

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: 10 December 2016

Object: Jupiter – Io-B

Start of pass:	1229 UT		
Jupiter Altitude:	42.5 degrees	Jupiter Azimuth:	165.9 degrees
Jupiter CML:	89.84	Jupiter Io Phase:	087.84
Jupiter RA	13:08	Jupiter Dec	-05:53
Sun Altitude:	-00.4 degrees	Sun Azimuth:	120.4 degrees
Sun RA	17:03	Sun Dec	-22:48

End of pass:	1410 UT		
Jupiter Altitude:	41.5 degrees	Jupiter Azimuth:	199.9 degrees
Jupiter CML:	150.89	Jupiter Io Phase	101.32
Jupiter RA	13:08	Jupiter Dec	-05:53
Sun Altitude:	14.4 degrees	Sun Azimuth:	138.5 degrees
Sun RA	17:04	Sun Dec	-22:49

 Observations made using:

1. FSX-8S fed by the TFD array
 - a. Initially 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 on Multicoupler have approximately 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' – phased for 2016-17 season
 - a. Calibrated 28 Nov. 2016
 - b. Connected to dipoles through HNRAO Multicoupler #3, port 1.
4. Icom R75 receiver fed by experimental DDRR antenna directly.
 - a. Calibrated 28 Nov. 2016

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Report:

The Io-B pass predicted to run from approximately 1200 UT through 1500 UT was a weak and unremarkable storm from this observatory. Emissions observed here seemed to begin about 1313 UT and end about 1410 UT. Emission span observed here from 18 MHz to 29 MHz. Starting with S-Bursts and followed later in the pass with a mix of L-Bursts and S-Bursts. One period appeared to be an N-Event.

One upward arc observed starting about 1354 UT from 19-26 MHz.

There was very little in the way of atmospherics until sunrise when static crashes, possibly distant lightning, could be heard on the Jove 2 receiver.

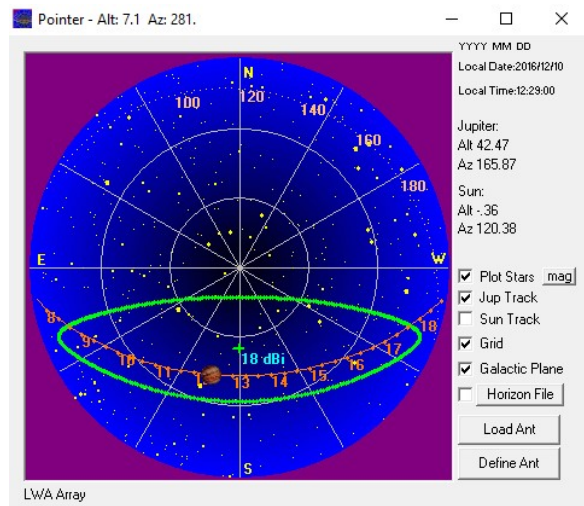
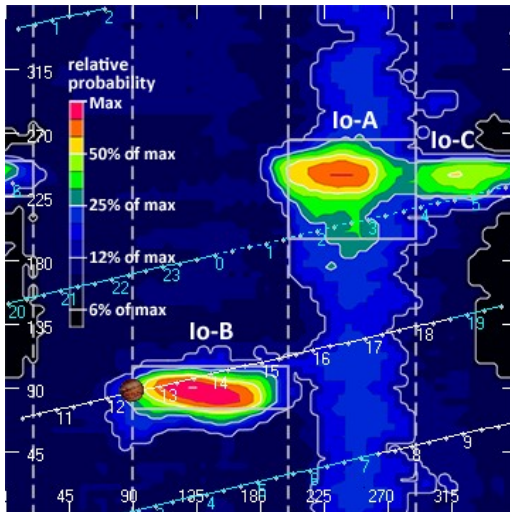
The majority of emissions were visible with the FSX-2/LWA array with the LWA elements in the 90-degree position. By the time emissions started, foreign broadcast stations began to overwhelm the front end of the FSX-8S/TFD array.

