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UCRL-ID-112755

Selected Results from LLNL-Hughes RAR for West Coast Scotland Experiment 1991

**Sean K. Lehman, Brooks Johnston, Richard Twogood,
Melvin Wieting, Thomas Yorkey, Harry Robey,
David Wheland, Ray Nagele**

January 5, 1993



**Lawrence
Livermore
National
Laboratory**

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UCRL-ID--112755

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Selected Results from LLNL-Hughes RAR for West Coast Scotland Experiment 1991

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Abstract

The joint US-UK 1991 West Coast Scotland Experiment (WCSEX) was held in two locations. From July 5 to 12, 1991, in Upper Loch Linnhe, and from July 18 to July 26, 1991, in the Sound of Sleat. The LLNL-Hughes team fielded a fully polarimetric X-band hill-side real aperture radar to collect internal wave wake data.

We present here a sample data set of the best radar runs.

2 1991 Intensity Images



References

- [1] Donald R. Wehner, *High Resolution Radar*, Artech House, Inc., MA 1987.

Run 7 Fri Jul 5 13:23:13 1991 GMT RUN #1 ROY 2 M/S DL1

View 1: HHta

Fri Jul 05 1991

1900 1950 2000 2050 2100 2150 2200

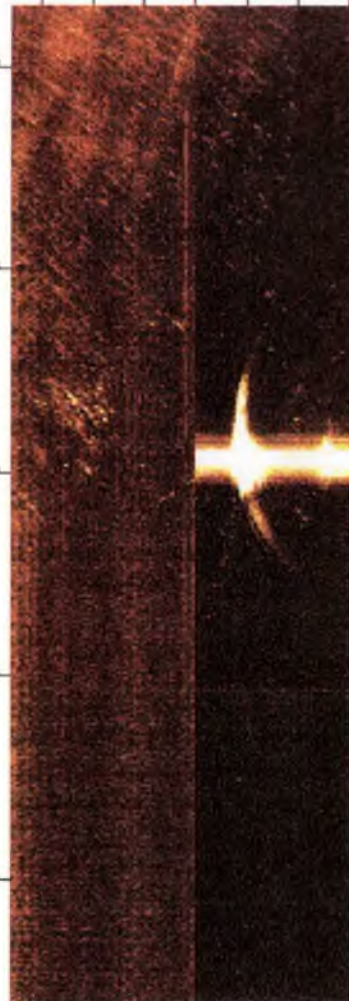
13:25:00

30:00

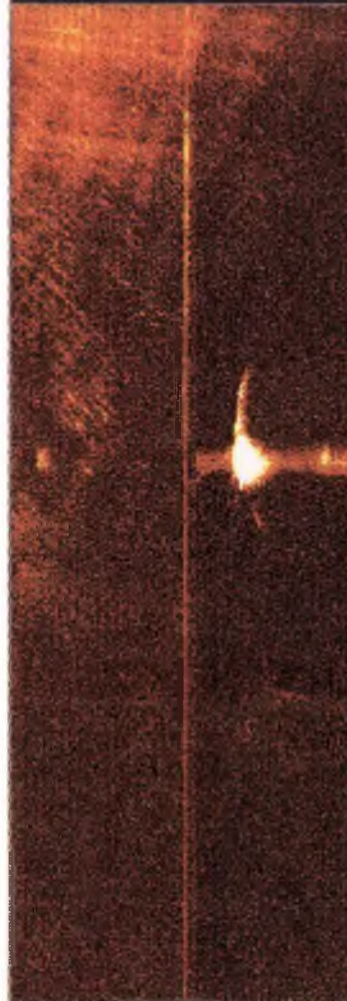
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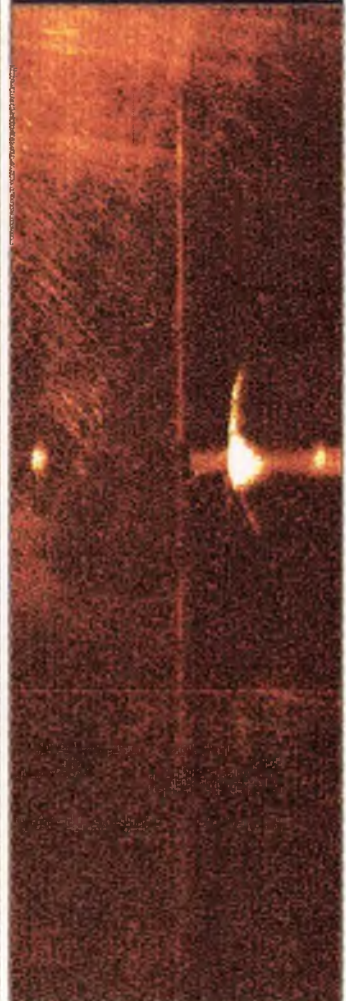
45:00



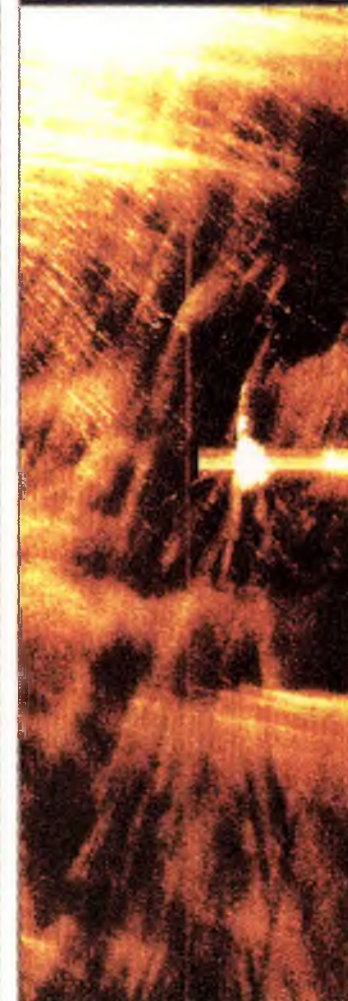
View 2: HVta



View 3: VHta



***View 1: VVta *** Thu Oct



Run 9 Fri Jul 5 13:51:24 1991 GMT RUN #2 ROY 2 M/S DL2

View 1: HHta

Fri Jul 05 1991
2150 2200 2250 2300 2350 2400 2450



View 2: HVta



View 3: VHta



***View 4: VVta *** Thu Oc



Fri Jul 05 1991 7/VVta 9/VVta

1900

2000

2100

2200

2300

2400

13:25:00

30:00

35:00

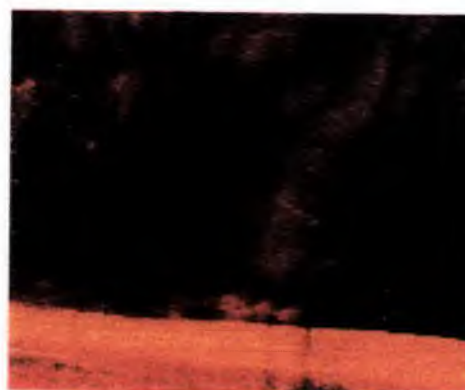
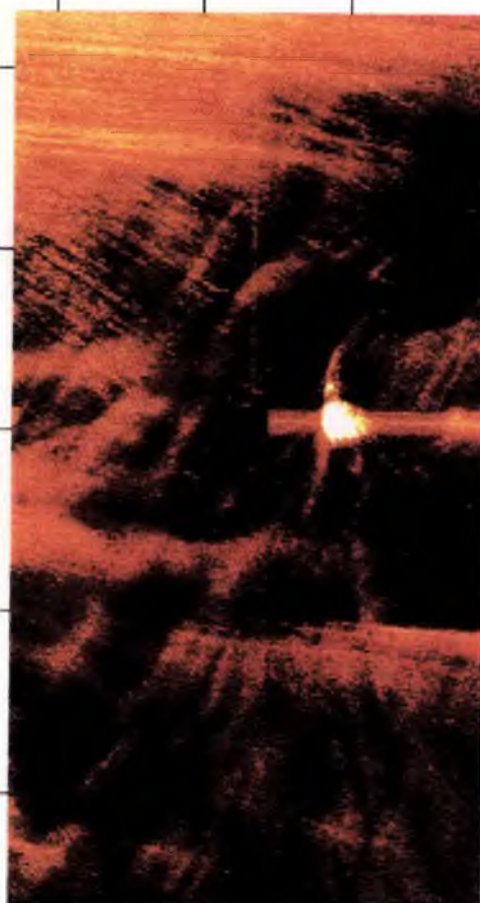
40:00

45:00

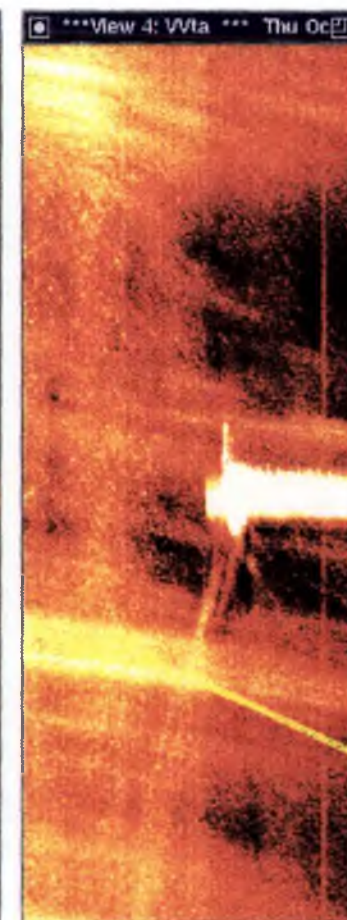
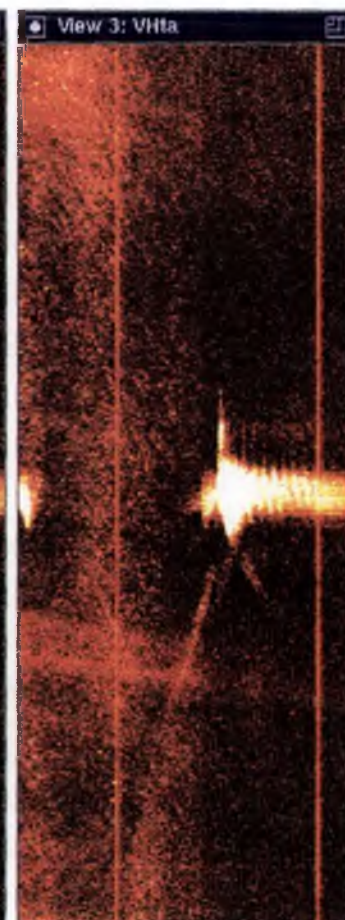
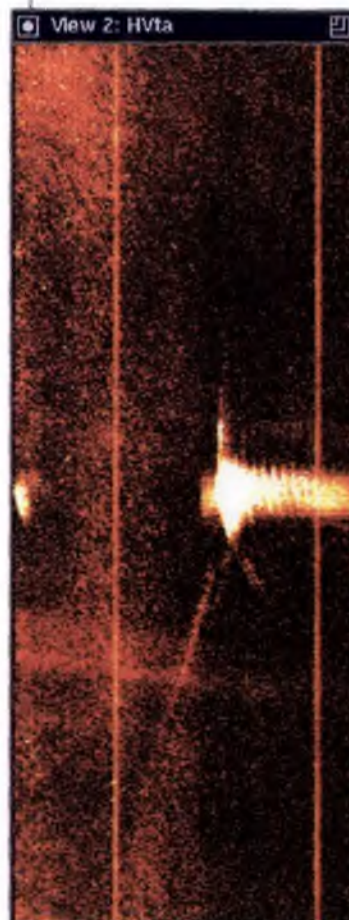
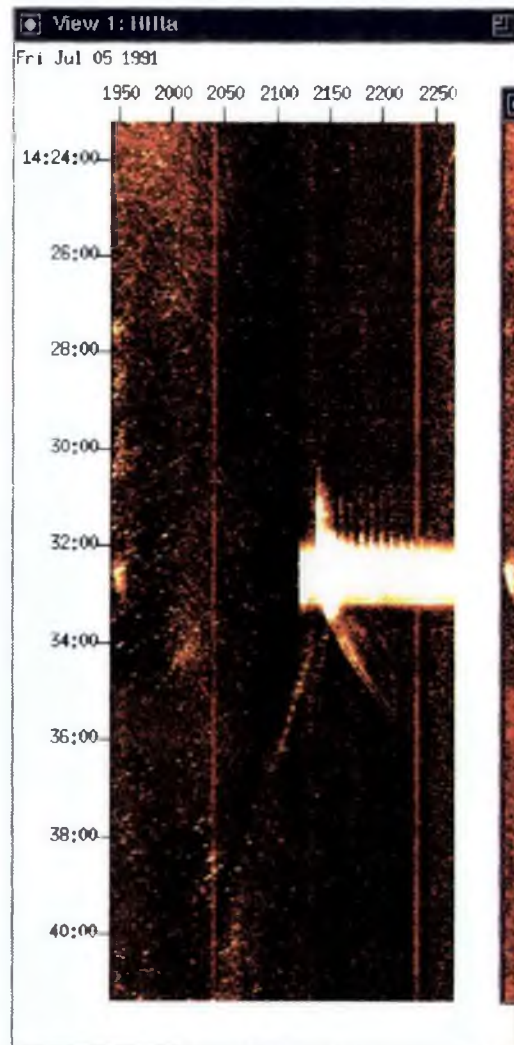
50:00

55:00

14:00:00



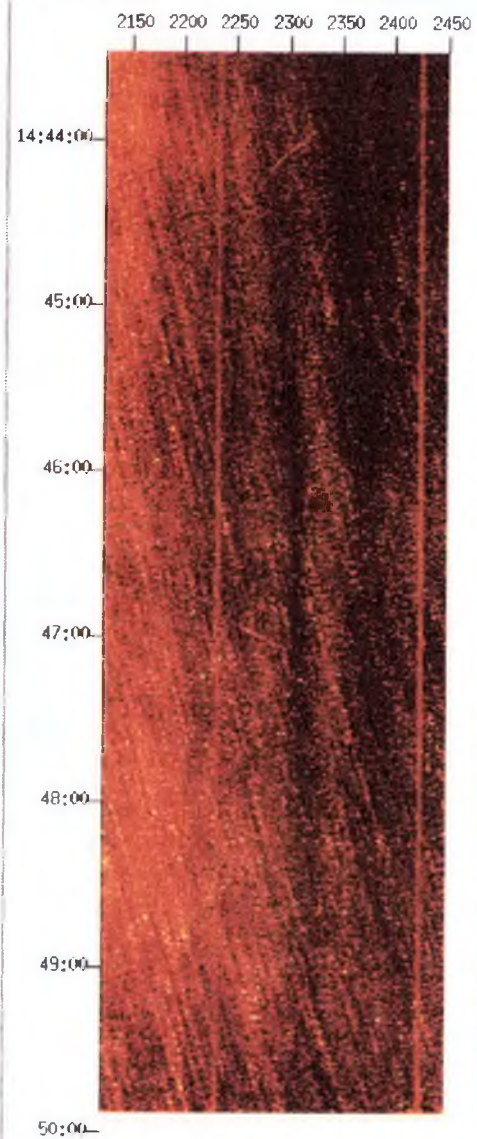
Run 1934 Fri Jul 5 14:23:41 1991 GMT RUN #3 ARK 2 M/S DL1



Run 1936 Fri Jul 5 14:43:51 1991 GMT RUN #4 ARK 2 H/S DLS

View 1: HH1a

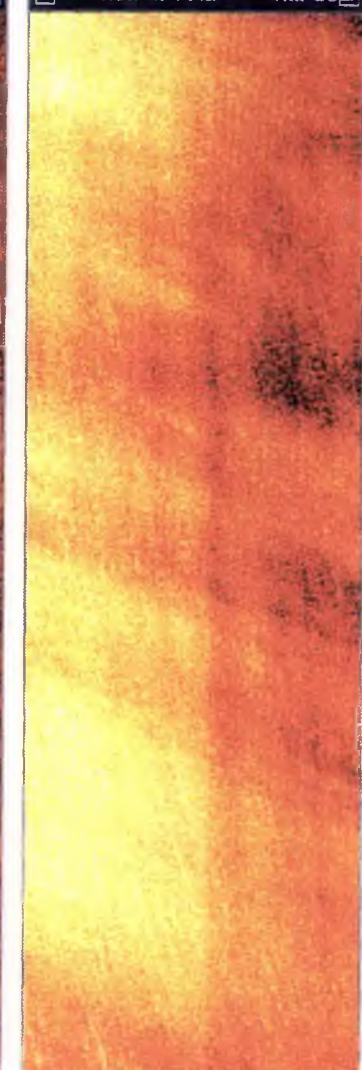
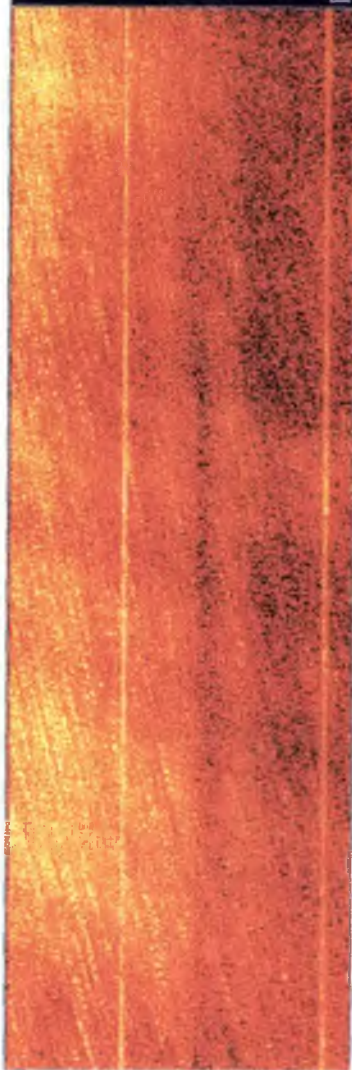
Fri Jul 05 1991



View 2: HV1a

View 3: VH1a

***View 4: VV1a *** Thu Oct



Fri Jul 05 1991 1934/VVta 1936/VVta

1950 2000 2050 2100 2150 2200 2250 2300 2350 2400

14:25:00

30:00

35:00

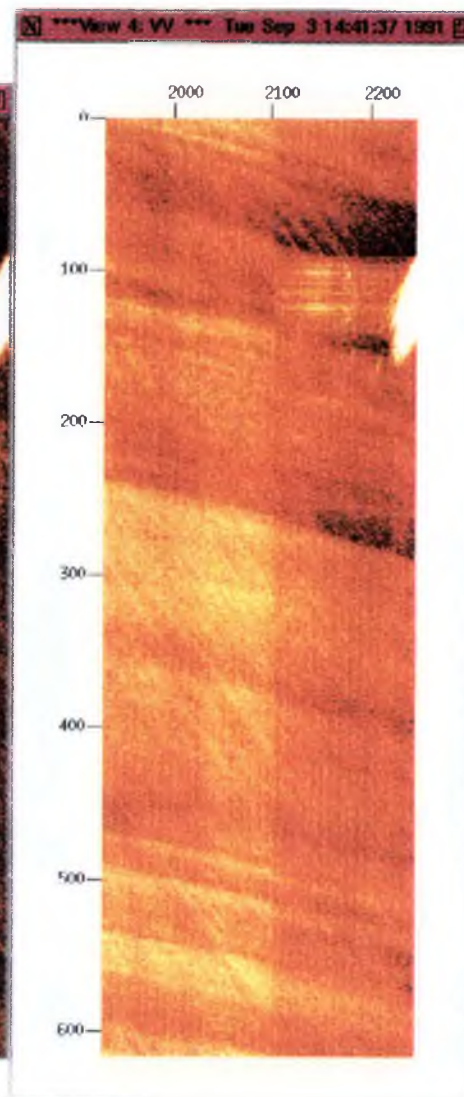
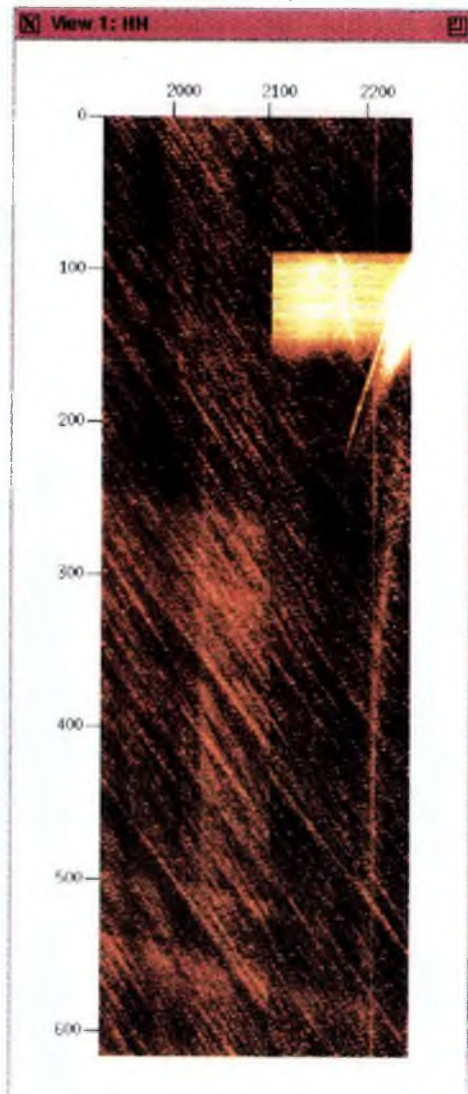
40:00



