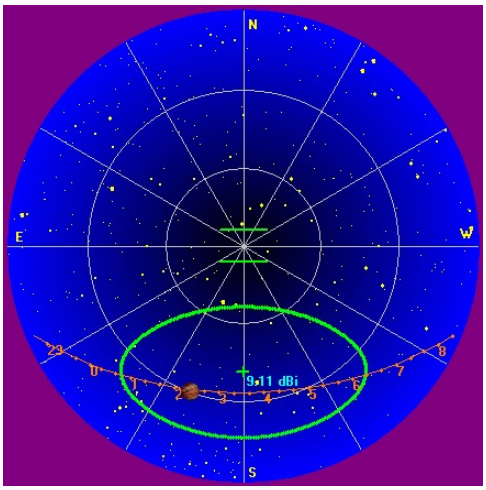
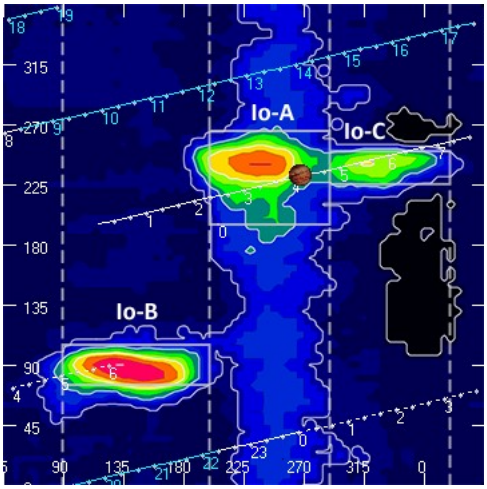
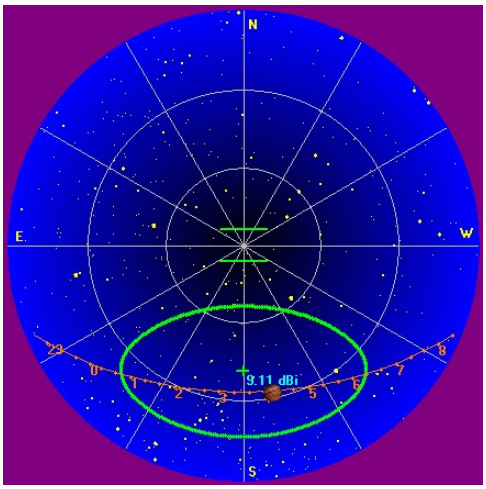


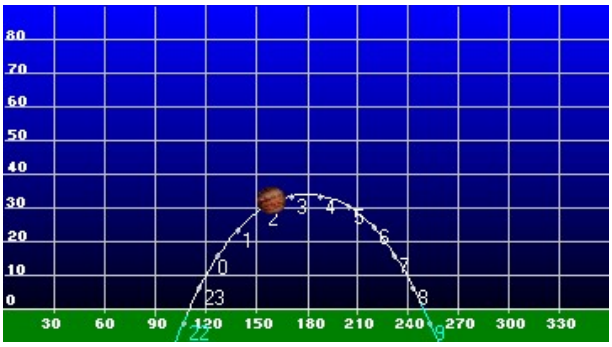
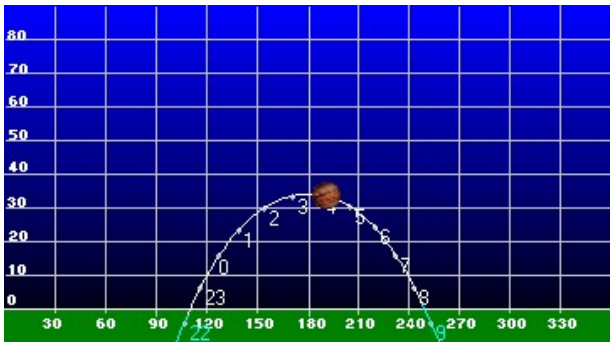


Beginning of Pass





End of Pass

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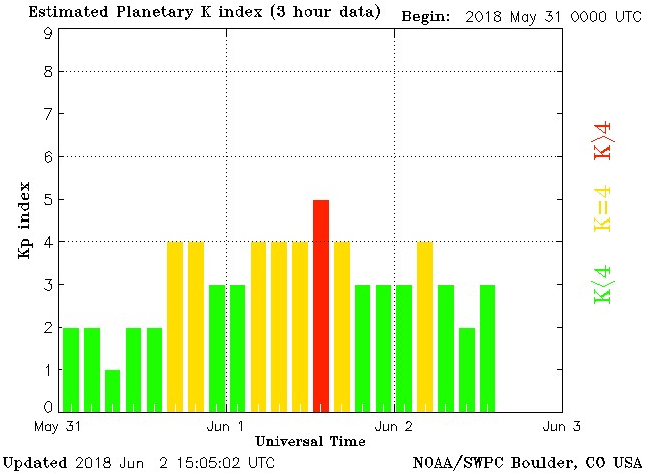
MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360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



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A weak Io-A storm with RCP L-burst emissions. There were no detectable S-bursts. L4 modulation lanes throughout the storm. Many of the emissions were nebulous or "wispy". The emissions were in groups with long periods of non-activity in between. Scintillation was obvious throughout the storm. It's unknown if this was interplanetary or ionospheric scintillation, but seems likely that it was ionospheric, however, the K indices has been high for several days. It's a matter that requires more research by this observer.

Only one notable period of moderately strong emissions at 0316 UT; CML 2354.34 and Io Phase 223.53.

This storm was observed with the FSX-8S spectrograph using the TFD array, the FSX-2 spectrograph using the LWA array, the SDRPlay RSP2 spectrograph using the TFD array and the Radio Jove 2 receiver using the Jove dual dipole array. All instruments recorded activity.

SkyPipe data has been uploaded to the Radio JOVE data archive.