Strongest burst observed here was at 1354:29 UT

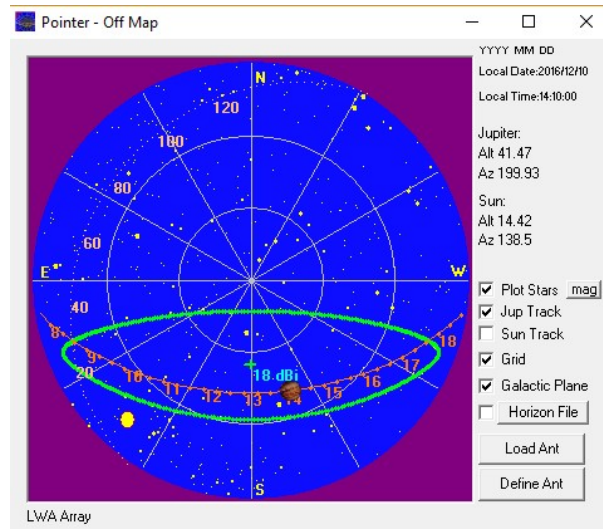
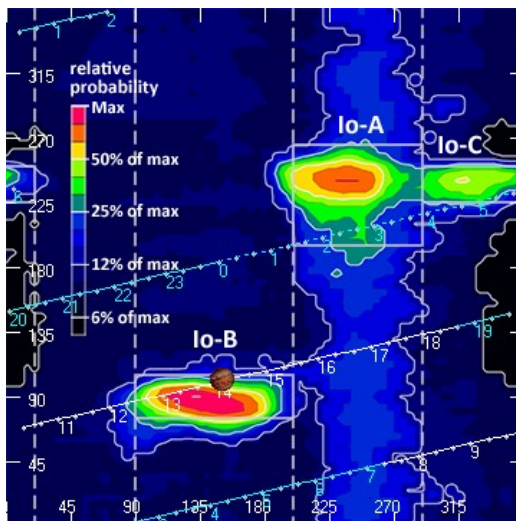
Both S-bursts and L-bursts were heard on the JOVE 2/dipoles @ 20.1 MHz and recorded with SkyPipe. However, an issue with RSP 2.7.15 prevents me from posting images. I was recording audio files with the RSP Wave Recorder and it affected the chart display. I've reported this to Jim Sky for review to determine the cause.

All in all, a very weak, unimpressive event.

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Beginning of Pass



End of Pass

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1. 1229 UT
 - a. FSX-8S CO 871 CG 3.5
 - b. FSX-2 CO 417 CG 3.5
 - c. **GB @ HNRAO 30 kK**
 - d. **GB @ LGM Alachua @ 48 kK**
 - e. **GB @ AJ4CO @ 27 kK**
 - f. No Jupiter on either spectrograph
 - g. Foreign broad cast station @ 17 MHz strong on both spectrographs
 - h. Line noise and cable TV switching power supply evident on FSX-8S
 - i. Little to no atmospherics
2. 1234 UT
 - a. No Jupiter on either spectrograph
 - b. Weak sweeper @ 1237 UT – 17-20 MHz
 - c. Radar on SkyPipe/JOVE @ 1242:20 UT
3. 1243 UT
 - a. No Jupiter on either spectrograph
 - b. No Jupiter on JOVE 2 receiver
 - c. Citizen Band @ 27 MHz beginning to appear on both spectrographs
 - d. Foreign broadcast @ 17 MHz getting stronger
4. 1249 UT
 - a. Strong sweeper 17-22 MHz
 - b. No Jupiter on either spectrograph
 - c. No Jupiter on JOVE 2 receiver
5. 1251 UT
 - a. Radar @ 1251 UT – JOVE 2
 - b. Odd trace on Icom R75/DDRR
6. 1258 UT
 - a. No Jupiter on either spectrograph
 - b. Beginning of atmospherics on Jove 2
 - c. Sun @ 4.5-degree altitude
 - d. Jupiter @ 177-degree altitude
 - e. Foreign broadcast stations becoming increasingly strong.
 - i. Station 17 MHz quite strong
 - ii. Strong broadcast @ approx. 21.5 MHz
 - iii. Strong sweeper on Jove 2 @ 1301 UT
 1. 17 – 23 MHz
 - f. Foreign broadcast on FSX-8S would make Jupiter difficult to see
7. 1304 UT
 - a. No Jupiter on either spectrograph
 - b. No Jupiter on Jove 2
 - c. Strong “woodpecker” @ 1304:30 UT on Jove 2