45:00



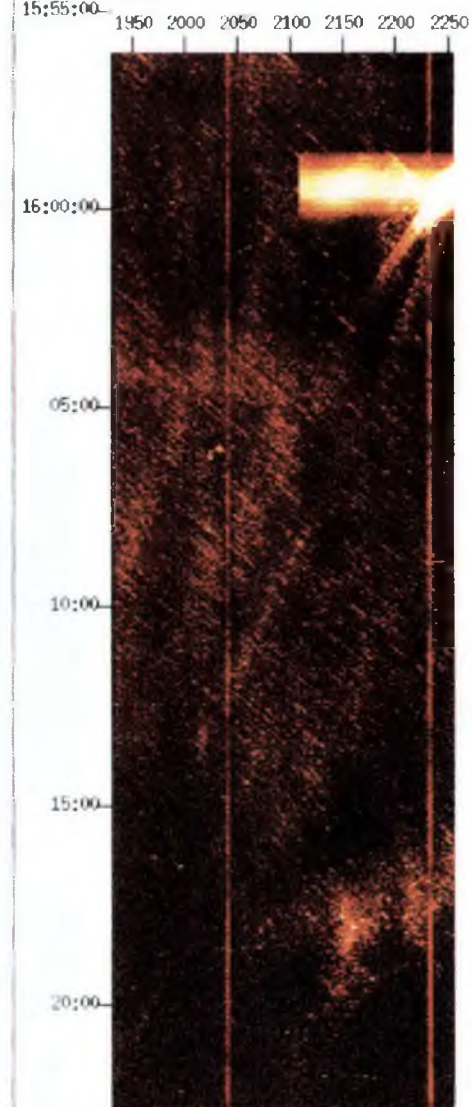
Run 1941 Fri Jul 5 15:22:13 1991 GMT RUN #5 ARK 1 M/S



Run 1946 Fri Jul 5 15:56:30 1991 GMT RIN #7 ROY 1 M/S

View 1: HHta

Fri Jul 05 1991
15:55:00



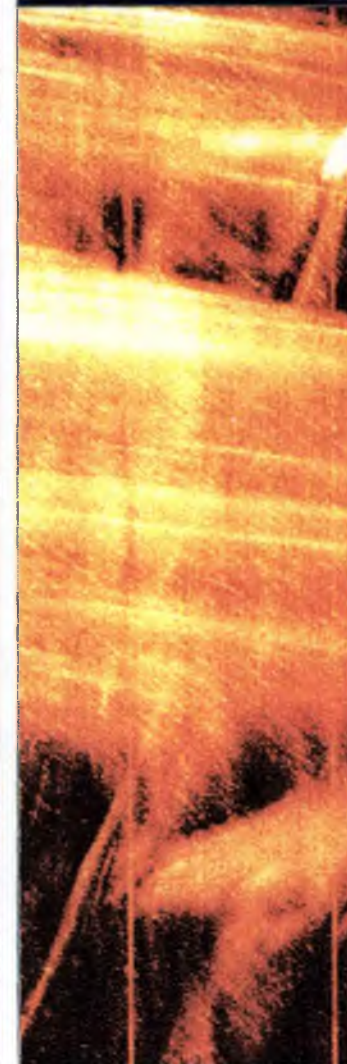
View 2: HVta



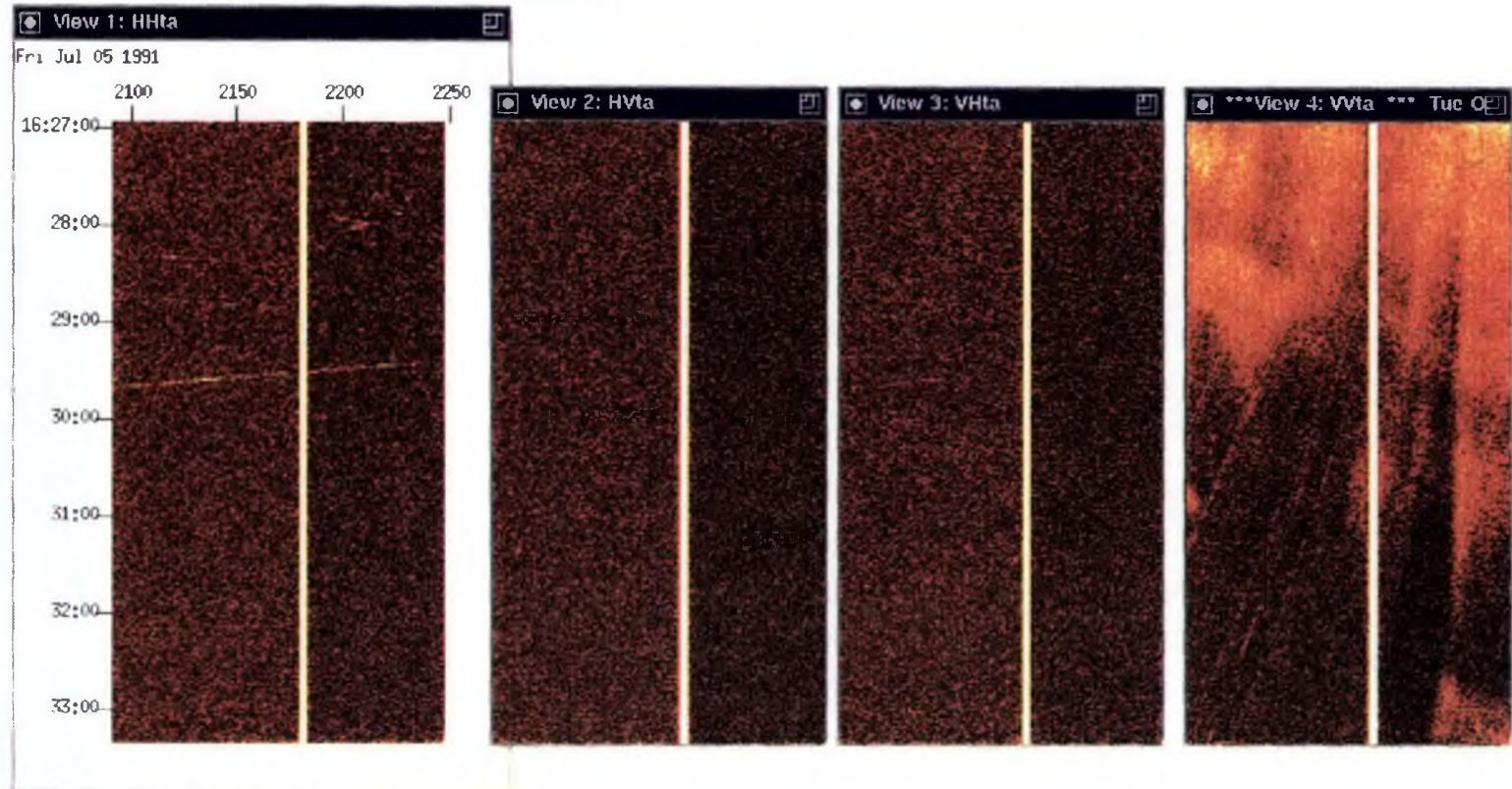
View 3: VHta



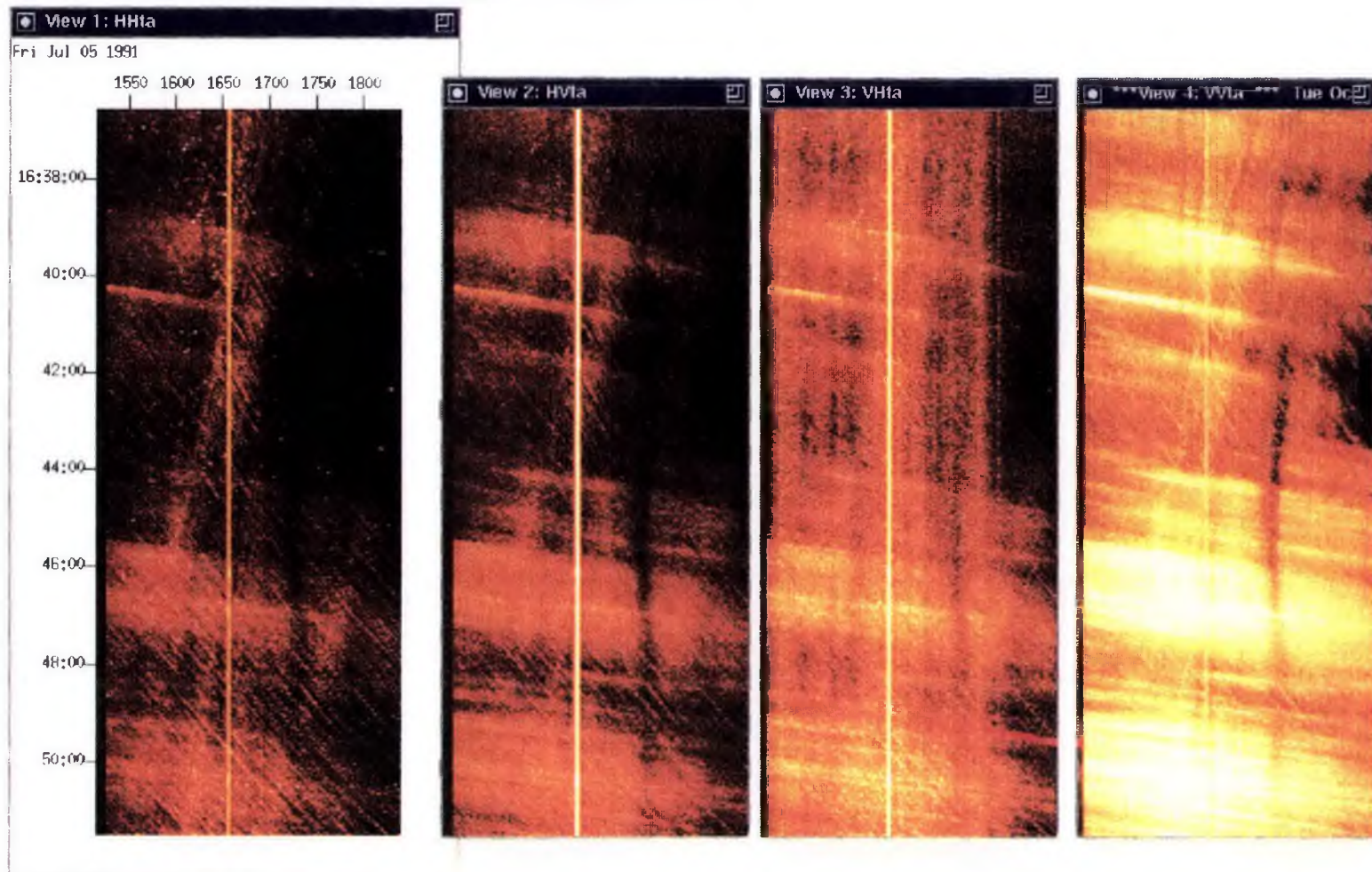
View 4: VVta Wed Co



Run 1947 Fri Jul 5 16:26:40 1991 GHI RUN #8 ROY 1M/S



Run 1949 Fri Jul 5 16:36:31 1991 GMT RUN #9 R0Y



Fri Jul 05 1991 1946/VVta 1947/VVta 1949/VVta

1500

1600

1700

1800

1900

2000

2100

2200

16:00:00—

10:00—

20:00—

30:00—

40:00—

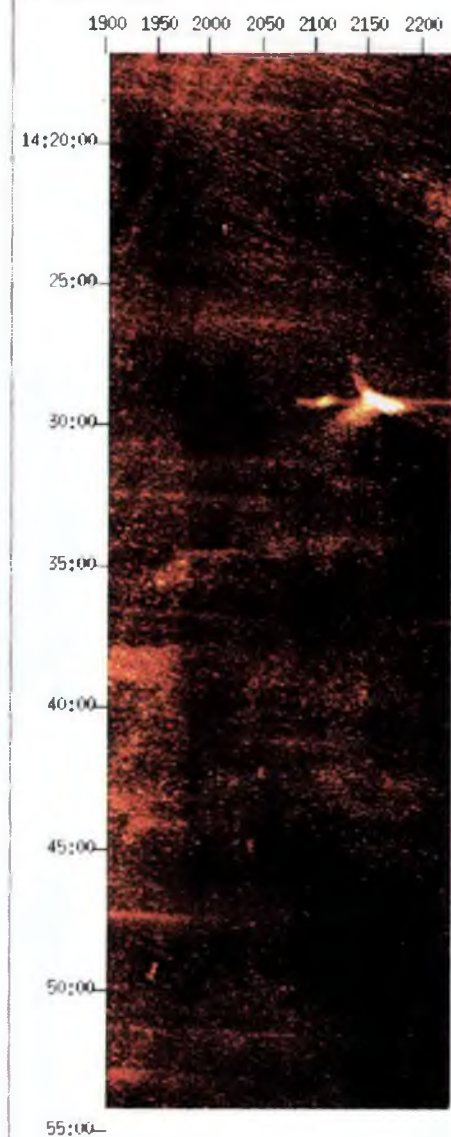
50:00—



Run 2035 Sat Jul 6 14:16:41 1991 GMT RUN #1 ROY 4 M/S DL1

View 1: HH1a

Sat Jul 06 1991



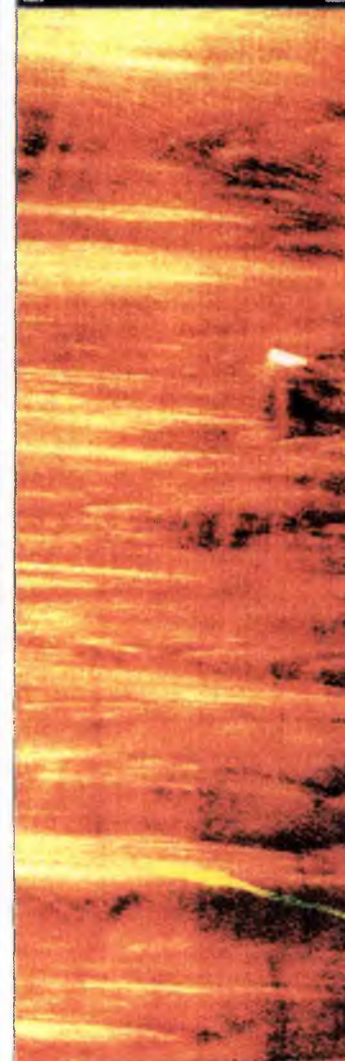
View 2: HV1a



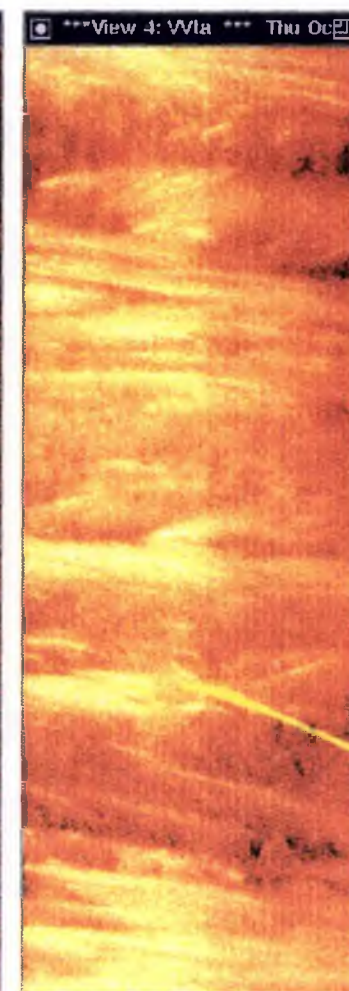
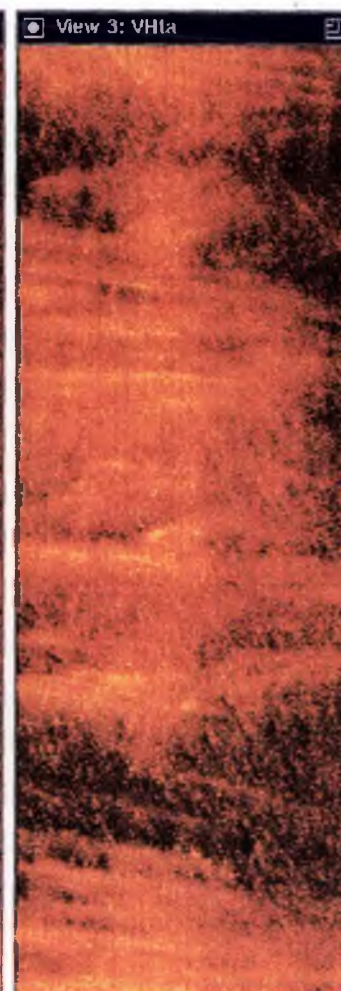
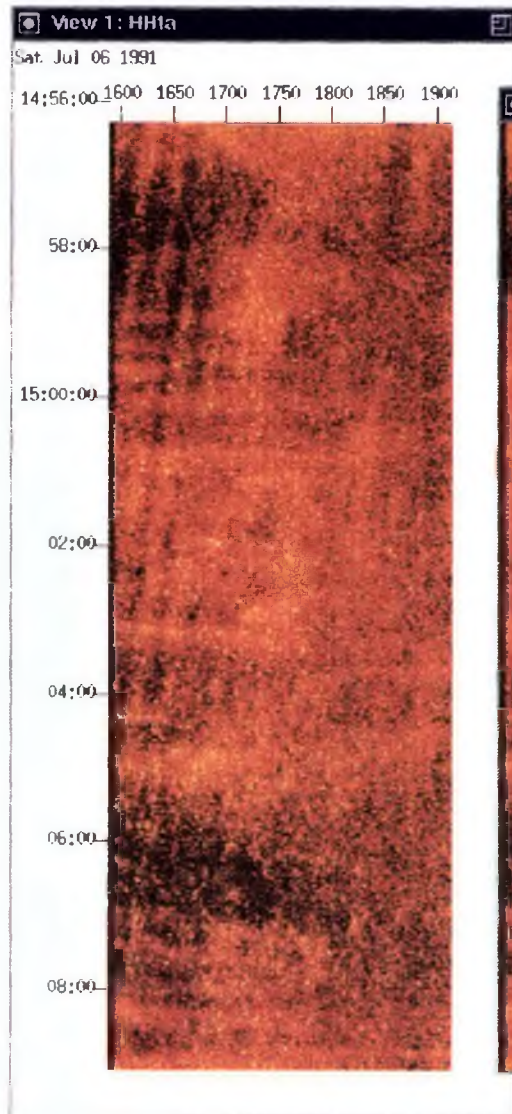
View 3: VH1a



