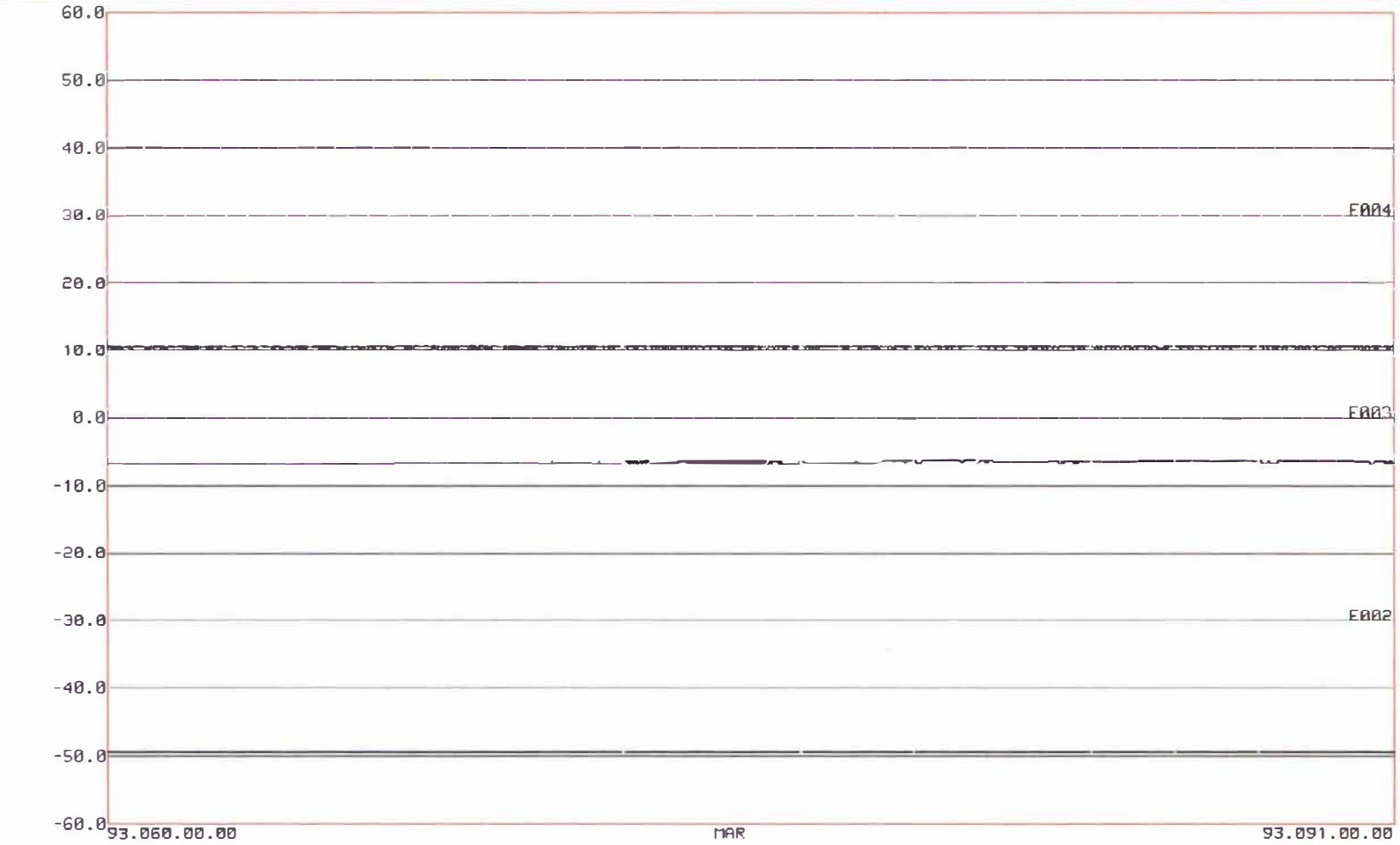
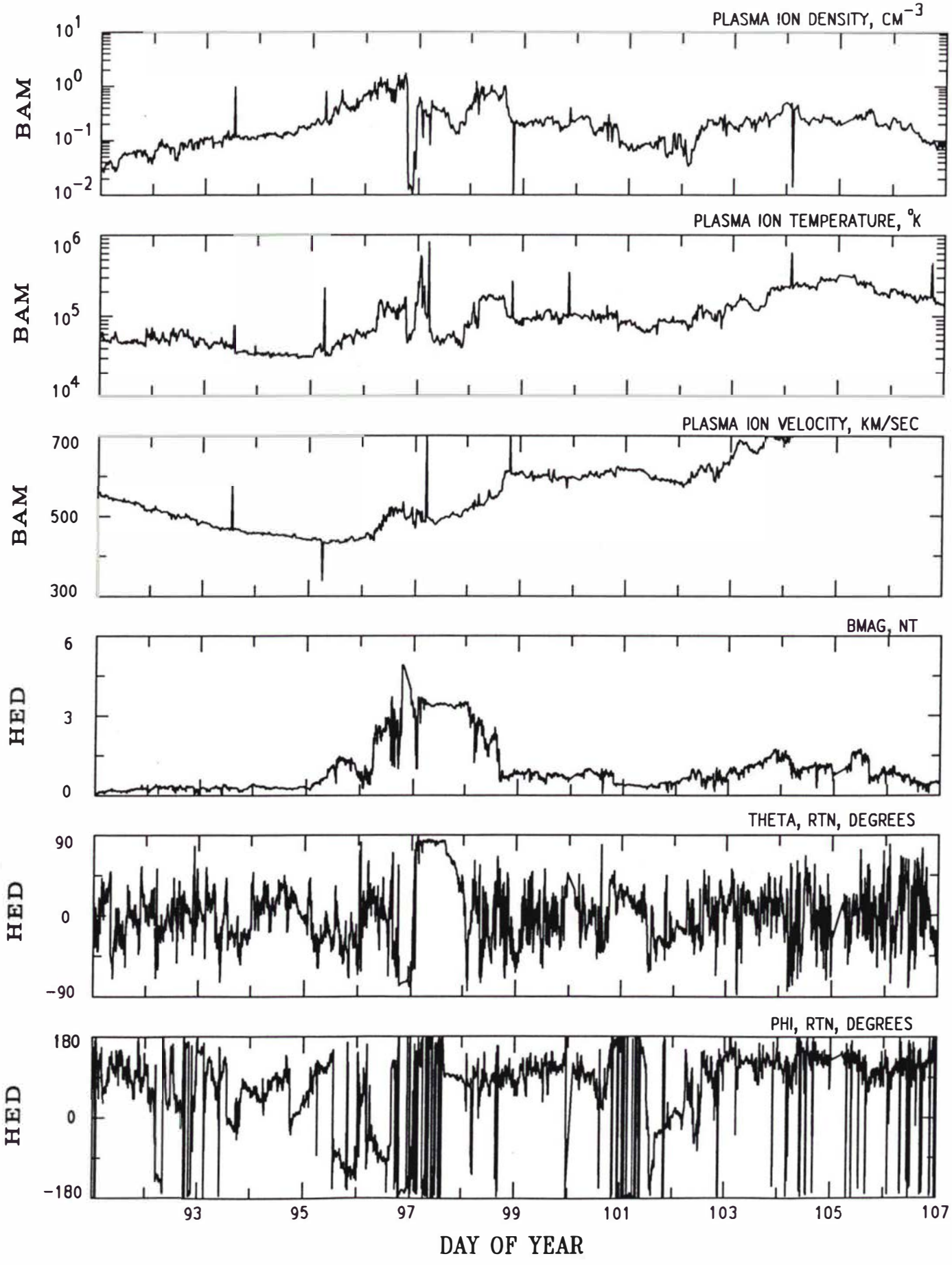
.93.091.00.11.05.690 HUS monthly long term thermal data 818 RET