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- d. Strong “woodpecker” @ 1305:30 and 1305:37 UT on Jove 2
- 8. 1307 UT
 - a. Reduced CG on FSX-8S to reduce foreign broadcast on display
 - b. FSX-2 display remains ok.
 - i. Foreign broadcast not affecting it.
 - c. **GB on HNRAO @ 32 kK**
 - d. **GB on LGM Alachua @ 51 kK**
 - e. **GB @ AJ4CO @ 29 kK**
- 9. 1311 UT
 - a. No Jupiter on either spectrograph
 - b. Foreign broadcast overwhelming FSX-8S front end
 - c. Strong sweeper @ 1312 UT 17-23 MHz
 - d. Strong sweeper @ 1313 UT 17-23 MHz
 - e. Woodpecker 1313 UT
 - f. Lightning? 1314:33 UT
- 10. **1313 UT**
 - a. **What might be S-bursts on FSX-2 @ 28 MHz**
- 11. 1315 UT
 - a. S bursts 27 MHz
 - b. N-event or chain of S-bursts @ 27 MHz
 - c. Atmospheric on Jove 2 @ 1318:19
- 12. 1319 UT
 - a. Weak S-bursts FSX-2 @ 27 MHz
 - b. Foreign broadcast makes seeing any Jupiter on FSX-8S
- 13. 1320 UT
 - a. Stronger emissions at 25 MHz on FSX-2
 - b. 1321 emissions @ 29 MHz?
 - c. 1322 emissions @ 29 MHz?
 - d. 1323 emissions @ 29 MHz?
 - e. Jupiter at CML 125.5 Io Phase 94.7
 - f. Jupiter at 43.36 Alt 184.23 AZ
- 14. 1326 UT
 - a. Weak S-bursts? @ 29 MHz
 - b. GB @ HNRAO 36 kK
 - c. GB @ LGM 47 kK
 - d. GB @ AJ4CO 29 kK
 - e. Weak S-bursts? @ 1327 @ 29 MHz
- 15. 1329 UT
 - a. Weak S-bursts? @ 29 MHz?
- 16. 1330:38 UT
 - a. What appear to be much stronger L-bursts 18-30 MHz

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- b. 1830:48 S-bursts on JOVE 2
 - c. All Jupiter on FSX-2
 - d. Nothing seen on FSX-8S due to foreign broadcast
- 17. 1321 UT
 - a. Stronger Jupiter I-bursts
 - b. JOVE 2 @ 1332:16
 - c. JOVE 2 @ 1332 40
 - d. JOVE 2 @ 1332:33 UT
 - e. JOVE 2 @ 1334:51 UT
 - f. Sweeper 1336:
 - g. JOVE 2 1336:37 L-burst?
 - h. FSX-2
- 18. 1339 UT
 - a. DDDR not emission -
- 19. 1340 UT
 - a. Foreign broadcast
- 20. 1341 Icom R75/DDRR
 - a. Voice broadcast of some sort. Not ham.
- 21. 1341:55 UT
 - a. L-bursts? 18-22 MHz
 - i. JOVE 2
 - ii. FSX-2
- 22. 1343:12 UT
 - a. L-bursts 18-22 MHz
 - i. JOVE 2
 - ii. FSX-2
- 23. 1843:30 UT
 - a. L-bursts
 - i. JOVE 2
 - ii. FSX-2
- 24. 1344:52 UT
 - a. 20-24 MHz
 - b. JOVE 2
 - c. FSX-2
- 25. 1446:39 UT
 - a. atmospherics Jove 2
- 26. 1347 UT
 - a. 19-21 MHz emissions
 - b. FSX-2
- 27. 1348 UT
 - a. Possibly FSX-8S 21 MHz