***View 4: VV1a *** Thu Oct



Run 2036 Sat Jul 6 14:56:40 1991 GMT RUN #2 ROY 4 M/S DL1



Sat Jul 06 1991 2035/VVta 2036/VVta

1600

1700

1800

1900

2000

2100

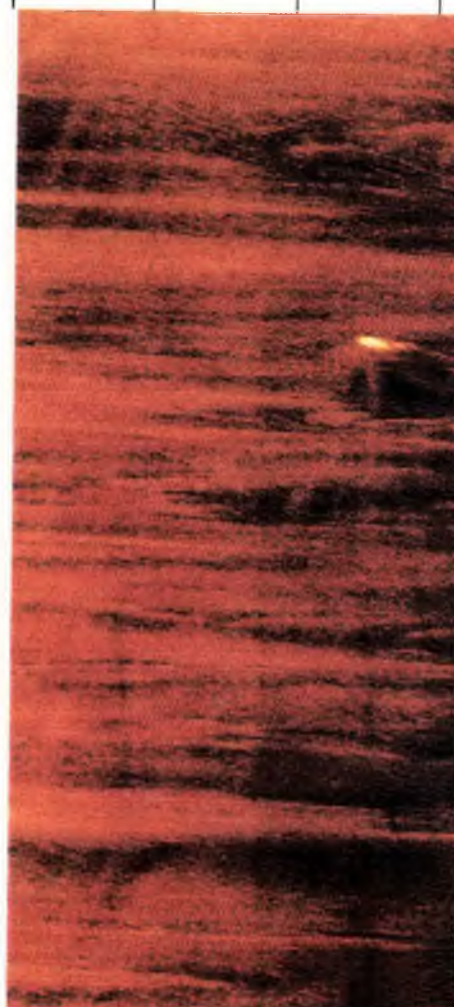
2200

14:20:00—

30:00—

40:00—

50:00—



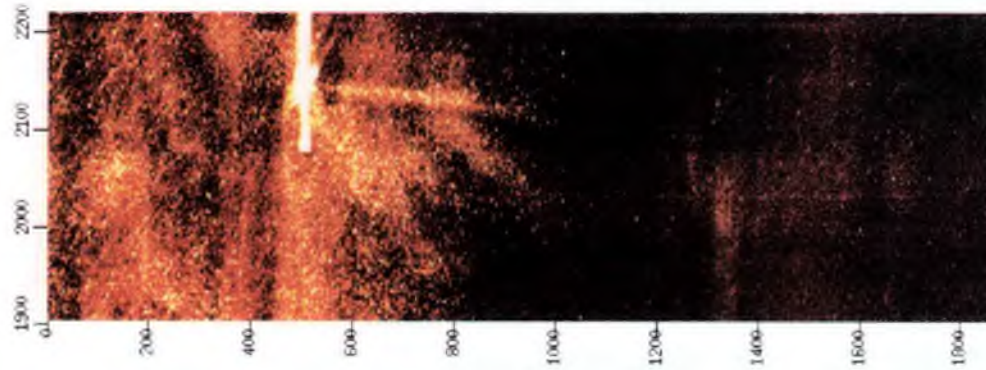
15:00:00—

10:00—

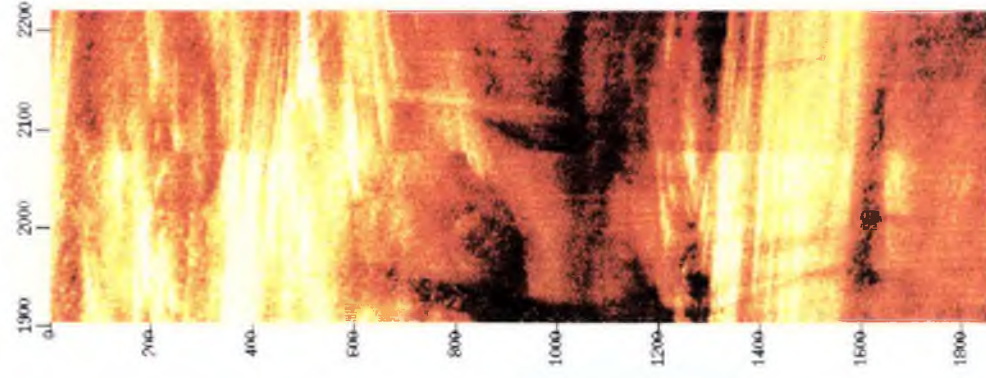


Run 2039 Sat Jul 6 15:20:41 1991 GMT RIN #3 40V 4M/S BL1

☒ View 1: HH 

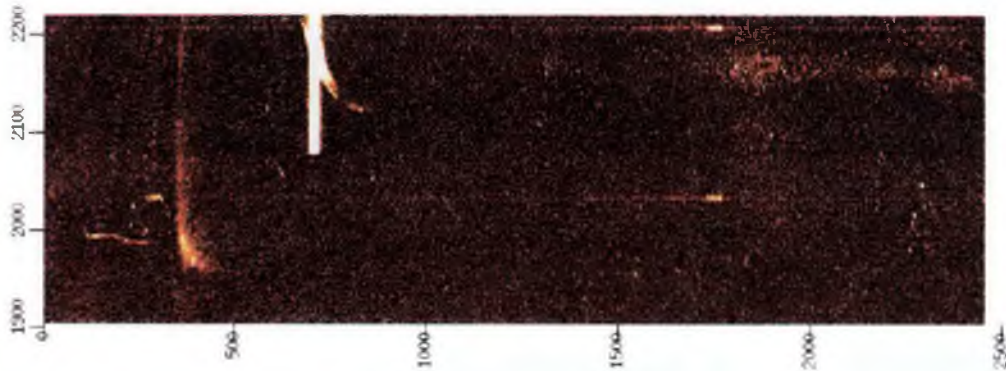


☒ View 4: VV  Tue Sep 3 15:35:38 1991

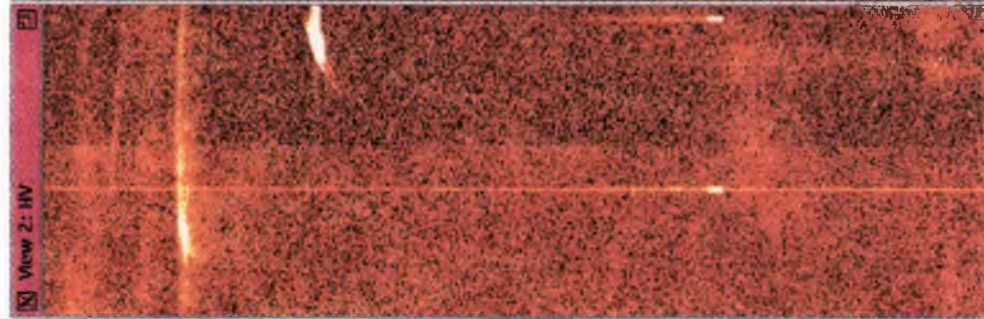


Run 2040 Sat Jul 8 18:00:40 1990 (RT) RUN #4 46% 4H/5 1H1

☒ View 1: HH



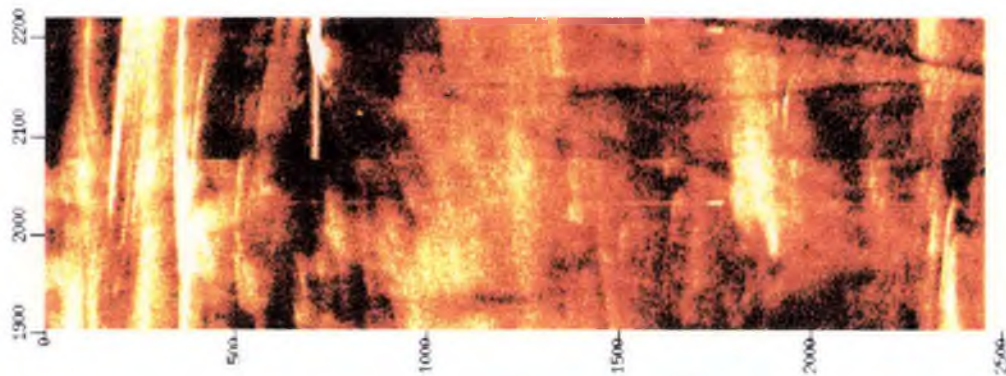
☒ View 2: HV



☒ View 3: VH



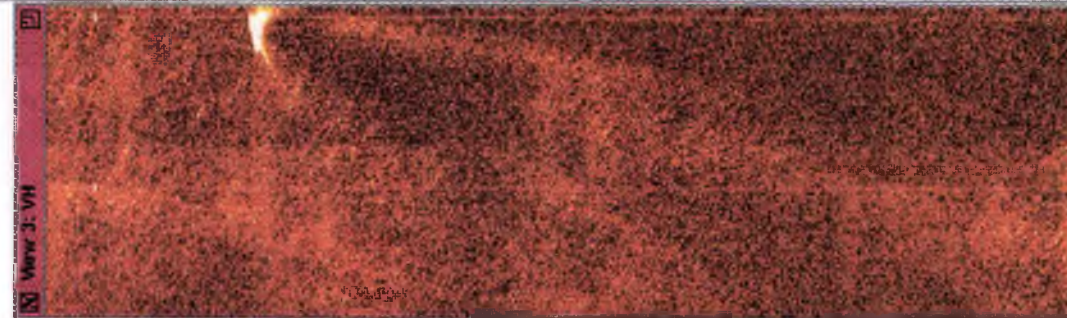
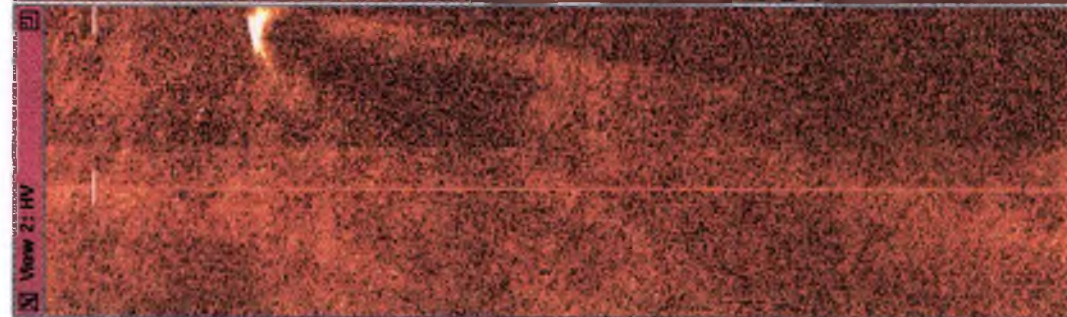
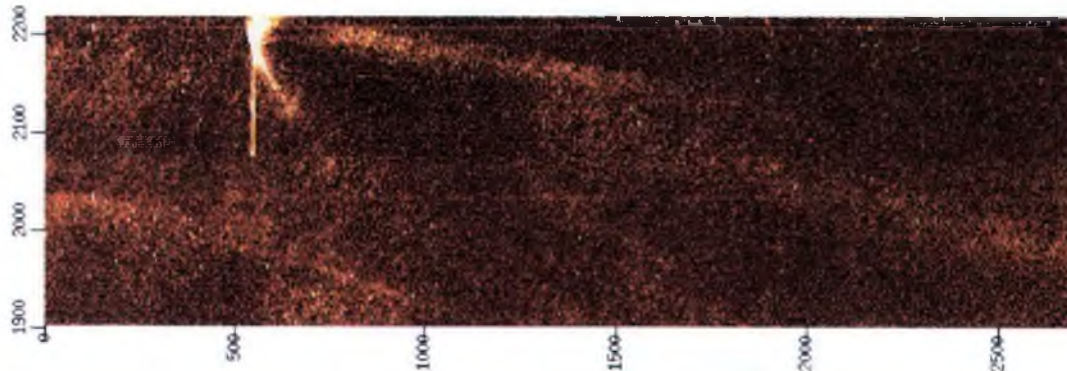
☒ View 4: VV



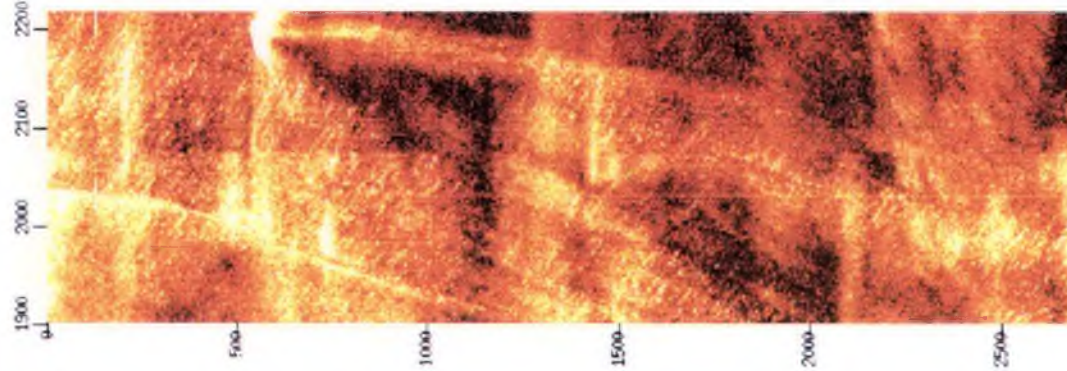
***View 4: VV *** Tue Sep 3 15:45:10 1991