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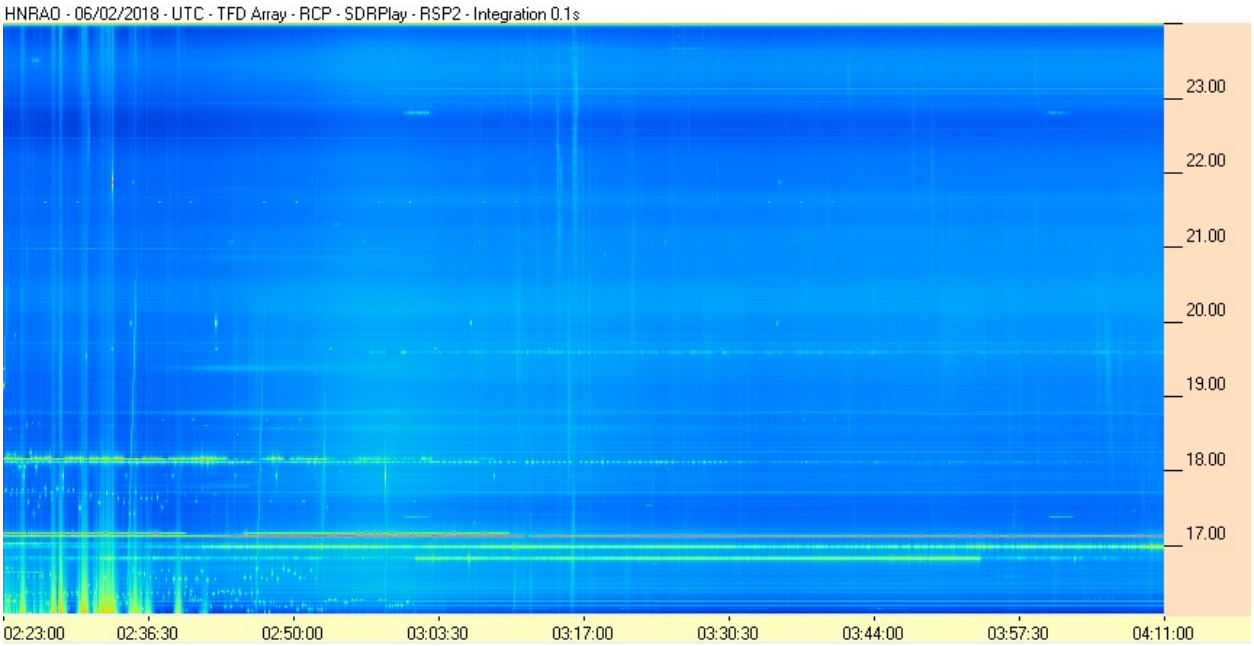
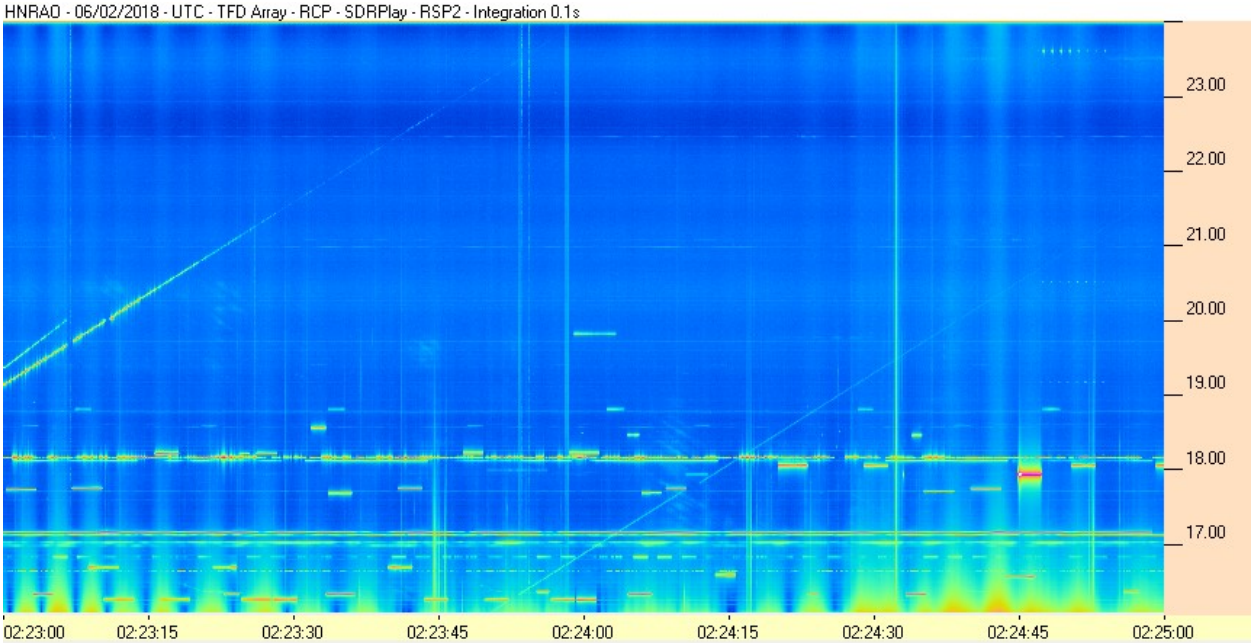
SDRPlay RSP2 / TFD Array