E002 2ARADTMP S/C	-6.8	E003 2BSENTMP S/C	-49.3	E004 2ASENSTMP EX	10.45



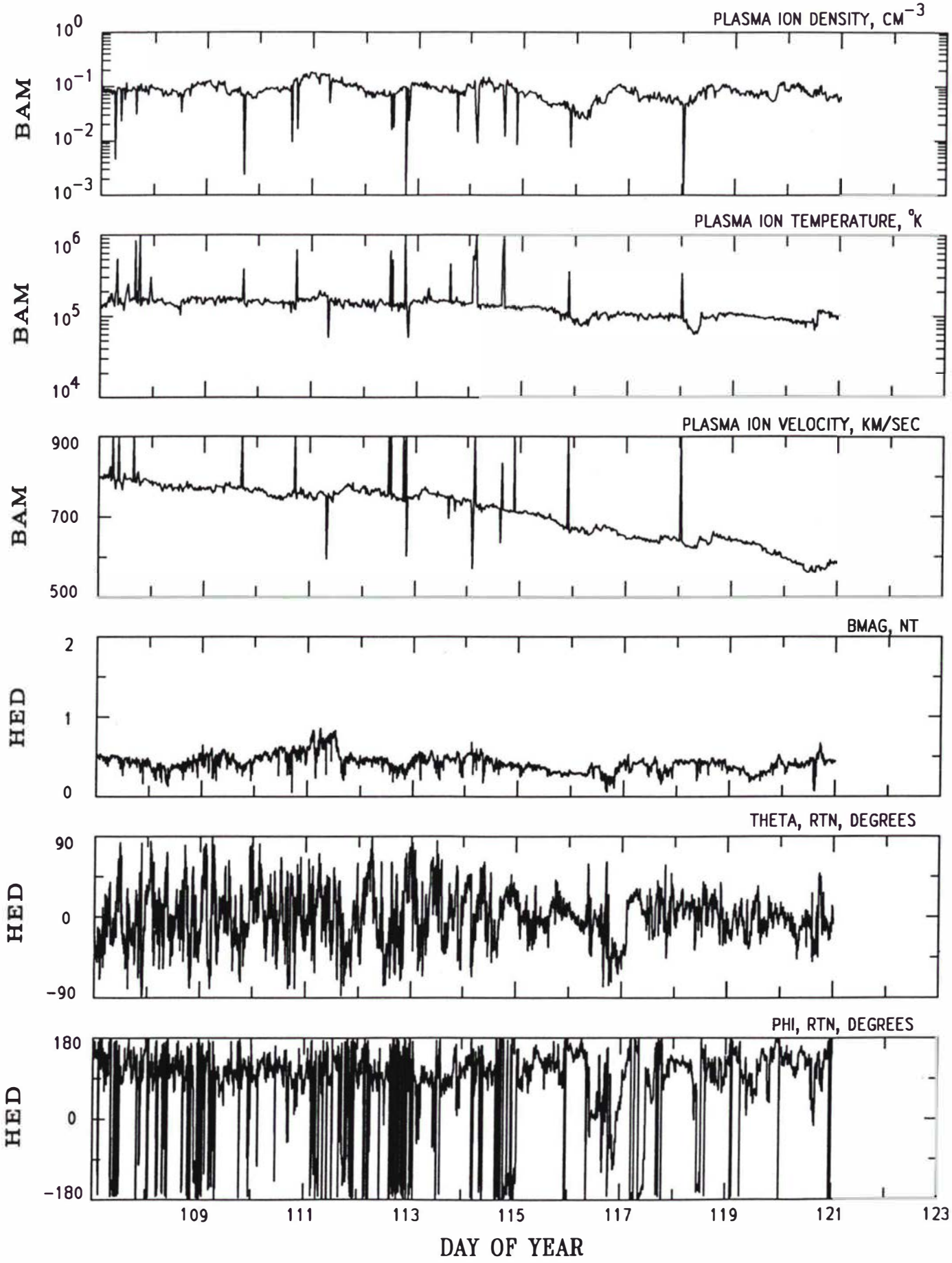
ULYSSES CDR – SOLAR WIND PLASMA AND MAGNETIC FIELD

93 091 APR 1 00:00:00.000 – 93 107 APR 17 00:00:00.000



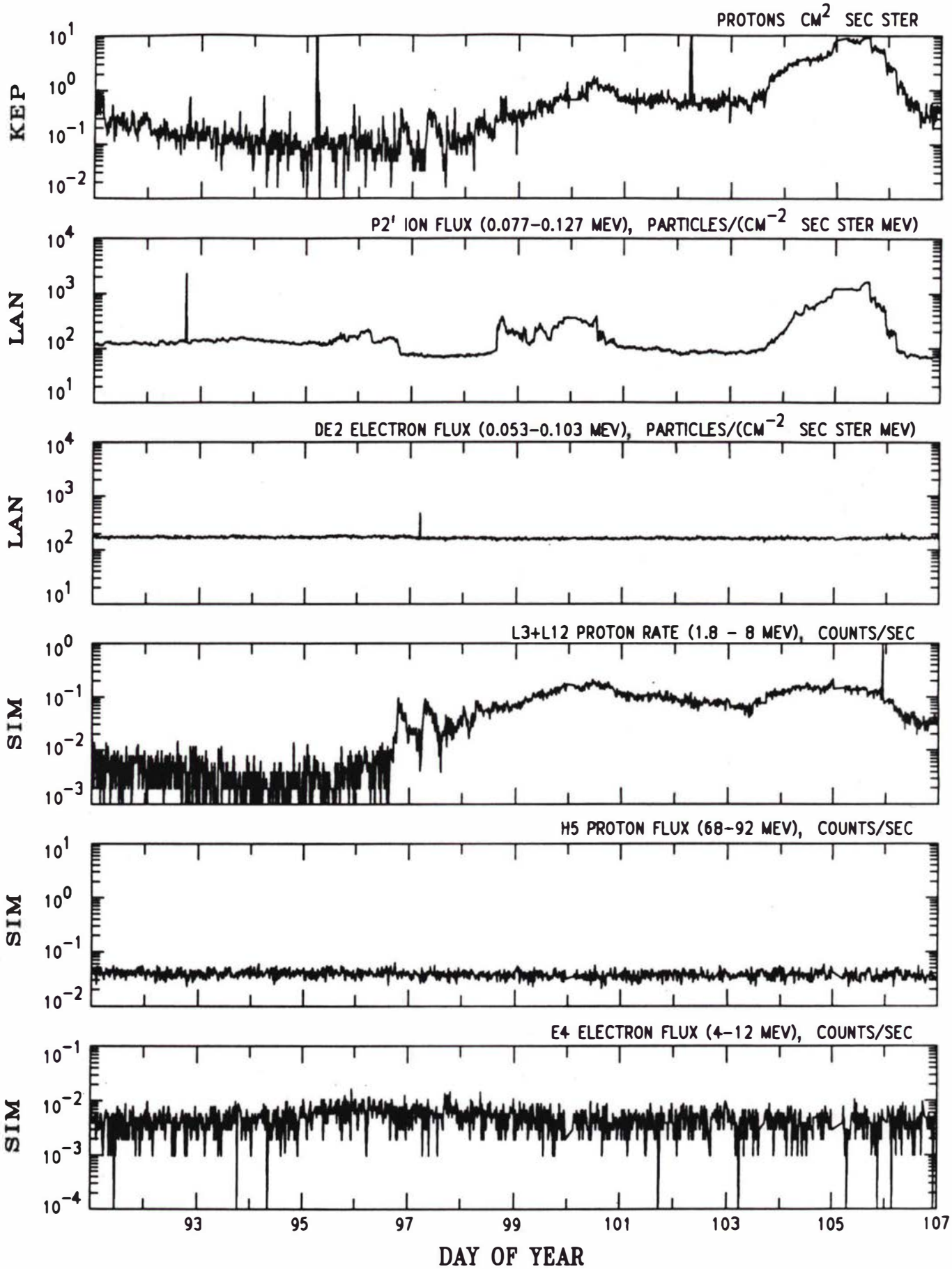
ULYSSES CDR – SOLAR WIND PLASMA AND MAGNETIC FIELD

93 107 APR 17 00:00:00.000 – 93 123 MAY 3 00:00:00.000



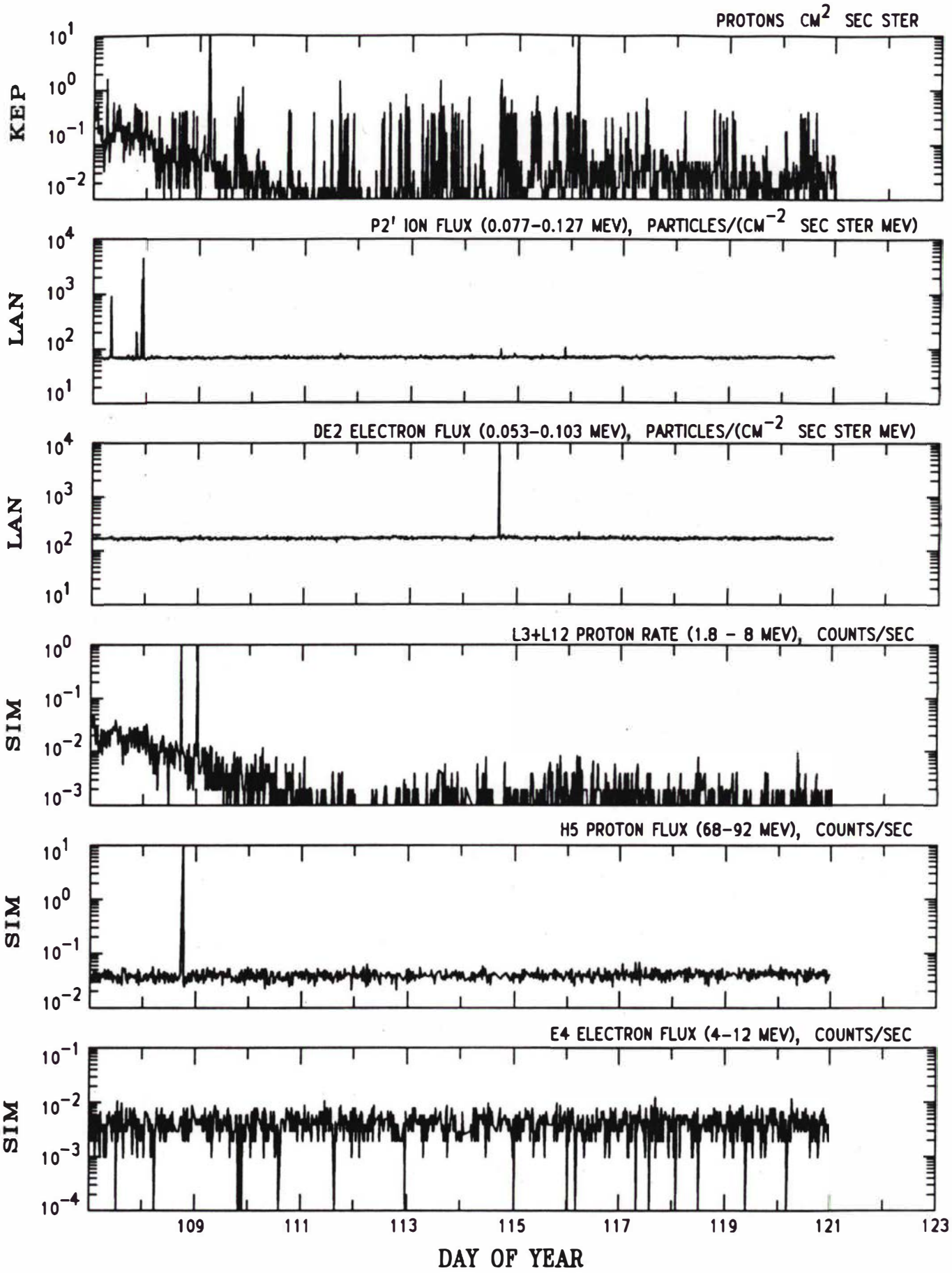
ULYSSES CDR - ENERGETIC PARTICLES, LOW ENERGY IONS AND COSMIC RAY

93 091 APR 1 00:00:00.000 - 93 107 APR 17 00:00:00.000



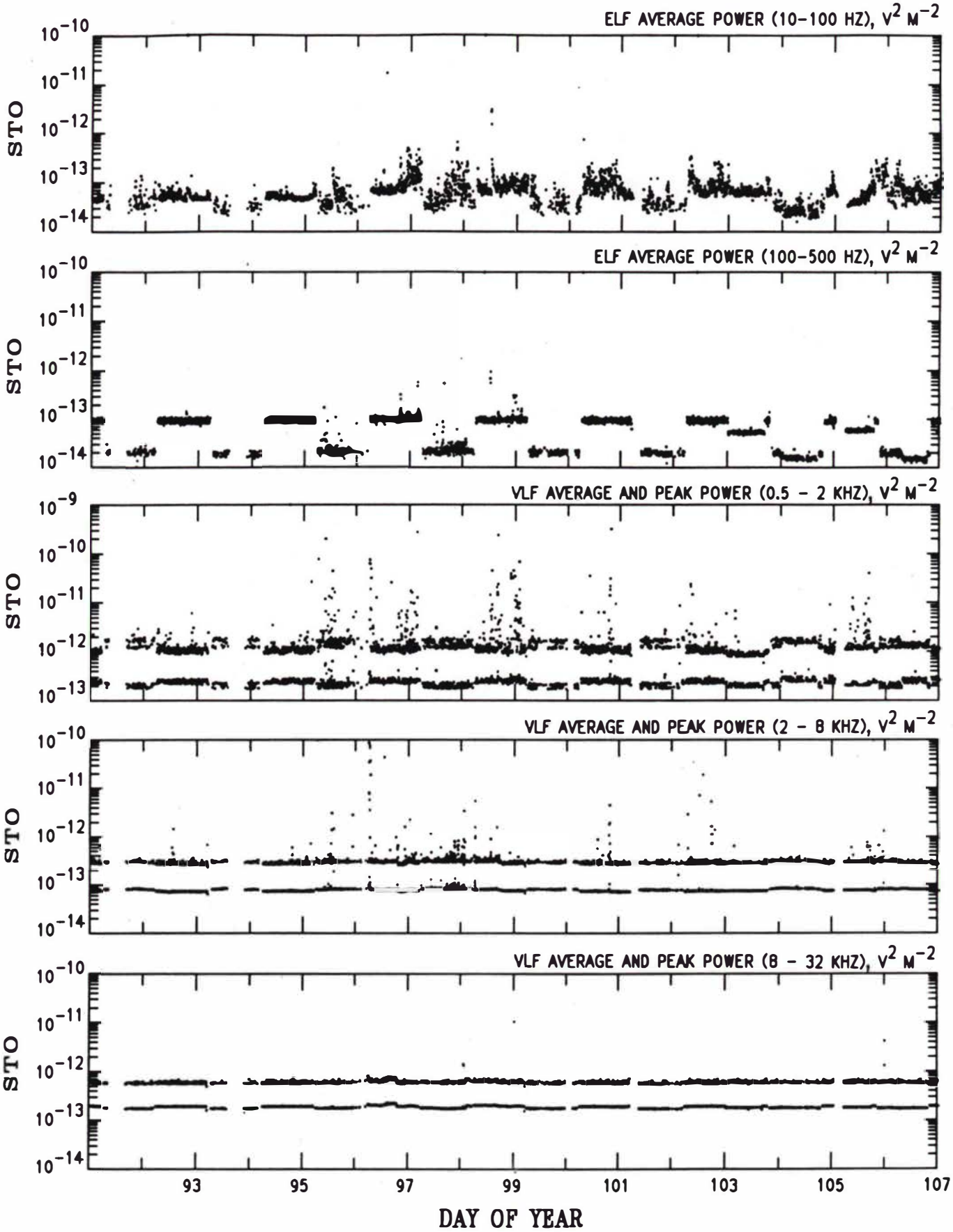
ULYSSES CDR – ENERGETIC PARTICLES, LOW ENERGY IONS AND COSMIC RAY

93 107 APR 17 00:00:00.000 – 93 123 MAY 3 00:00:00.000



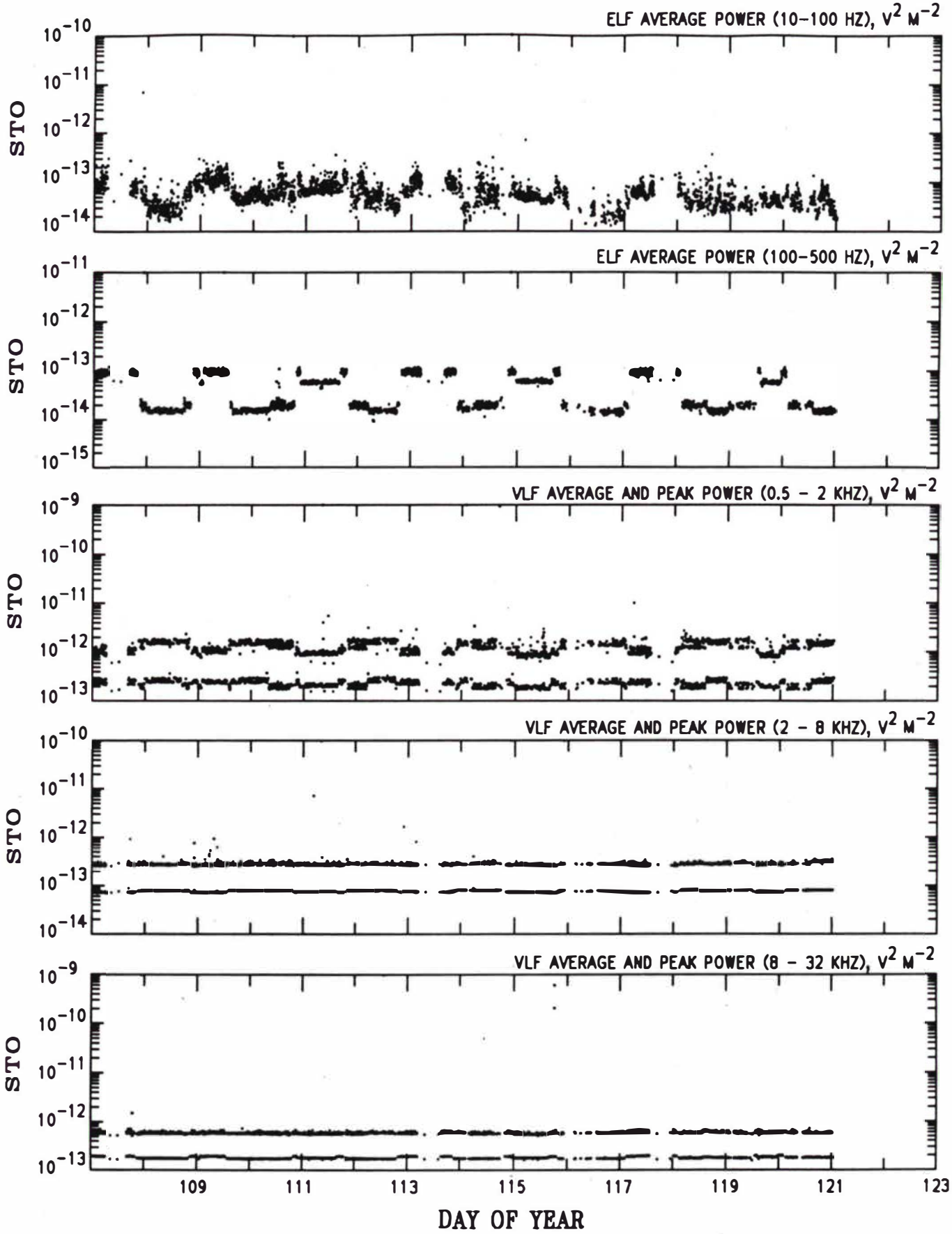
ULYSSES CDR - PLASMA WAVE

93 091 APR 1 00:00:00.000 - 93 107 APR 17 00:00:00.000



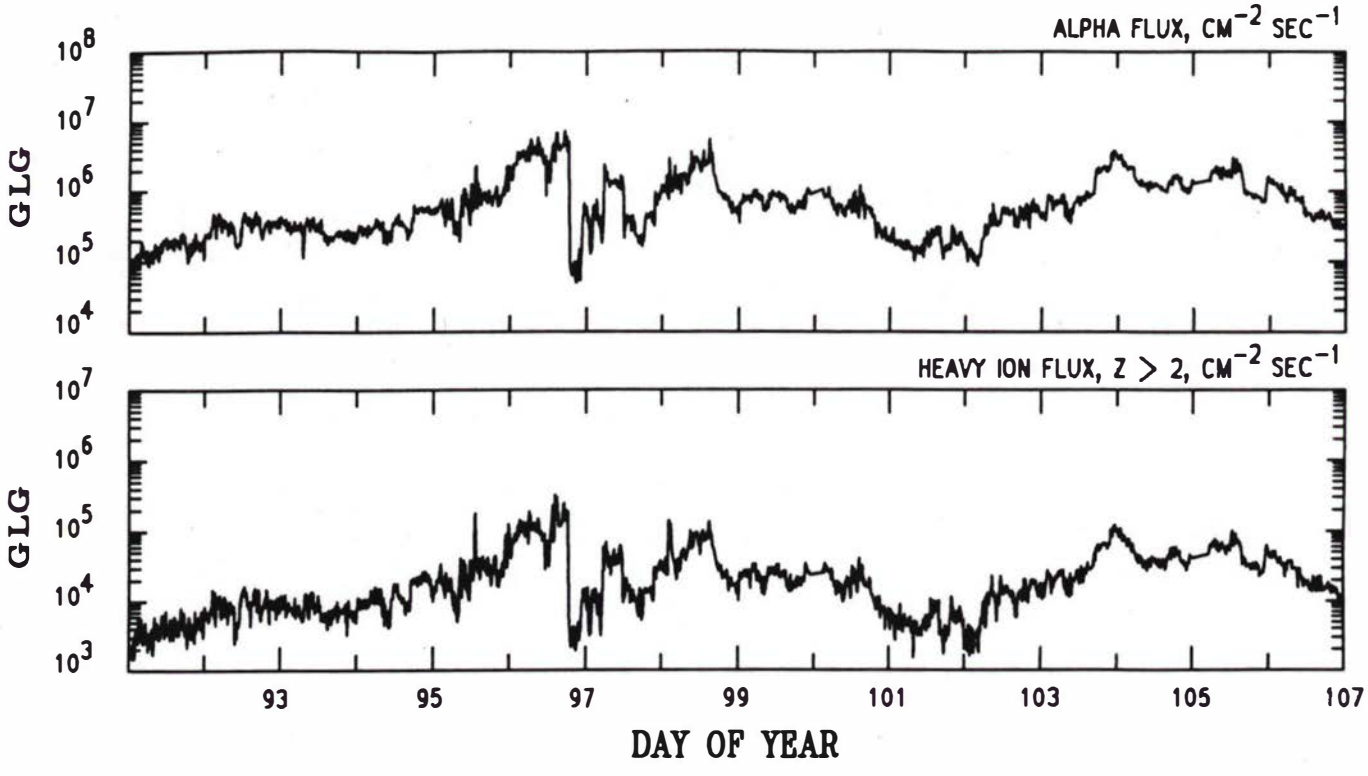
ULYSSES CDR - PLASMA WAVE

93 107 APR 17 00:00:00.000 - 93 123 MAY 3 00:00:00.000



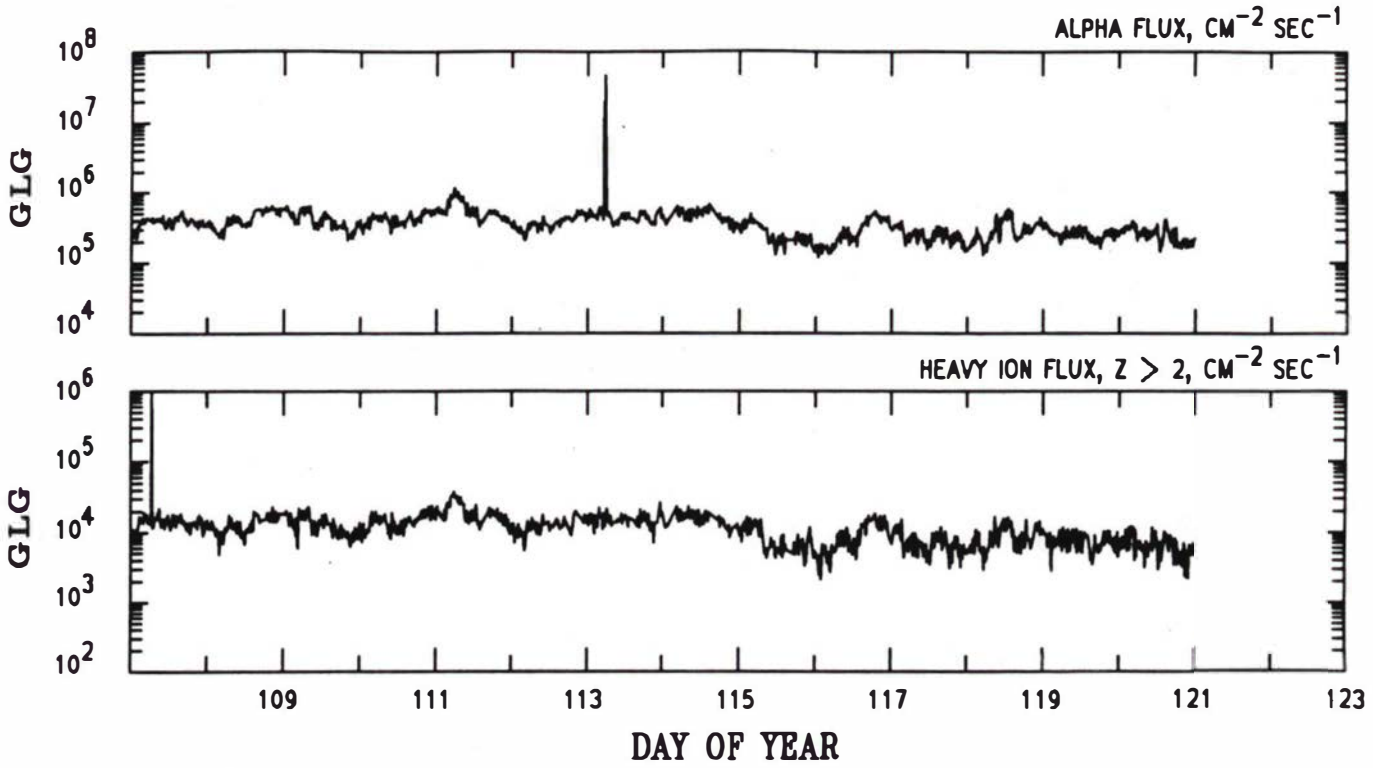
ULYSSES CDR – SOLAR WIND ION COMPOSITION

93 091 APR 1 00:00:00.000 – 93 107 APR 17 00:00:00.000



ULYSSES CDR – SOLAR WIND ION COMPOSITION

93 107 APR 17 00:00:00.000 – 93 123 MAY 3 00:00:00.000



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          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2279
EVENT OF 1993 APR  1 DAY OF YEAR= 91
EVENT CROSSING TIME AT BATSE      :  4445. S. OR 01:14:05.0
COORDINATES ARE     .000     .000      6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 256.000  -29.000
BATSE PEAK COUNTING RATE:  14000    C/S
EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
POSITION OF ULYSSES ON  1/ 4/  93 IS:
RA=  146.933 DEC=  -13.330 DIST=    4.077 AU
BATSE-ULYSSES DISTANCE =  609874320. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 80.43 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=  338.19 SECS.
CROSSING TIME AT ULYSSES    IS  4783. S. OR   01:19:43 +/-  403.41 SECONDS
```



```
From BRIGGS@ssl.msfc.nasa.gov Sun Apr  4 21:19:48 1993
Date:    Sun, 4 Apr 1993 23:23:07 -0500 (CDT)
From: BRIGGS@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2279   930401    9078   04445    14000   256   -29
```

No

```
                BATSE BURST TRIGGER
NO.: 02279

TIME: TJD=9078 SECONDS=4445

TYPE: BURST                    SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: 38.5  SIGMA

INTENSITY:          COUNTS/CM2

LOCATION: ZENITH=1.3    AZIMUTH=168.4  ERROR=      DEGREES

COMMENTS:
MODERATE BURST OF DURATION ABOUT 1 SEC.  MANY SPIKES.
```

```
          ********************
          *CATSEARCH PROGRAM*
          ********************

 ATSE BURST # 2279
EVENT OF 1993 APR  1 DAY OF YEAR= 91
EVENT CROSSING TIME AT BATSE      :  4446. S. OR 01:14:05.8
COORDINATES ARE   0.000   0.000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 238.890  -33.030
BATSE PEAK COUNTING RATE:  0000   C/S

EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
POSITION OF ULYSSES ON  1/ 4/  93 IS:
RA=  146.933 DEC=  -13.330 DIST=    4.077 AU
BATSE-ULYSSES DISTANCE =  609877312. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL    DIRECTION= 95.61 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -198.98 SECS.
CROSSING TIME AT ULYSSES    IS  4247. S. OR 01:10:46.8 +/-  398.48 SECONDS
```

9/11/95

ULYSSES RT

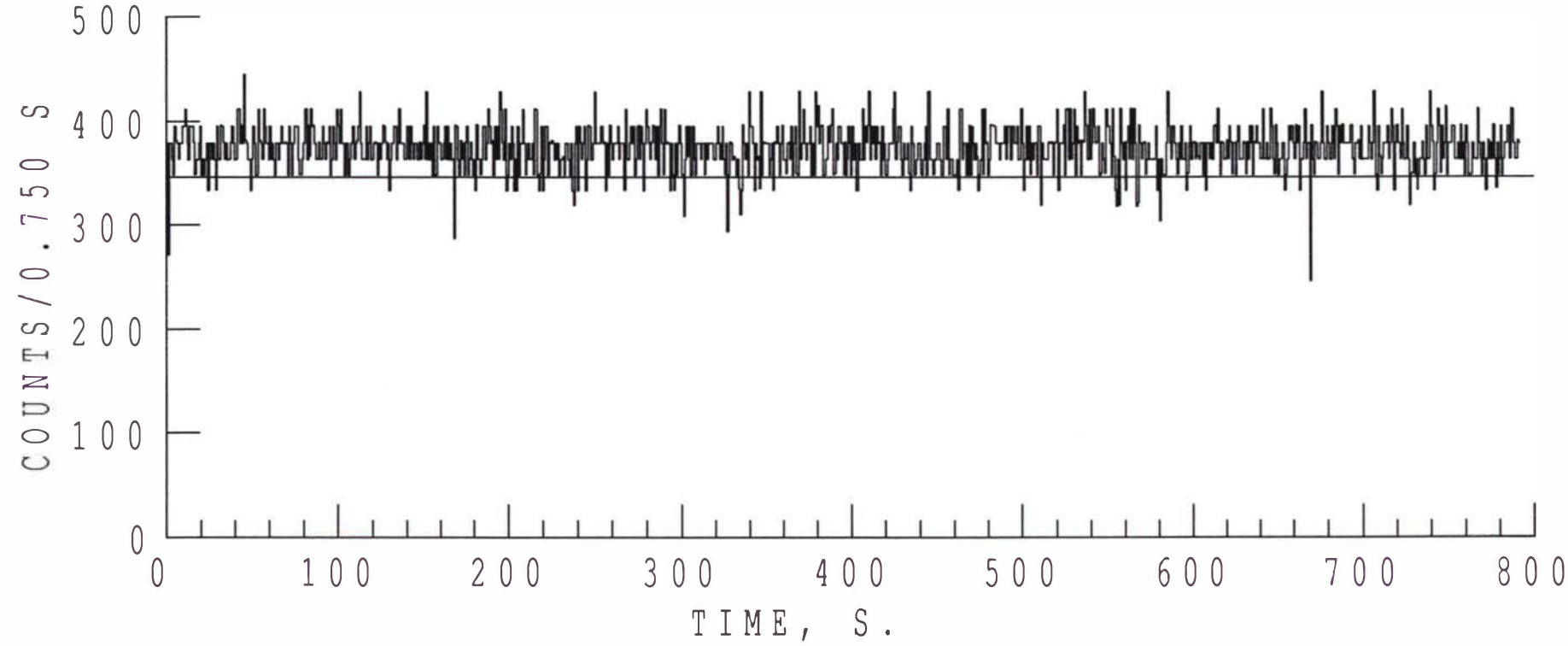
1/ 4/93 3852.072 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



****
BATSEARCH PROGRAM
****

BATSE BURST # 2280
EVENT OF 1993 APR 1 DAY OF YEAR= 91
EVENT CROSSING TIME AT BATSE : 22892. S. OR 06:21:32.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 231.000 -49.000
BATSE PEAK COUNTING RATE: 10000 C/S
EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 1/ 4/ 93 IS:
RA= 146.933 DEC= -13.330 DIST= 4.077 AU
BATSE-ULYSSES DISTANCE = 609874320. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=103.89 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -488.22 SECS.
CROSSING TIME AT ULYSSES IS 22404. S. OR 06:13:23 +/- 385.45 SECONDS

Apr 5 07:55 1993 standard input Page 33

From BRIGGS@ssl.msfc.nasa.gov Sun Apr 4 21:21:30 1993
Date: Sun, 4 Apr 1993 23:24:50 -0500 (CDT)
From: BRIGGS@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2280	930401	9078	22892	10000	231	-49

NO

BATSE BURST TRIGGER
NO.: 02280

TIME: TJD=9078 SECONDS=22892

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: 23.9 SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=28.3 AZIMUTH=239.2 ERROR= DEGREES

COMMENTS:
NO PRE-BURST DATA DUE TO GAPS. BURST DECLINES IN INTENSITY STARTING AT TRIGGER TIME. RETURNS TO BACKGROUND LEVEL AT ABOUT 0.8 SEC

```
          ********************
          *CATSEARCH PROGRAM*
          ********************

 ATSE BURST # 2280
EVENT OF 1993 APR  1 DAY OF YEAR= 91
EVENT CROSSING TIME AT BATSE      : 22893. S. OR 06:21:32.6
COORDINATES ARE   0.000   0.000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 203.100  -48.610
BATSE PEAK COUNTING RATE:  0000   C/S

EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
POSITION OF ULYSSES ON  1/ 4/  93 IS:
RA=  146.933 DEC=  -13.330 DIST=    4.077 AU
BATSE-ULYSSES DISTANCE =  609877312. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL    DIRECTION=122.09 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1080.60 SECS.
CROSSING TIME AT ULYSSES    IS 21812. S. OR 06:03:32.0 +/-  332.83 SECONDS
```

9/11/95

ULYSSES RT

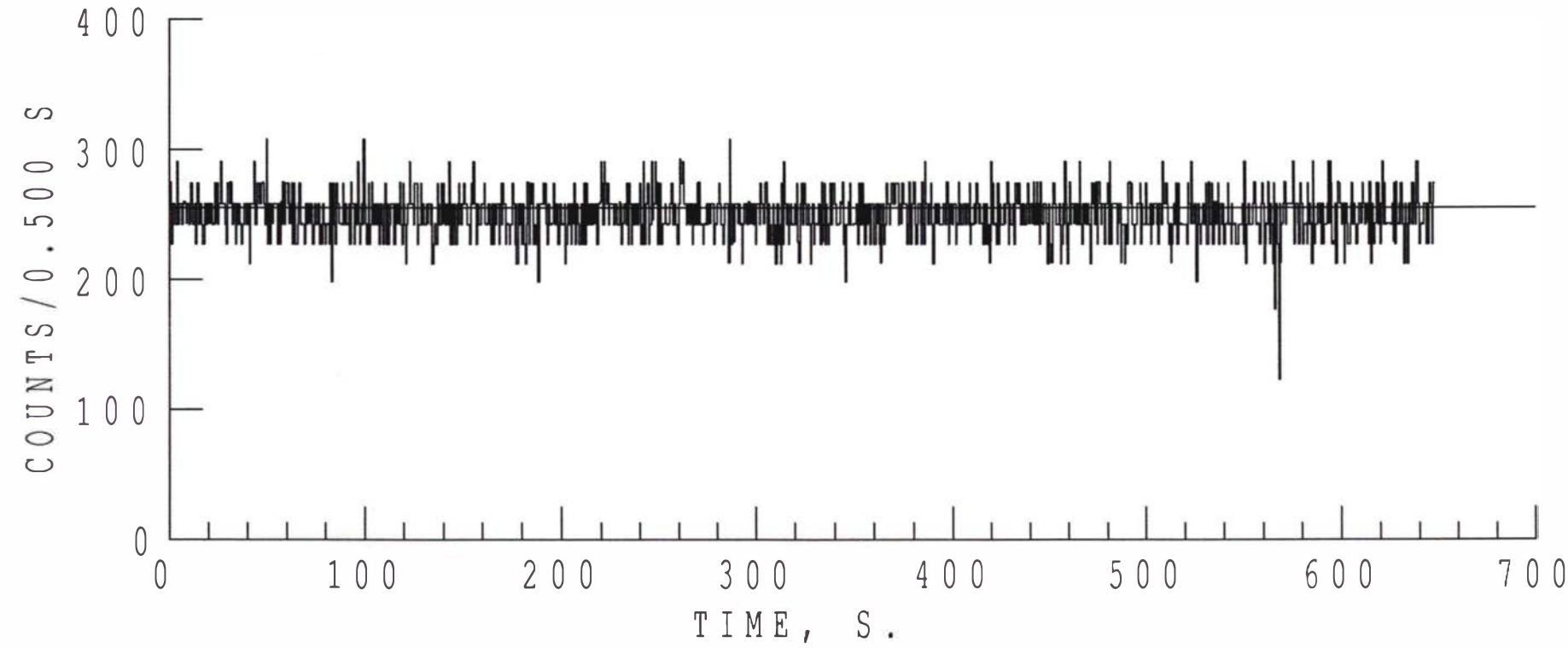
1/ 4/93 21492.098 s

0.250 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



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          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2281
EVENT OF 1993 APR  1 DAY OF YEAR= 91
EVENT CROSSING TIME AT BATSE      : 35889. S. OR 09:58:09.0
COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 339.000    15.000
BATSE PEAK COUNTING RATE:    2600     C/S
EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
POSITION OF ULYSSES ON  1/ 4/  93 IS:
RA=  146.933 DEC=  -13.330 DIST=     4.077 AU
BATSE-ULYSSES DISTANCE =  609874320. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 11.82 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1991.21 SECS.
CROSSING TIME AT ULYSSES     IS 37880. S. OR   10:31:20 +/-  152.57 SECONDS




Apr  5 07:55 1993  standard input Page 35


From BRIGGS@ssl.msfc.nasa.gov Sun Apr  4 21:24:54 1993
Date:     Sun, 4 Apr 1993 23:28:13 -0500 (CDT)
From: BRIGGS@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #    Date      TJD      sec    Max ct/s    RA    Dec
   2281    930401     9078    35889      2600    339    +15


                          NO


                  BATSE BURST TRIGGER
NO.: 02281

TIME: TJD=9078 SECONDS=35889

TYPE: BURST                       SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: 8.9    SIGMA

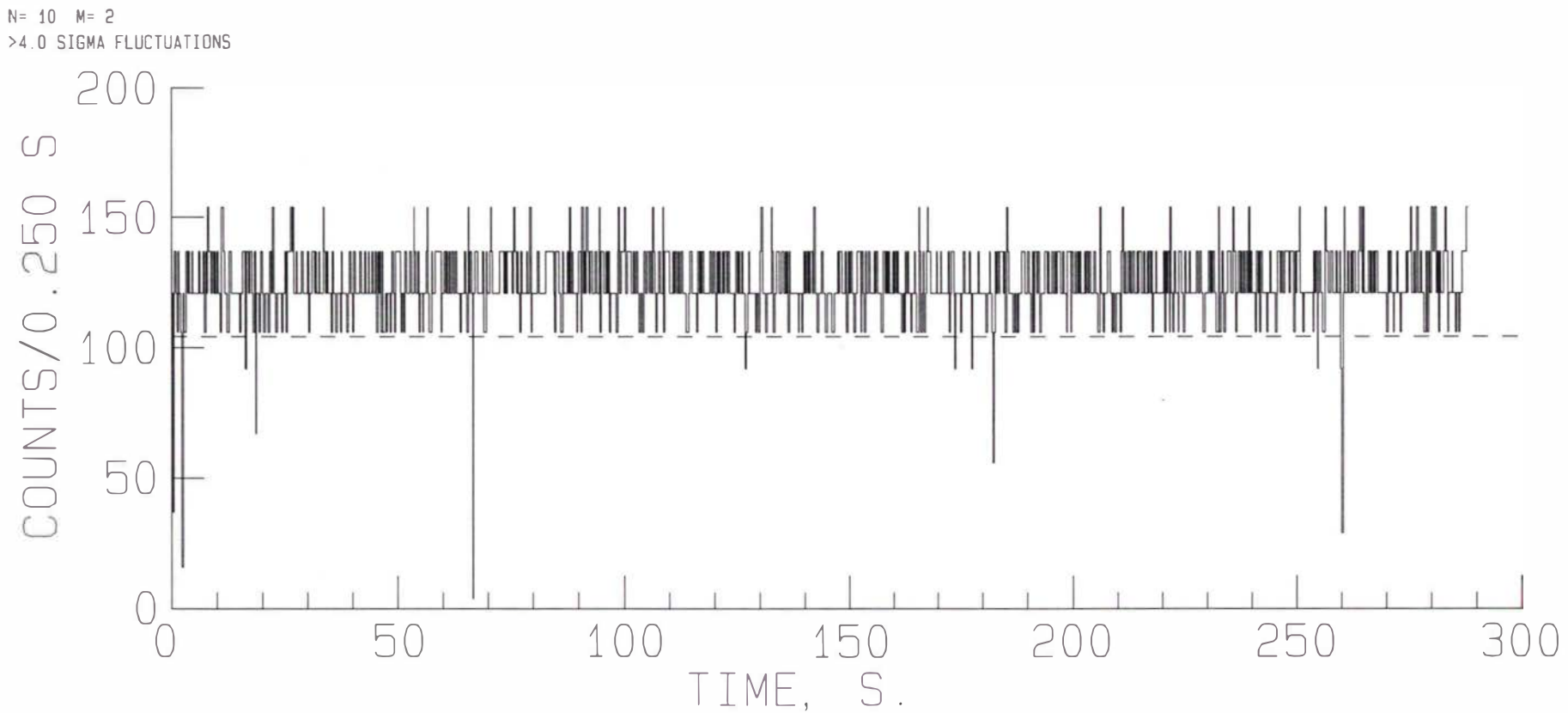
INTENSITY:           COUNTS/CM2

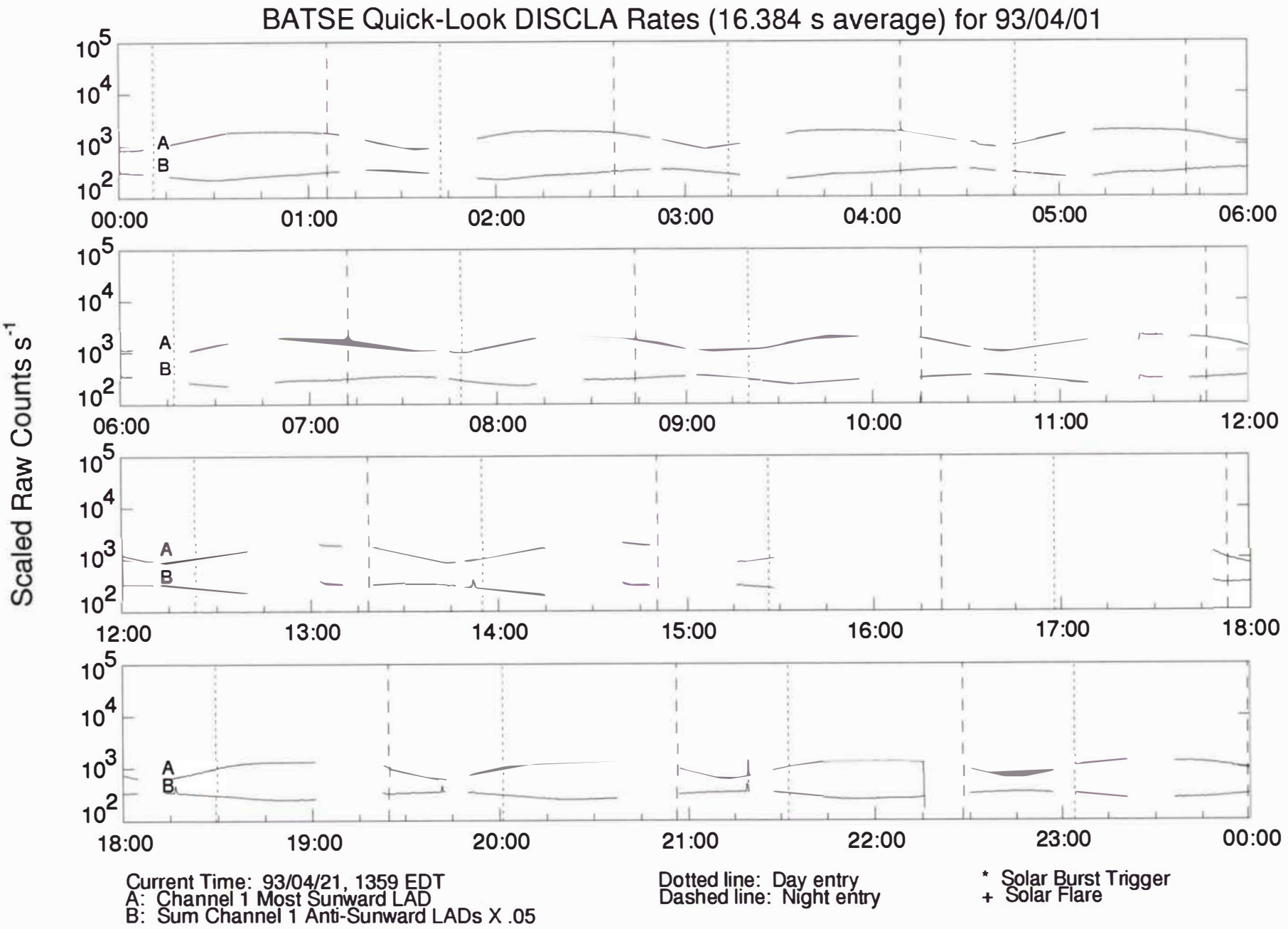
LOCATION: ZENITH=90.1    AZIMUTH=24.4    ERROR=       DEGREES

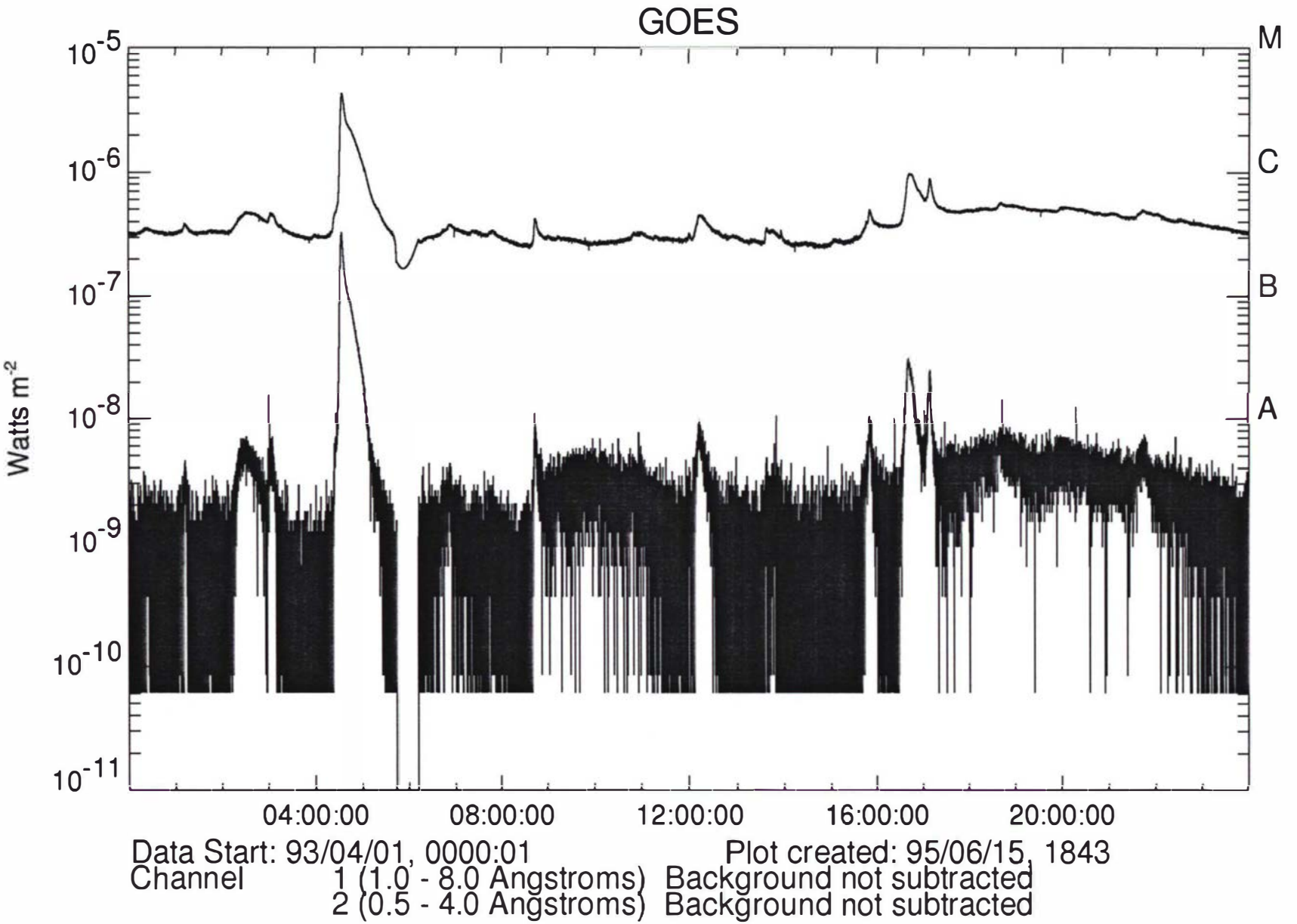
COMMENTS:
AGAIN, NO PRE-BURST DATA DUE TO TELEMETRY GAPS.  BURST RETURNS TO BACKGROUND
LEVEL 0.1 SEC AFTER TRIGGER TIME.    NOT SEEN ABOVE 100 KEV.
```

15/ 6/93

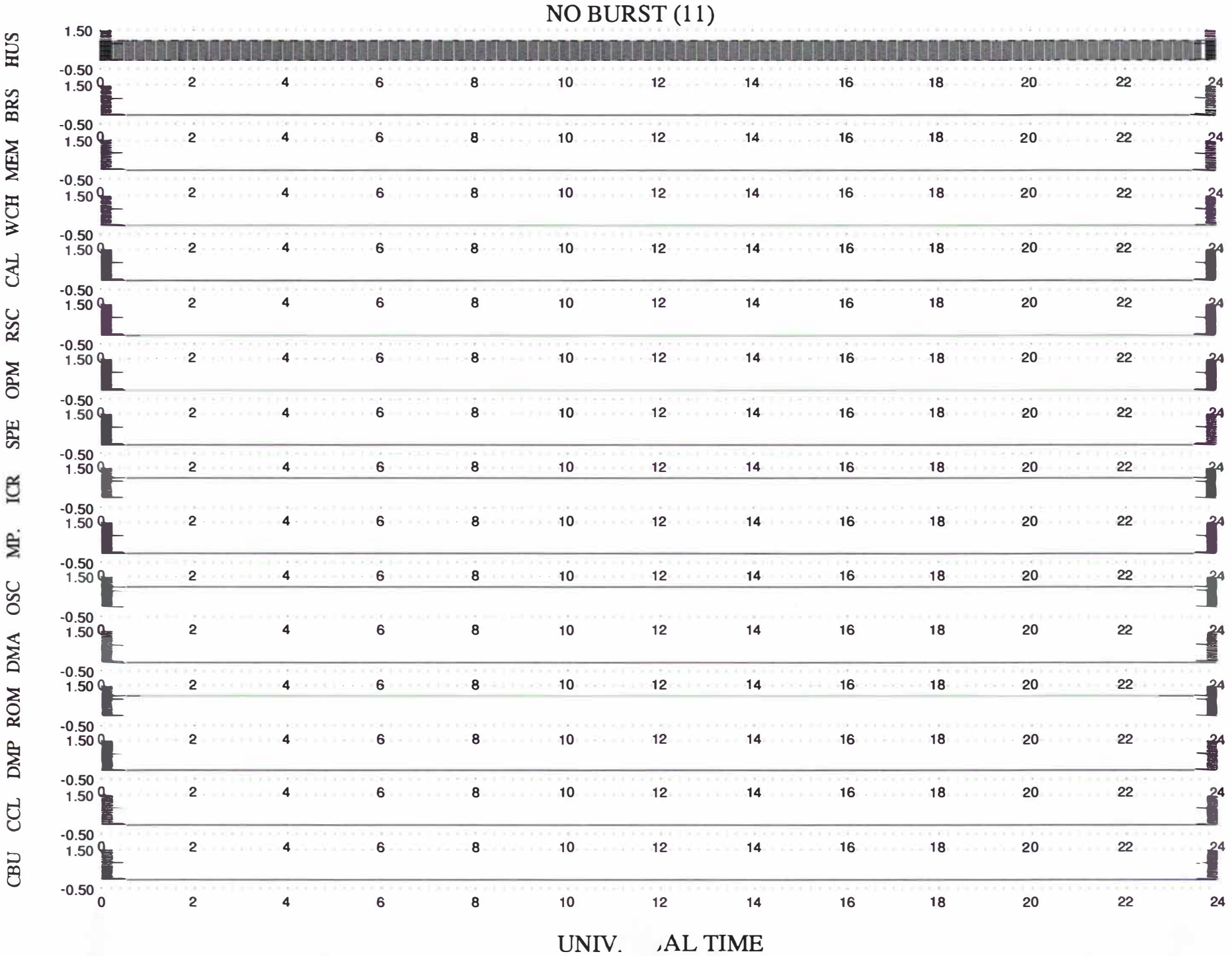
ULYSSES RT
1/ 4/93 37728.102 s
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/01
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1359 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

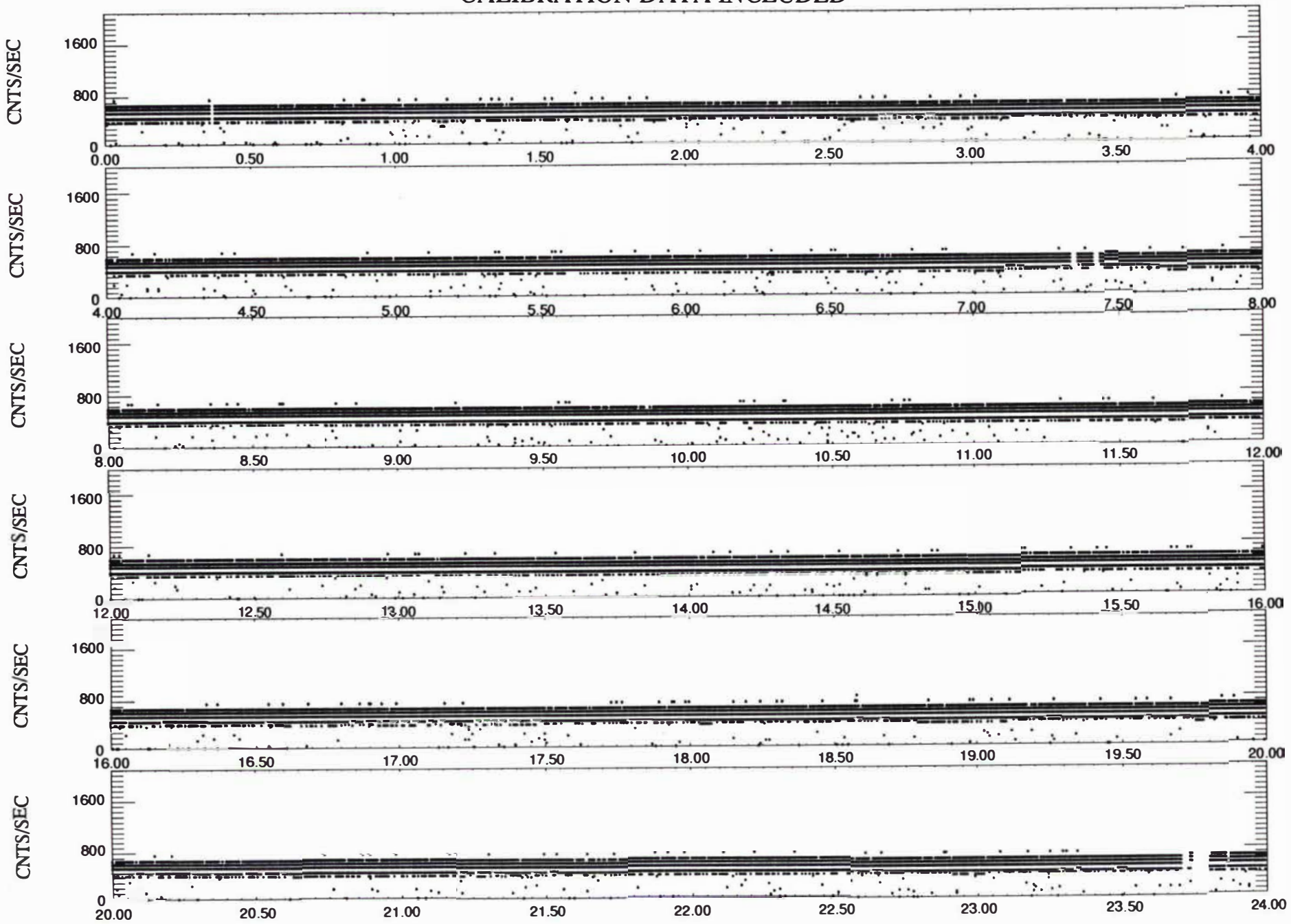

GOES
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
M
C
B
A
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/01, 0000:01
Plot created: 95/06/15, 1843
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 91, year 1993 to day 91, year 1993 6/12/93