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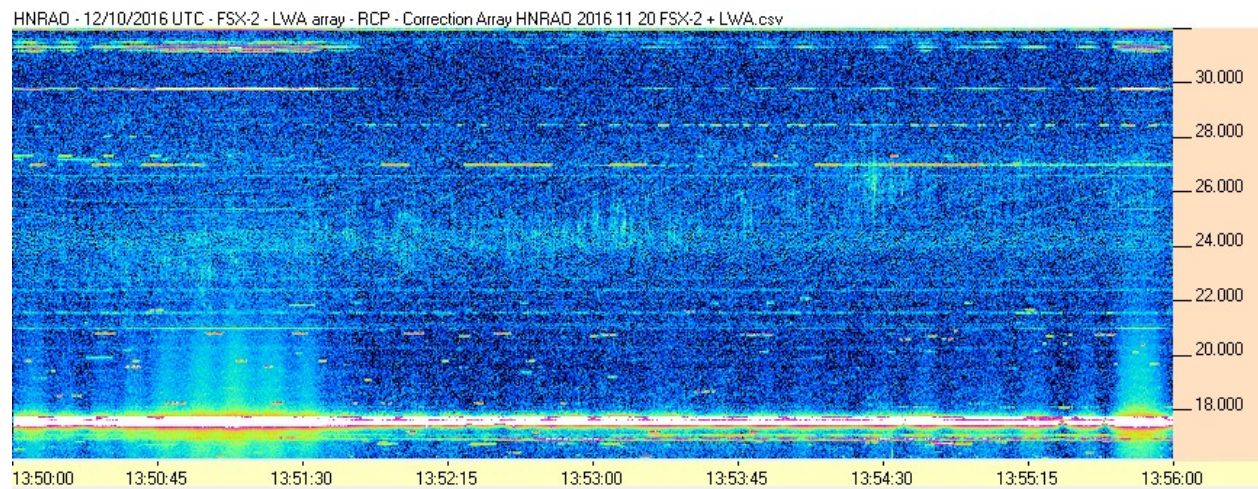
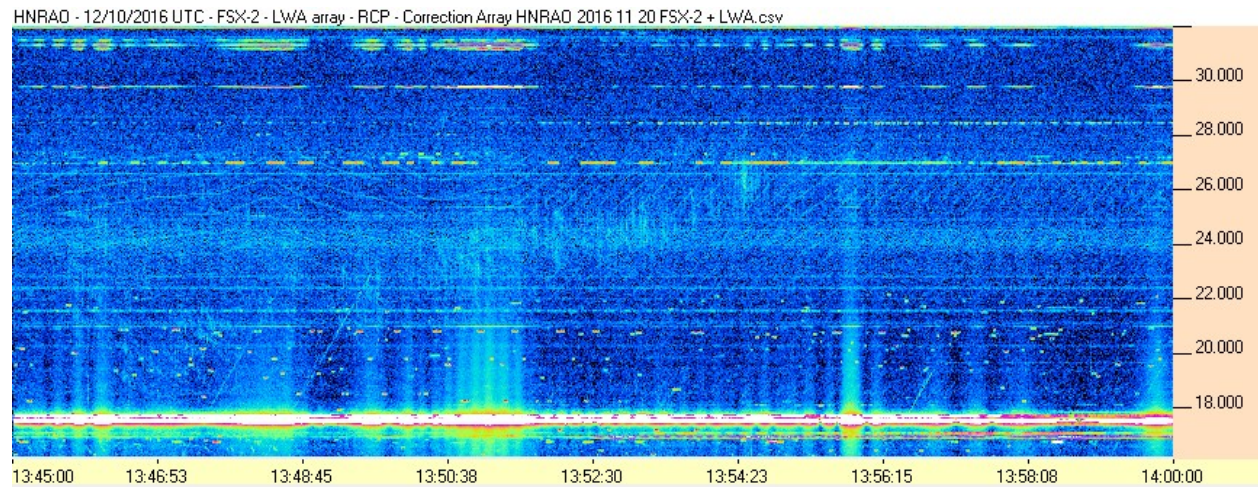