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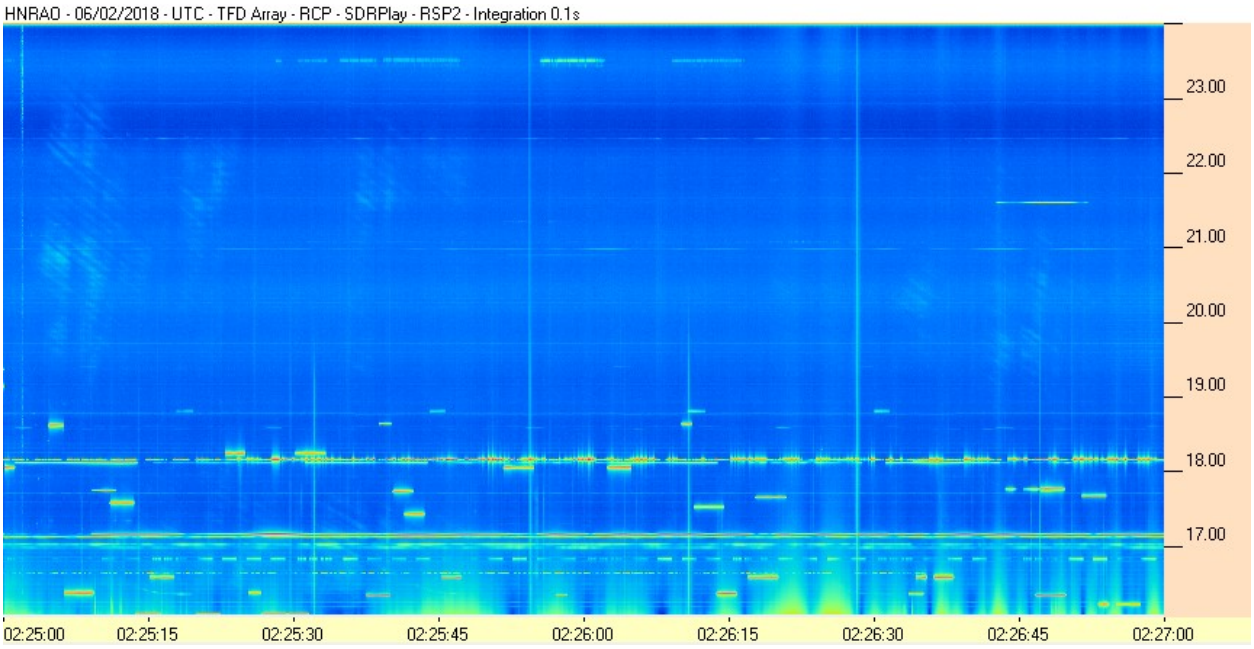

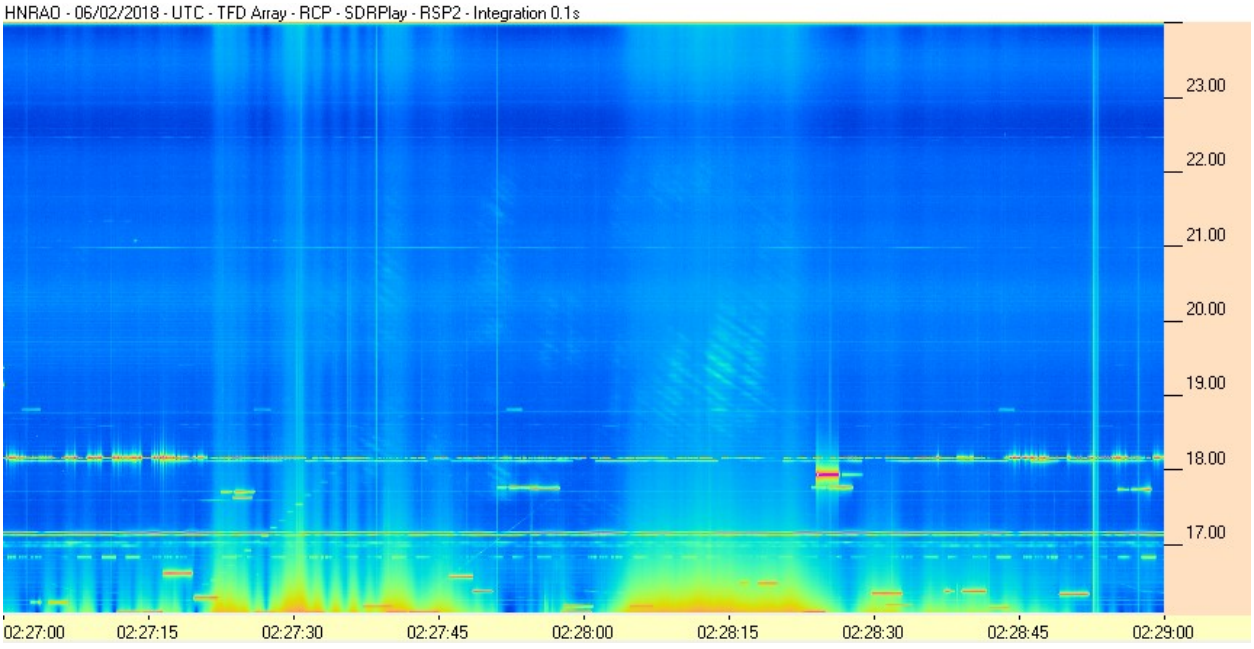

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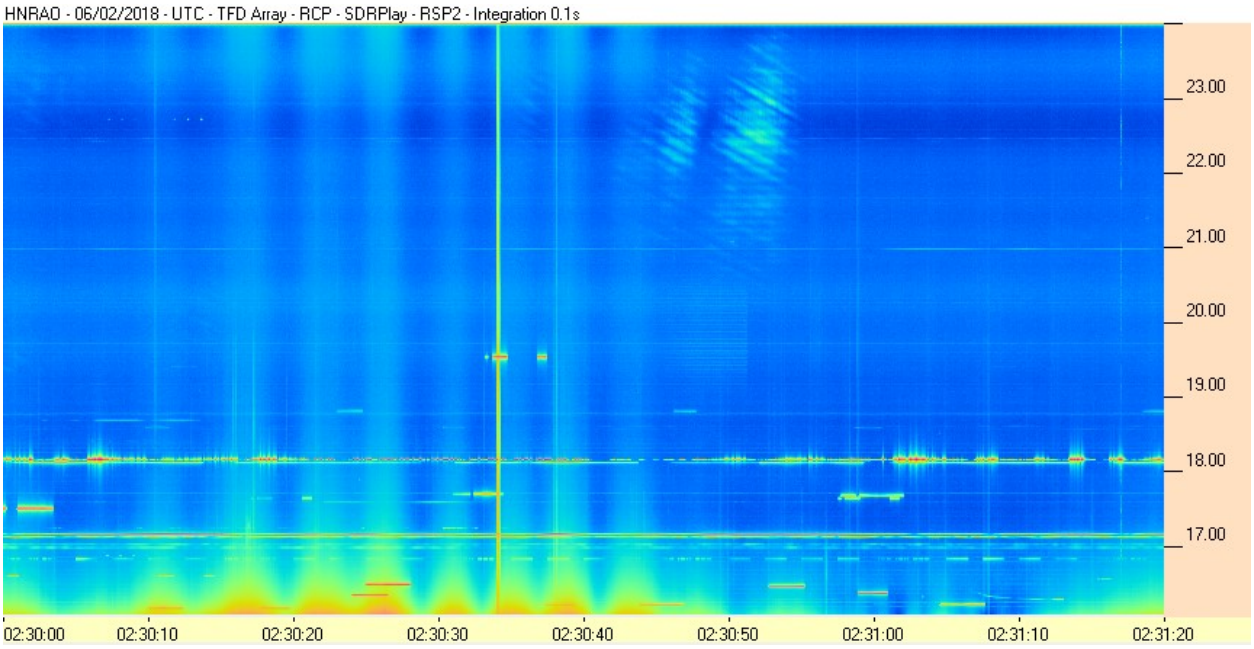