Run 2041 Set Jul 6 17:06:22 1991 GMT RUN #5 80Y CH/S UP1

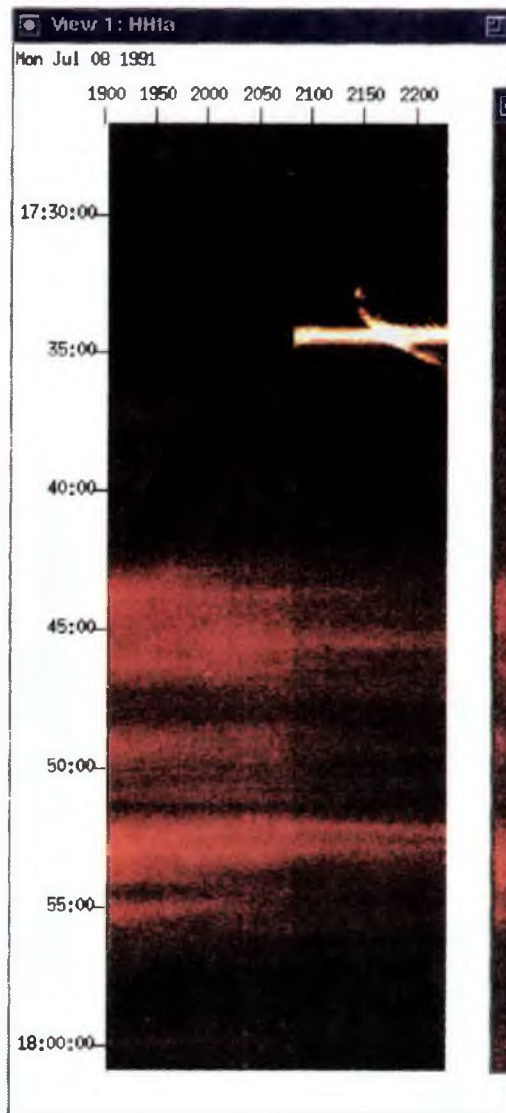
View 1: HH



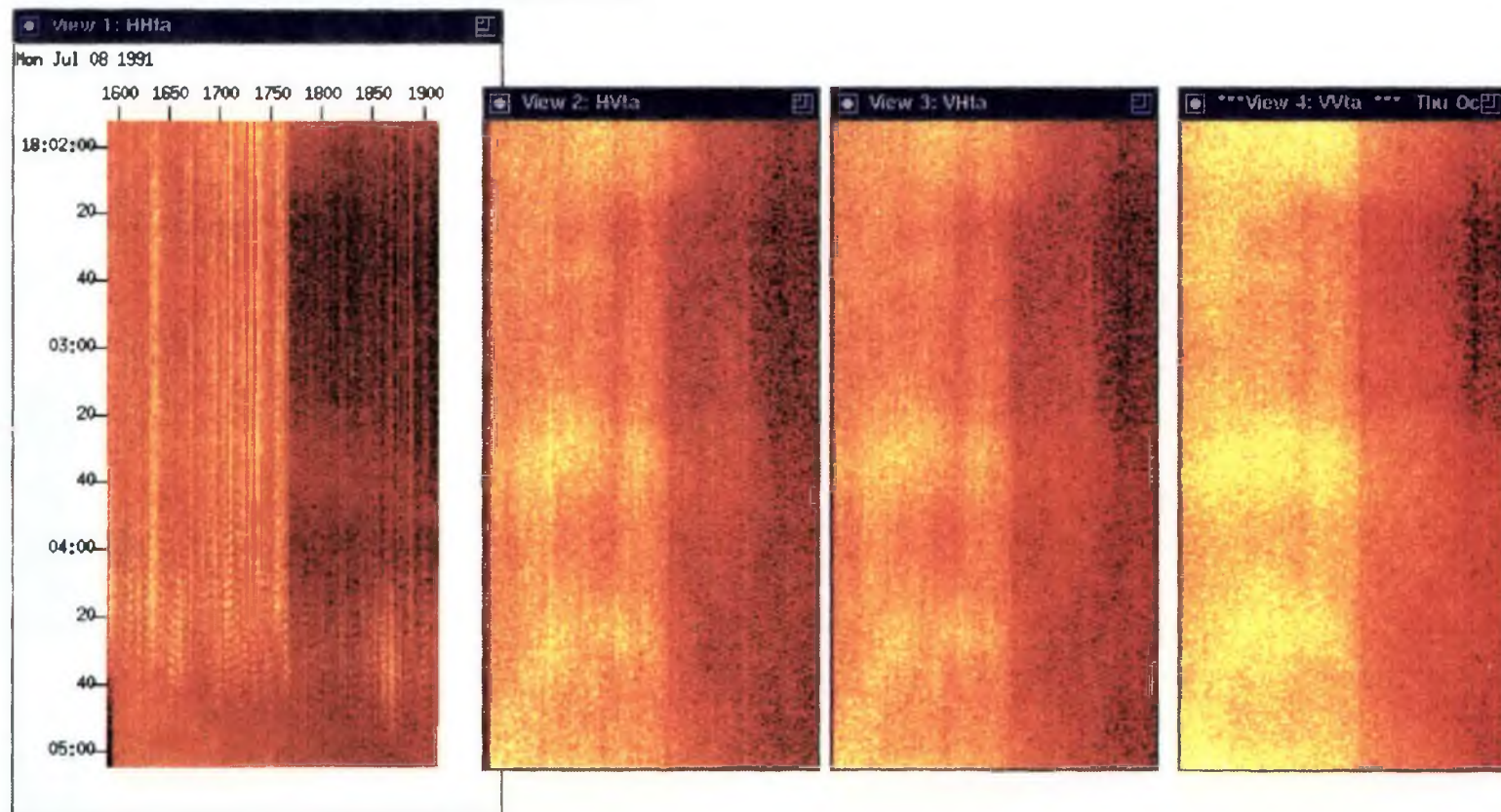
View 4: VV



Run 2134 Mon Jul 8 17:26:32 1991 GMT RUN #4 ARA DL 4MS NW



Run 2135 Mon Jul 8 18:01:35 1991 GMT RUN 05 ARA DL 4MS NNH



Mon Jul 08 1991 2134/VVta 2135/VVta 2136/VVta

1600

1700

1800

1900

2000

2100

2200

17:30:00—

35:00—

40:00—

45:00—

50:00—

55:00—

18:00:00—

05:00—

10:00—



Run 2166 Tue Jul 9 16:16:33 1991 GMT RUN #1 ROY DL 4MS NW

View 1: HH1a

Tue Jul 09 1991

1950 2000 2050 2100 2150 2200 2250

16:20:00

25:00

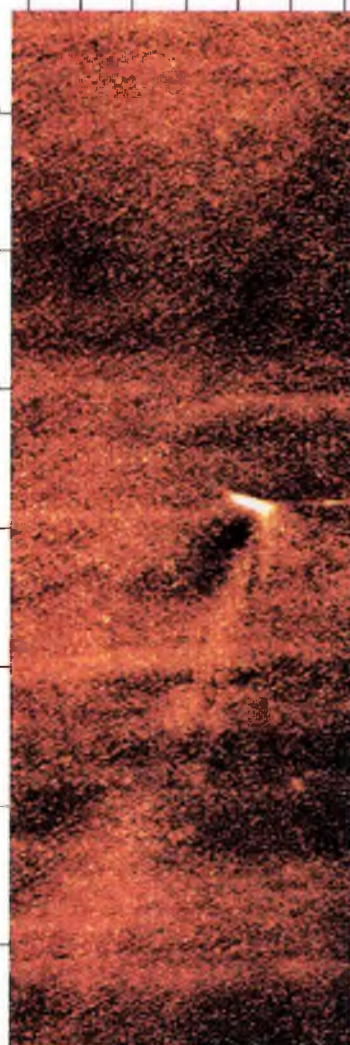
30:00

35:00

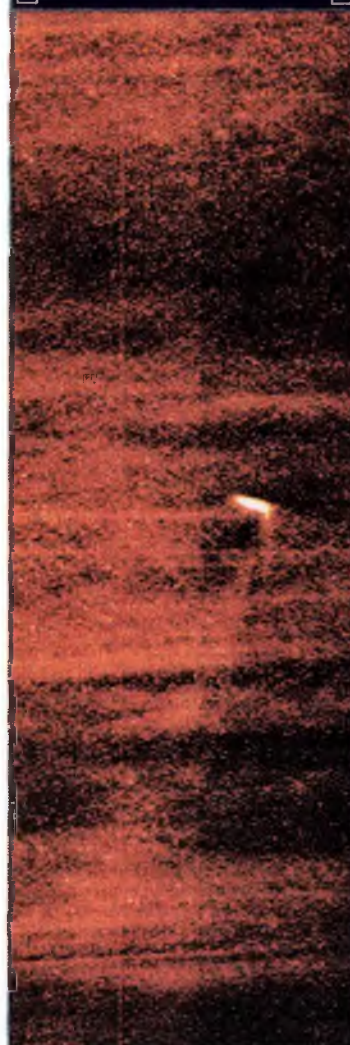
40:00

45:00

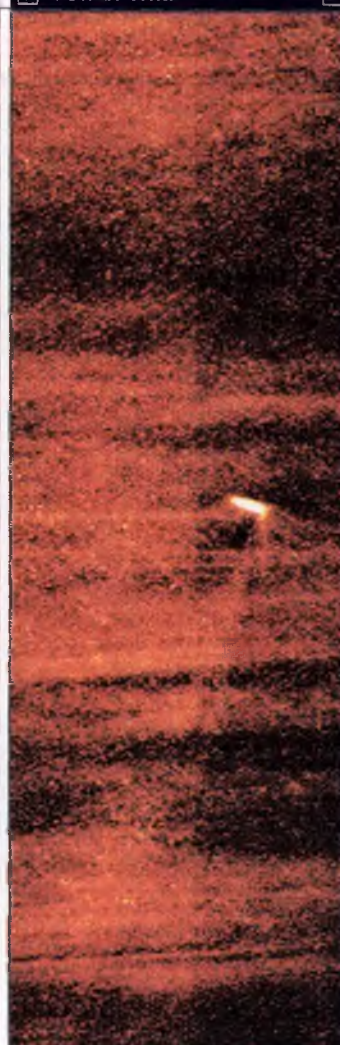
50:00



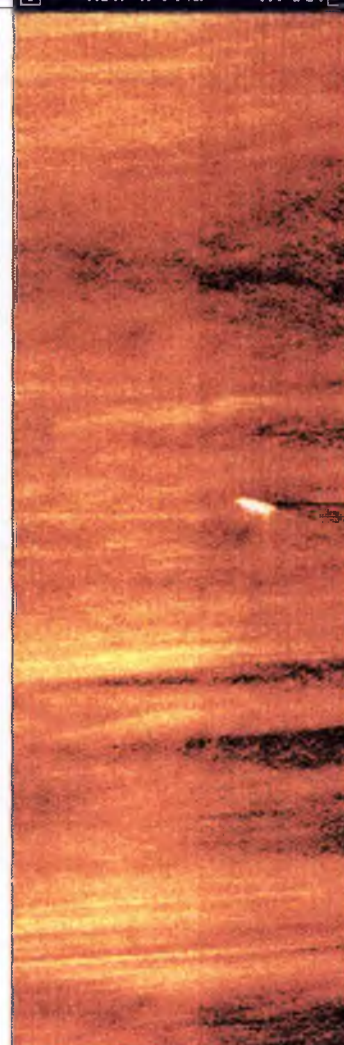
View 2: HV1a



View 3: VH1a



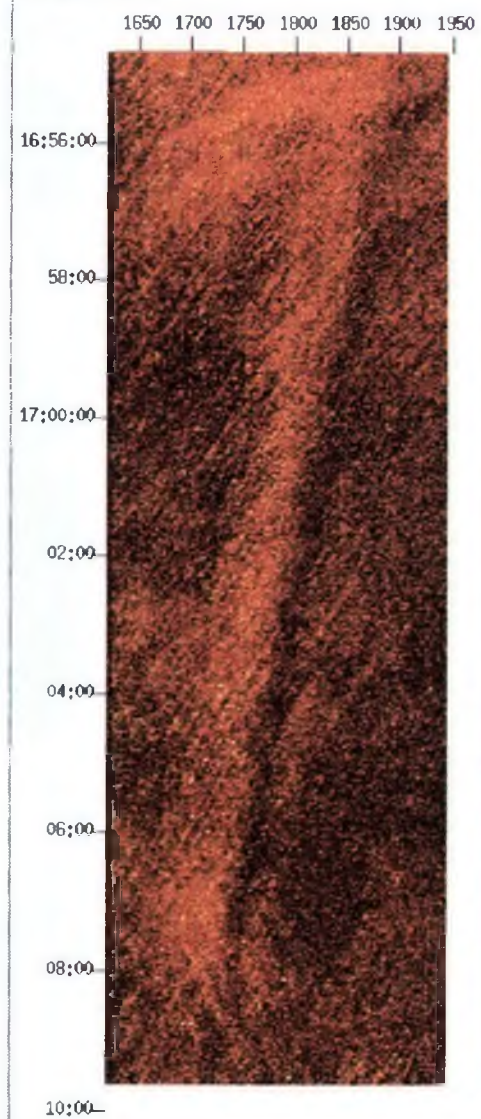
***View 4: VV1a *** Fri Oct



Run 2167 Tue Jul 9 16:54:20 1991 GMT RUN #2 ROY DL 4MS NNW

View 1: HHta

Tue Jul 09 1991



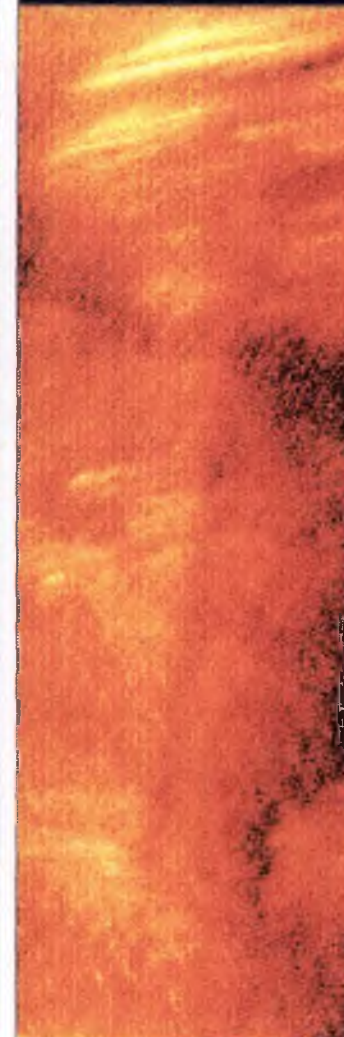
View 2: HVta



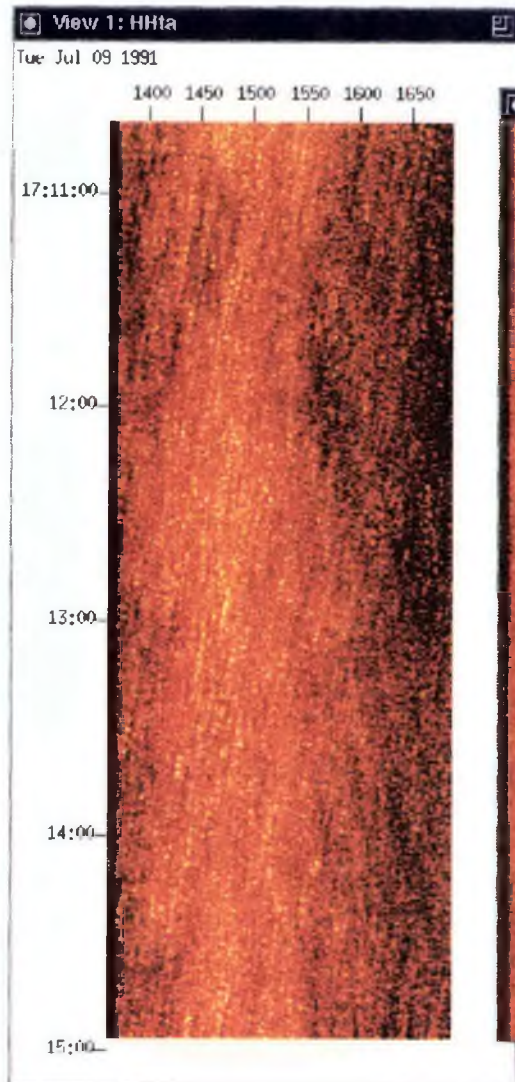
View 3: VIta



***View 4: VVta *** Fri Oct



Run 2168 Tue Jul 9 17:10:14 1991 GMT RUN #3 ROY DL 4MS NNNW



Tue Jul 09 1991 2166/HHta 2167/HHta 2168/HHta

1400
|

1500
|

1600
|

1700
|

1800
|

1900
|

2000
|

2100
|

2200
|

16:20:00—

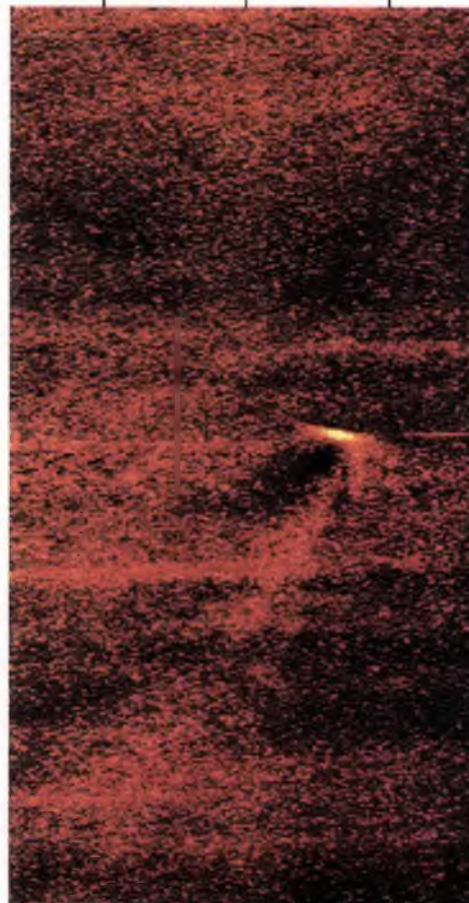
30:00—

40:00—

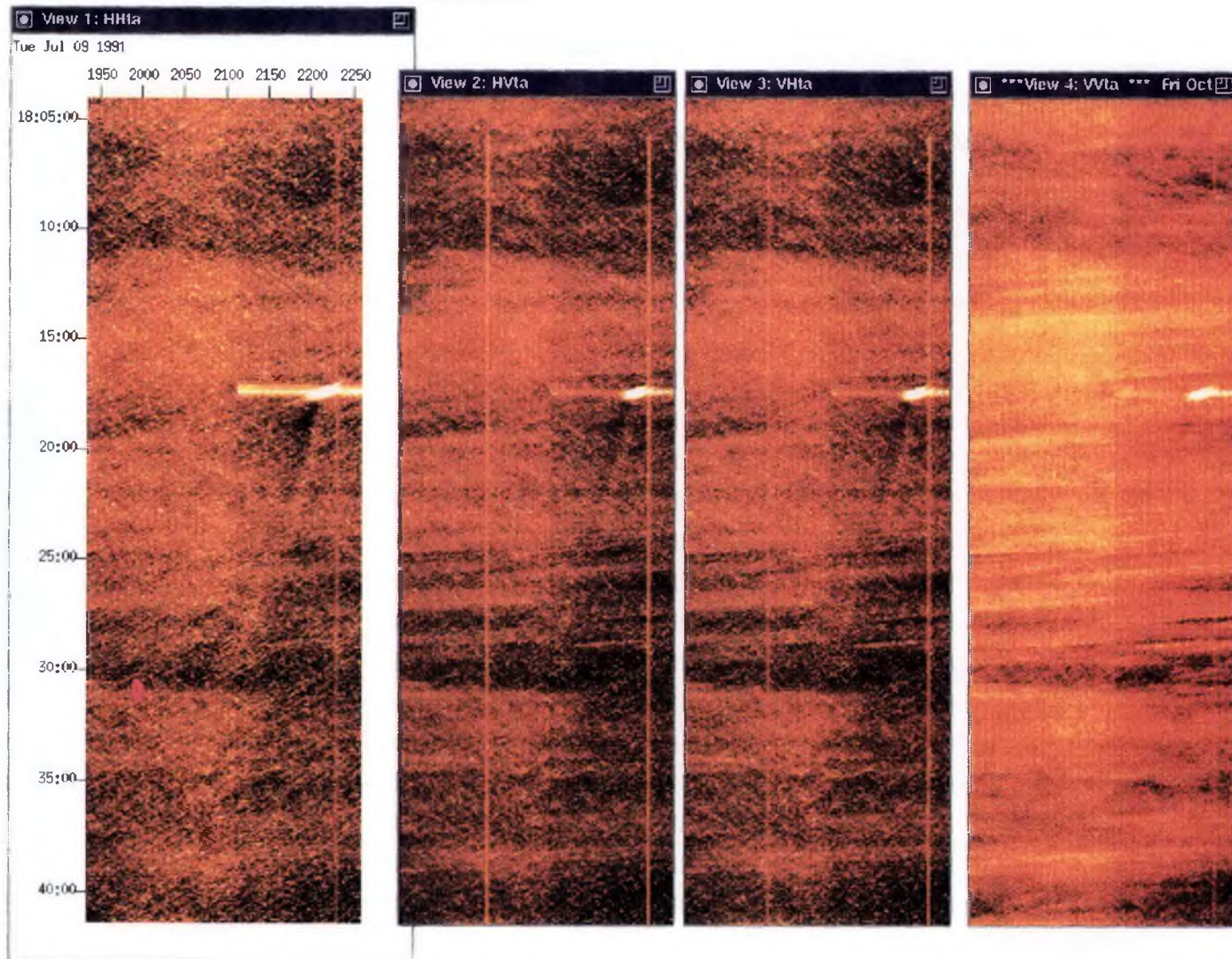
50:00—

17:00:00—

10:00—



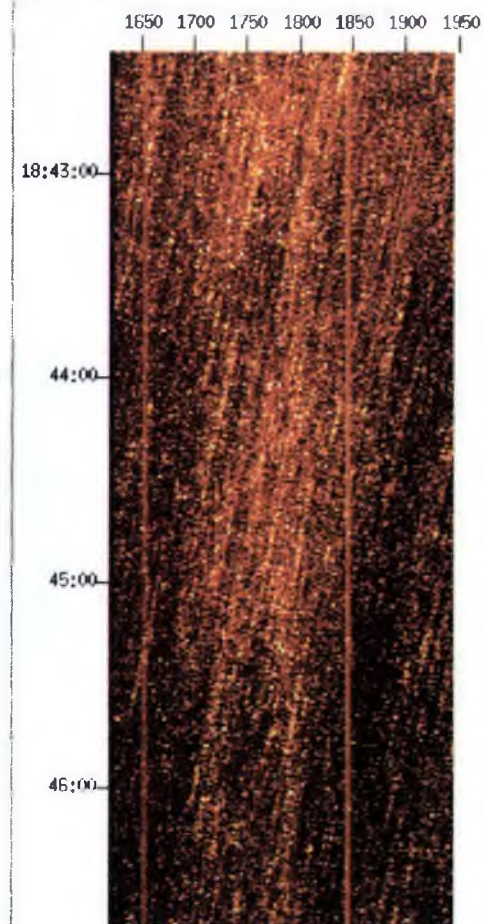
Run 2178 Tue Jul 9 18:03:38 1991 GMT RUN #4 ARH UL 4MS NW



Run 2179 Tue Jul 9 18:41:53 1991 GMT RUN #5 ARA UL 4MS NNW

View 1: HH1a

Tue Jul 09 1991



View 2: HV1a



View 3: VH1a



***View 4: VV1a *** Fri Oct



Tue Jul 09 1991 2178/HHta 2179/HHta

1600 1700 1800 1900 2000 2100 2200
18:05:00—

10:00—

15:00—

20:00—

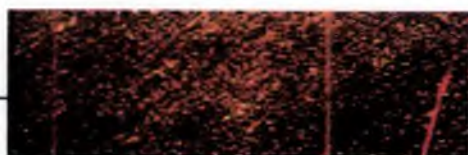
25:00—

30:00—

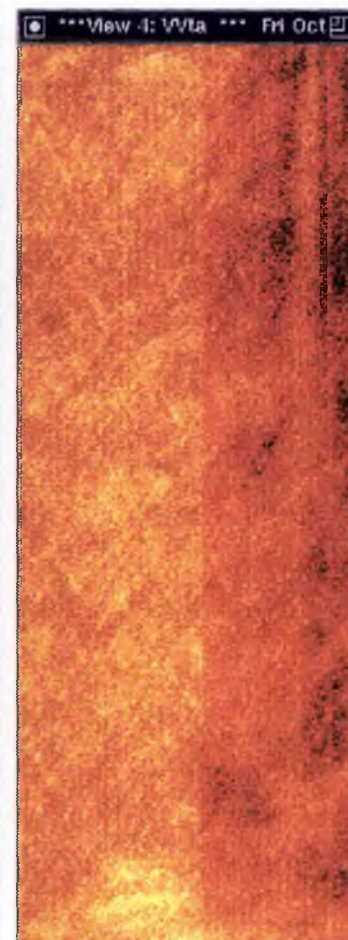
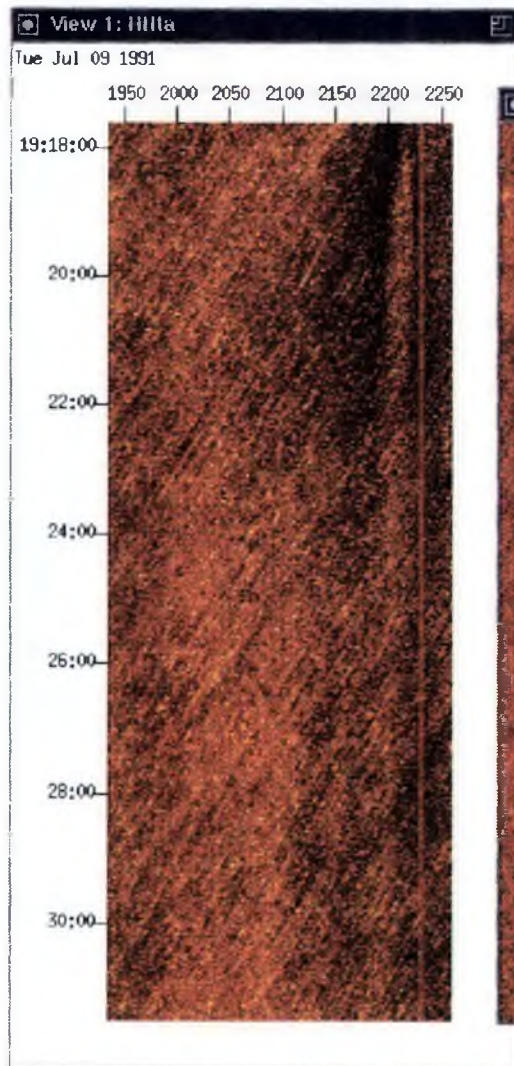
35:00—

40:00—

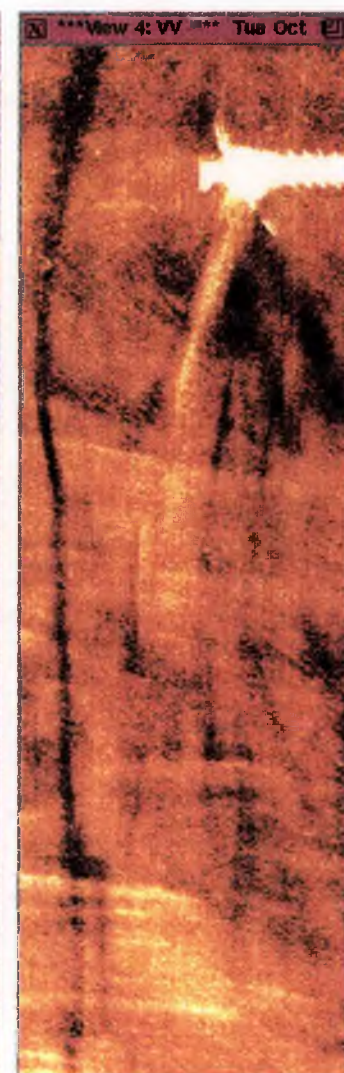
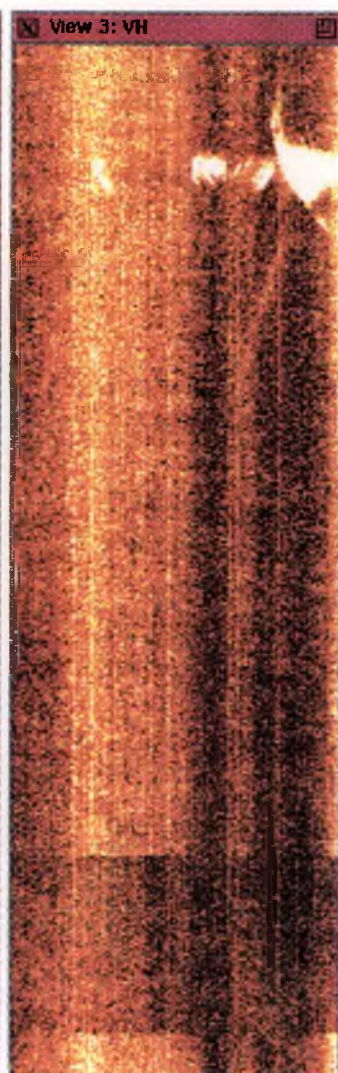
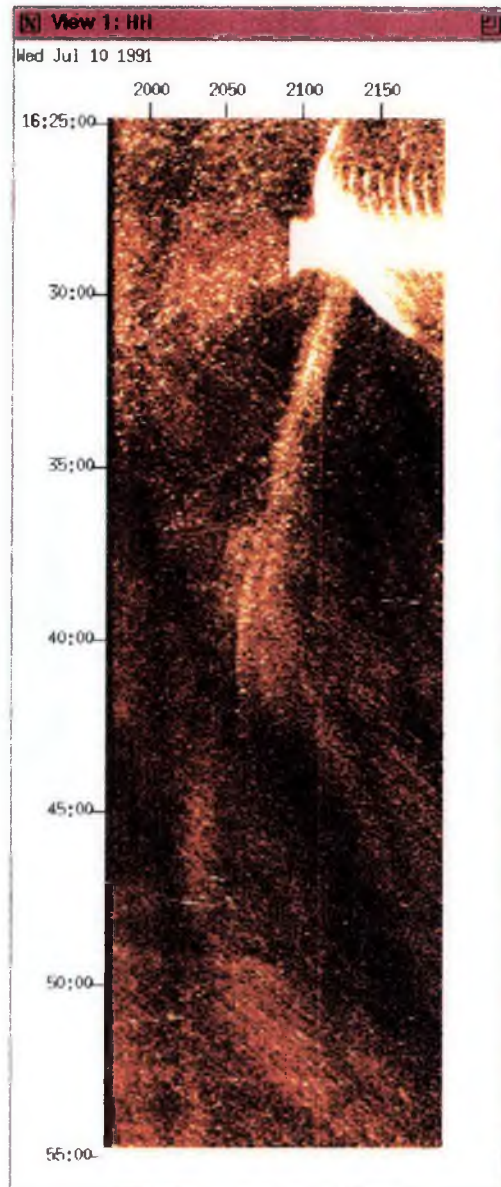
45:00—