- 28. 1349 UT
 - a. Emissions 21-23 MHz
 - b. FSX-2
- 29. 1351:05 UT
 - a. Emissions 23-24 MHz
 - b. FSX-2
 - c. FSX-8S
 - d. Much stronger Emissions continued upward sweep
 - e. Long chain 1351-? @ 24 MHz
 - f. Strongest burst yet @ 1354:33 UT @ 26 MHz
 - g. FSX-2
 - h. FSX-8S
 - i. Arc seems to start at 19MHz and topping out about 26 MHz
- 30. 1357:48 UT
 - a. Woodpecker on DDDR not on JOVE
- 31. 1358:16 UT
 - a. Woodpecker on DDDR not on JOVE
- 32. 1359:41 UT
 - a. atmospherics, not Jupiter
- 33. 1400:46 UT
 - a. Sweeper
- 34. 1401:02 UT
 - a. sweeper
- 35. 1401:30 UT
 - a. Emissions @ 21 MHz???
 - b. FSX-2
- 36. 1403:30 UT
 - a. Emissions @ 28 MHz
 - b. FSX-2
- 37. 1410 UT
 - a. End of storm

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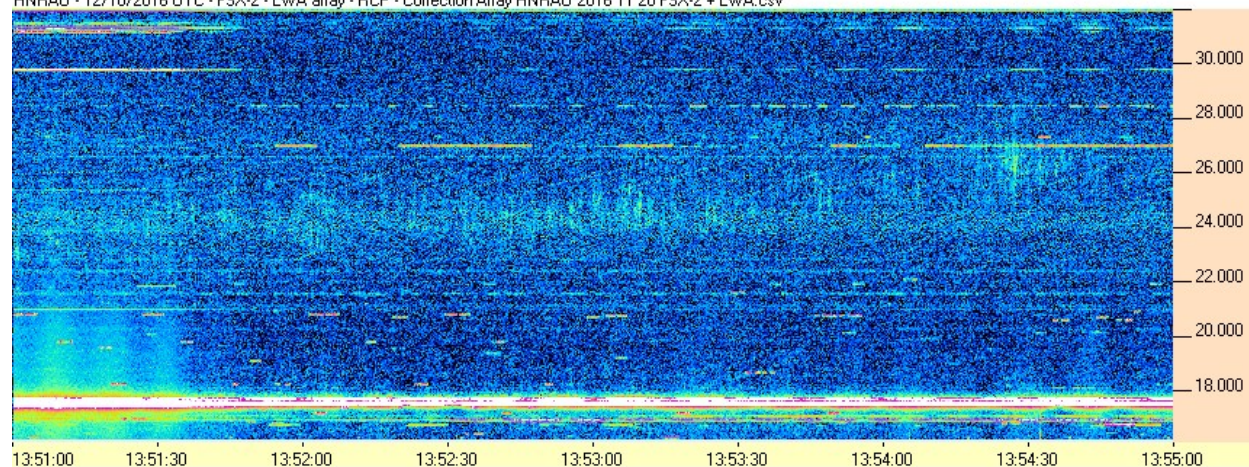
FSX-2 & LWA Array