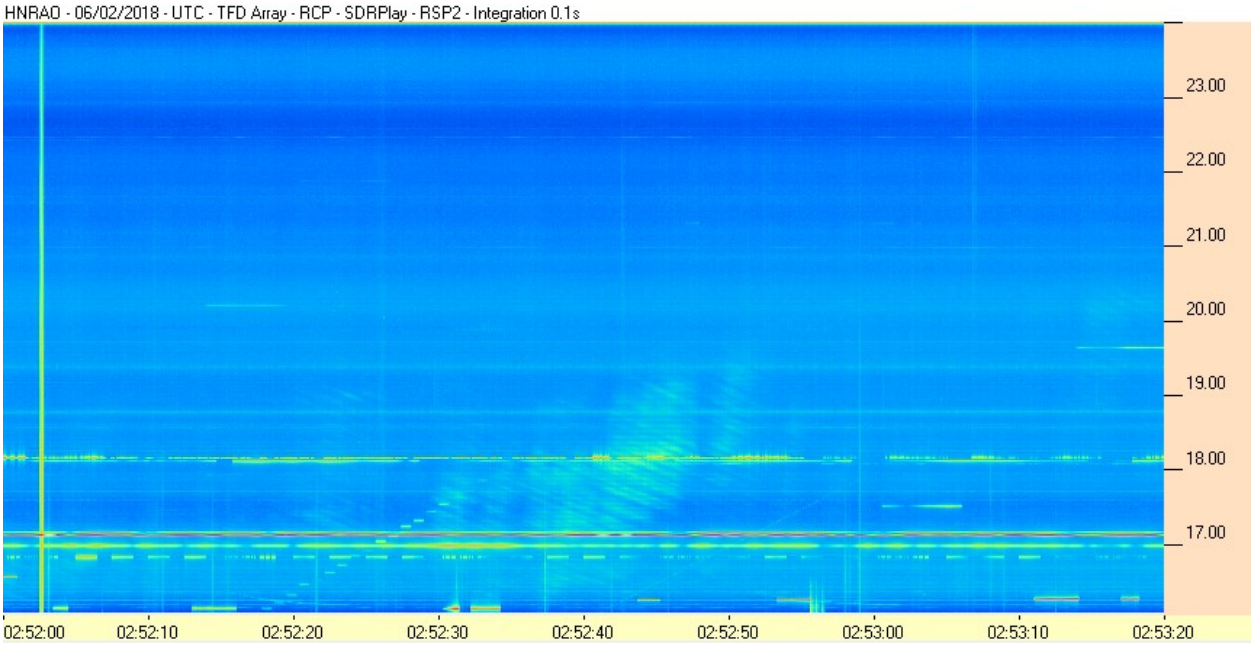

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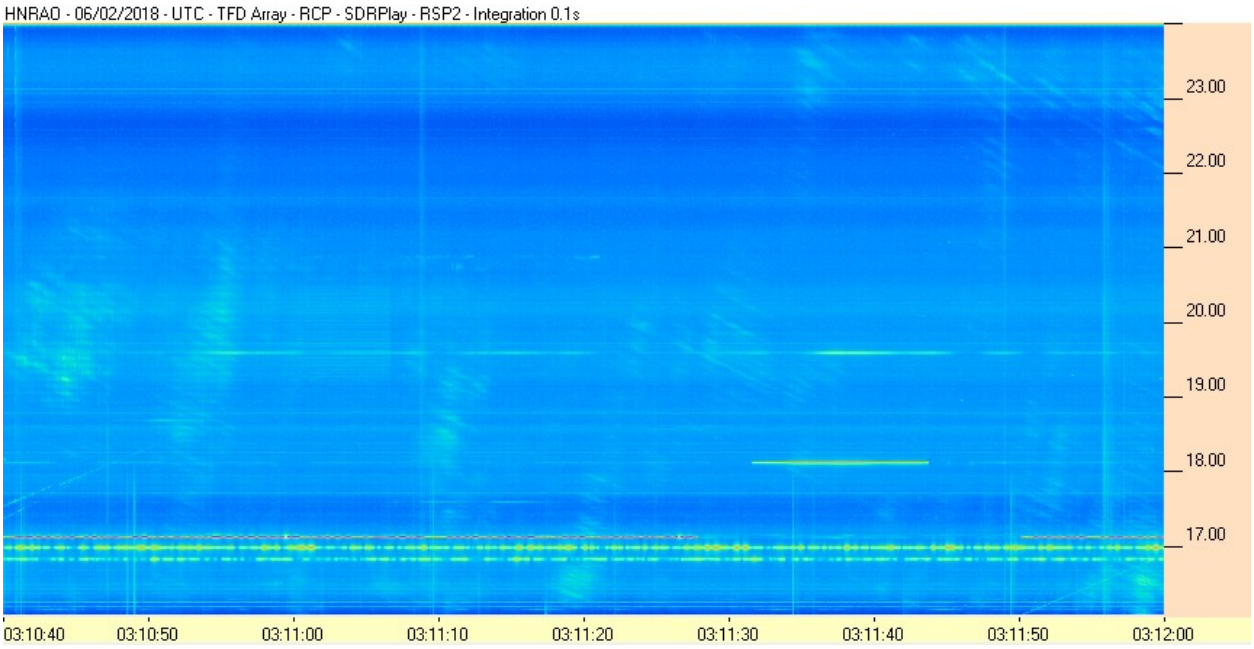