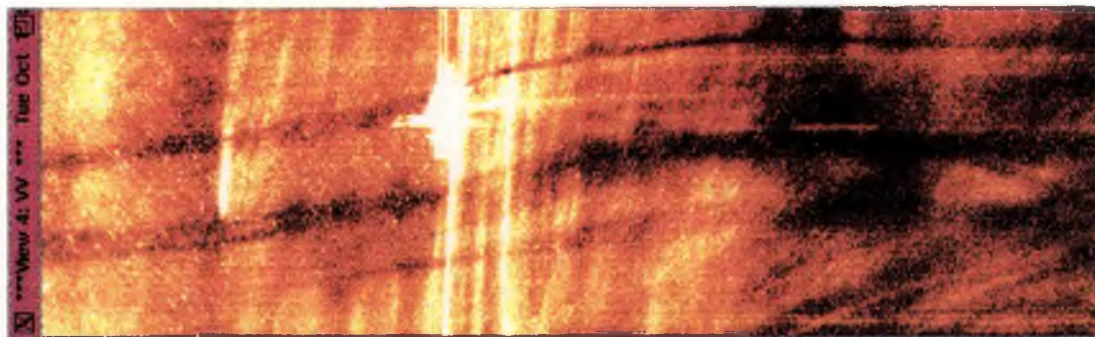
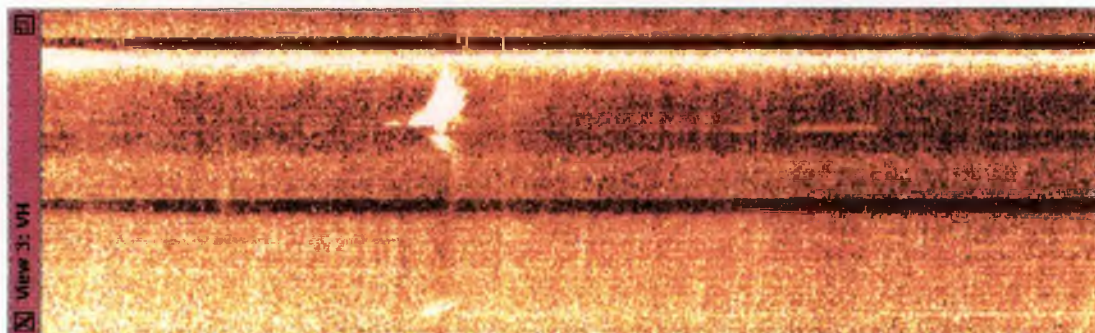
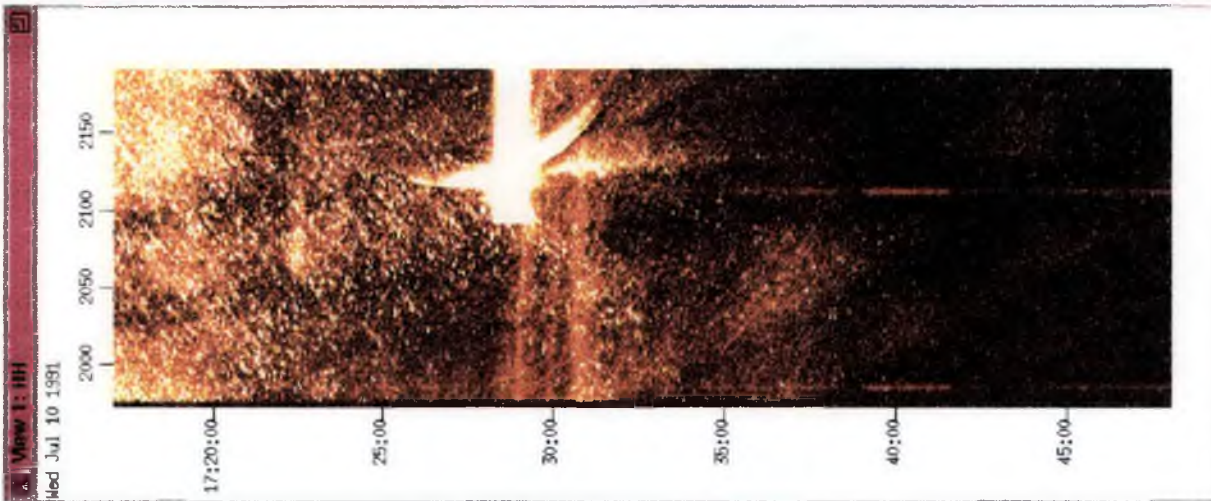
Run 2181 Tue Jul 9 19:17:14 1991 GMT RUN #6 ROY UL 4MS NW



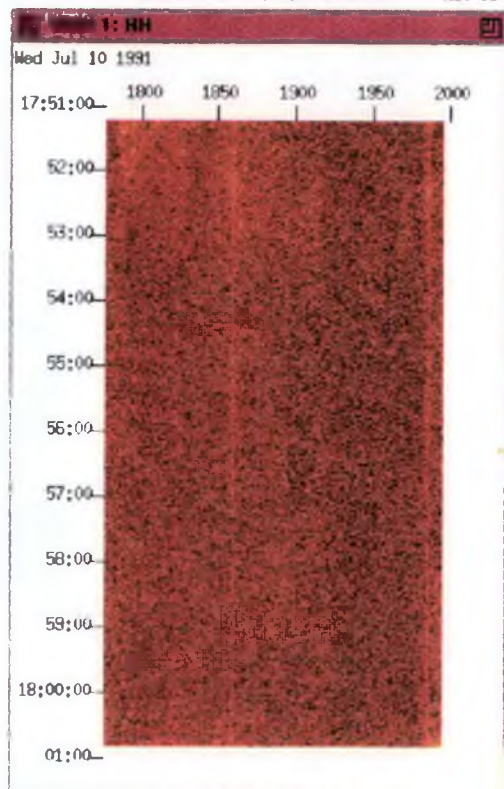
Run 2223 Wed Jul 10 16:25:16 1991 GMT ARA DL 2MS NW



Run 2224 Med Jul 10 17:16:42 1991 GMT ROY BL 205 NM



Run 2225 Wed Jul 10 17:51:22 1991 GMT ROY DL 2HS NNW



Wed Jul 10 1991 2224/VV 2225/VV

1800

1850

1900

1950

2000

2050

2100

2150

17:20:00—

25:00—

30:00—

35:00—

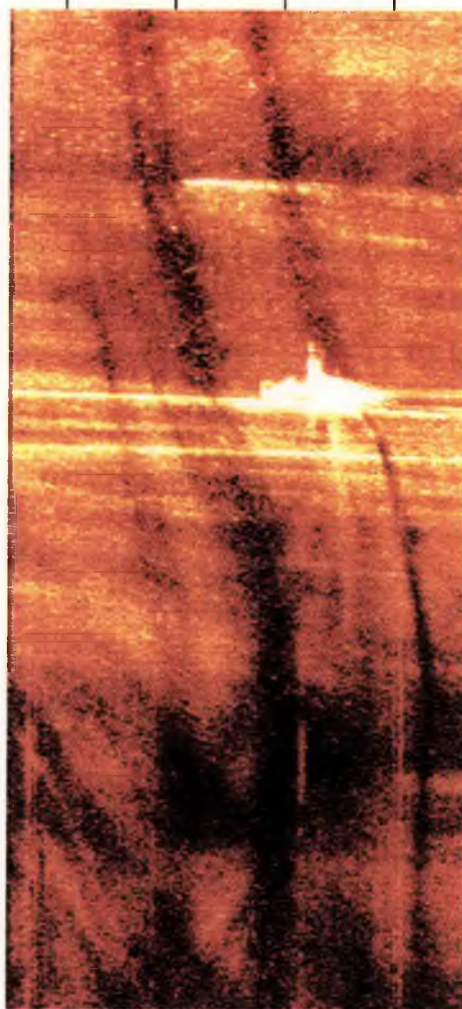
40:00—

45:00—

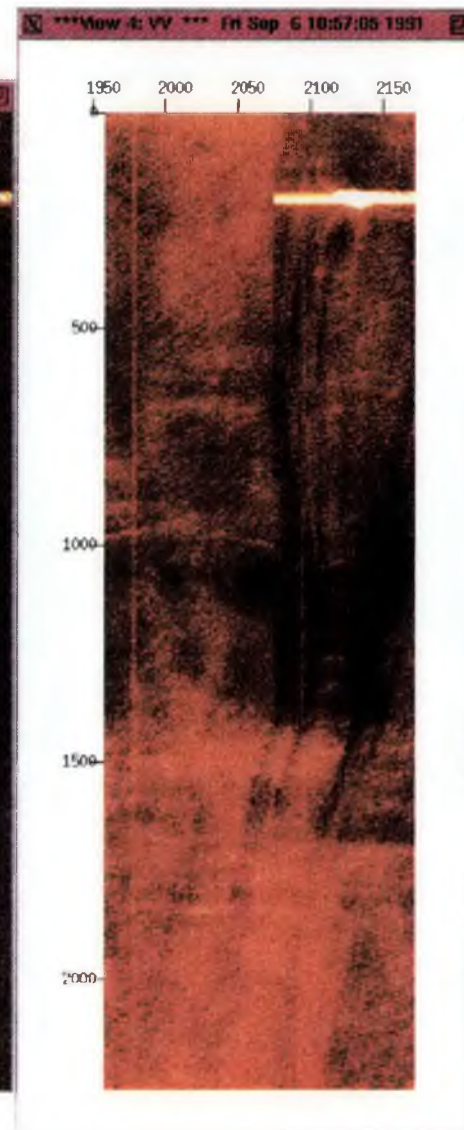
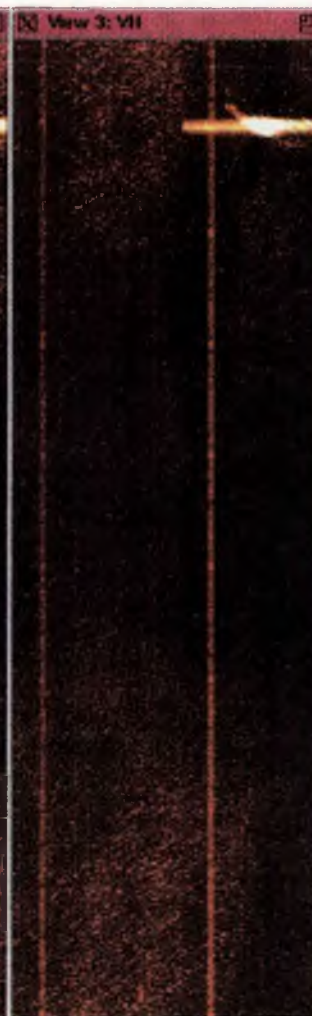
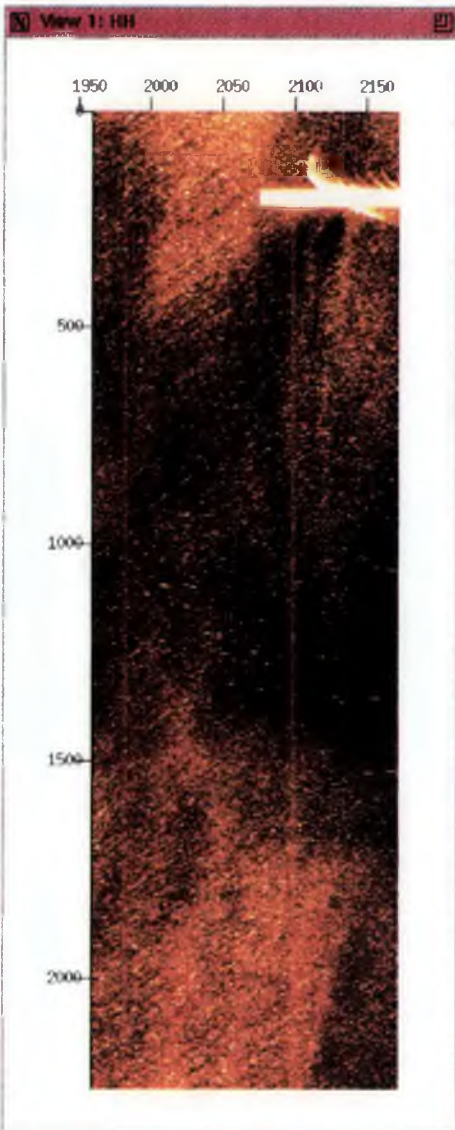
50:00—

55:00—

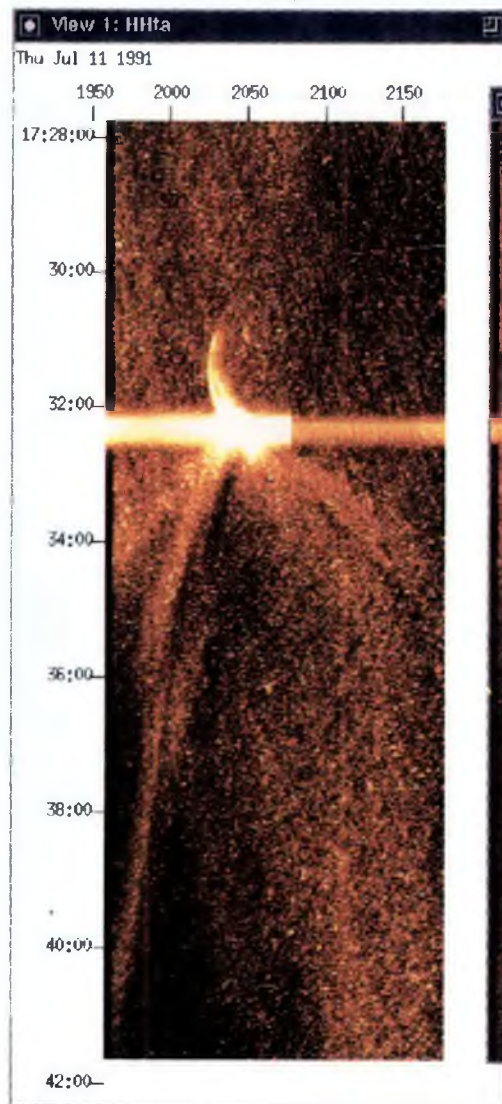
18:00:00—



Run 2256 Thu Jul 11 16:30:06 1991 GMT CAL + 30 DBM TARGET



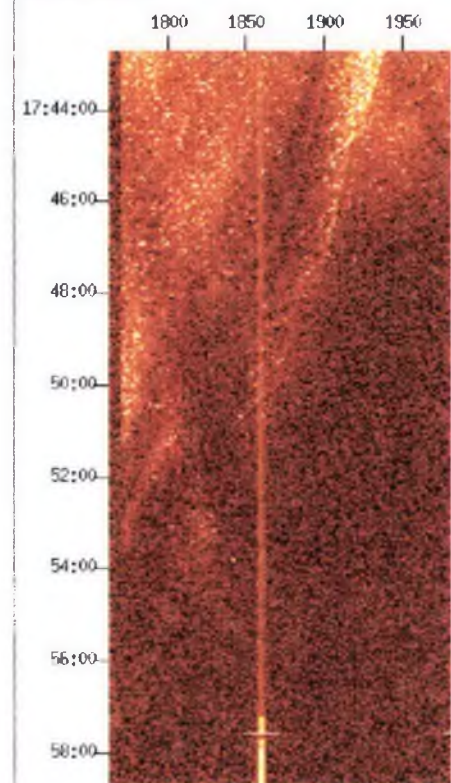
Run 2257 Thu Jul 11 17:28:05 1991 GMT ROY 2A DLNW



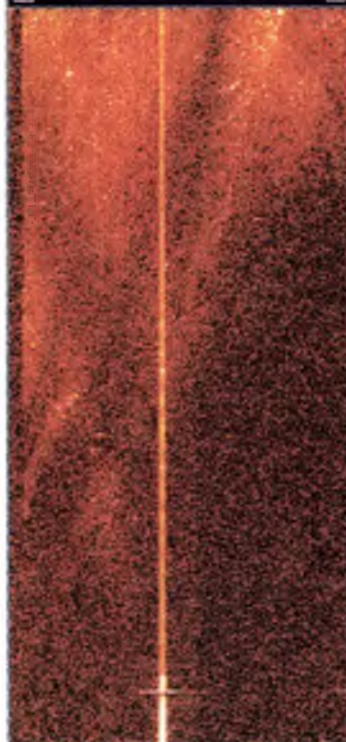
Run 2258 Thu Jul 11 17:43:11 1991 GMT RUY 2H JLNW

View 1: HHta

Thu Jul 11 1991



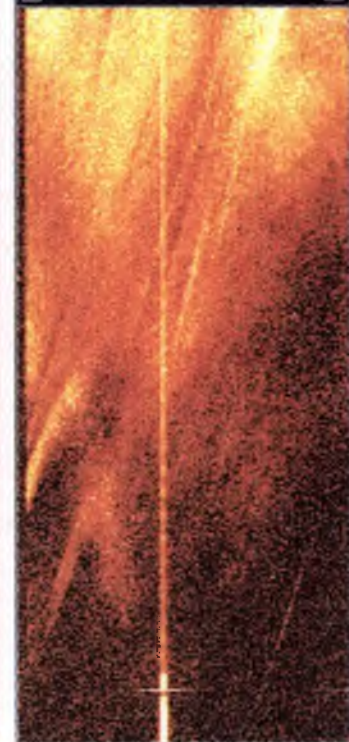
View 2: HVta



View 3: VHta



***View 4: VVta *** Thu Oct 27



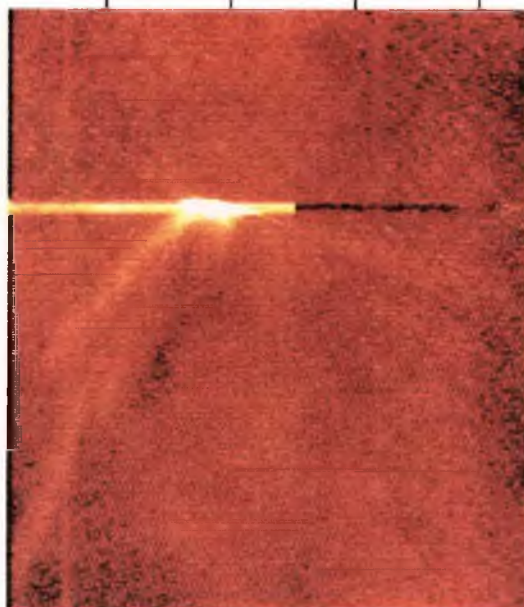
Thu Jul 11 1991 2257/VVta 2258/VVta 2259/VVta

1800 1850 1900 1950 2000 2050 2100 2150

17:30:00—

35:00—

40:00—



45:00—

50:00—

55:00—



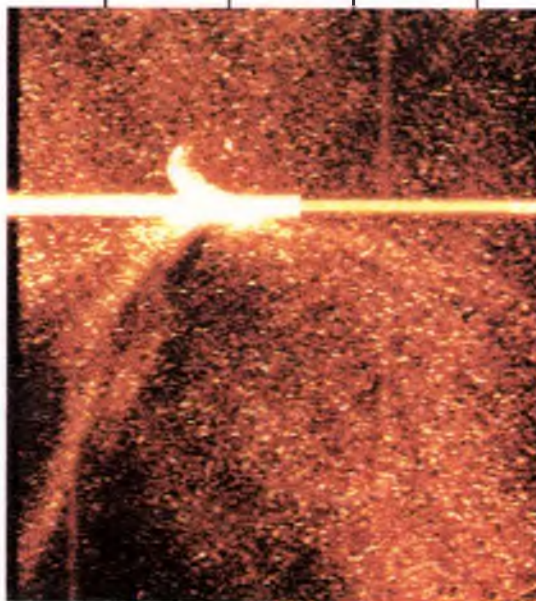
Thu Jul 11 1991 2257/HHta 2258/HHta 2259/HHta