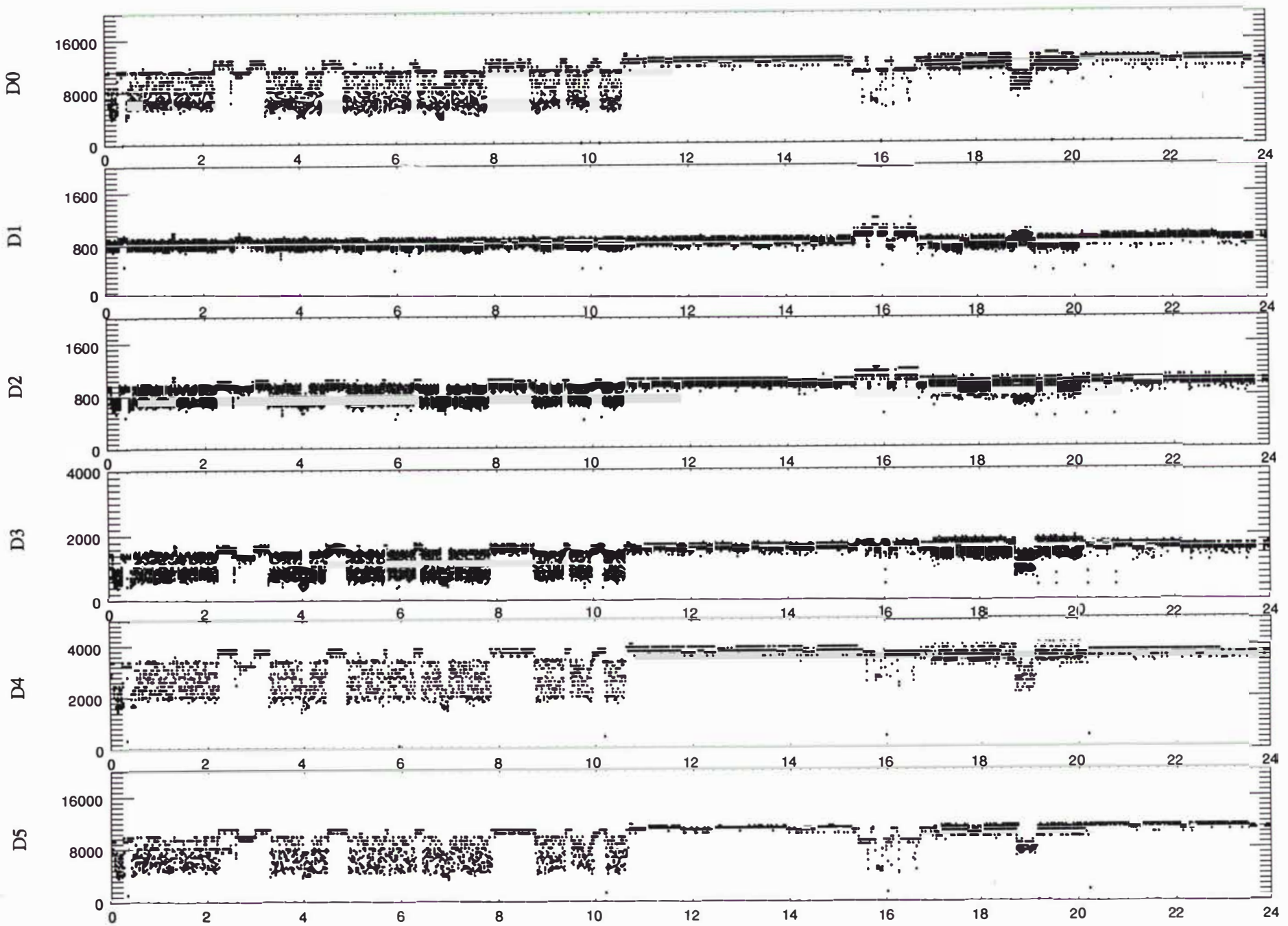
HUS 2A, MODE 1, NOT AVERAGED EDR day 91, year 1993 to day 91, year 1993 6/12/93

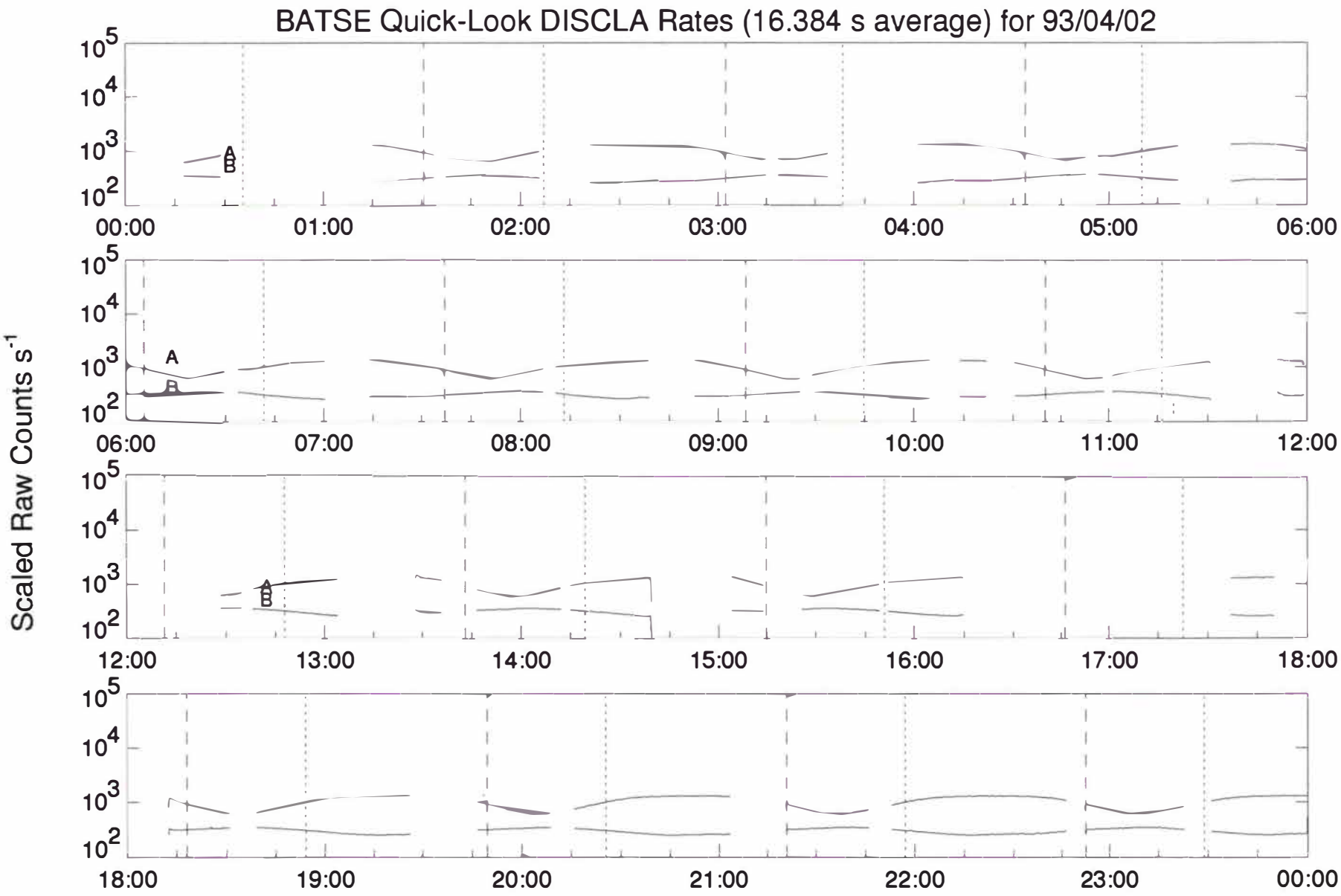
CALIBRATION DATA INCLUDED

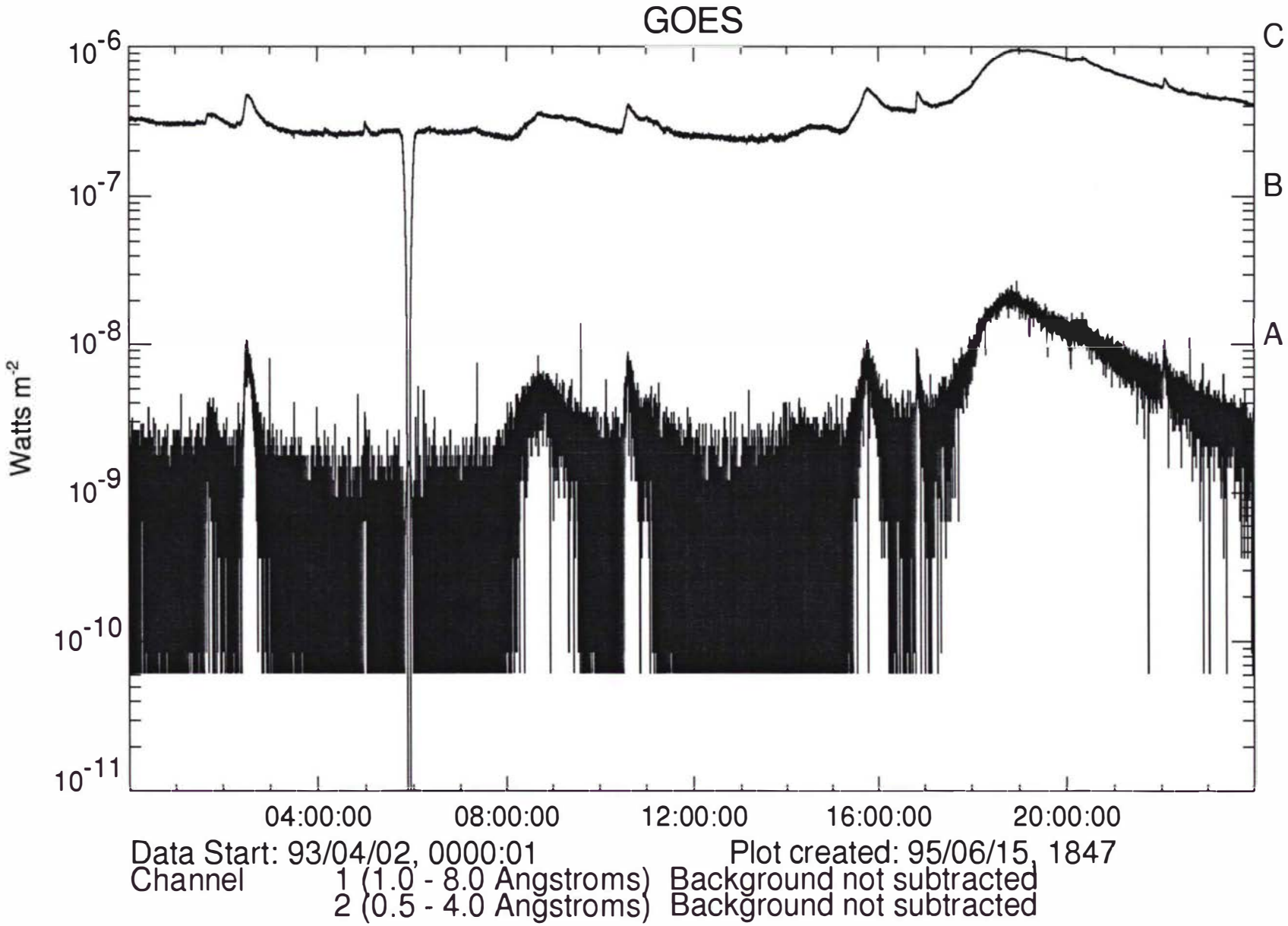


UNIVERSAL TIME

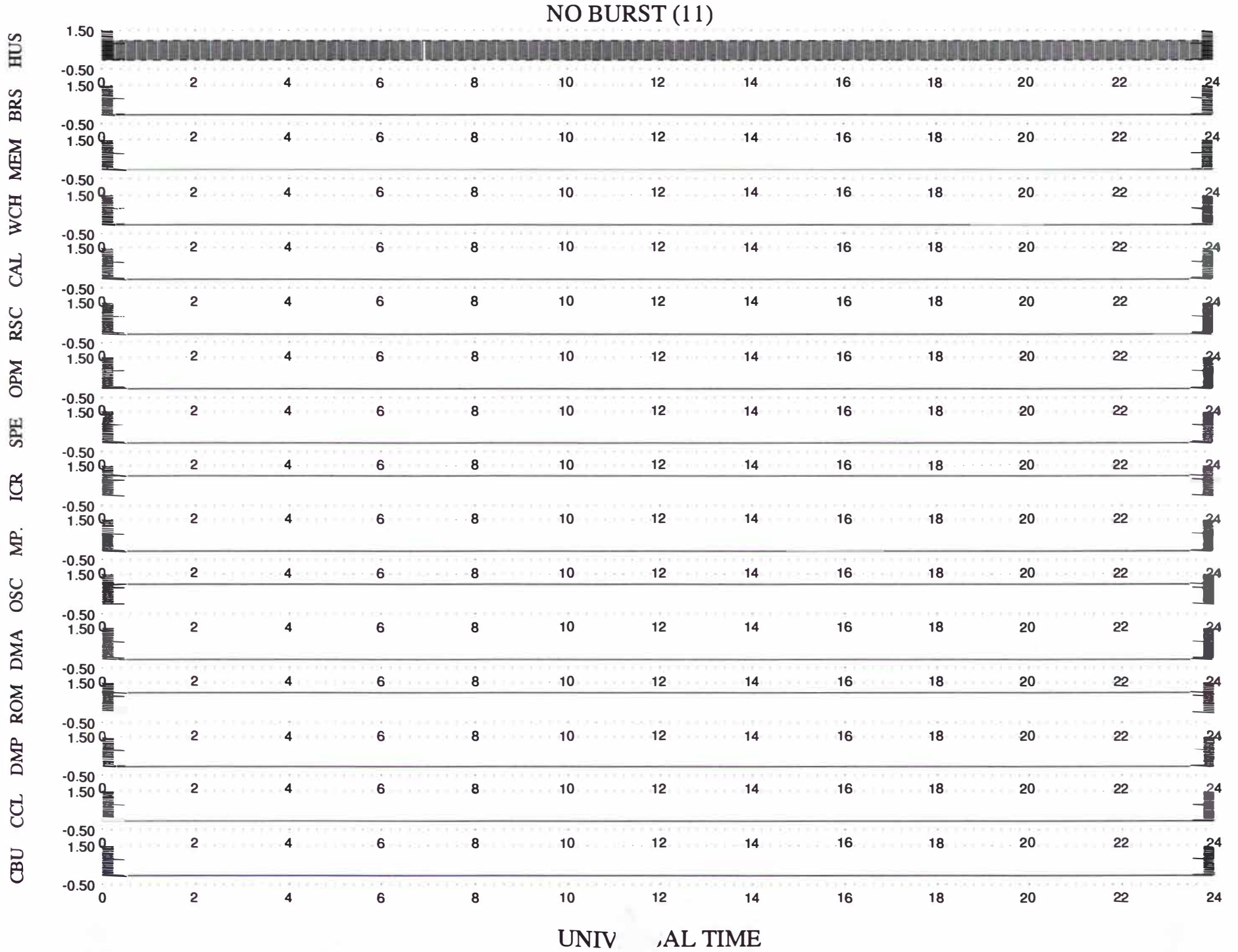
HUS 2B COUNTS / SEC QEDR day 91, year 1993 to day 91, year 1993 4/5/93




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/02
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1400 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

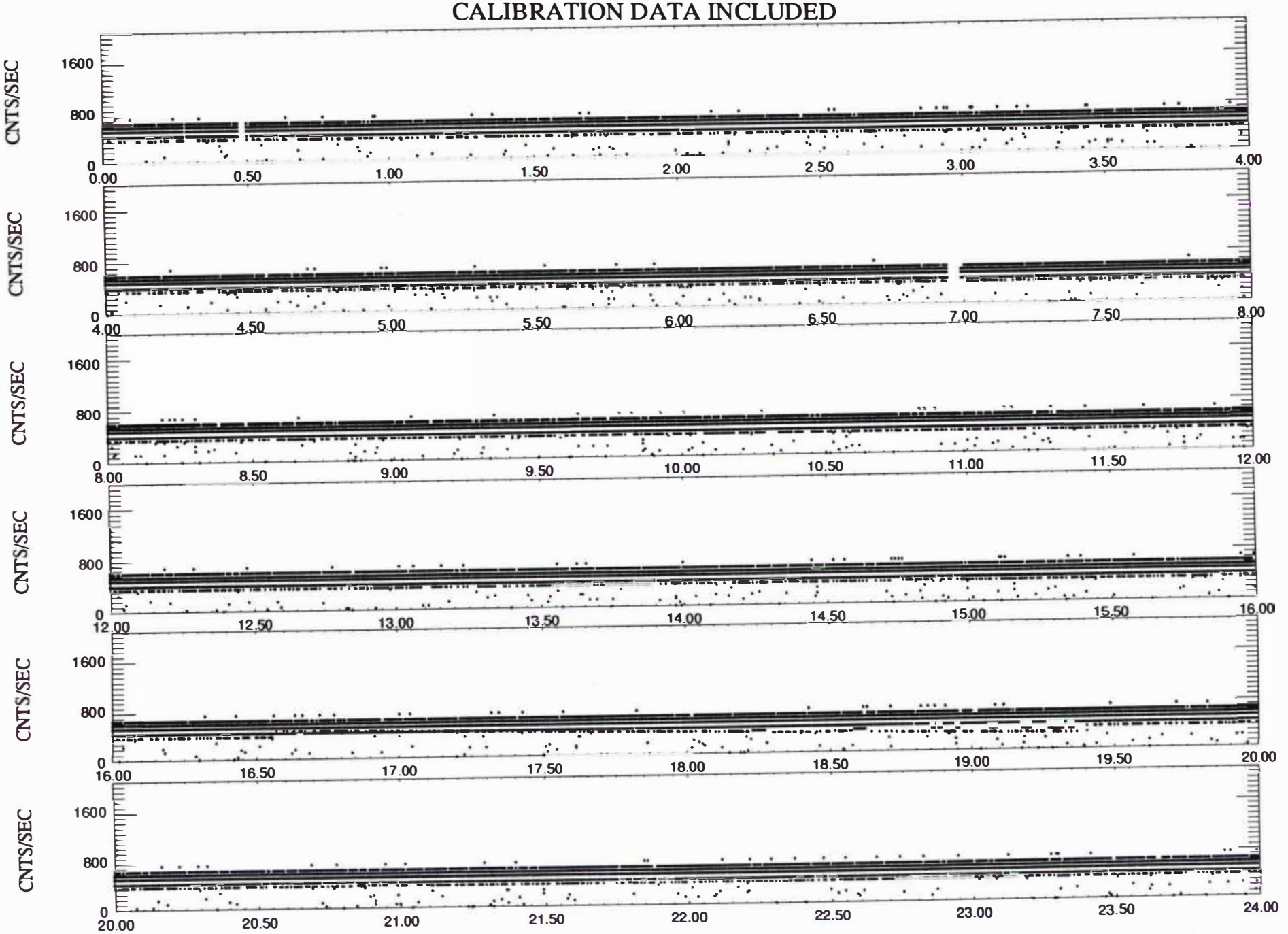

GOES
C
B
A
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/02, 0000:01
Plot created: 95/06/15, 1847
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 92, year 1993 to day 92, year 1993 6/12/93



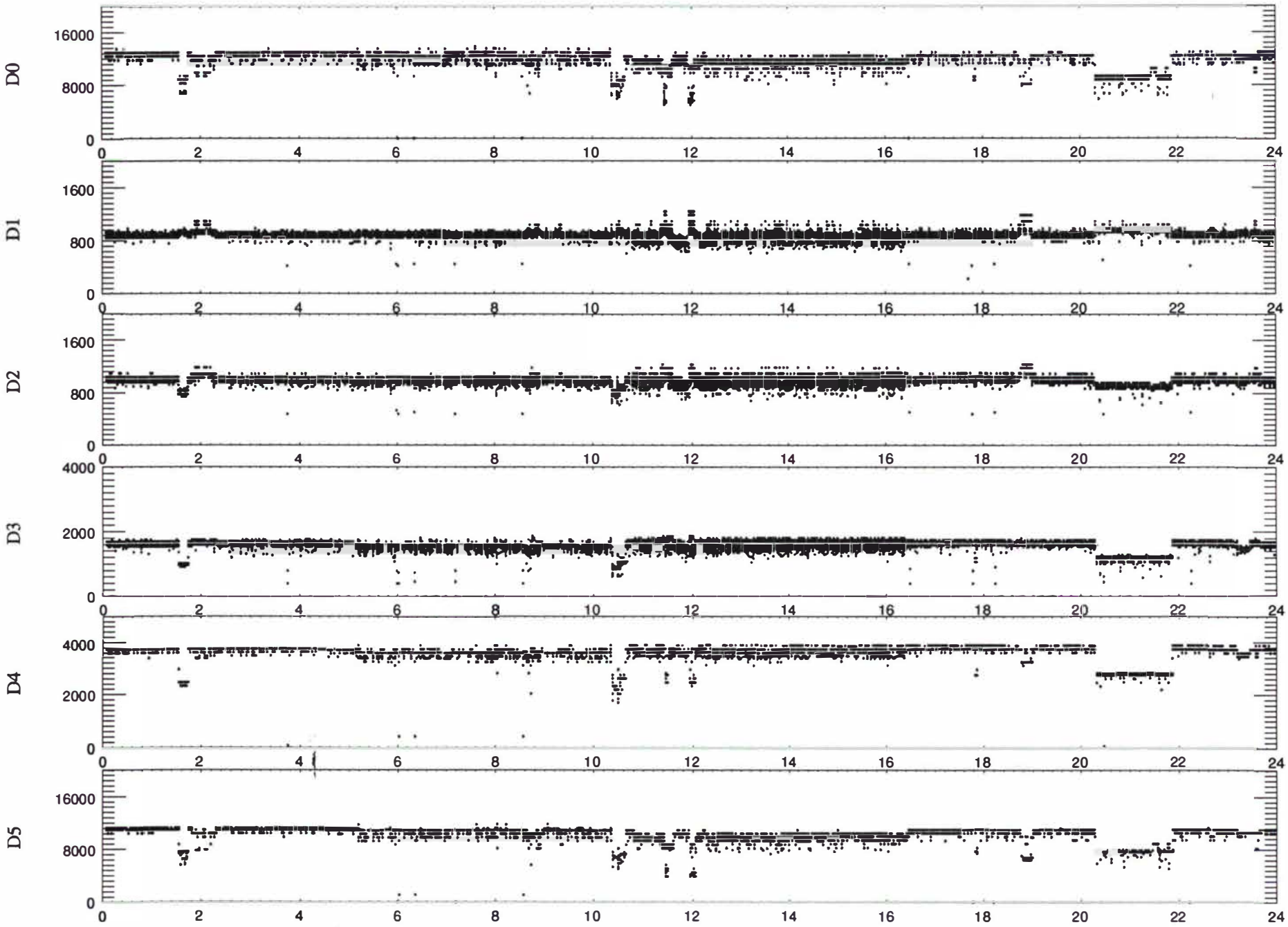
HUS 2A, MODE 1, NOT AVERAGED EDR day 92, year 1993 to day 92, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIVERSAL TIME