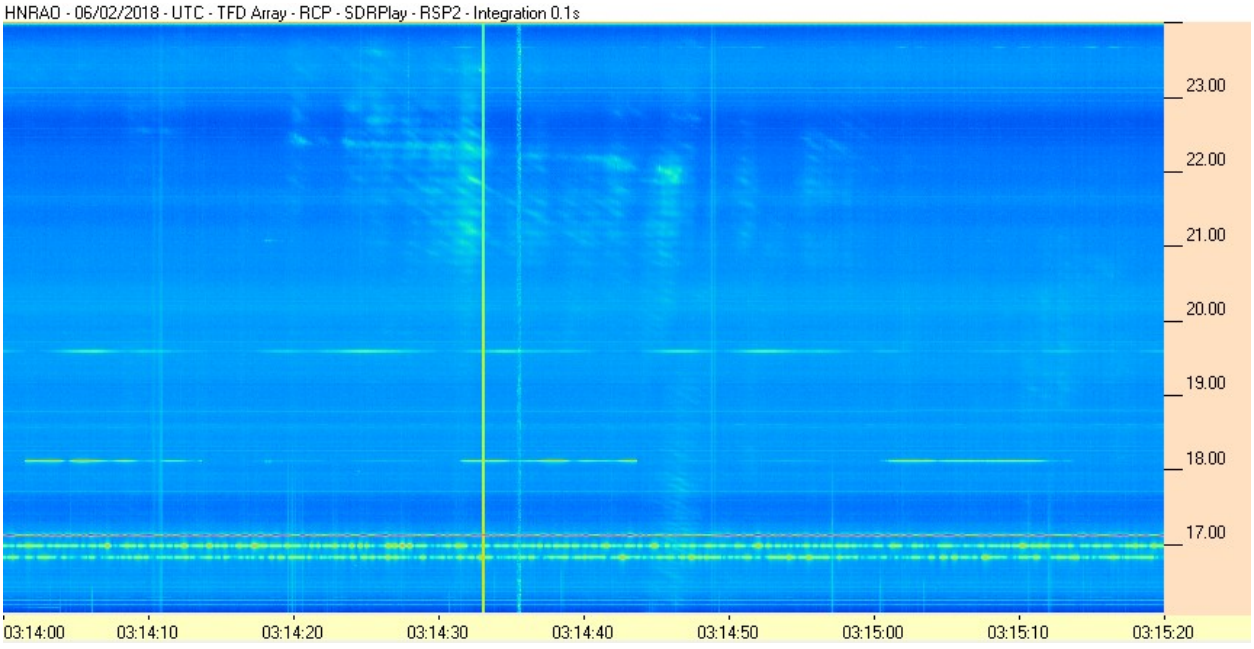

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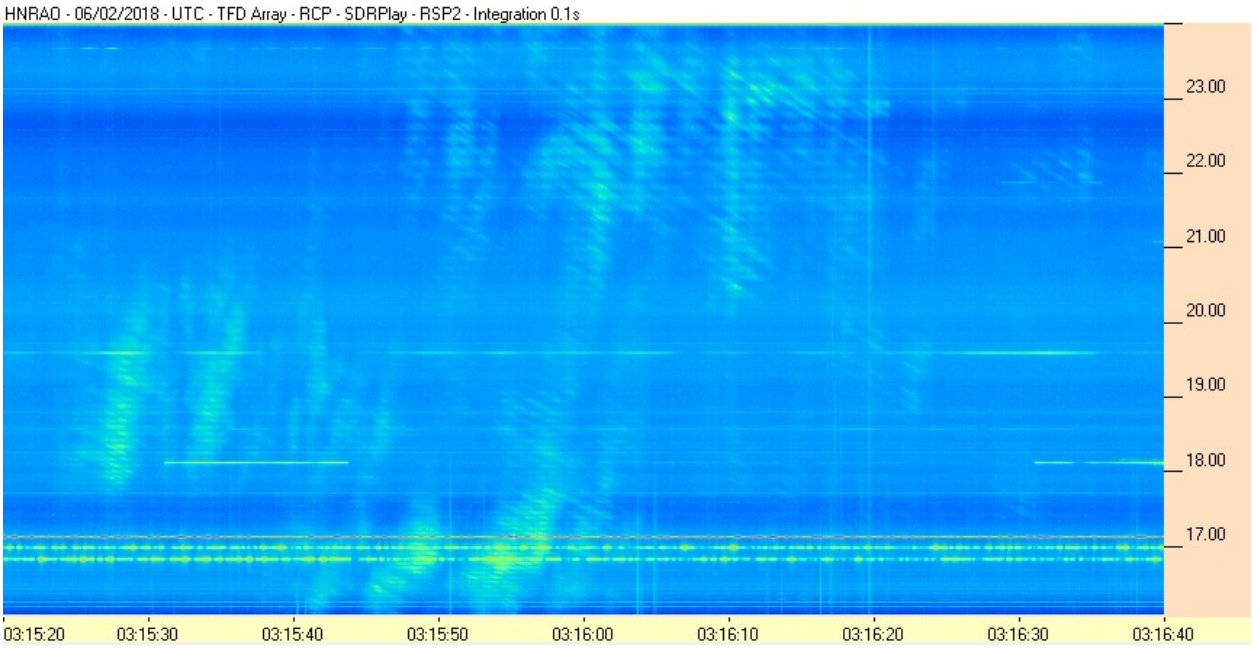