1800 1850 1900 1950 2000 2050 2100 2150

17:30:00—

35:00—

40:00—



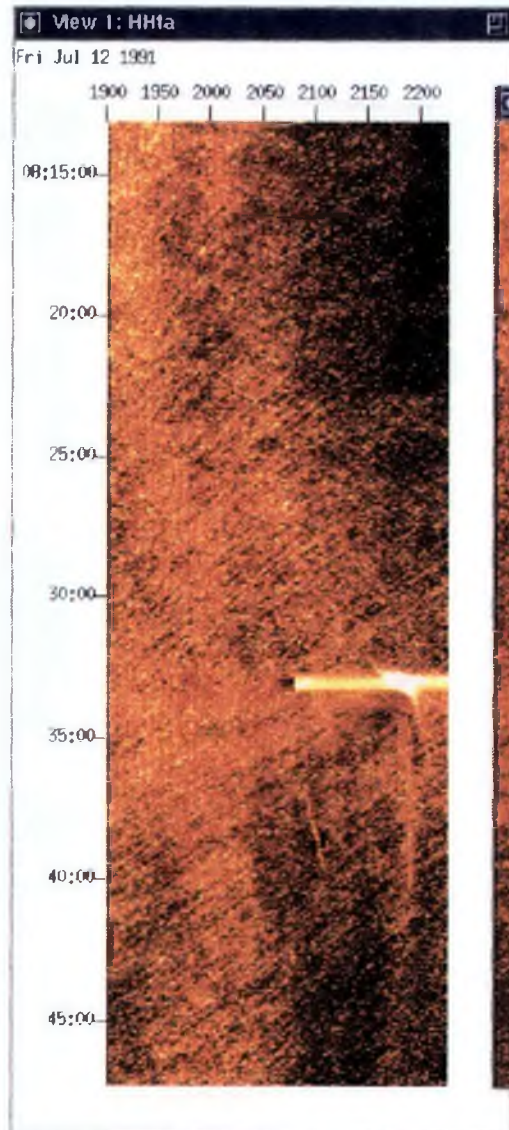
45:00—

50:00—

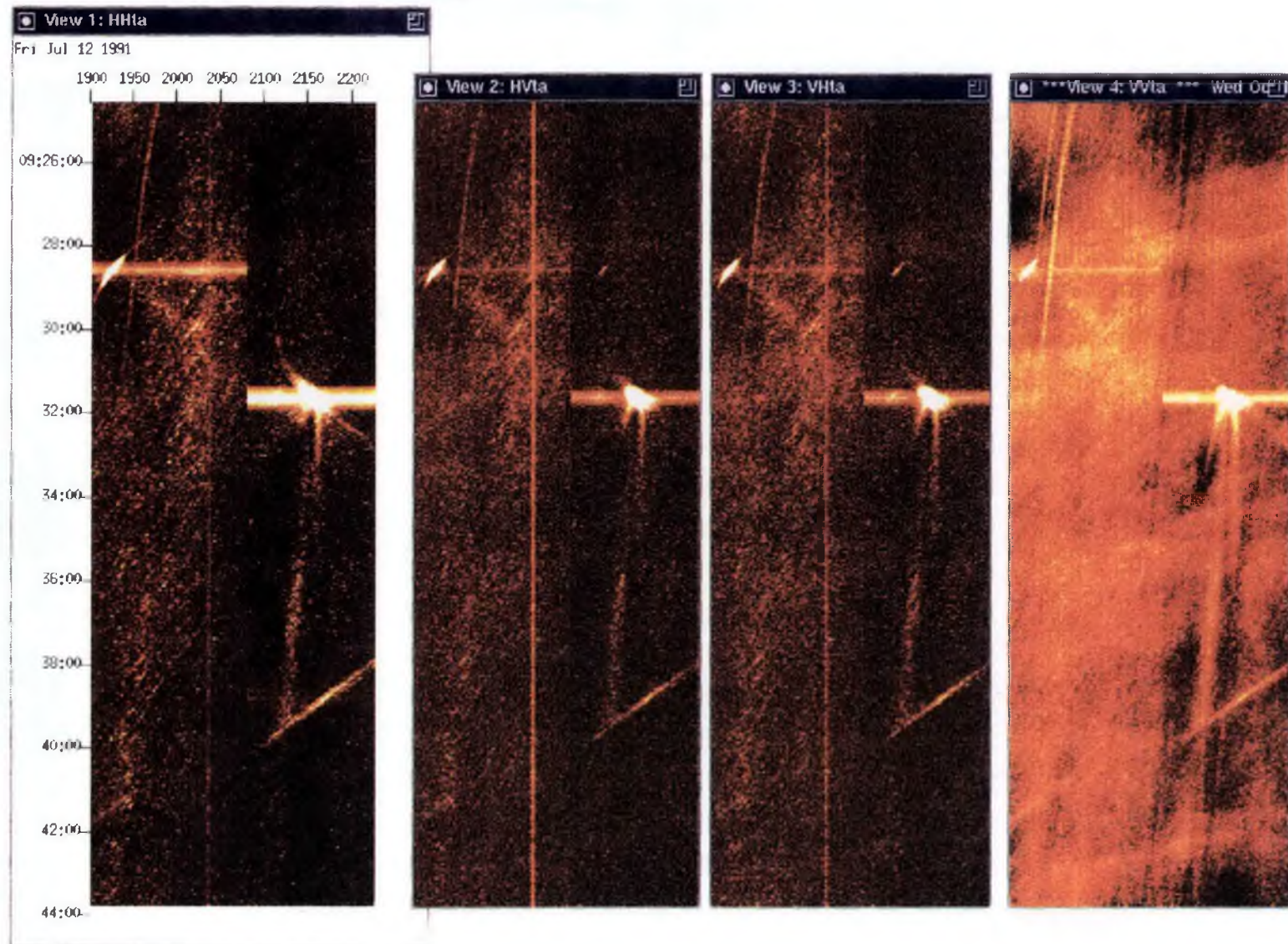
55:00—



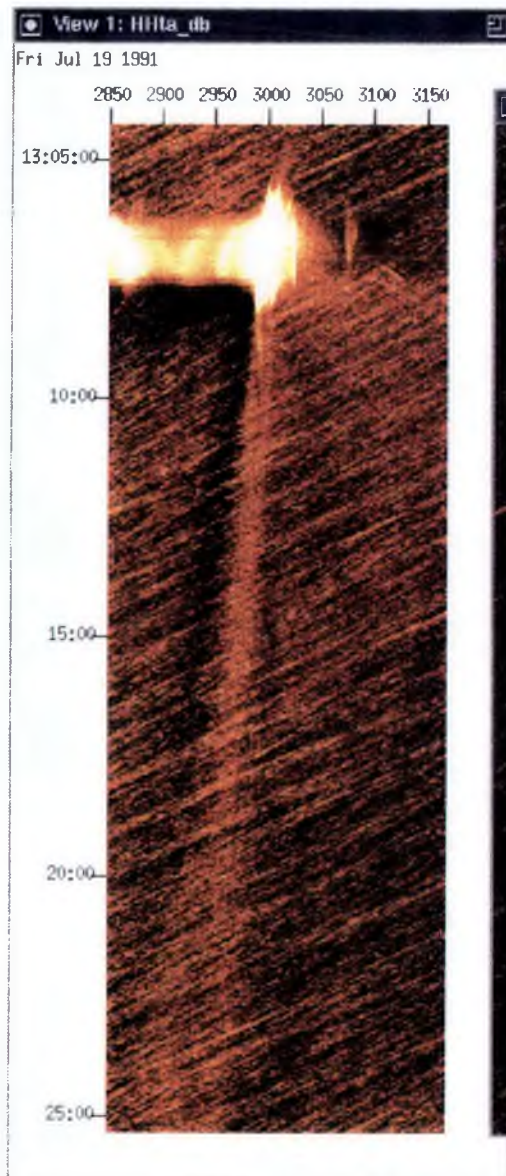
Run 2281 Fri Jul 12 08:13:24 1991 GMT ROY1ADM



Run 2283 Fri Jul 12 09:24:58 1991 GMT ROY1ADL 4MS



Run 2519 Fri Jul 19 13:04:22 1991 GMT BLUE ROVER 2MS DOWN SOUND R TO I

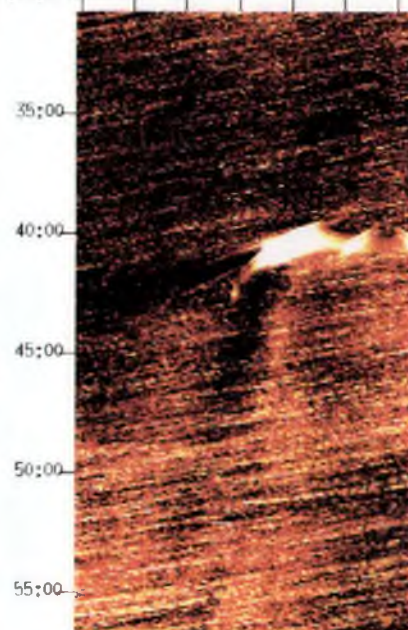


Run 2521 Fri Jul 19 14:31:11 1991 GMT RFA 2MS UP SOUND L 10 P

View 1: HHta_db

Fri Jul 19 1991

14:30:00 2850 2900 2950 3000 3050 3100 3150



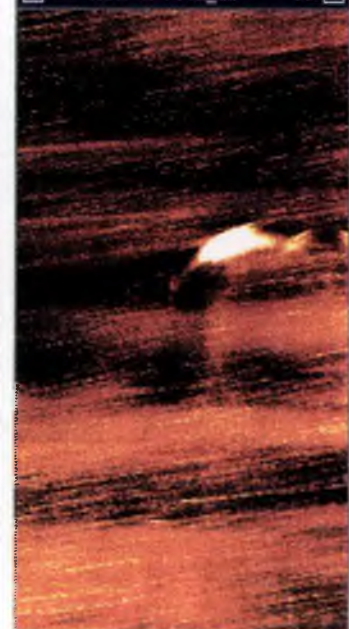
View 2: HVta_db



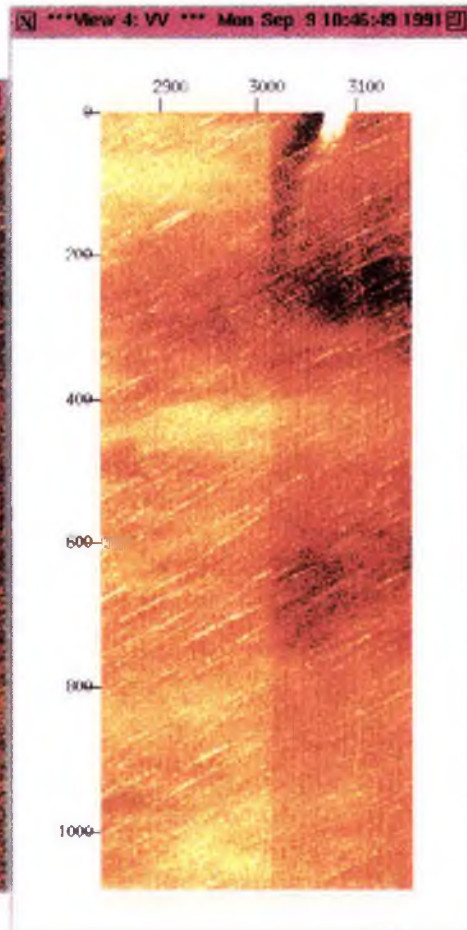
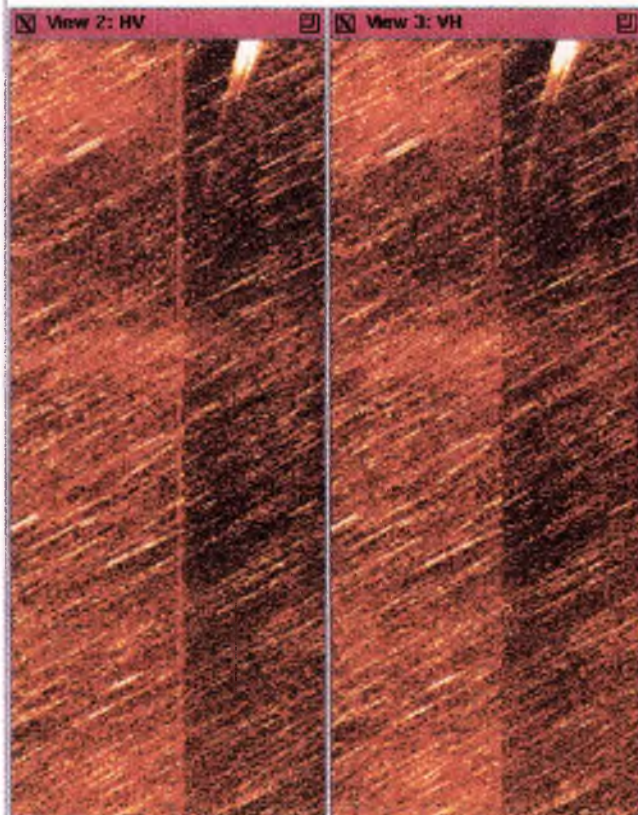
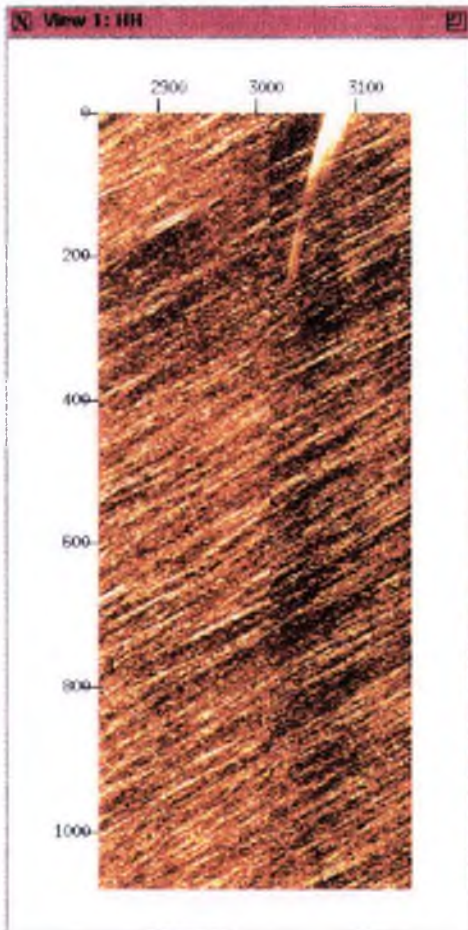
View 3: VHta_db



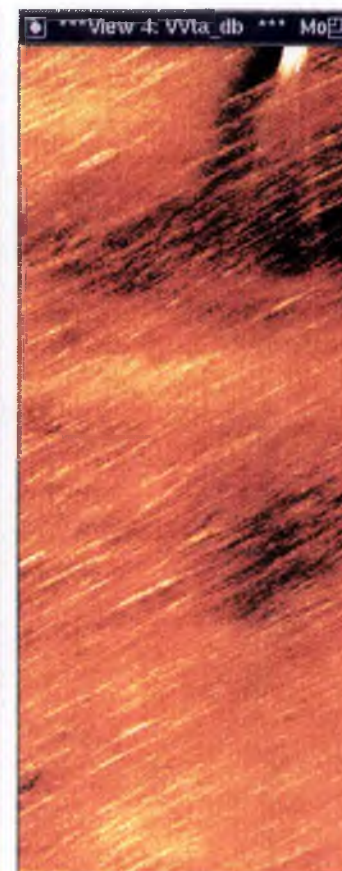
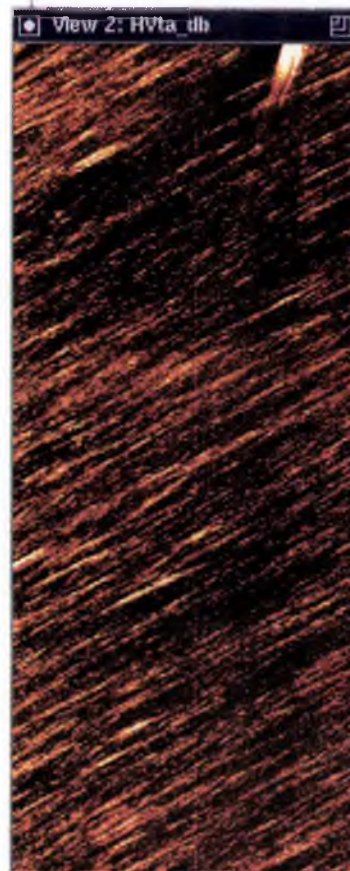
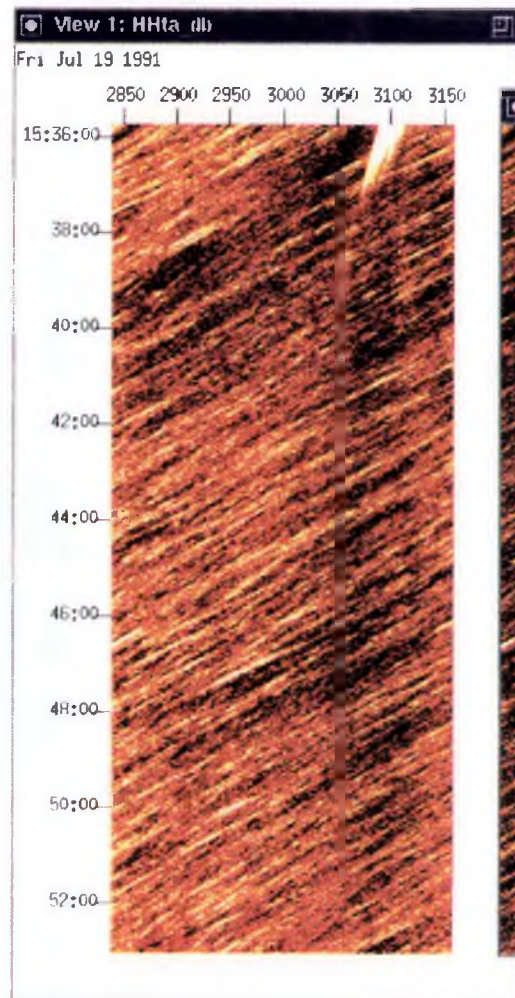
***View 4: VVta_db ***



Run 2530 Fri Jul 19 15:36:03 1991 GMT RFR 1MS UP SOUND L TO R



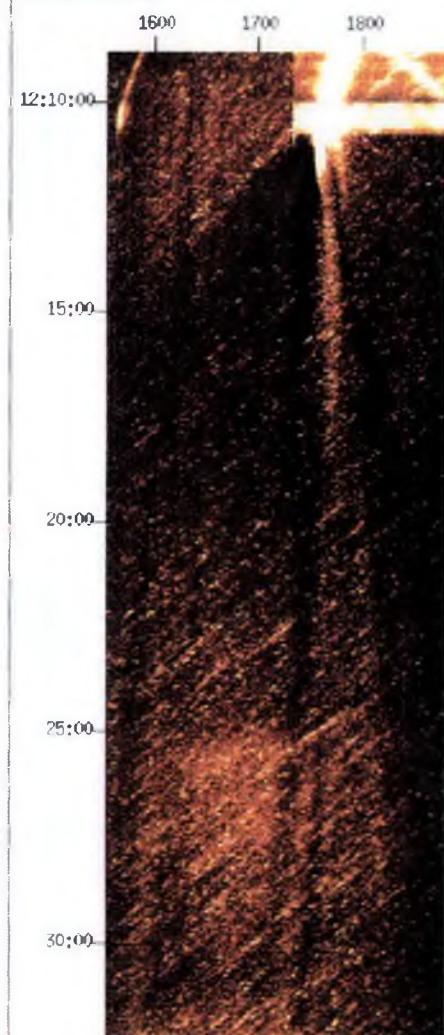
Run 2530 Fri Jul 19 15:36:03 1991 GMT RFA 1MS UP SOUND L TO R



Run 2598 Sat Jul 20 12:08:29 1991 GMT ROY 2MS E TO W (R TO L)