HUS 2B COUNTS / SEC QEDR day 92, year 1993 to day 92, year 1993 4/6/93



Kommers

UNTRIGGERED

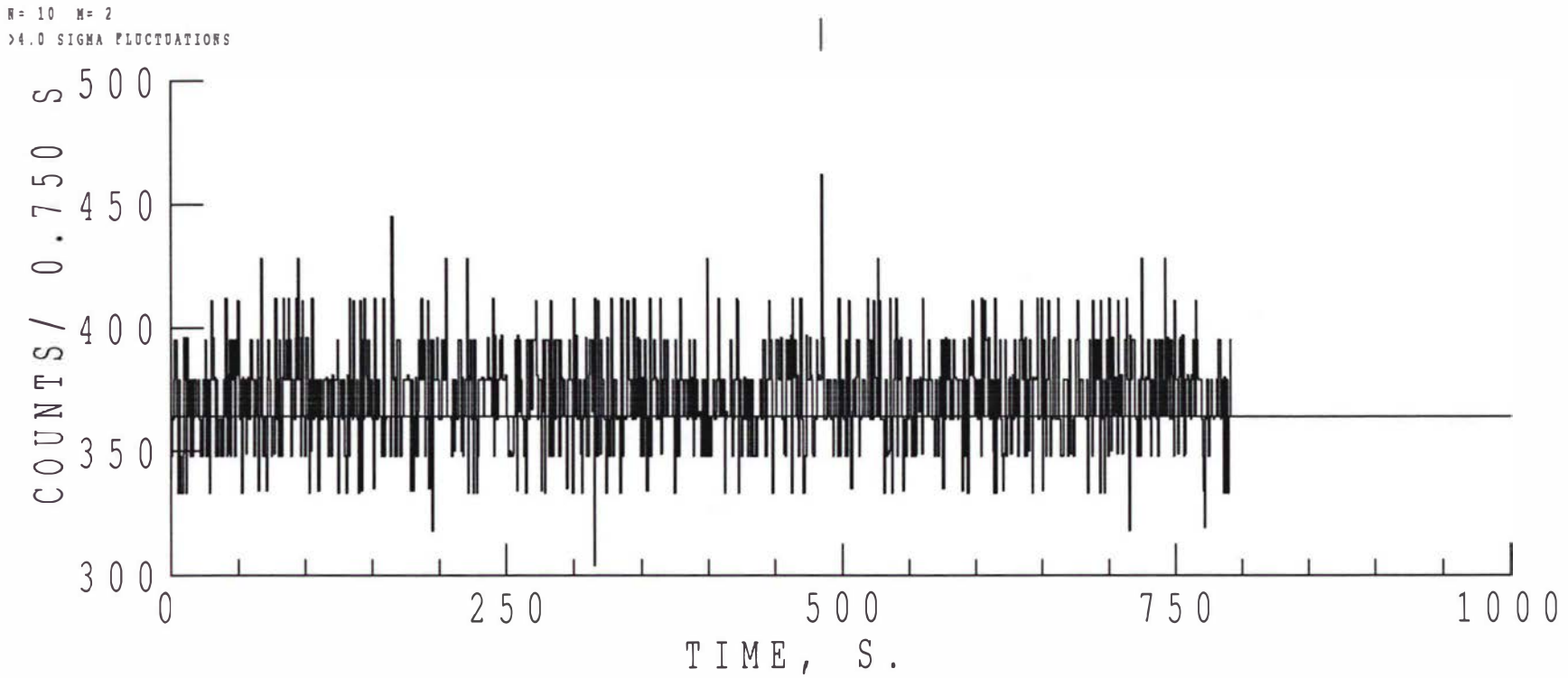
ULYSSES RT

21/ 5/97

3/ 4/93 72612.094 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV



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          ********************
          *BATSEARCH PROGRAM*
          ********************

 BATSE BURST #     2282
 EVENT OF 1993 APR  3 DAY OF YEAR= 93
 EVENT CROSSING TIME AT BATSE      : 44965. S. OR 12:29:25.0
 COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION:  61.000  -43.000
 BATSE PEAK COUNTING RATE:    6500    C/S
 EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
 POSITION OF ULYSSES ON  3/ 4/  93 IS:
 RA=  146.565 DEC=  -13.218 DIST=    4.090 AU
 BATSE-ULYSSES DISTANCE =  611938800. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=102.18 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH= -430.69 SECS.
 CROSSING TIME AT ULYSSES    IS 44534. S. OR   12:22:14 +/-  389.87 SECONDS
```



```
From MEEGAN@ssl.msfc.nasa.gov Mon Apr  5 10:49:33 1993
Date:    Mon, 5 Apr 1993 12:52:48 -0500 (CDT)
From: MEEGAN@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2282   930403    9080   44965     6500   061   -43
```

X(7)

BATSE BURST TRIGGER

NO.: 02282

TIME: TJD=9080 SECONDS=44965

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= 90. AZIMUTH=354. ERROR= DEGREES

COMMENTS:
ABOUT 1.5 SECONDS LONG WITH LOTS OF STRUCTURE. WEAK, BUT DETECTABLE,
ABOVE 300 KEV.

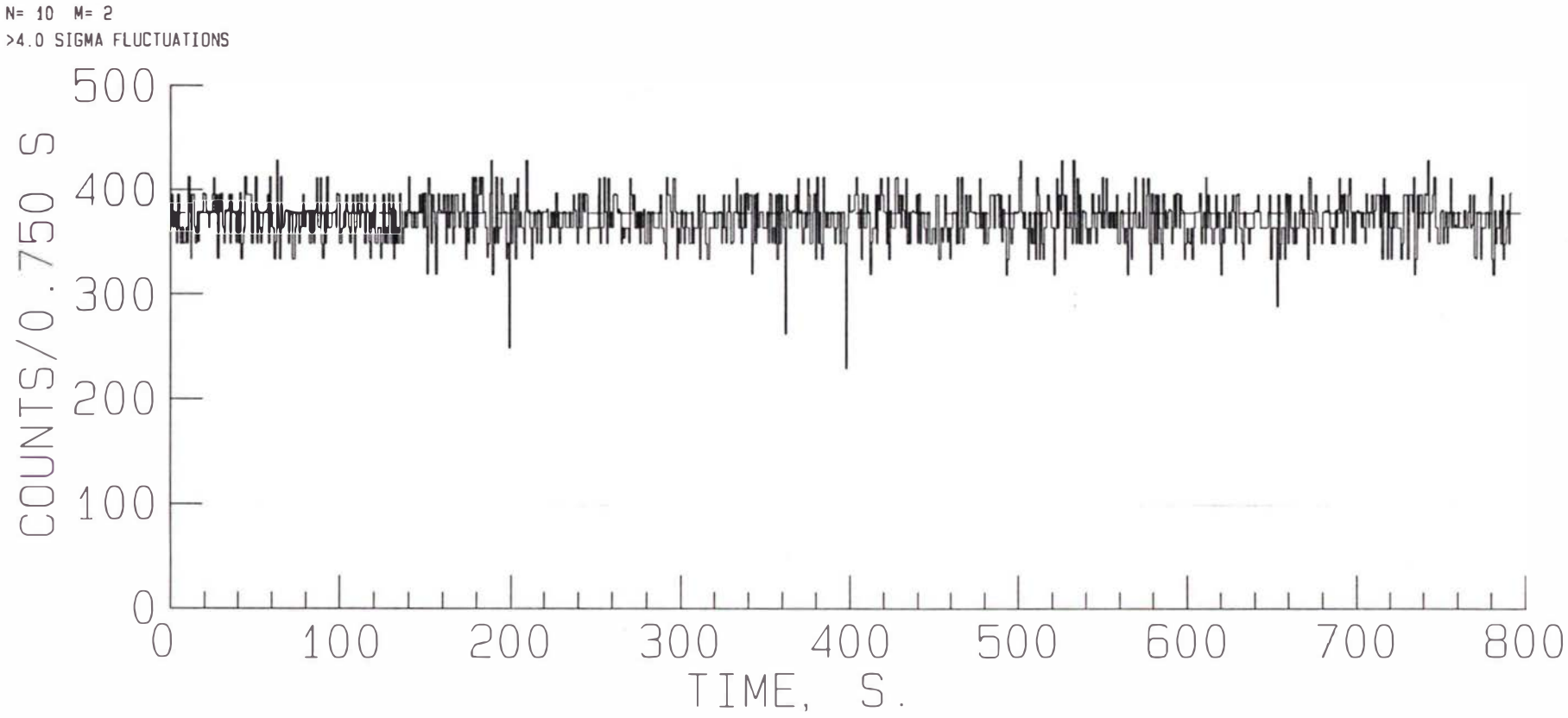
13/ 4/93

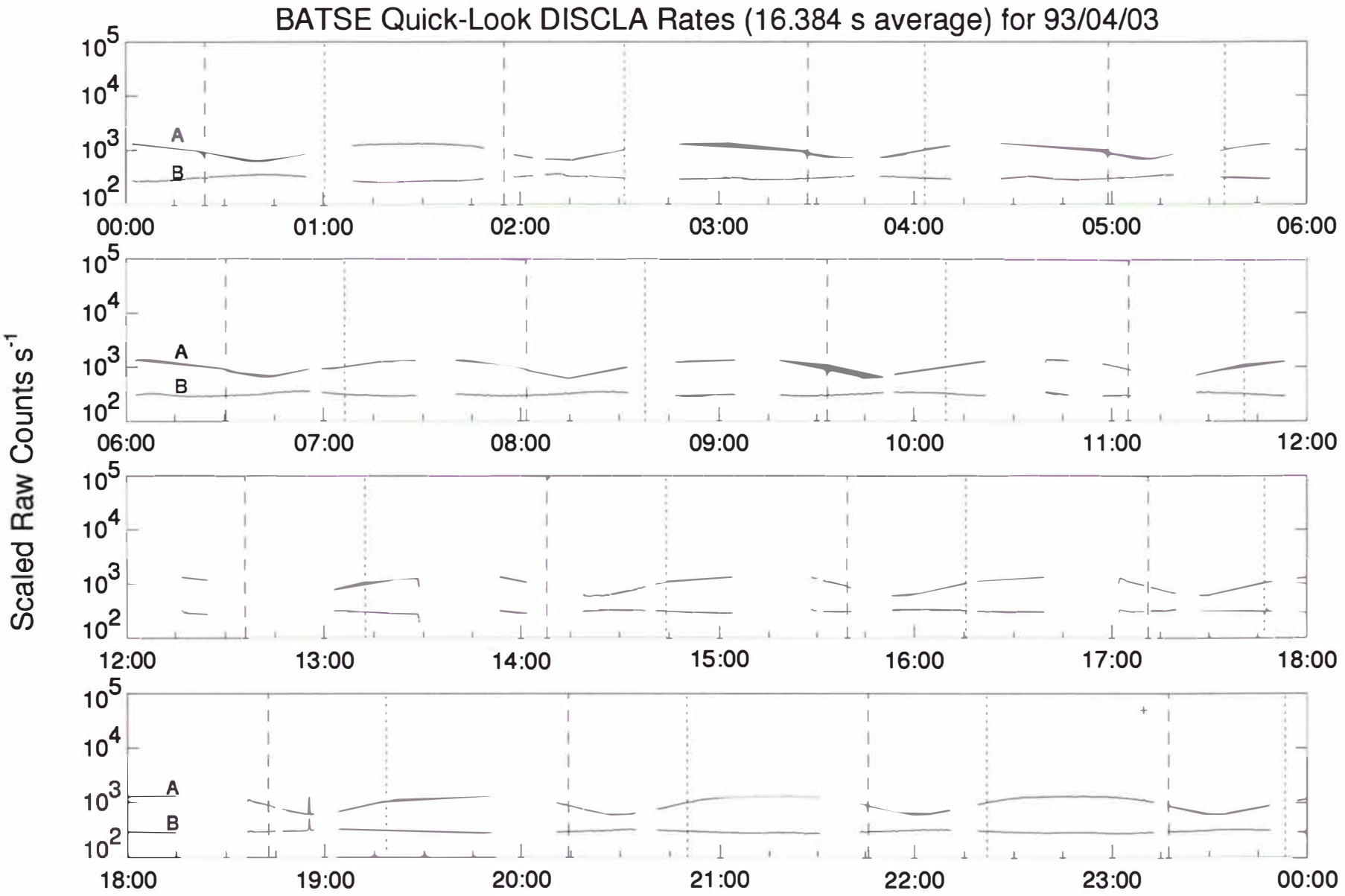
ULYSSES RT

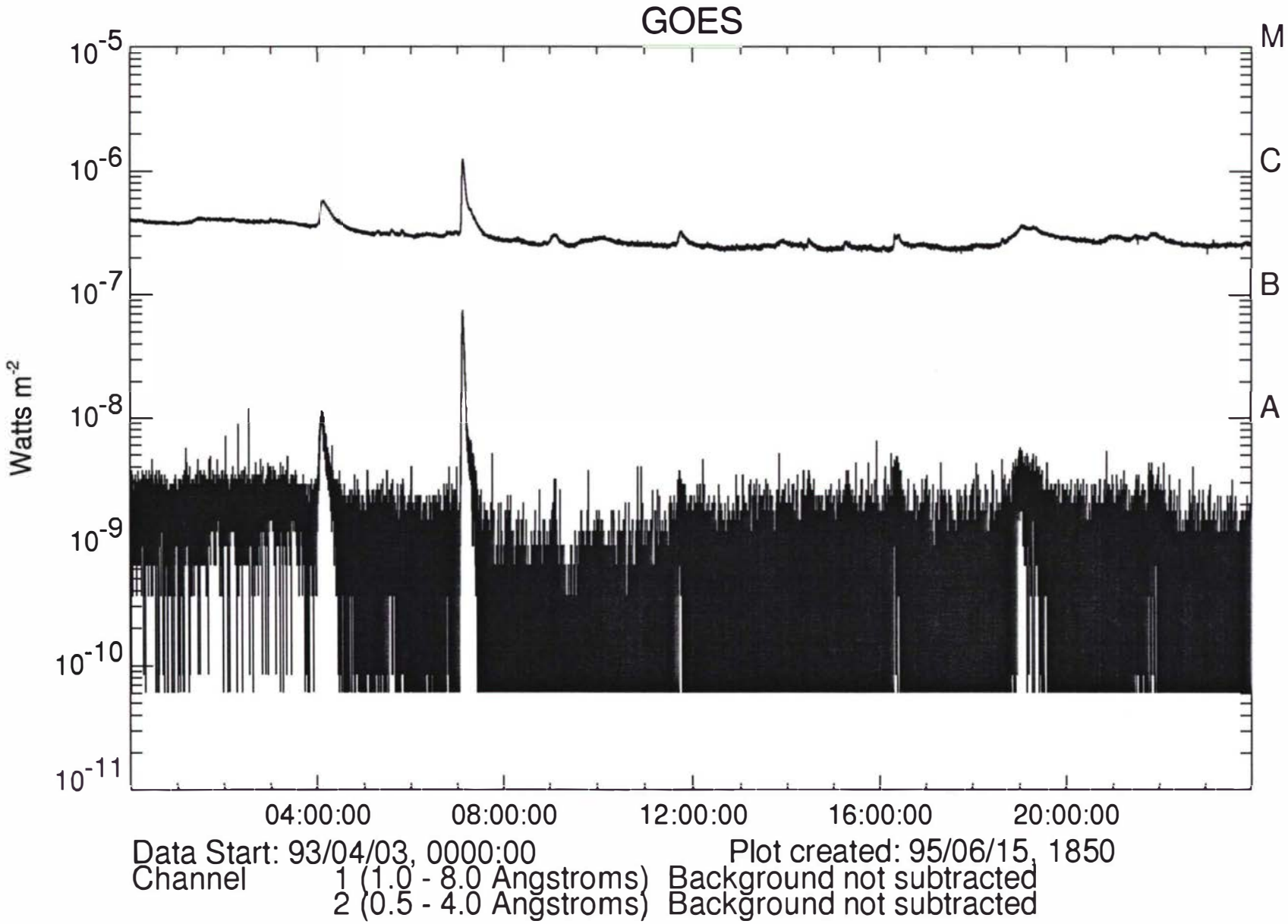
3/ 4/93 44136.152 s

0.250 S INTERVALS REGROUPED BY 3

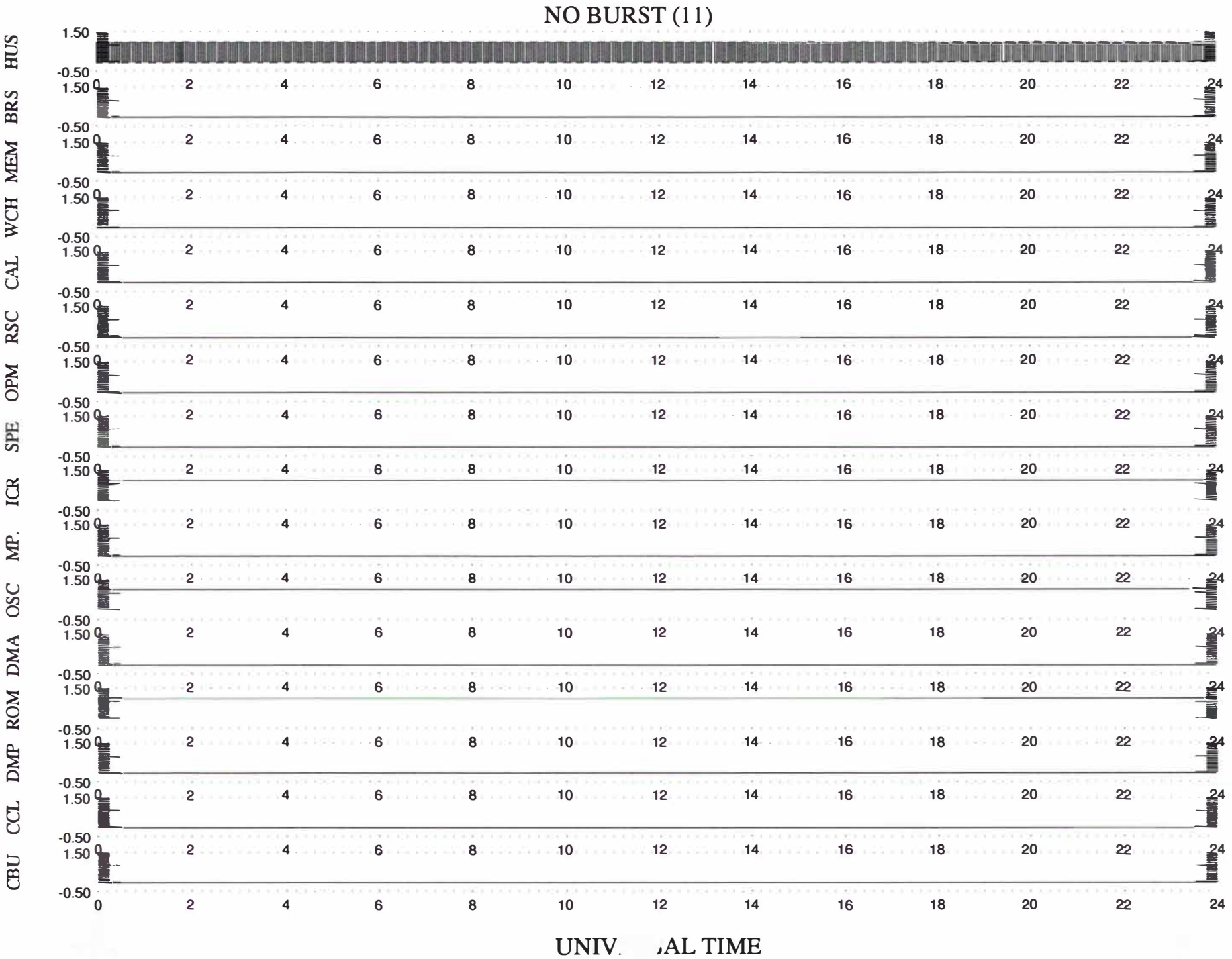
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/03
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1401 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

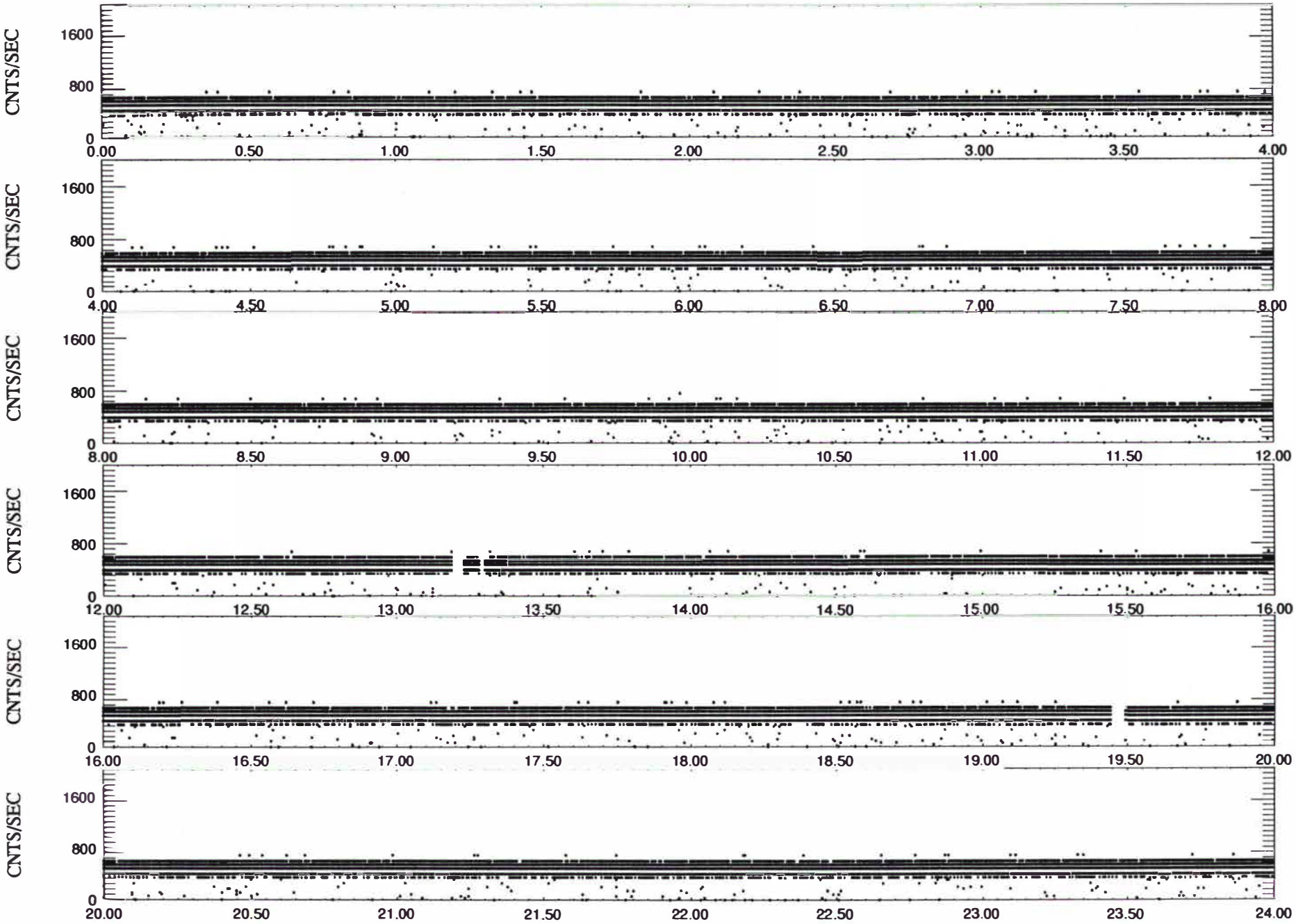

GOES
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
M
C
B
A
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/03, 0000:00
Plot created: 95/06/15, 1850
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 93, year 1993 to day 93, year 1993 6/12/93



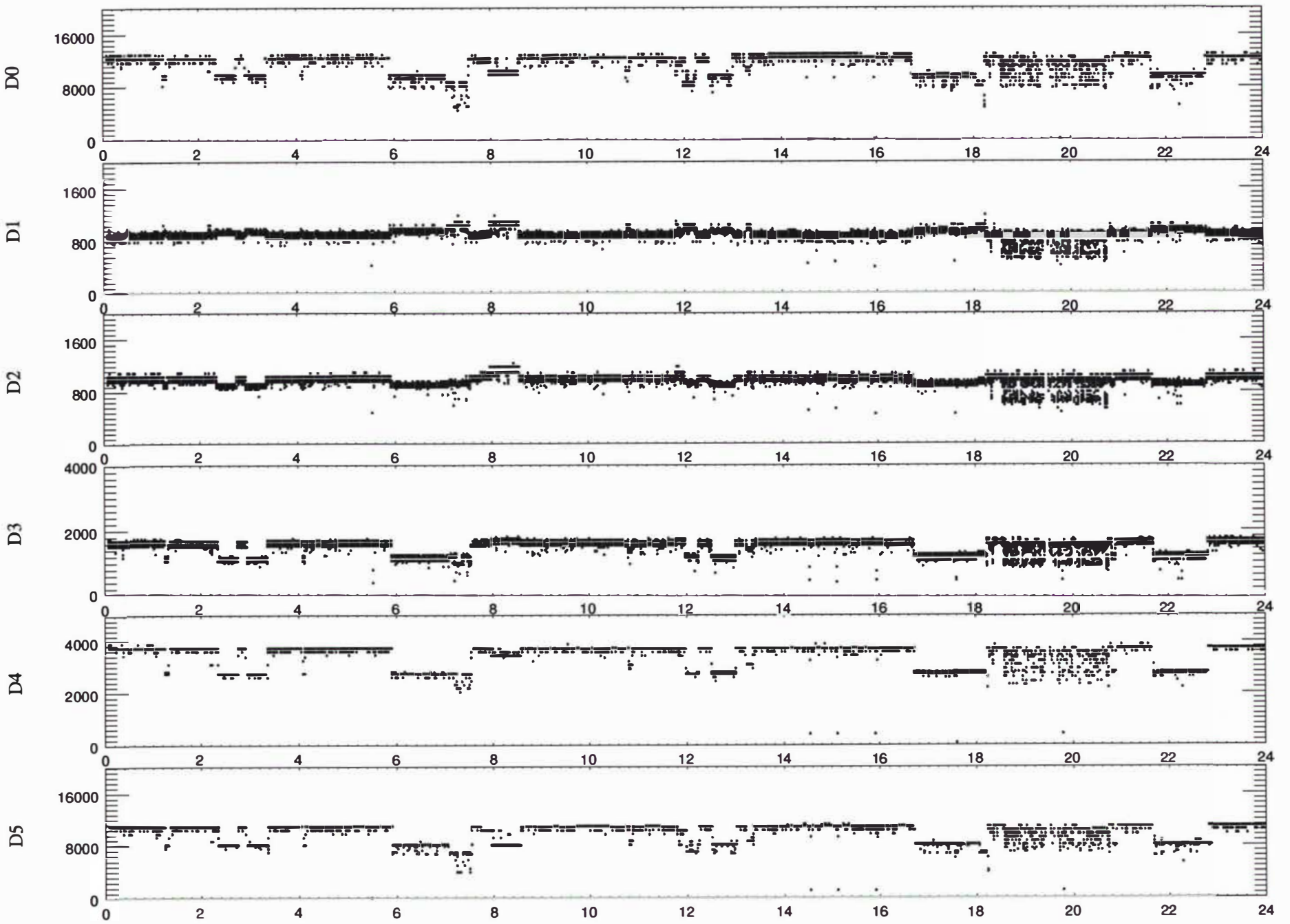
HUS 2A, MODE 1, NOT AVERAGED EDR day 93, year 1993 to day 93, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIVERSAL TIME

HUS 2B COUNTS / SEC QEDR day 93, year 1993 to day 93, year 1993 4/6/93



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2283
EVENT OF 1993 APR  4 DAY OF YEAR= 94
EVENT CROSSING TIME AT BATSE      : 19544. S. OR 05:25:44.0
COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION:  27.000     3.000
BATSE PEAK COUNTING RATE:    3200     C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
POSITION OF ULYSSES ON  4/ 4/  93 IS:
RA=  146.387 DEC=  -13.161 DIST=     4.098 AU
BATSE-ULYSSES DISTANCE =  613030880. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 60.72 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1000.09 SECS.
CROSSING TIME AT ULYSSES     IS 20544. S. OR   05:42:24 +/-  374.85 SECONDS




Apr  6 15:47 1993  standard input Page 5


From BHAT@ssl.msfc.nasa.gov Tue Apr  6 10:21:10 1993
Date:    Tue, 6 Apr 1993 12:24:31 -0500 (CDT)
From: BHAT@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s   RA    Dec
   2283    930404    9081    19544      3200    027   +03


                              NO

                  BATSE BURST TRIGGER
NO.:  2283

TIME: TJD=9081 SECONDS=19544

TYPE: BURST                       SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:        SIGMA

INTENSITY:           COUNTS/CM2

LOCATION: ZENITH=143.3  AZIMUTH=013.7  ERROR=       DEGREES

COMMENTS:
THIS IS A WEAK BURST LASTING FOR ABOUT 2.5 S. THE TIME HISTORY CONSISTS OF 2
SHARP PEAKS EACH ABOUT 0.5 S LONG AND SEPARATED BY ABOUT 2 SEC. SIGNAL IS SEEN
ABOVE 300 KEV.
```