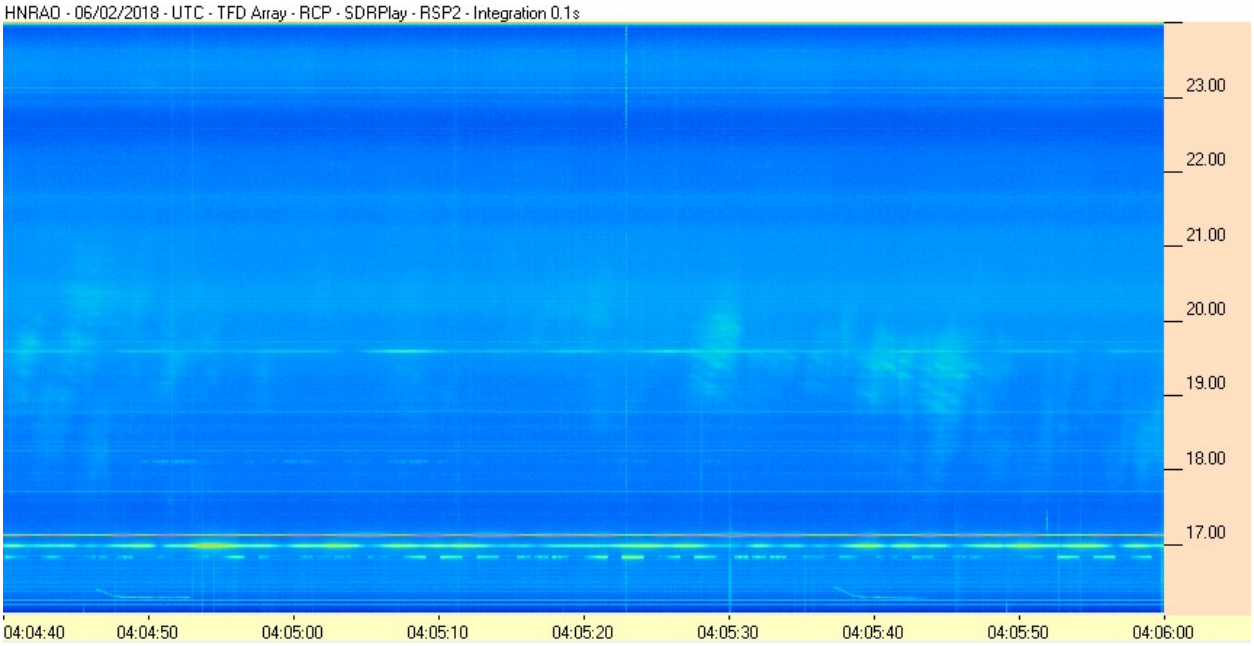

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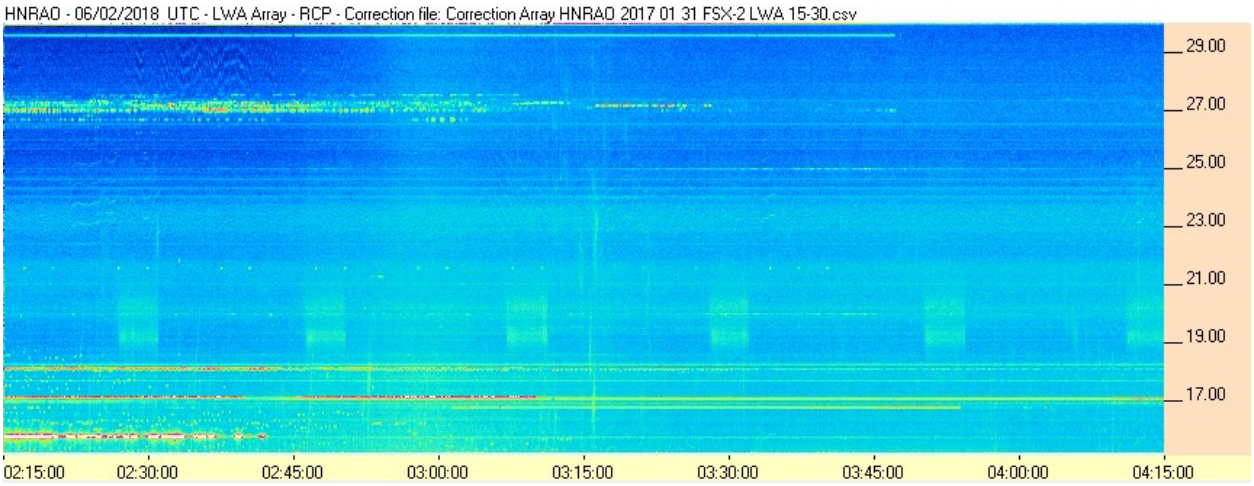