View 1: HH

Sat Jul 20 1991



View 2: HV



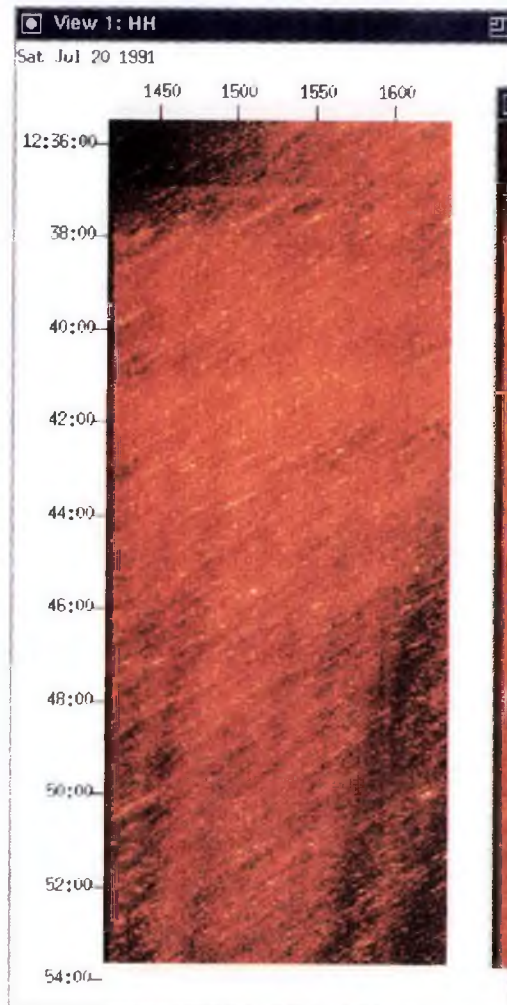
View 3: VH



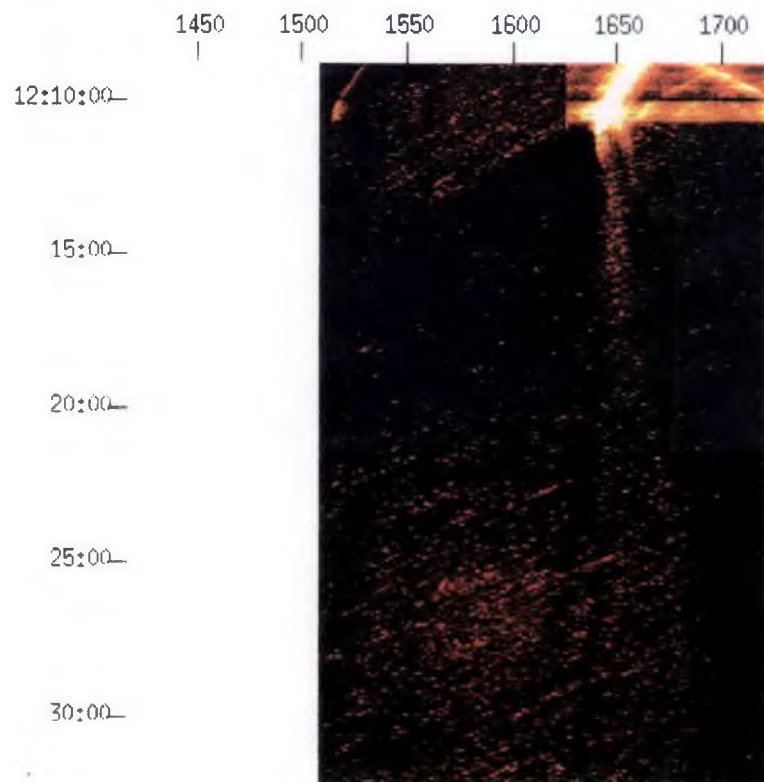
***View 4: VV *** Thu-Oct



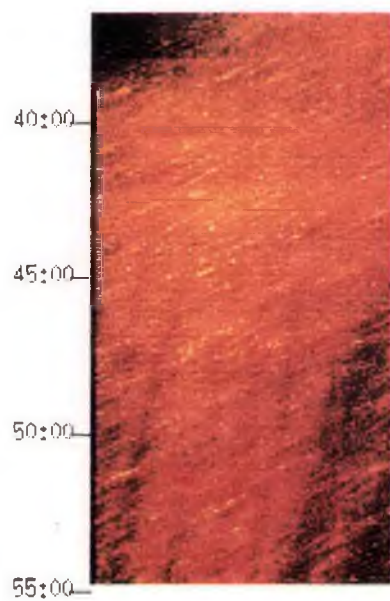
Run 2599 Sat Jul 20 12:35:53 1991 GMT ROY 2MS E TO W (R TO L) NEAR NEAR WAKE



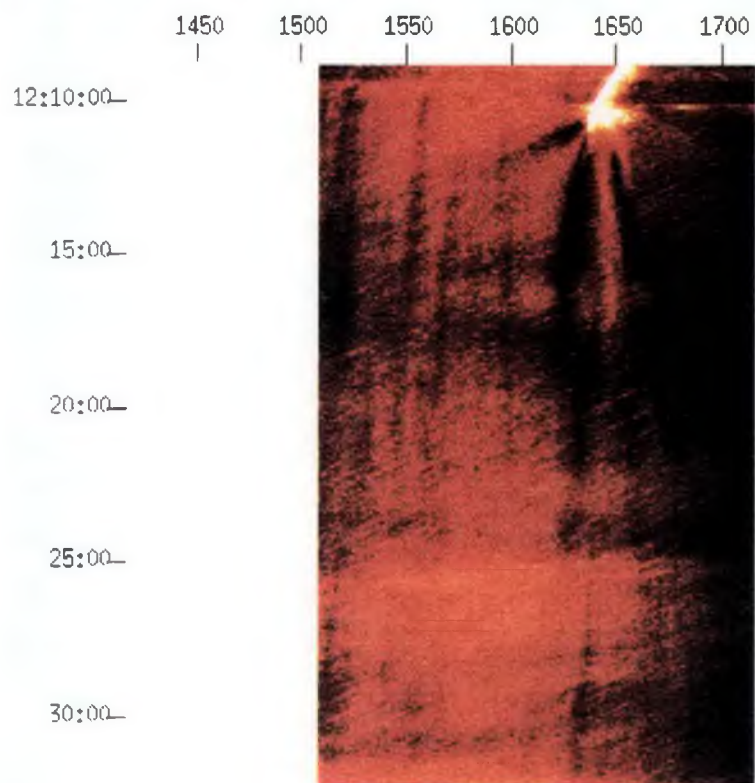
Sat Jul 20 1991 2598/HHta 2599/HHta



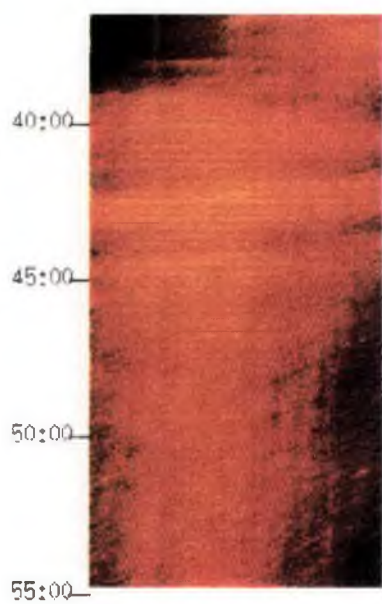
35:00—



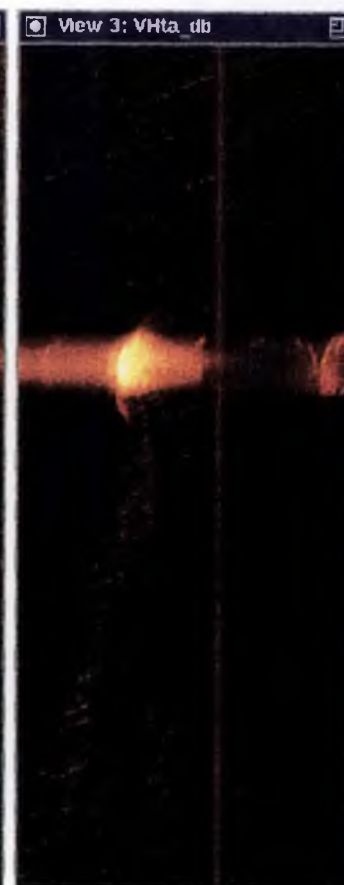
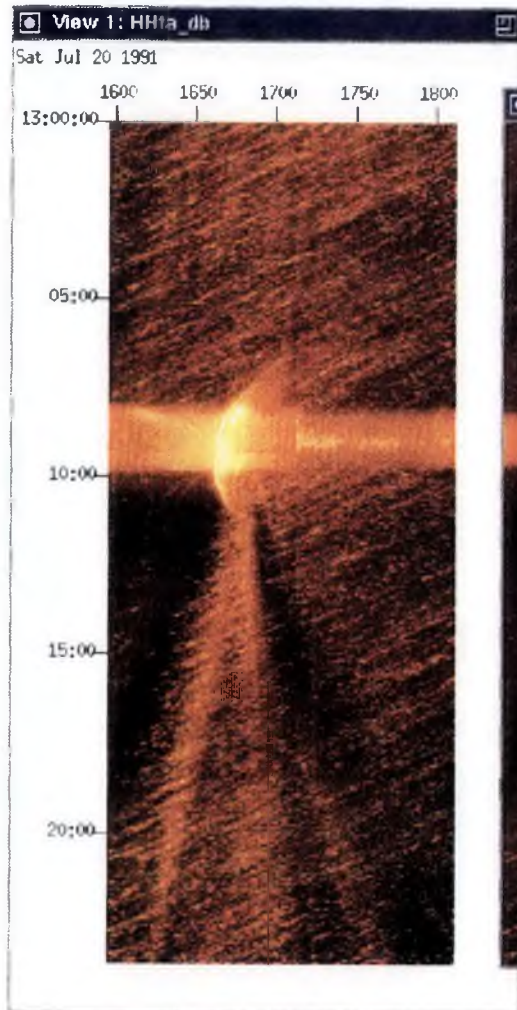
Sat Jul 20 1991 2598/VVta 2599/VVta



35:00—



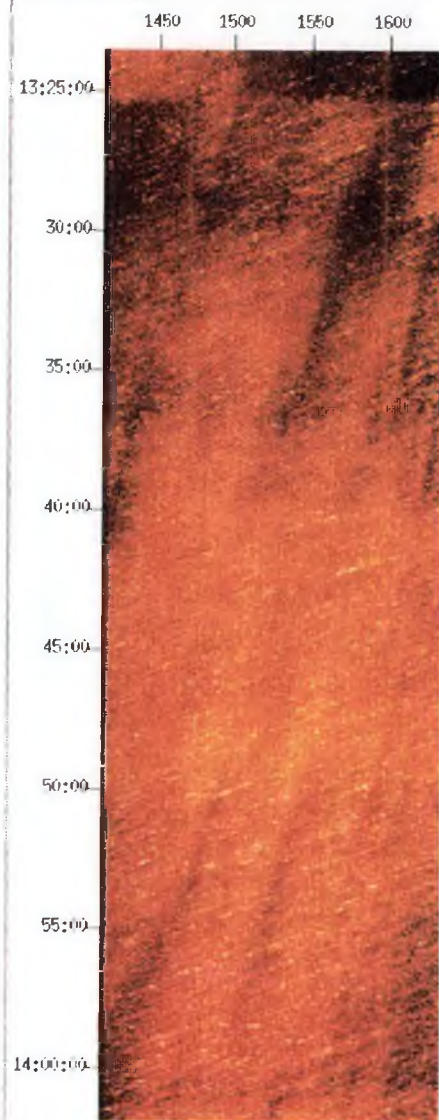
Run 2600 Sat Jul 20 12:59:29 1991 GMT RFA2A 2MS E TO W (R TO L) NEAR W&W



Run: 2601 Sat Jul 20 13:23:08 1991 GMT RFA2B 2MS E TO W (R TO L) NEAR WAKE

View 1: HH

Sat Jul 20 1991



View 2: HV



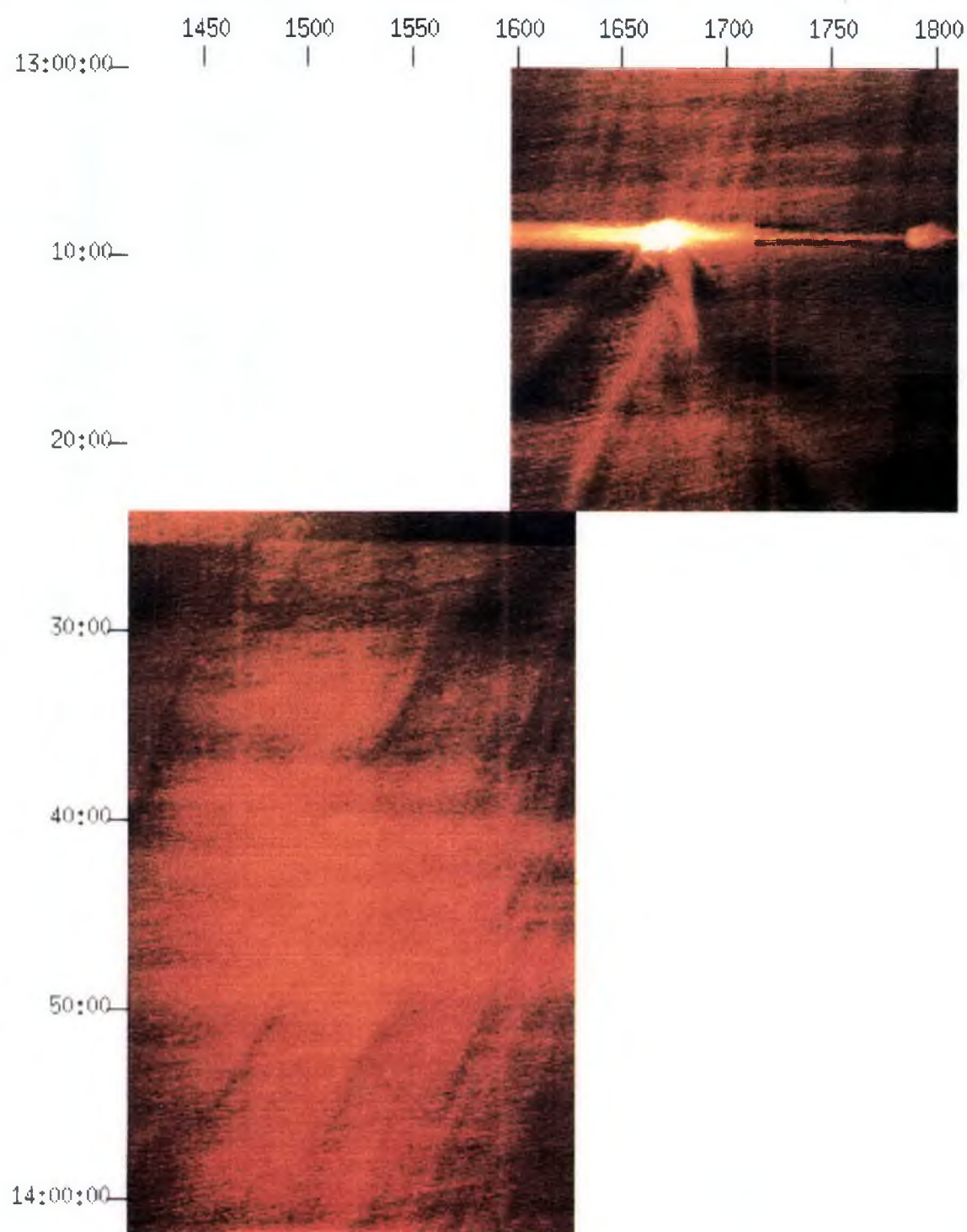
View 3: VH



View 4: VV Thu Oct 2



Sat Jul 20 1991 2600/VVta 2601/VVta



Sat Jul 20 1991 2600/HHta 2601/HHta

13:00:00— 1450 1500 1550 1600 1650 1700 1750 1800

10:00—

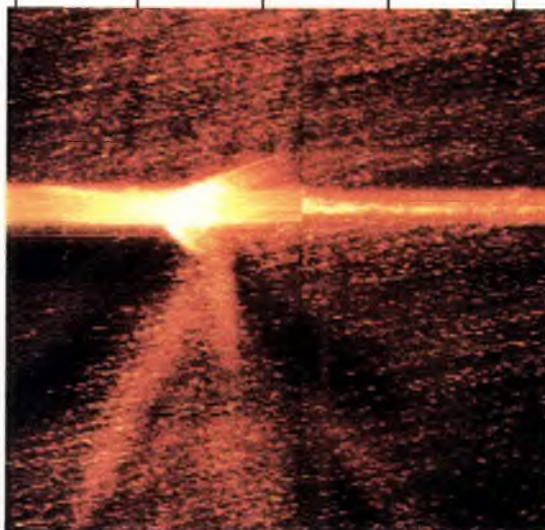
20:00—

30:00—

40:00—

50:00—

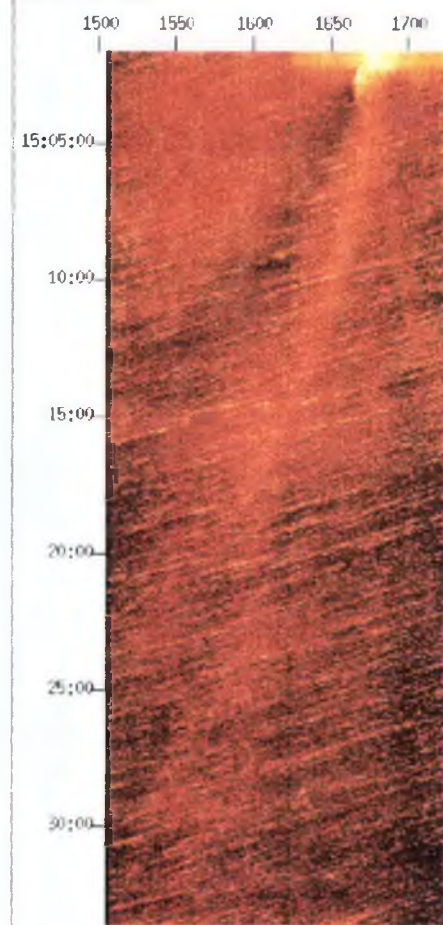
14:00:00—



Run 2608 Sat Jul 20 15:01:44 1991 GMT RFA 3A 2MS W TO E (L TO R) NEAR WAKE

View 1: HH

Sat Jul 20 1991



View 2: HV



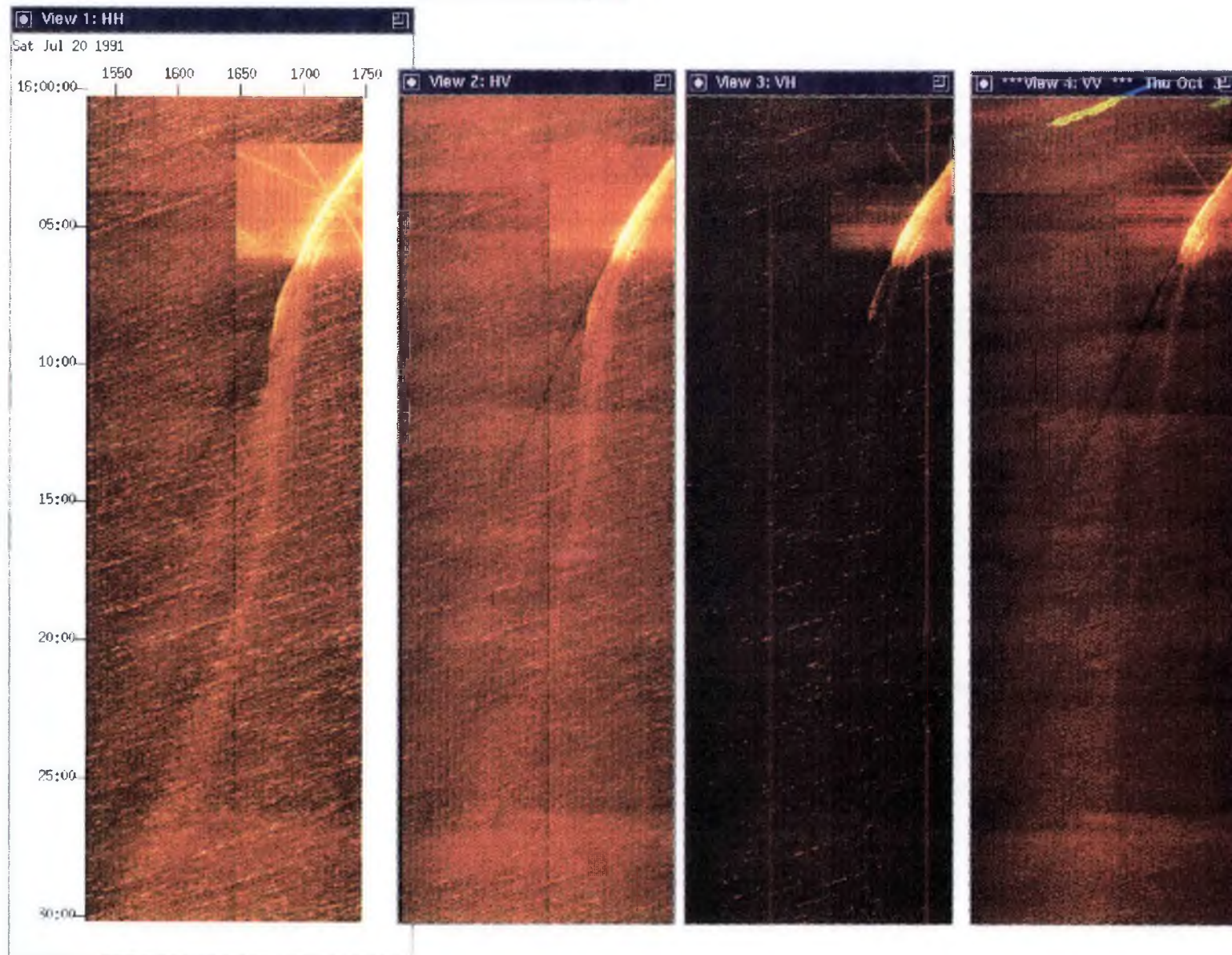
View 3: VH



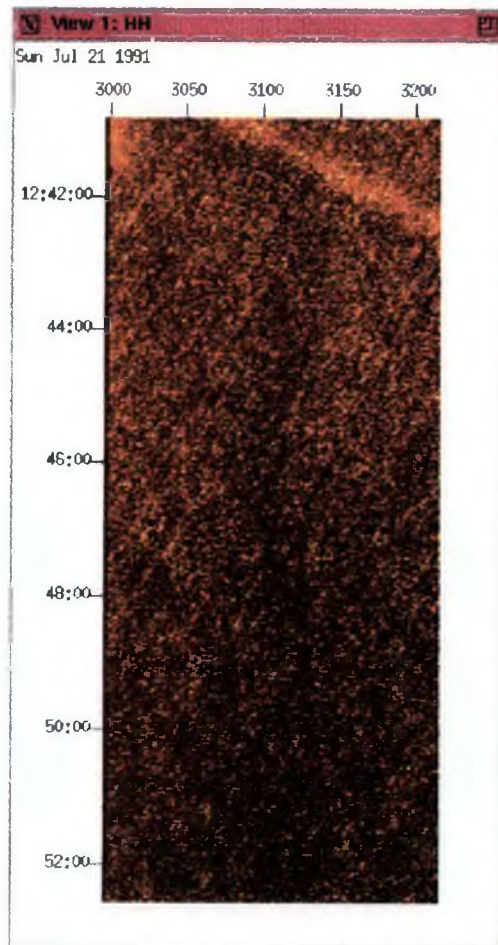
***View 4: VV *** Thu Oct



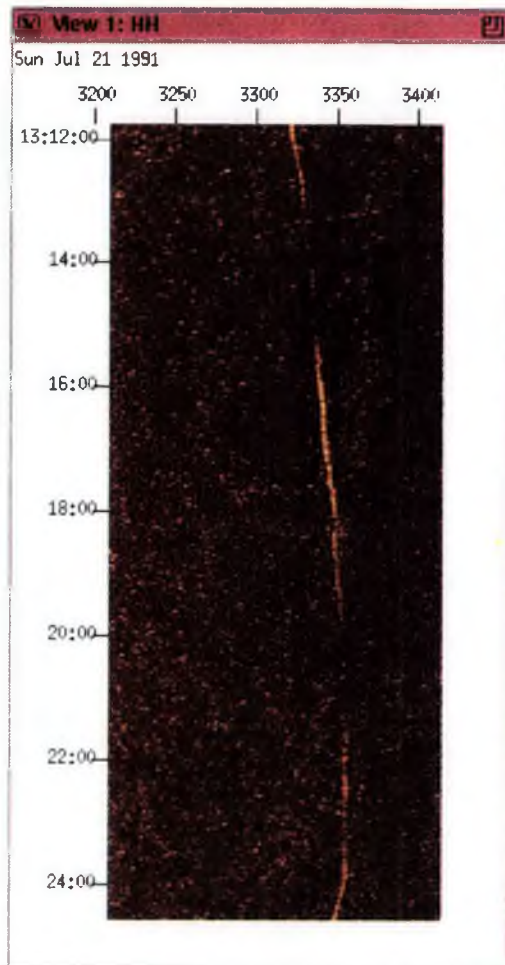
Run 2611 Sat Jul 20 16:00:27 1991 GMT ROY 4H 1MS W TO E (L TO R) NEAR WAKE