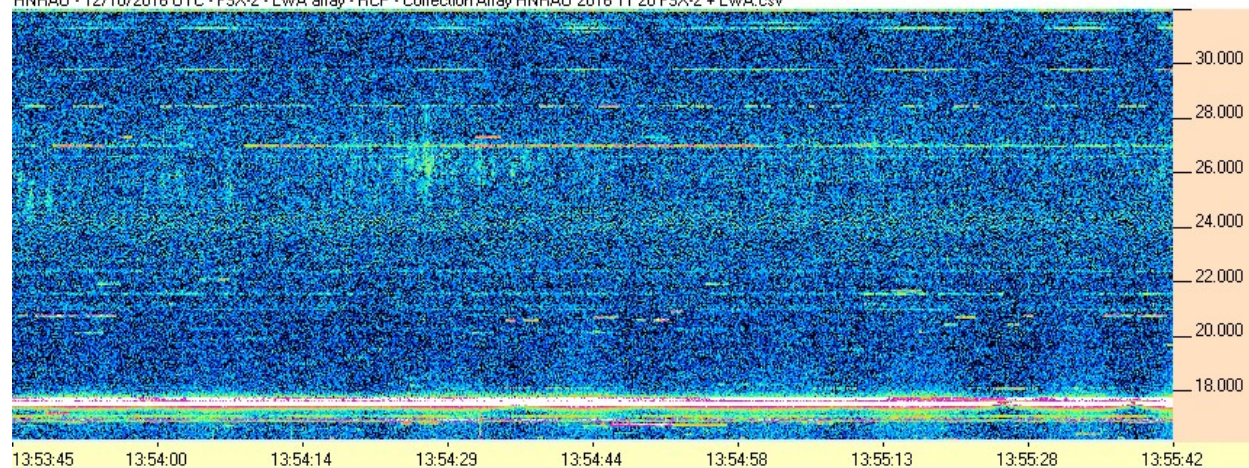
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HNRAO - 12/10/2016 UTC - FSX-2 - LWA array - RCP - Correction Array HNRAO 2016 11 20 FSX-2 + LWA.csv