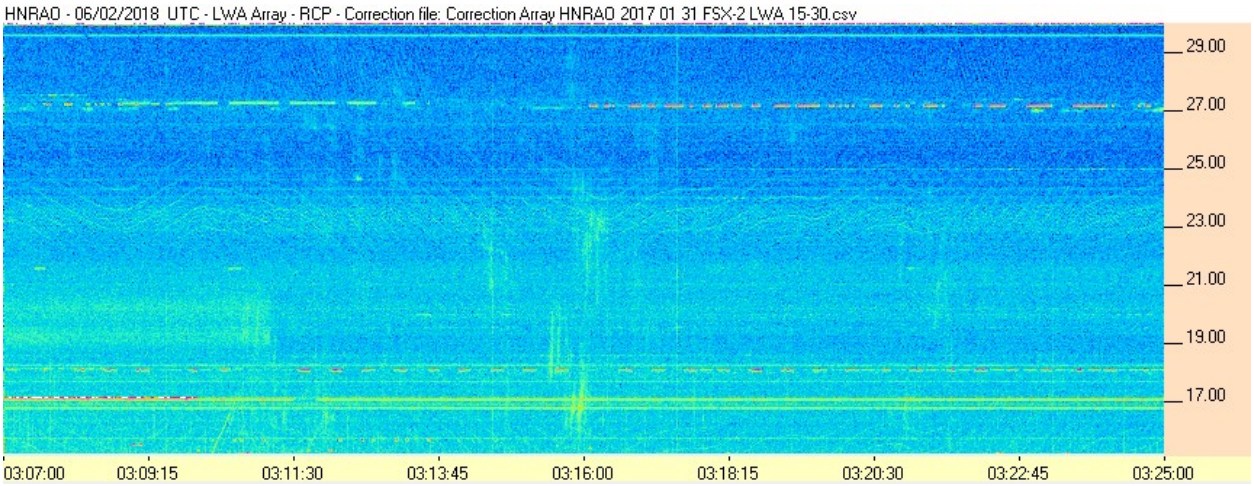
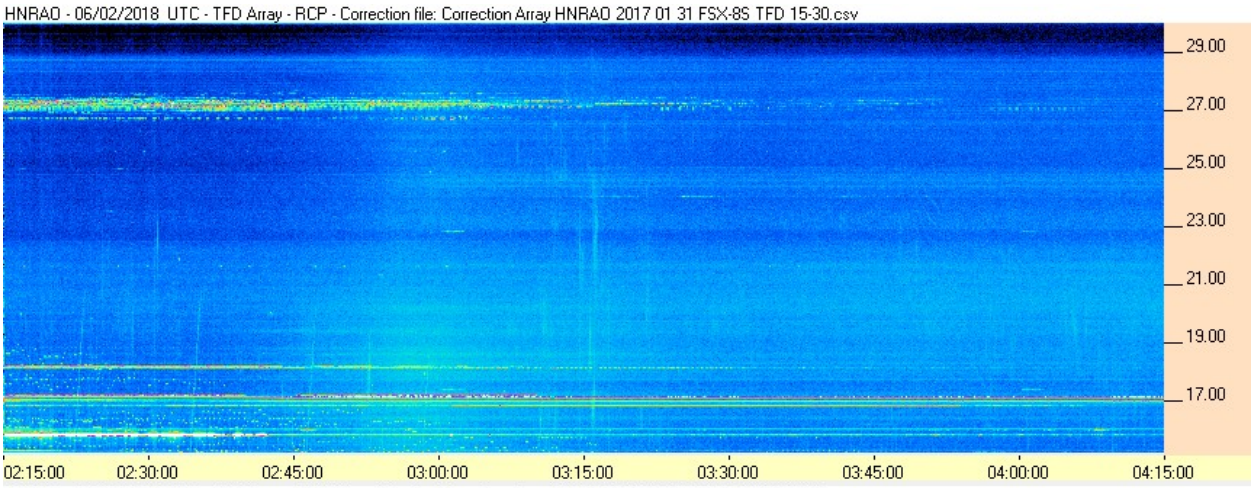
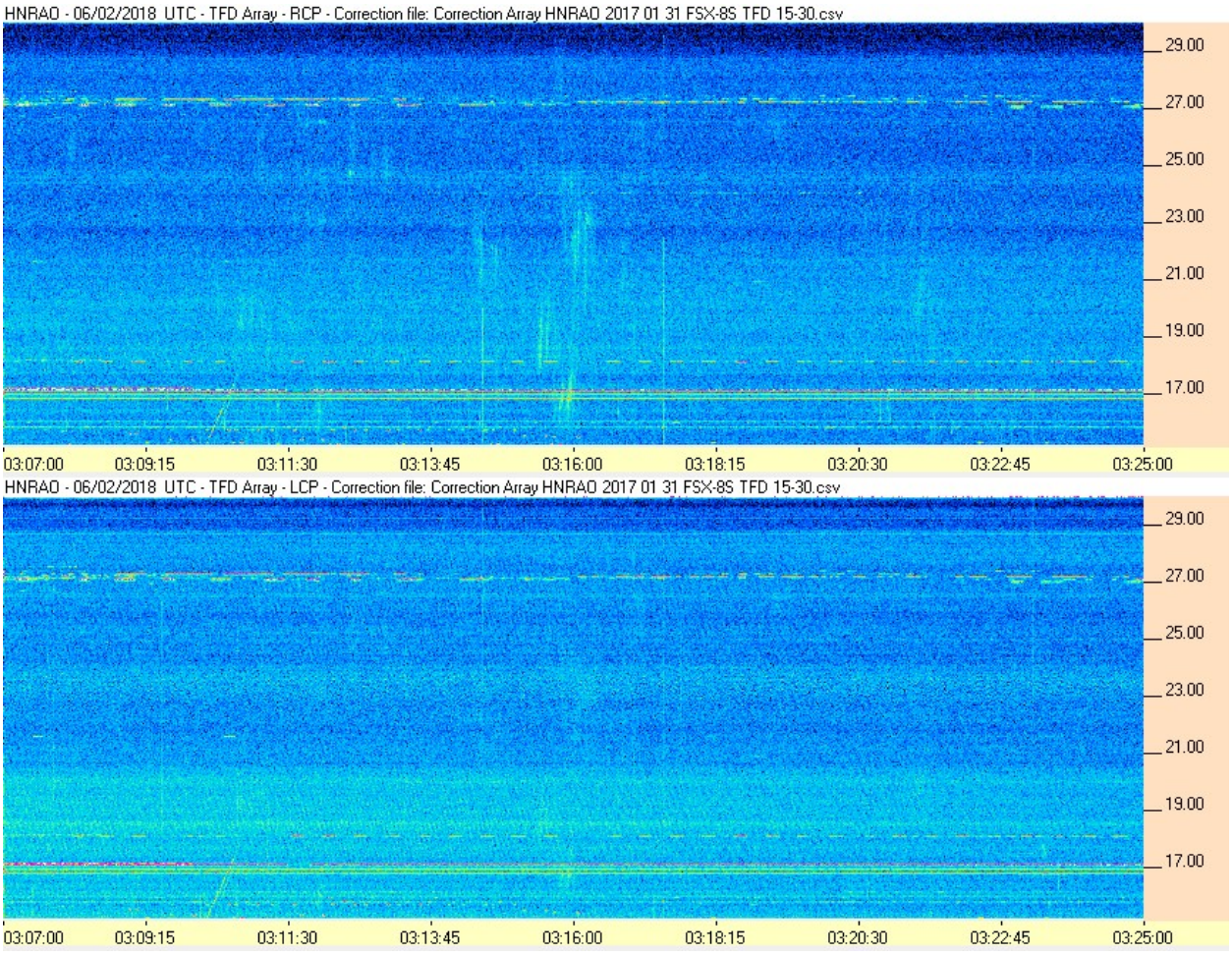
FSX-2 / LWA Array





FSX-8S / TFD Array




HNRAO - 06/02/2018 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
03:07:00
03:09:15
03:11:30
03:13:45
03:16:00
03:18:15
03:20:30
03:22:45
03:25:00
HNRAO - 06/02/2018 UTC - TFD Array - LCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv
29.00
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03:16:00
03:18:15
03:20:30
03:22:45
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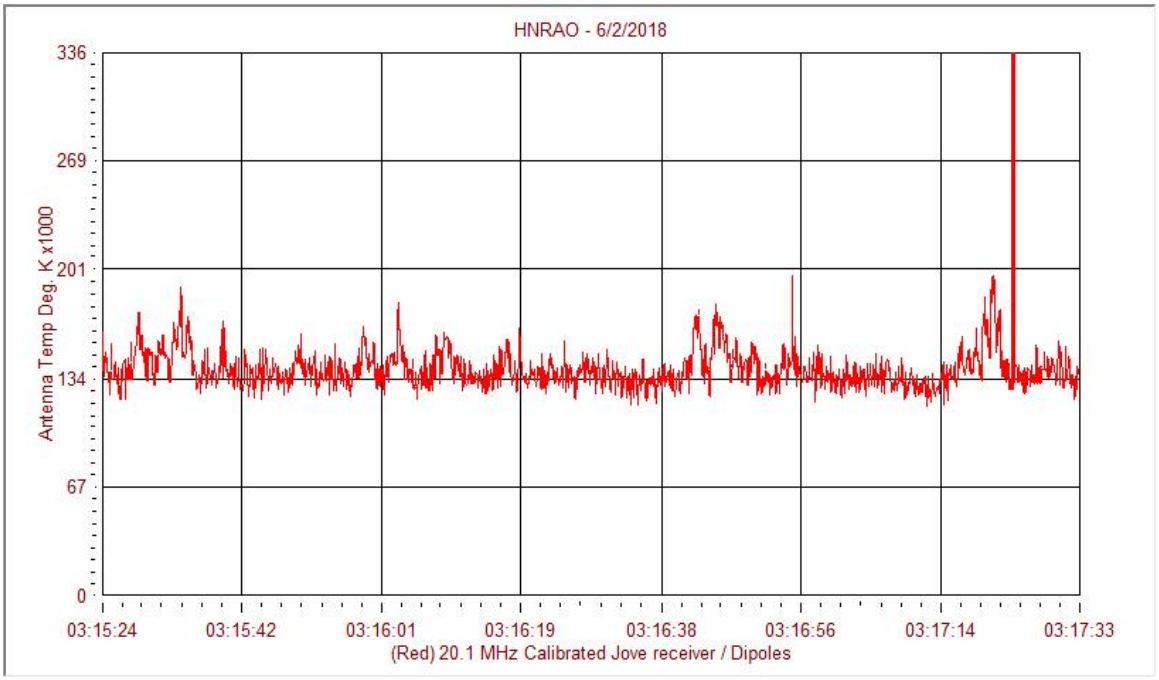
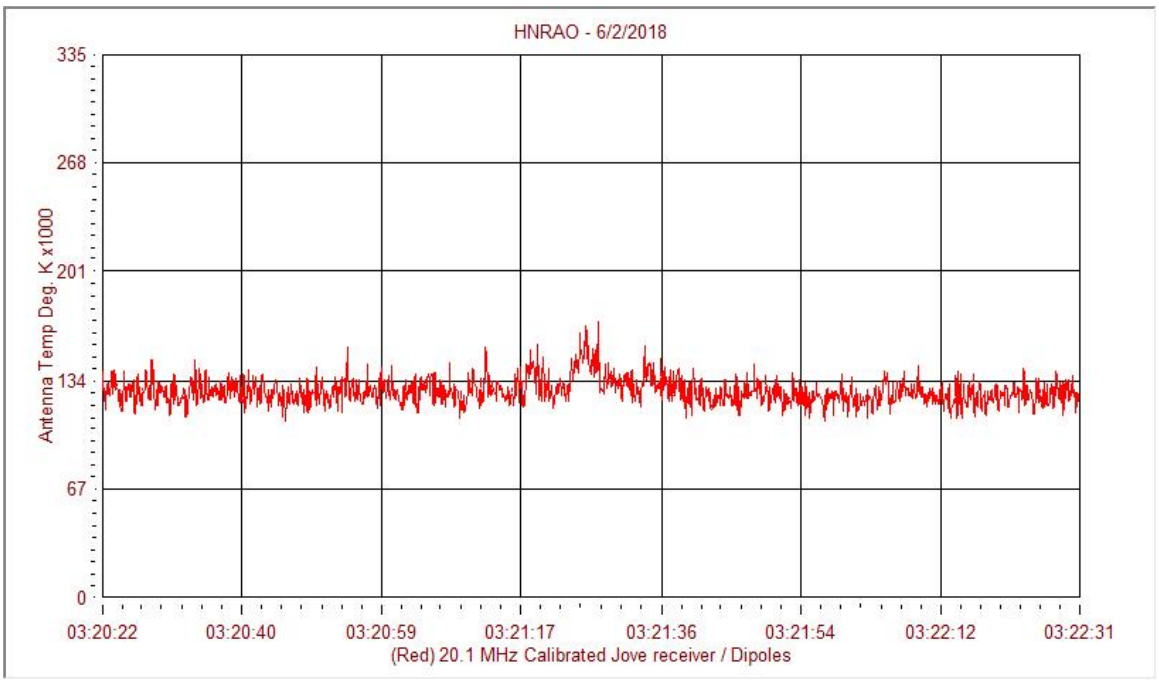
Radio JOVE II receiver / JOVE Dipole array





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