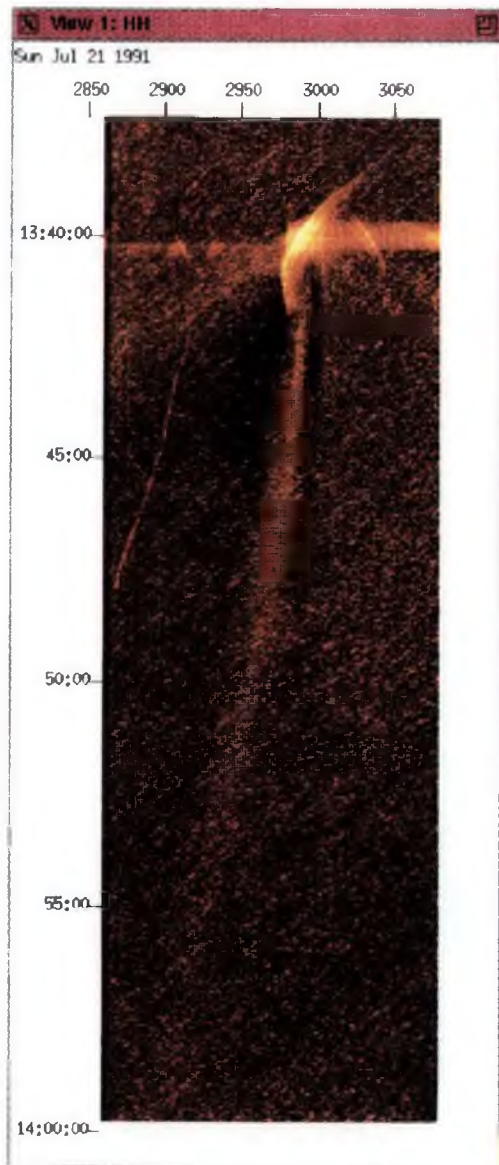
Run 2673 Sun Jul 21 12:40:31 1991 GMT RFA 6 MS FAR WAKE UP SOUND



Run 2679 Sun Jul 21 13:12:02 1991 GMT RFA 6 MS FAR WAKE UP SOUND FAR FAR

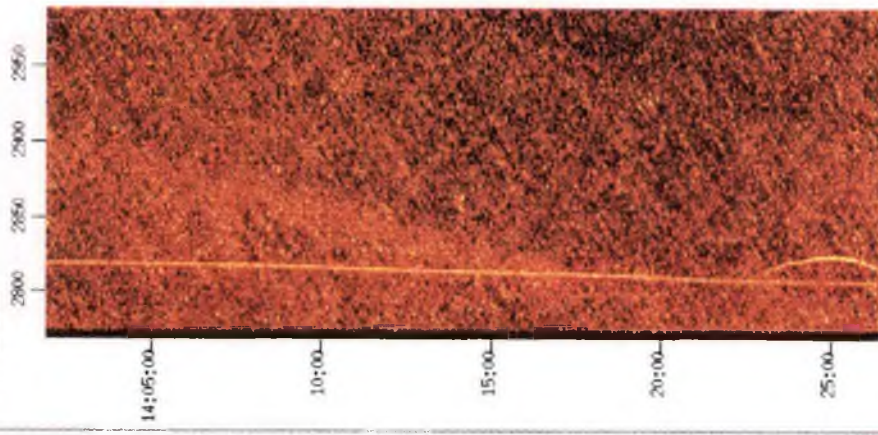


Run 2688 Sun Jul 21 13:37:08 1991 GMT RFA 6 MS FAR WAKE UP SOUND FAR FAR



Run 2690 Sun Jul 21 14:02:09 1991 GMT ROY28 4 H/S NEAR WAKE UP SLEET

1:00
Sun Jul 21 1991



Sun Jul 21 1991 2688/HH 2690/HH

2800 2850 2900 2950 3000 3050

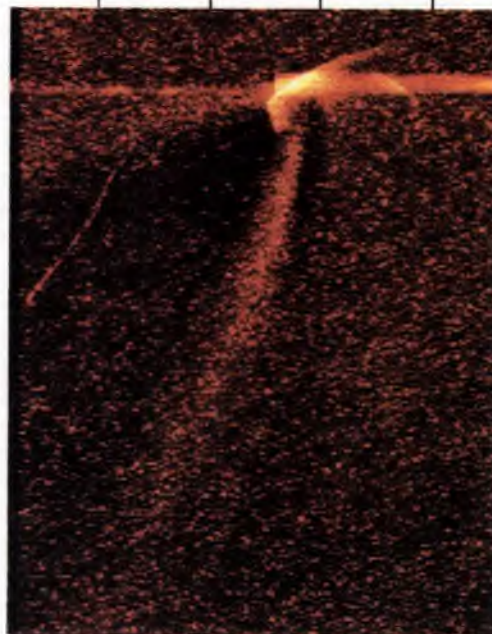
13:40:00—

45:00—

50:00—

55:00—

14:00:00—



05:00—

10:00—

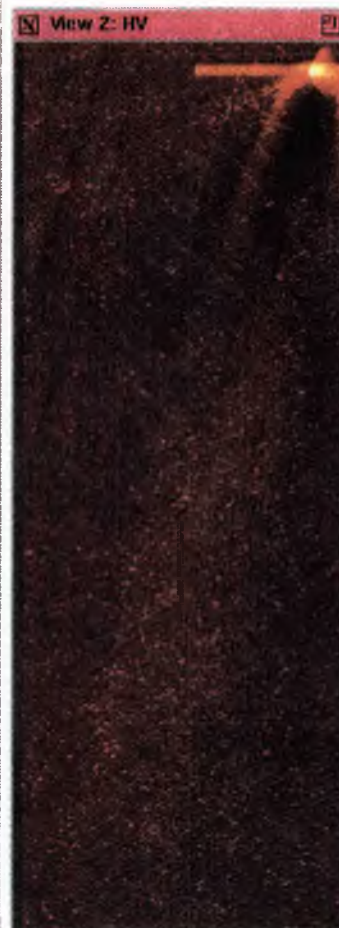
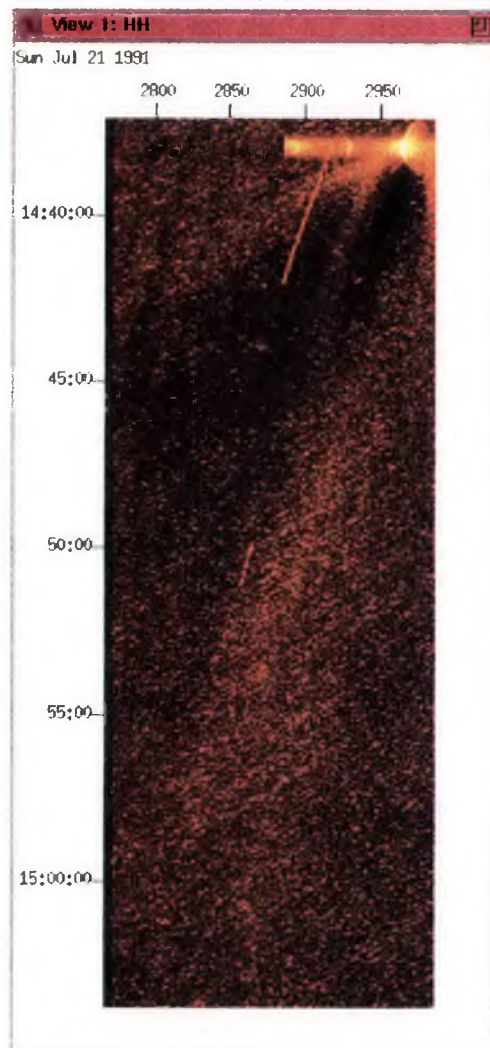
15:00—

20:00—

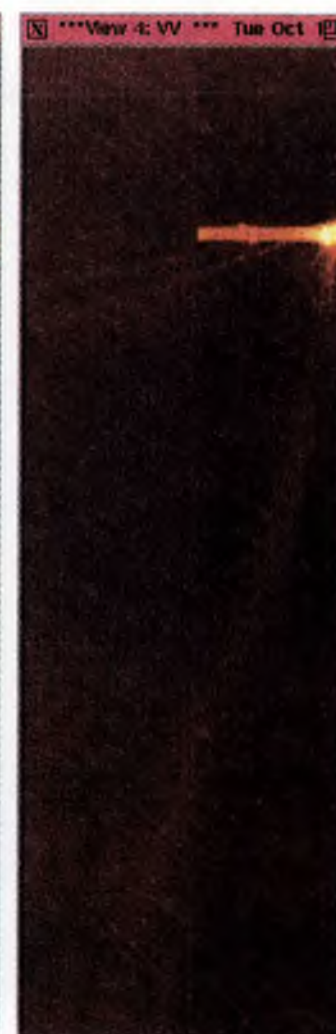
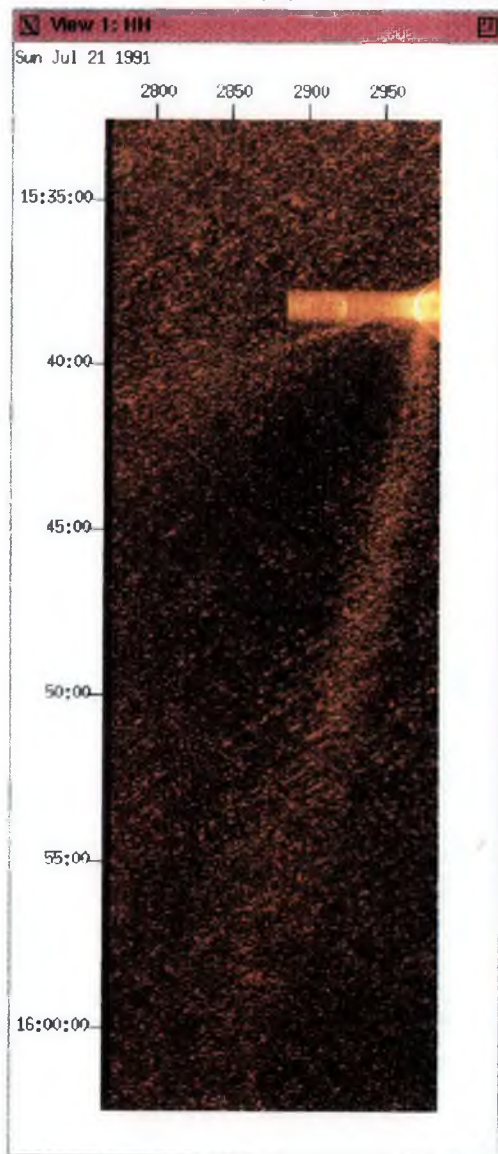
25:00—



Run 2692 Sun Jul 21 14:37:27 1991 GMT RUYSA 6 M/S NEAR WAKE DOWN SLEET



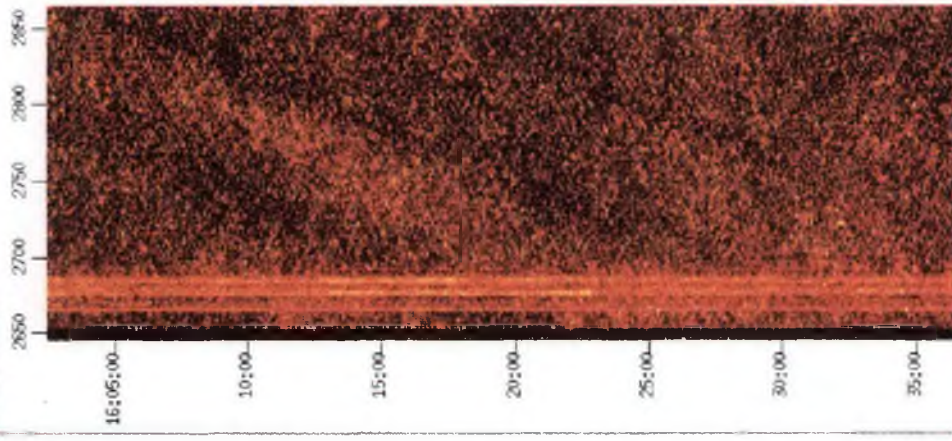
Run 2693 Sun Jul 21 15:32:20 1991 GMT RFA4A 6 M/S NEAR WAKE DOWN SLEAT



Run 2894 Sun Jul 21 16:02:07 1991 GMT 08:44B 6 H/S NEAR LARG TOWN SLEET

View 1: HH

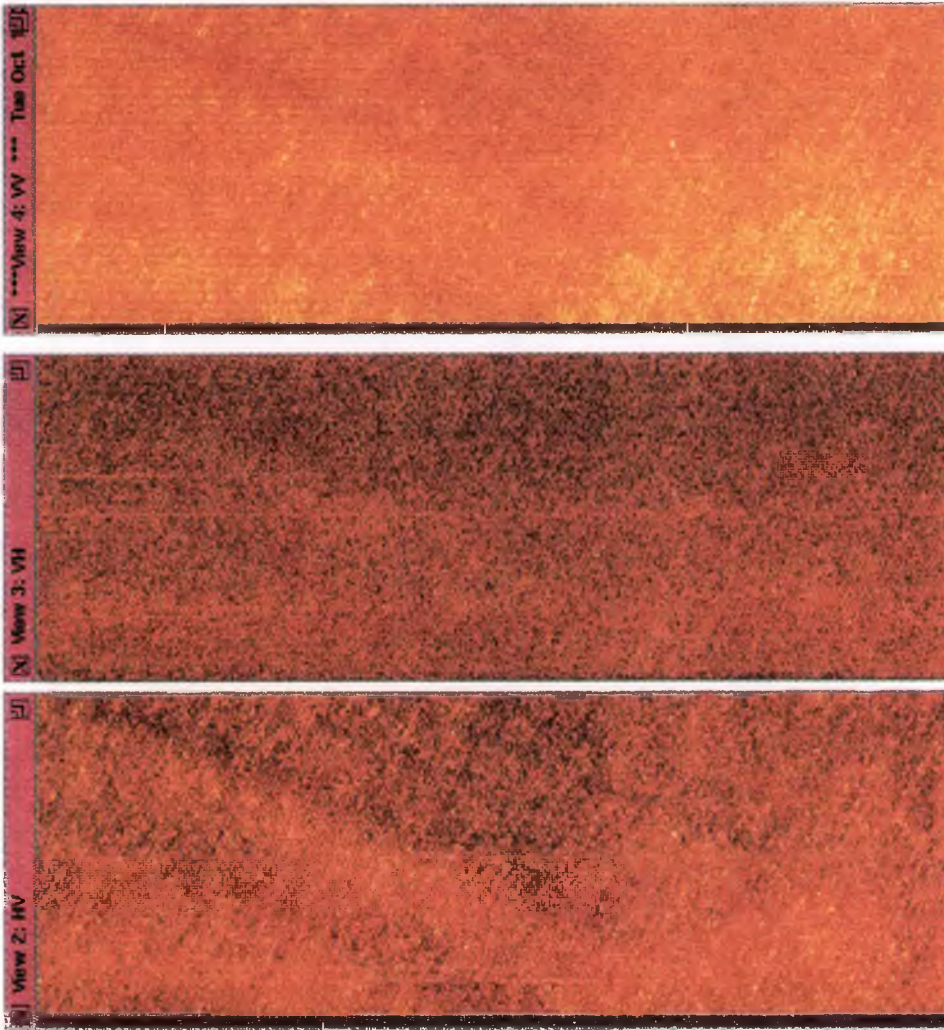
Sun Jul 21 1991



View 2: HV

View 3: VH

View 4: VV



Sun Jul 21 1991 2693/HH 2694/HH

2650 2700 2750 2800 2850 2900 2950

15:40:00

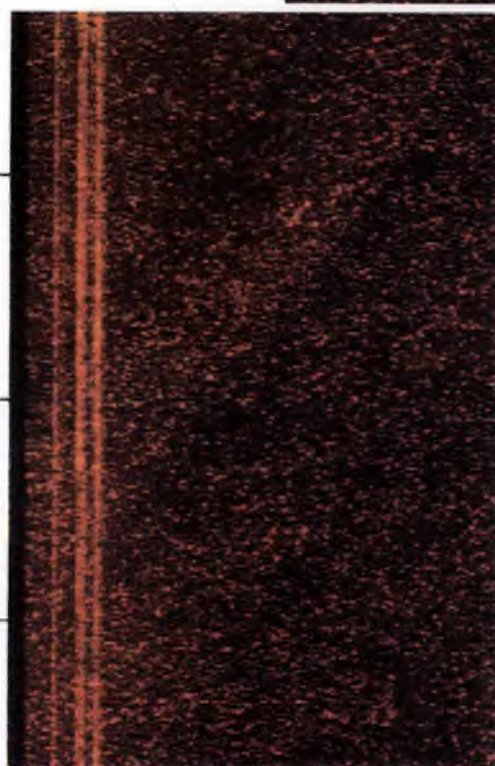
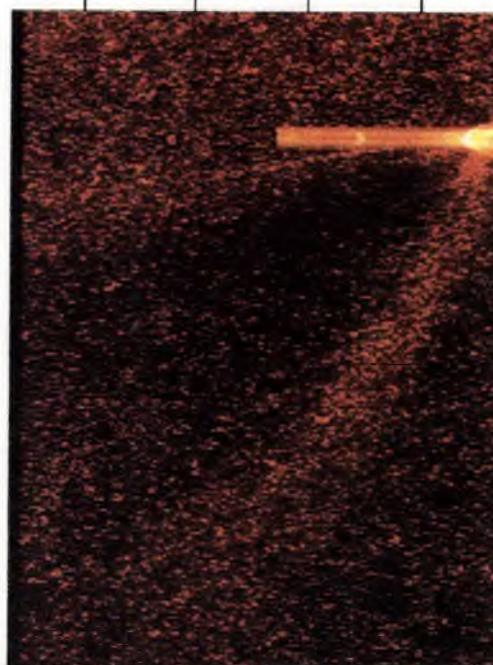
50:00

16:00:00

10:00

20:00

30:00



Run 2819 Mon Jul 22 16:51:51 1991 GMT ROY 4A L TO R UP LOCK