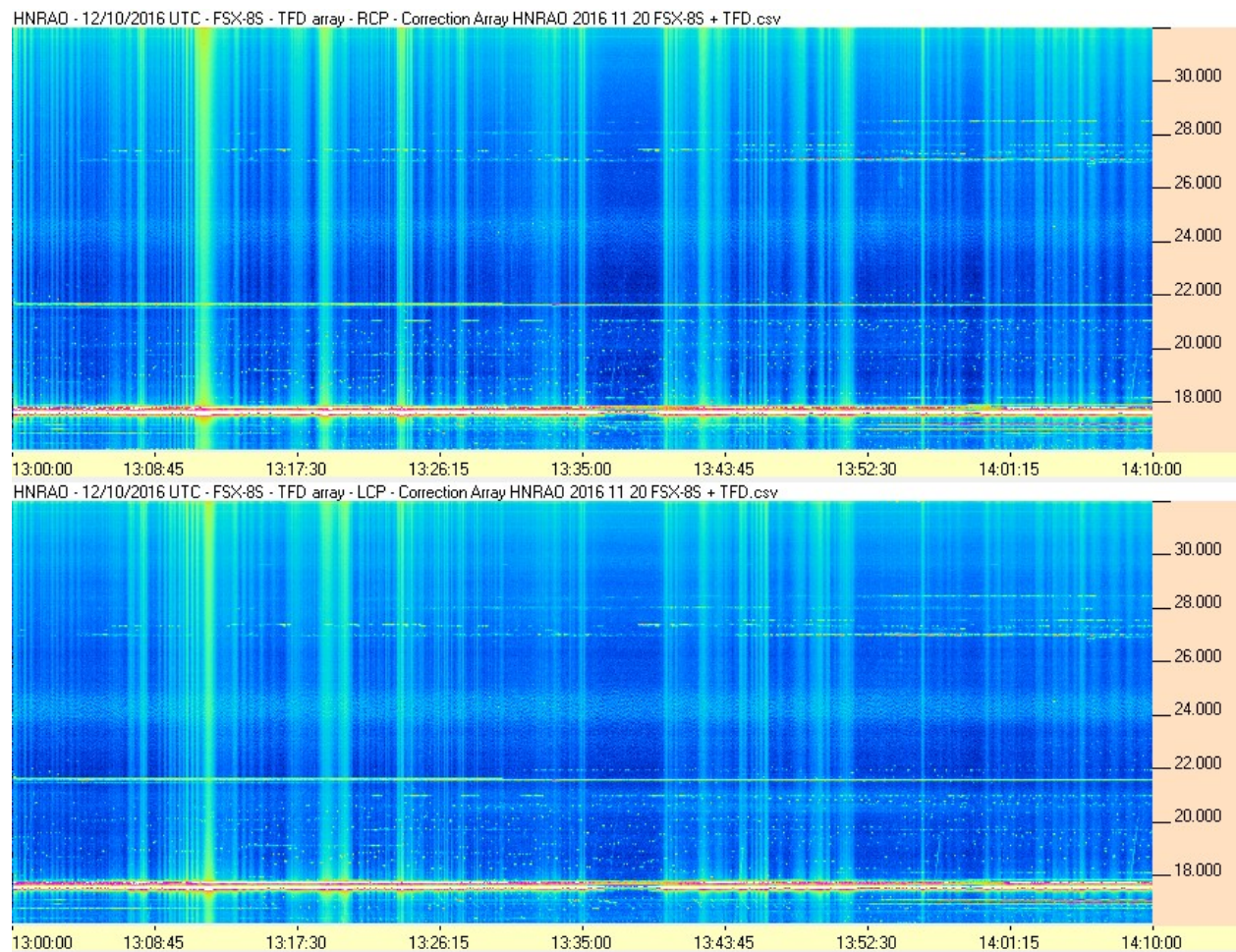
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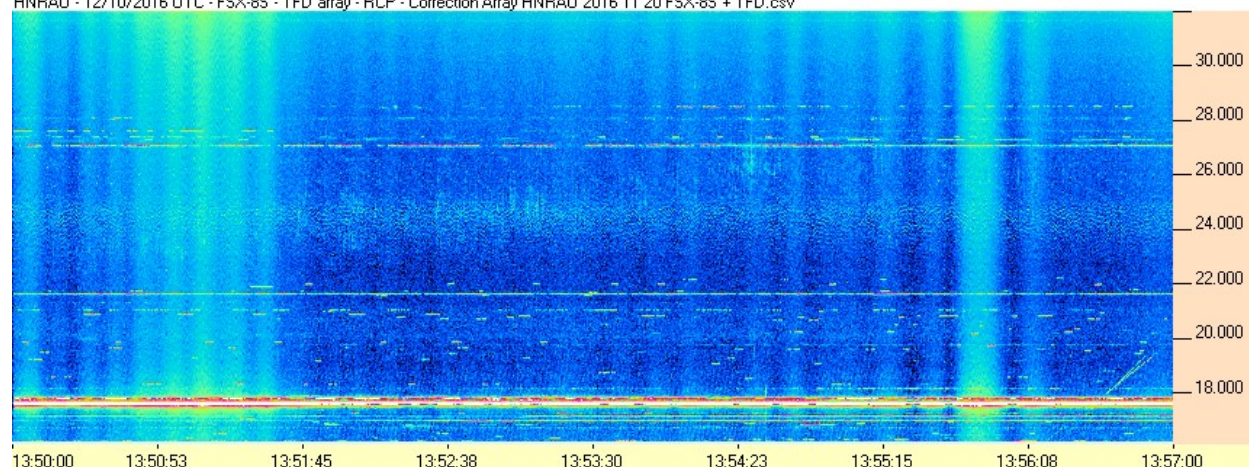
FSX-8S & TFD Array



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HNRAO - 12/10/2016 UTC - FSX-8S - TFD array - RCP - Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



HNRAO - 12/10/2016 UTC - FSX-8S - TFD array - RCP - Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv