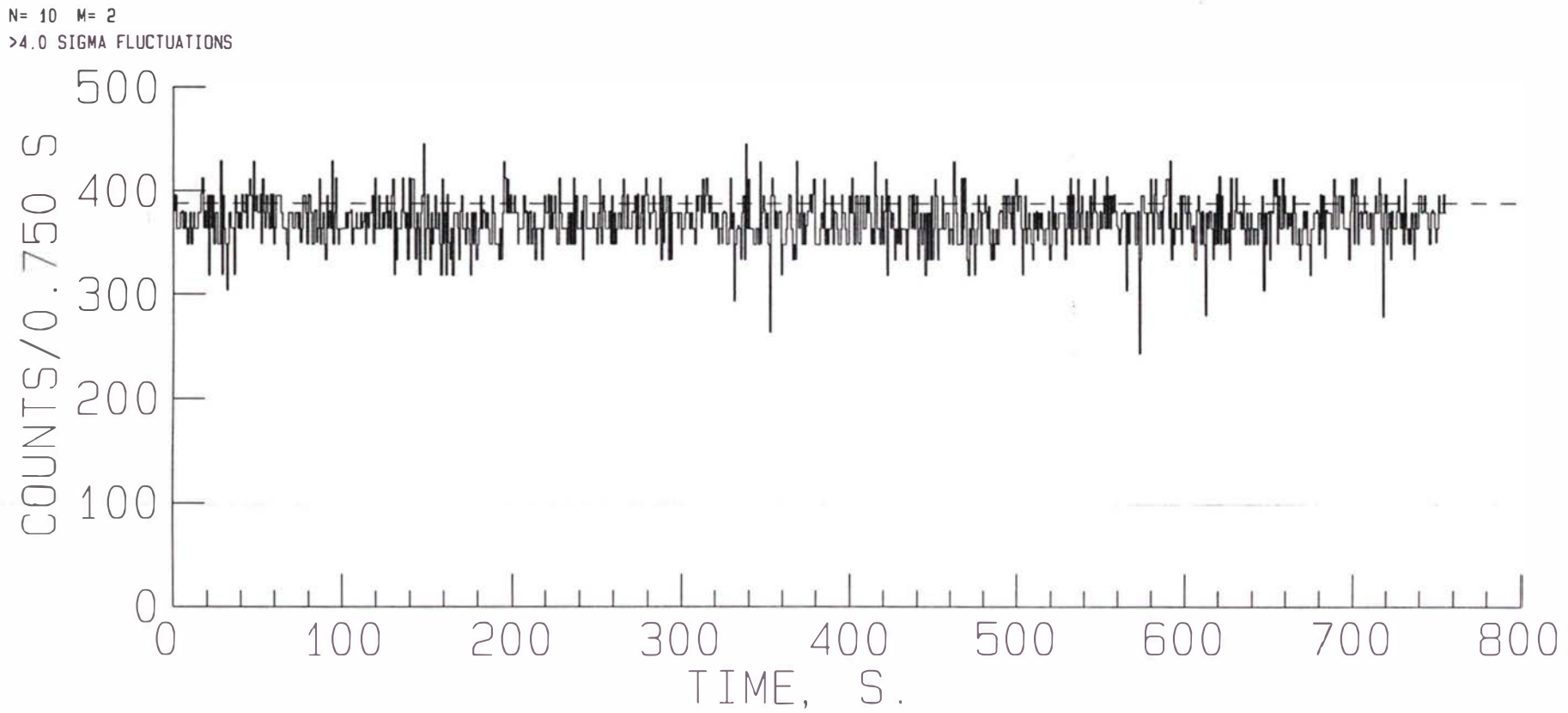
13/ 4/93

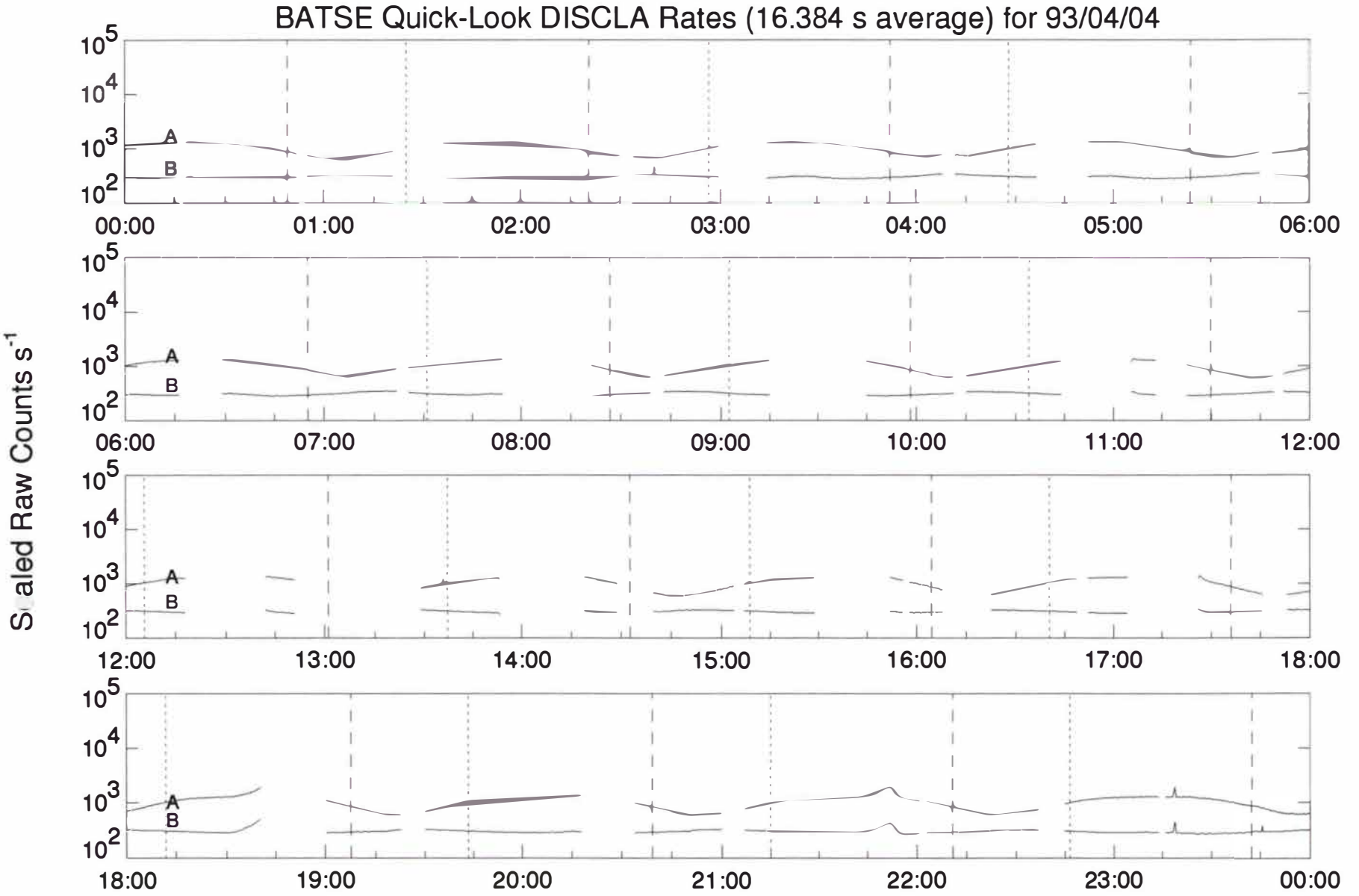
ULYSSES RT

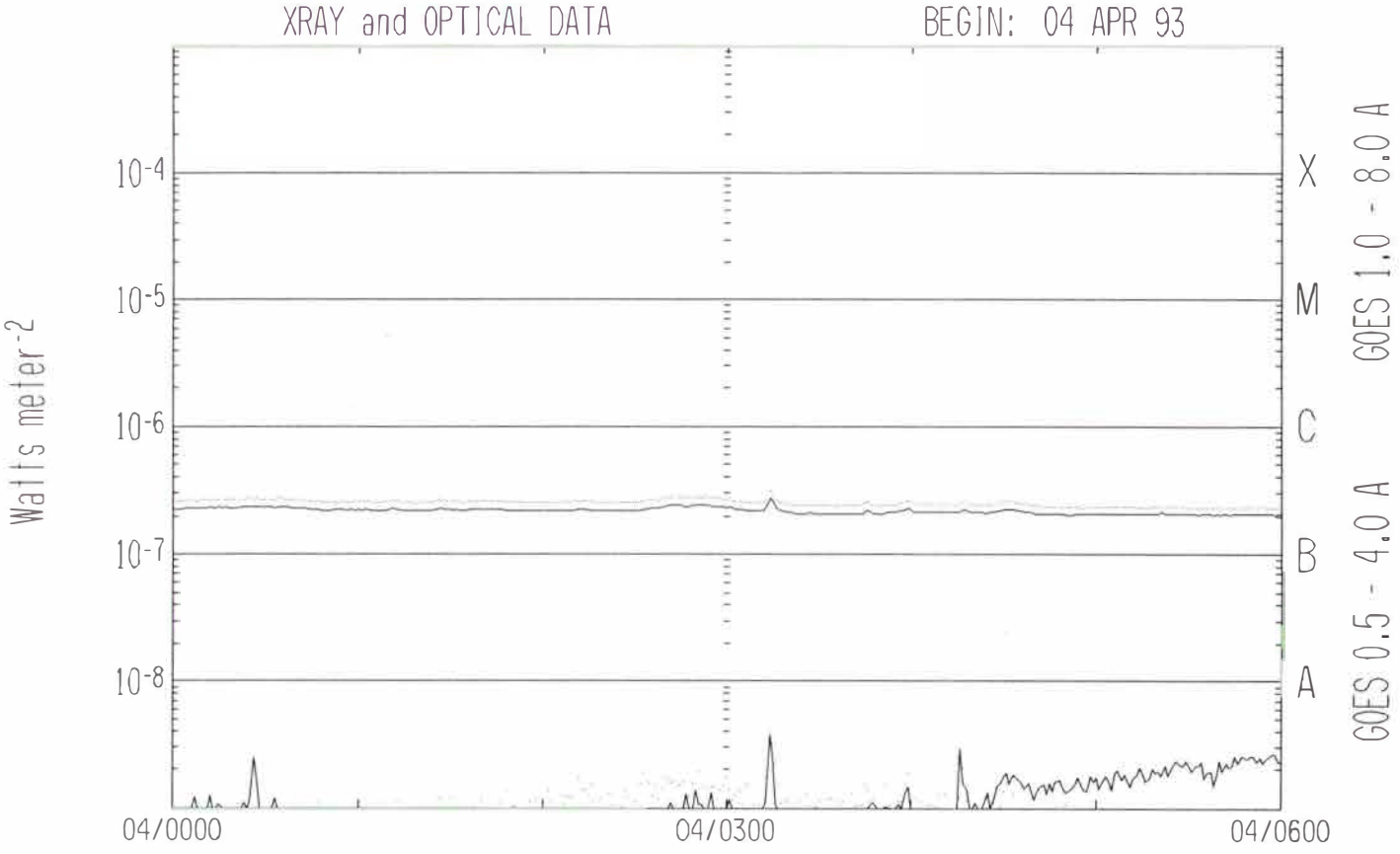
4/ 4/93 20160.129 s

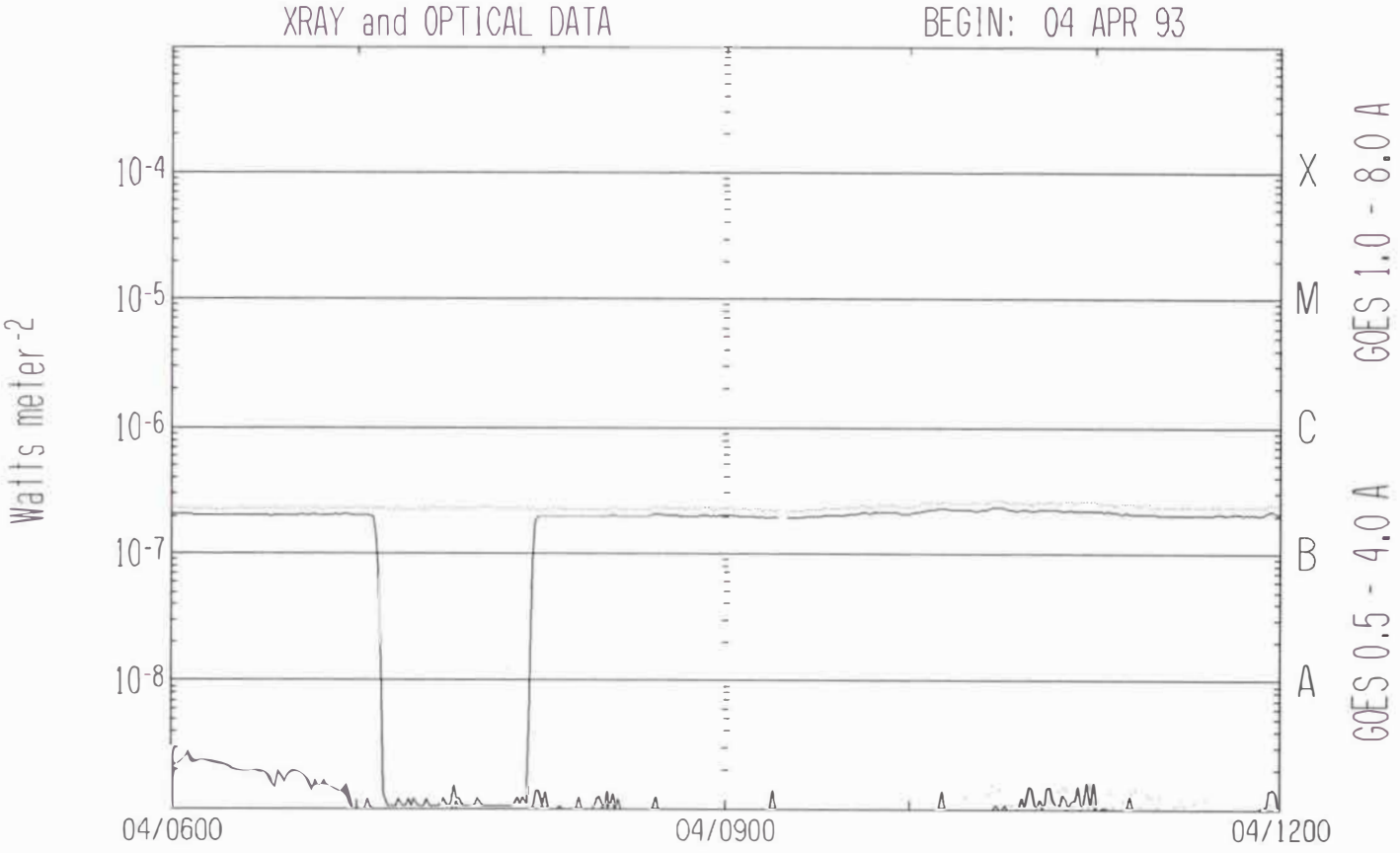
0.250 S INTERVALS REGROUPED BY 3

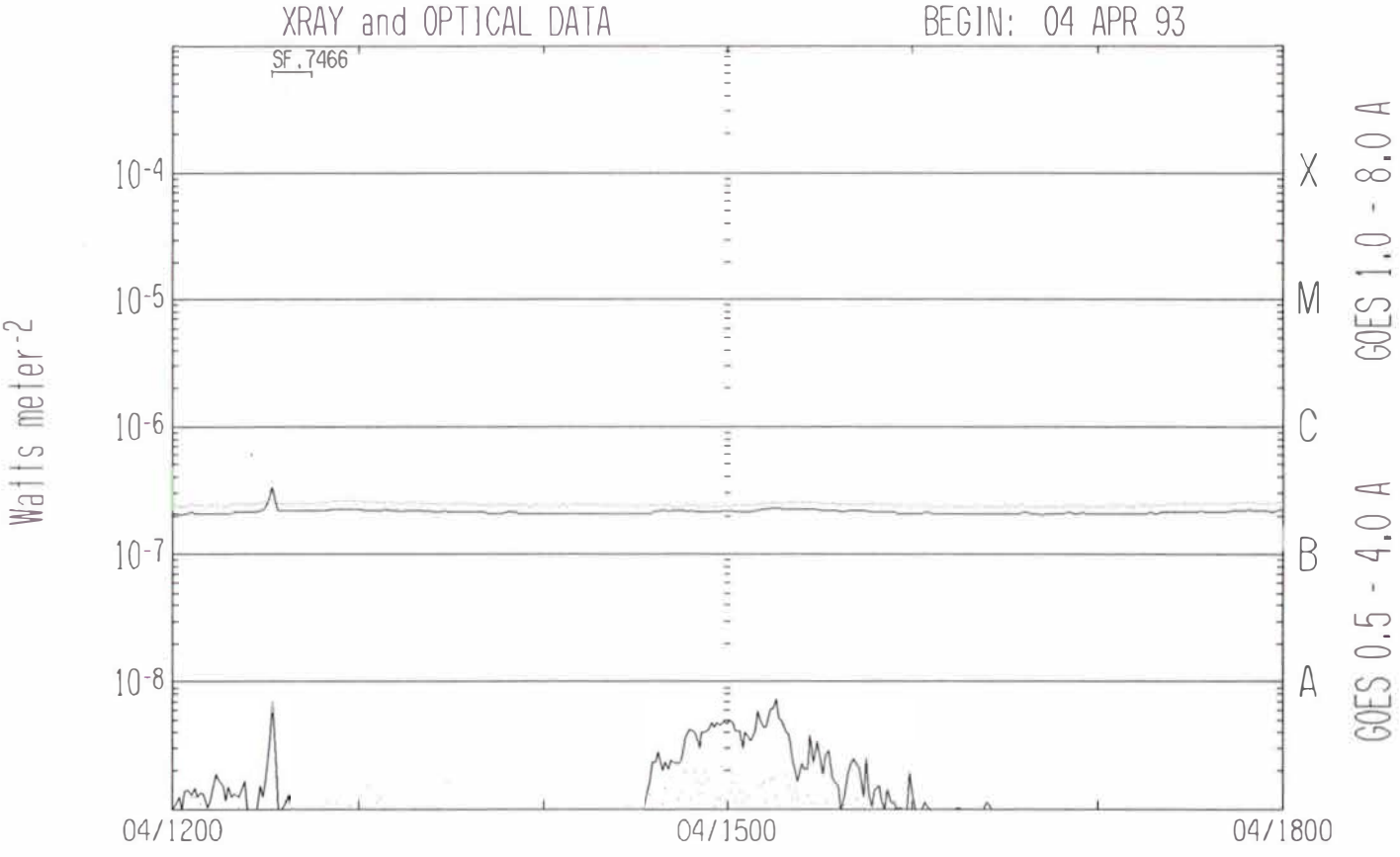
0- 0 keV

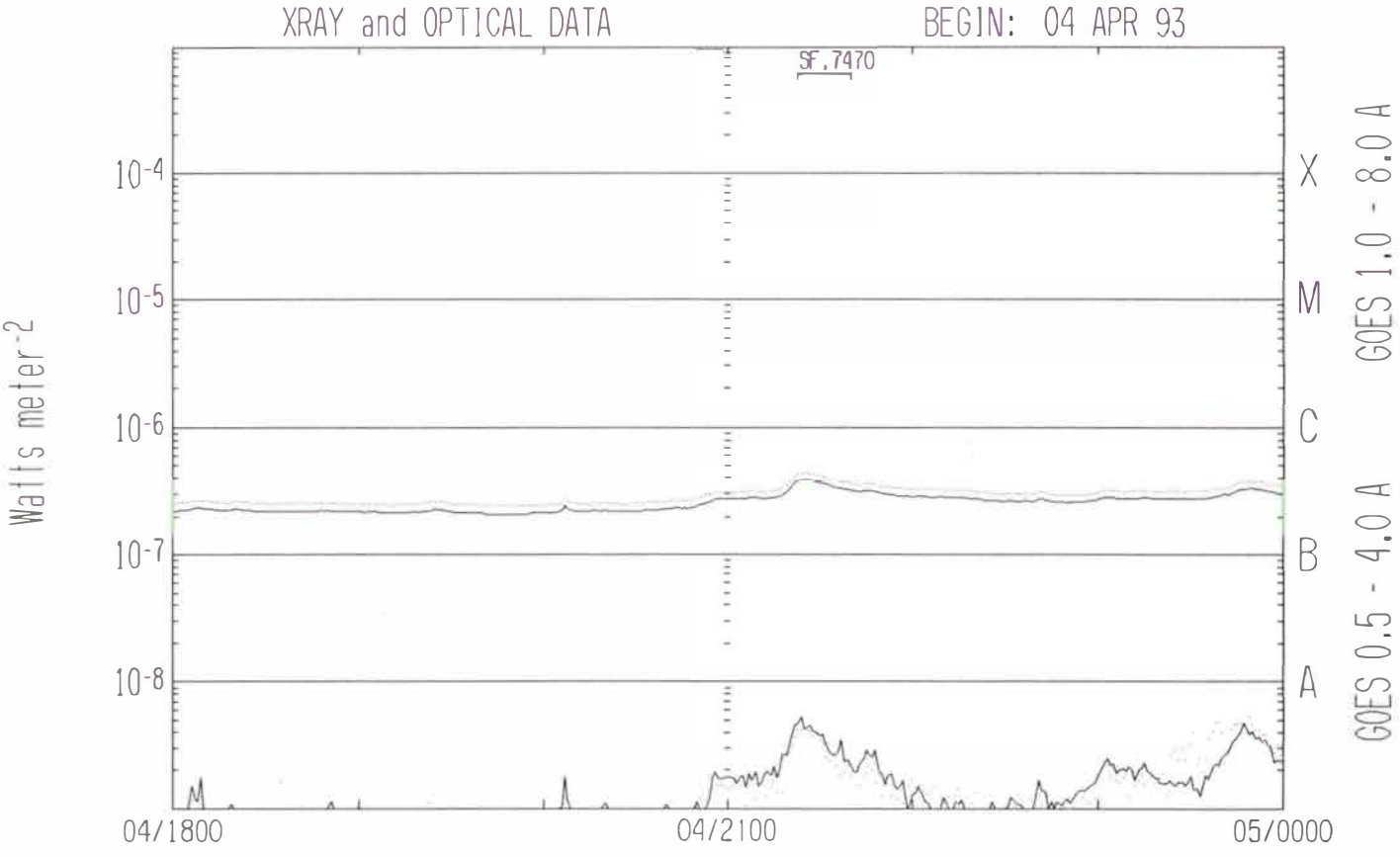



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/04
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1402 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

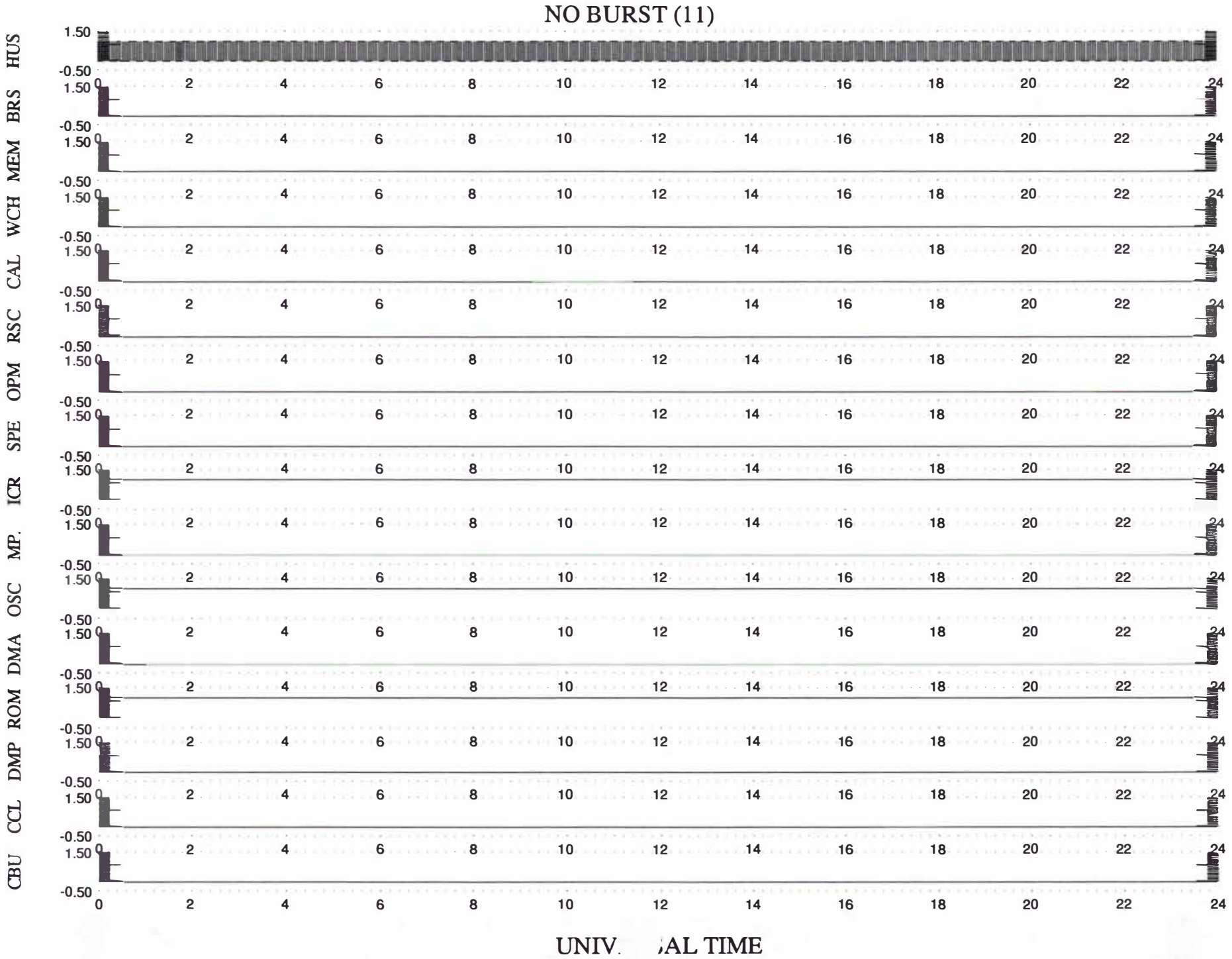

XRAY and OPTICAL DATA
BEGIN: 04 APR 93
Watts meter-2
10-4
10-5
10-6
10-7
10-8
X
M
C
B
A
GOES 1.0 - 8.0 A
GOES 0.5 - 4.0 A
04/0000
04/0300
04/0600


XRAY and OPTICAL DATA
BEGIN: 04 APR 93
Watts meter-2
10-4
10-5
10-6
10-7
10-8
X
M
C
B
A
GOES 1.0 - 8.0 A
GOES 0.5 - 4.0 A
04/0600
04/0900
04/1200


XRAY and OPTICAL DATA
BEGIN: 04 APR 93
SF.7466
Watts meter-2
10-4
10-5
10-6
10-7
10-8
X
M
C
B
A
GOES 1.0 - 8.0 A
GOES 0.5 - 4.0 A
04/1200
04/1500
04/1800

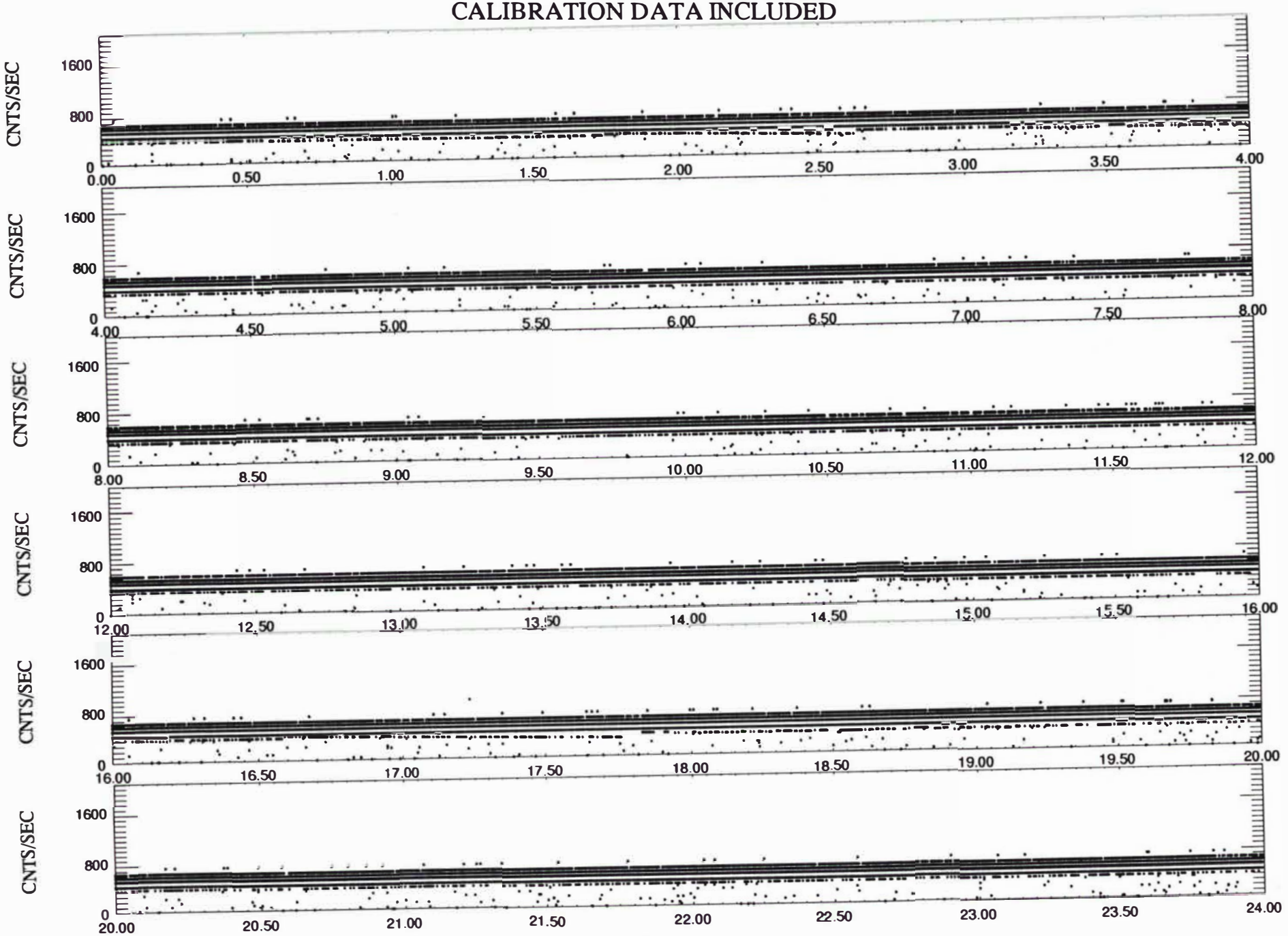

XRAY and OPTICAL DATA
BEGIN: 04 APR 93
SF,7470
Watts meter-2
10-4
10-5
10-6
10-7
10-8
X
M
C
B
A
GOES 1.0 - 8.0 A
GOES 0.5 - 4.0 A
04/1800
04/2100
05/0000

HUS MODES EDR day 94, year 1993 to day 94, year 1993 6/12/93



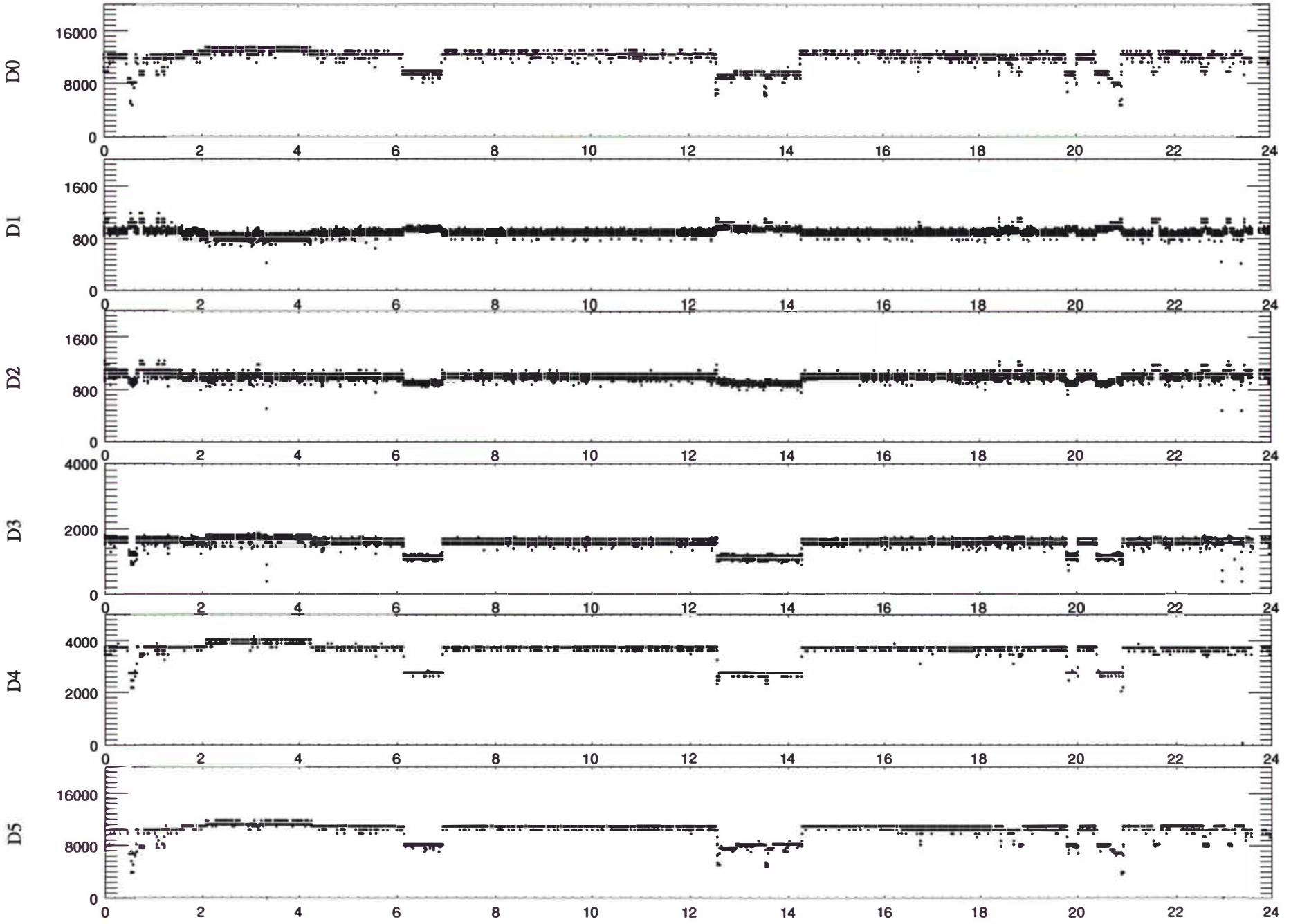
HUS 2A, MODE 1, NOT AVERAGED EDR day 94, year 1993 to day 94, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIVERSAL TIME

HUS 2B COUNTS / SEC QEDR day 94, year 1993 to day 94, year 1993 4/6/93



From KOSHUT@fender.msfc.nasa.gov Wed Apr 7 08:35:28 1993
Date: Wed, 7 Apr 1993 10:38:28 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1215

BATSE BURST TRIGGER
NO.: 02284

TIME: TJD=9082 SECONDS=16149

TYPE: PARTICL SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
PARTICLE PRECIPITATION EVENT.

From KOSHUT@fender.msfc.nasa.gov Wed Apr 7 08:39:27 1993
Date: Wed, 7 Apr 1993 10:42:42 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1215

BATSE BURST TRIGGER
NO.: 02285

TIME: TJD=9082 SECONDS=29148

TYPE: PARTICL SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
PARTICLE PRECIPITATION EVENT.

```
          ********************
          *BATSEARCH PROGRAM*
          ********************

 BATSE BURST #     2286
 EVENT OF 1993 APR  5 DAY OF YEAR= 95
 EVENT CROSSING TIME AT BATSE      : 32089. S. OR 08:54:49.0
 COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 195.000     8.000
 BATSE PEAK COUNTING RATE:  30000     C/S
 EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
 POSITION OF ULYSSES ON  5/ 4/  93 IS:
 RA=  146.213 DEC=  -13.105 DIST=     4.105 AU
 BATSE-ULYSSES DISTANCE =  614152880. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=127.15 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1237.14 SECS.
 CROSSING TIME AT ULYSSES     IS 30852. S. OR   08:34:11 +/-  314.70 SECONDS
```



```
From KOSHUT@fender.msfc.nasa.gov Wed Apr  7 09:00:01 1993
Date:    Wed, 7 Apr 1993 11:03:30 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s   RA    Dec
   2286    930405    9082    32089     30000    195    +08
```

RI

```
                  BATSE BURST TRIGGER
 NO.: 02286

 TIME: TJD=9082 SECONDS=32089

 TYPE: BURST                        SOLAR FLARE TRIGGER SIGNAL:N

 SIGNIFICANCE:        SIGMA

 INTENSITY:           COUNTS/CM2

 LOCATION: ZENITH=48      AZIMUTH=211.   ERROR=       DEGREES

 COMMENTS:
 BURST OF ~ 35 SECONDS DURATION, WITH EMISSION OBSERVED ABOVE 300 KEV.
 PEAK RATE OBSERVED AT ~ TRIGGER + 20 SECONDS.
```

Helio corr removed

Date: Dec 18 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

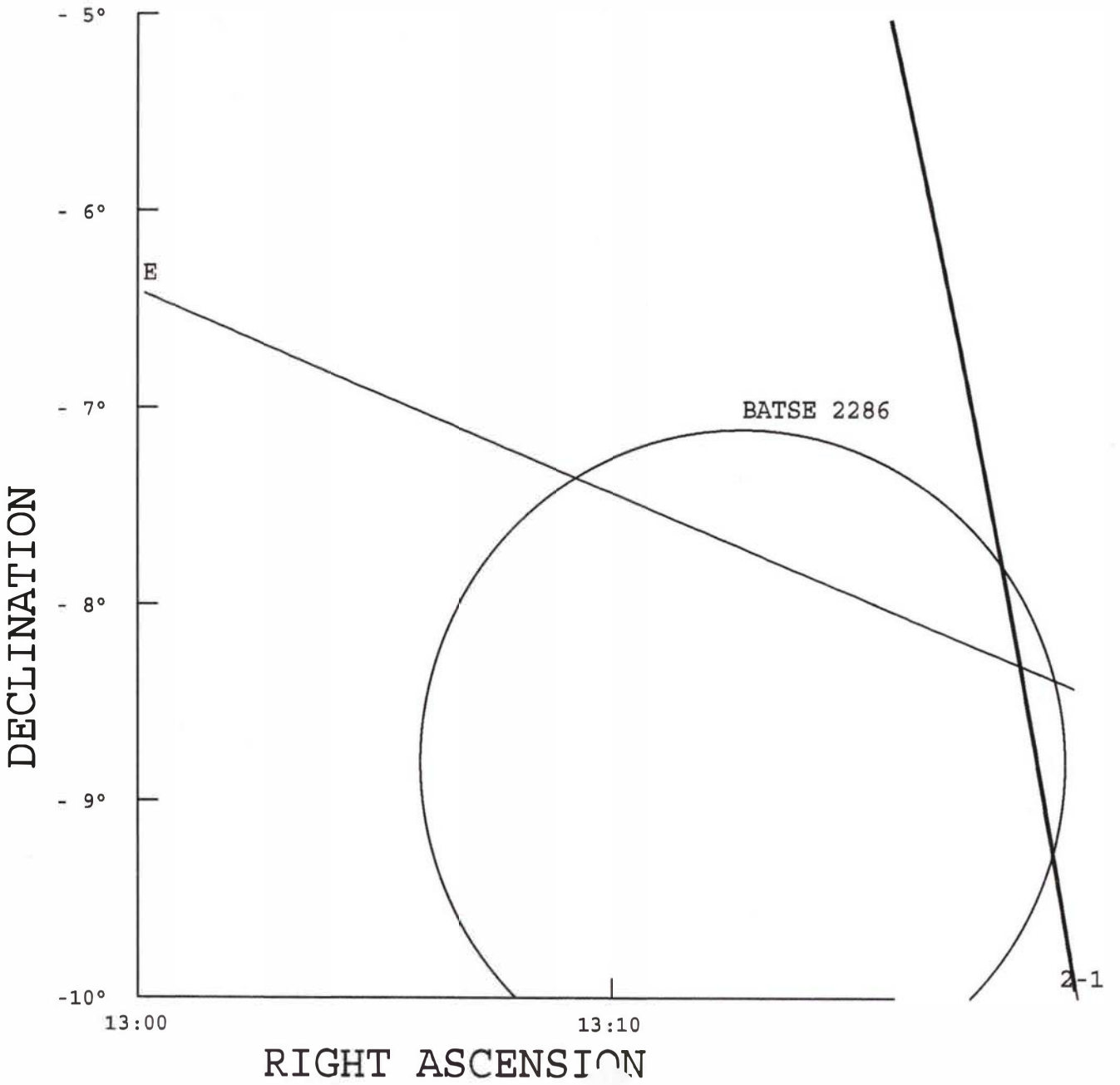
☐ Geocentric time used?

☑ ACCESS database updated?

EVENT OF APR 5, 1993 8:33

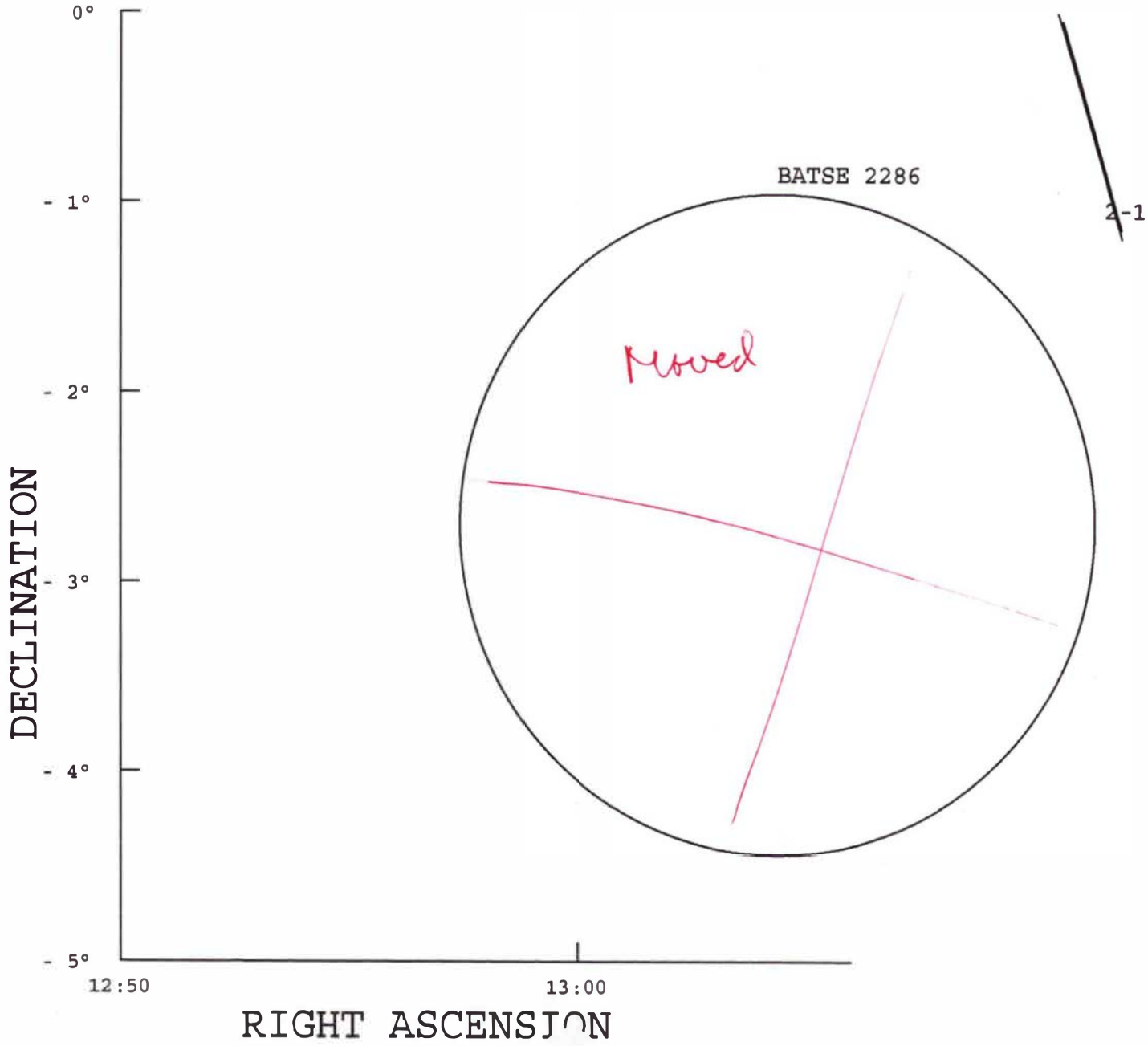
5/ 3/98

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE

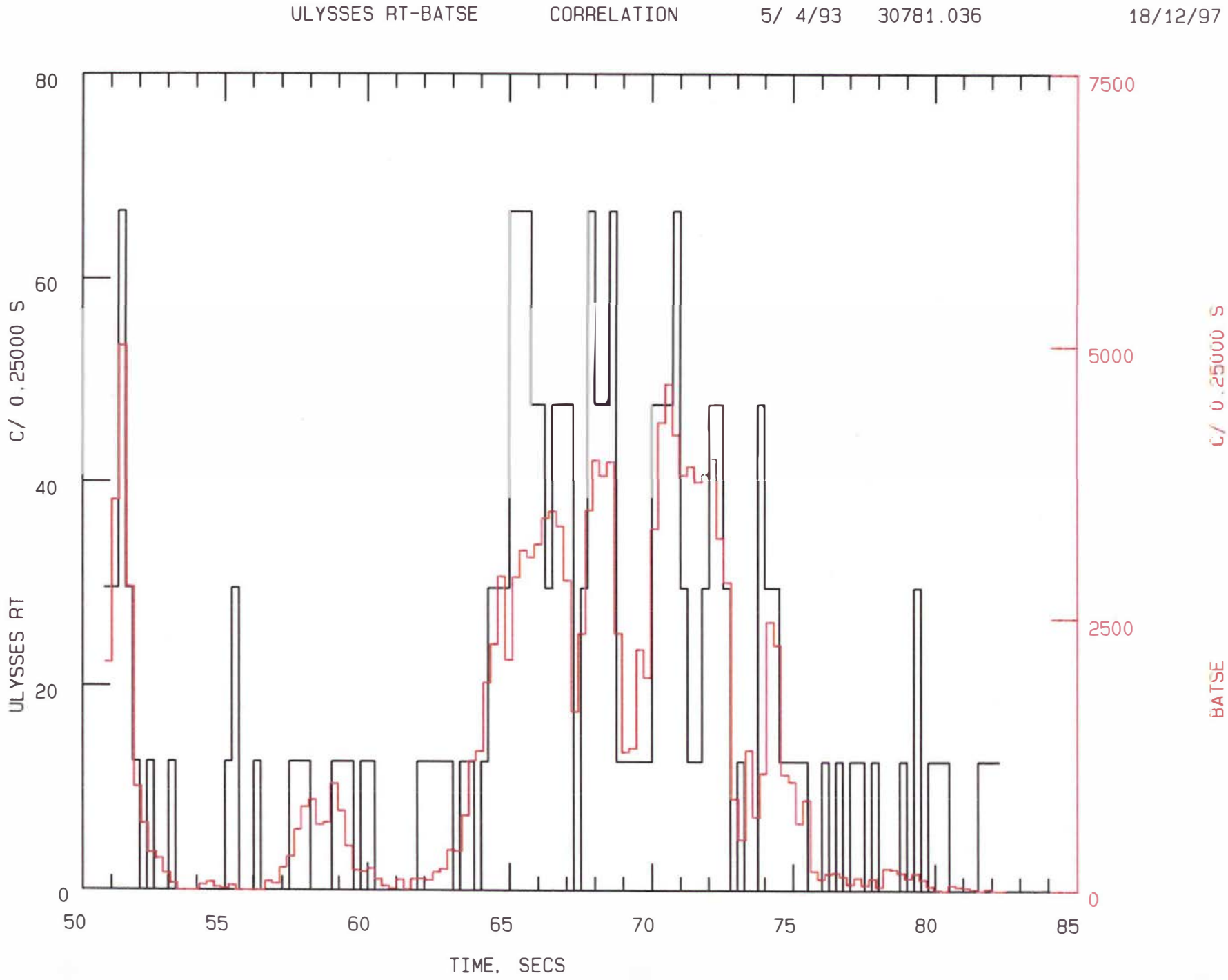


EVENT OF APR 5, 1993 8:33

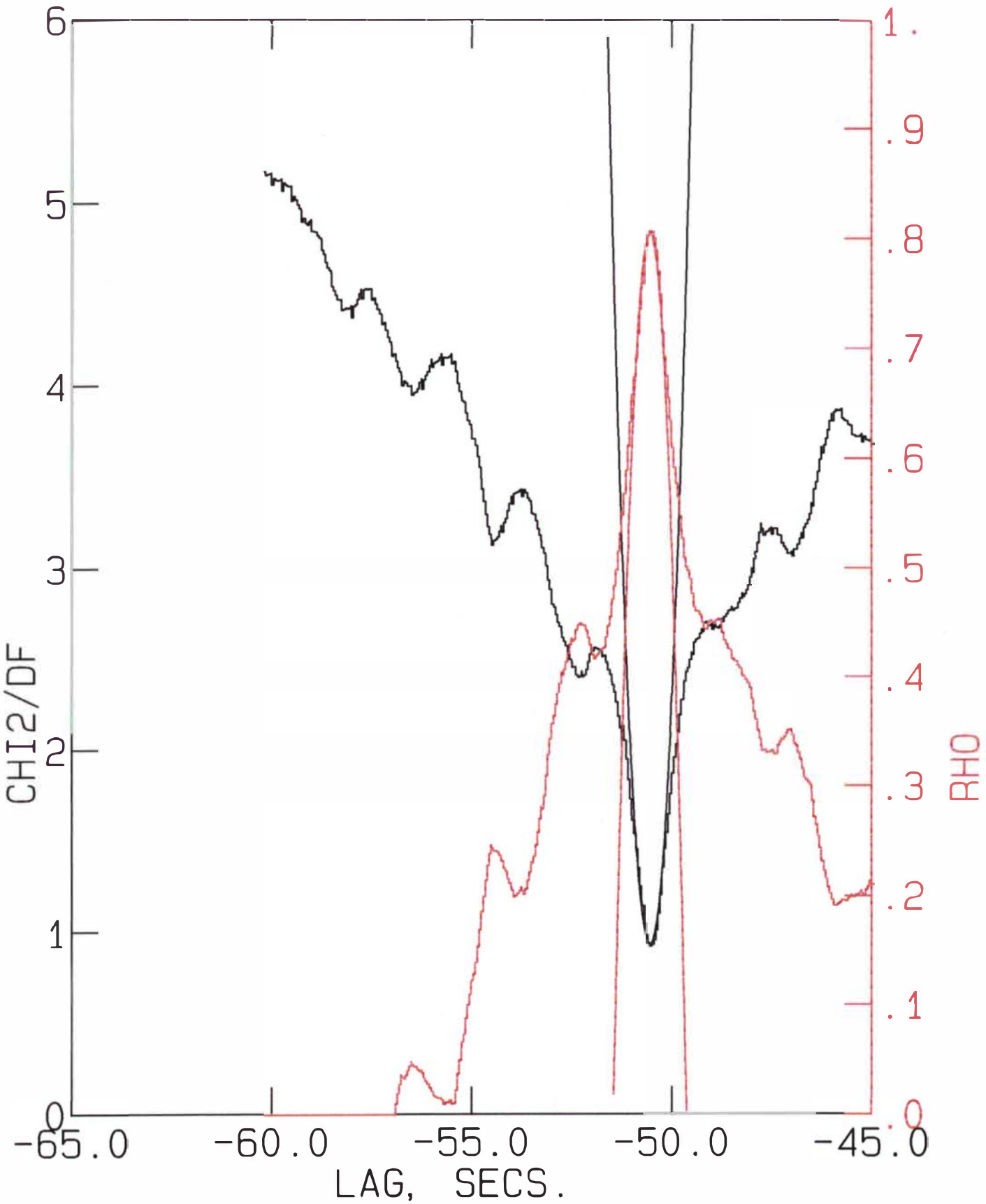
18/12/97



N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE


ULYSSES RT-BATSE CORRELATION 5/ 4/93 30781.036 18/12/97
80
60
40
20
0
C/ 0.25000 S
ULYSSES RT
7500
5000
2500
0
C/ 0.25000 S
BATSE
50
55
60
65
70
75
80
85
TIME, SECS

ULYSSES RT-BATSE CORRELATION 5/ 4/93 30781.036



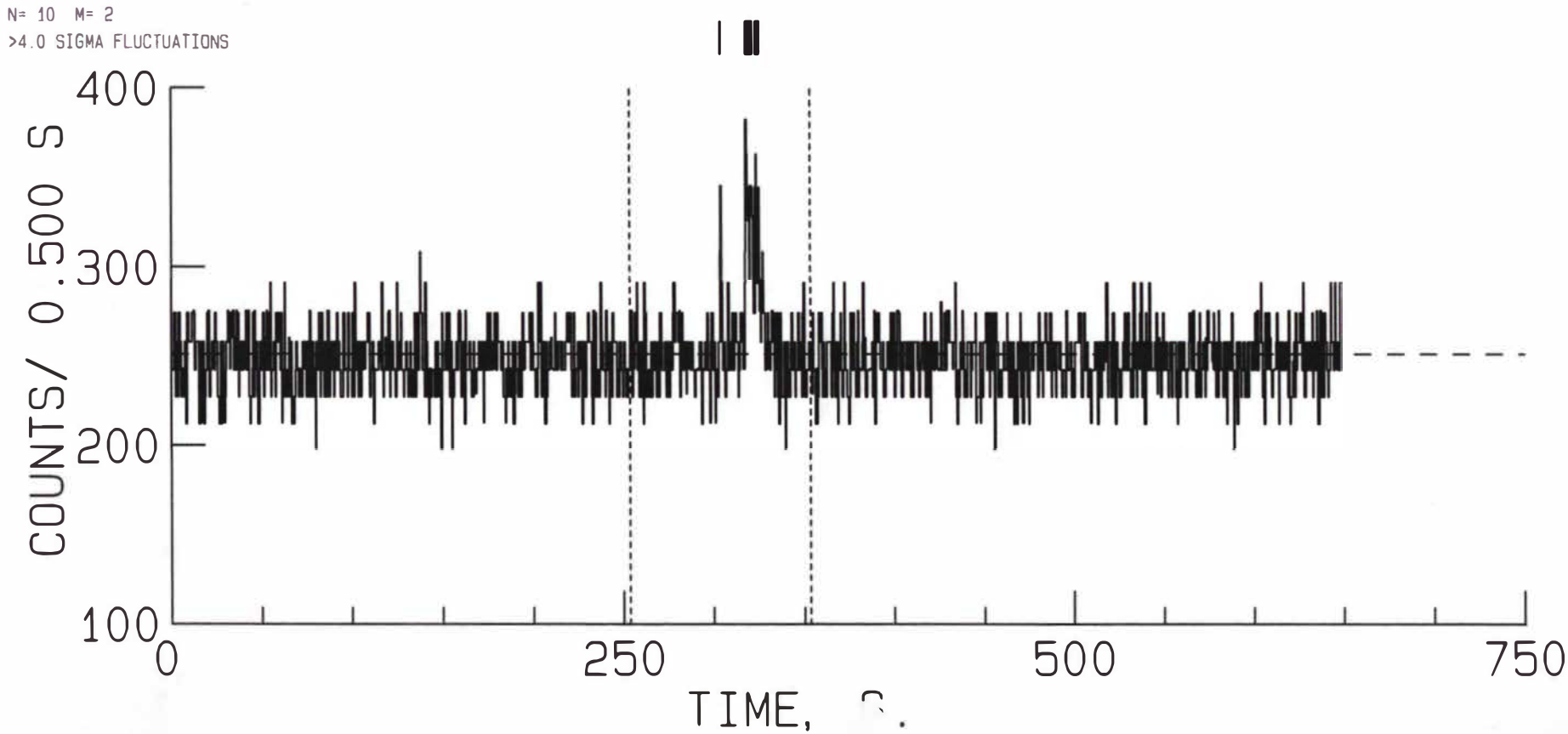
ULYSSES RT

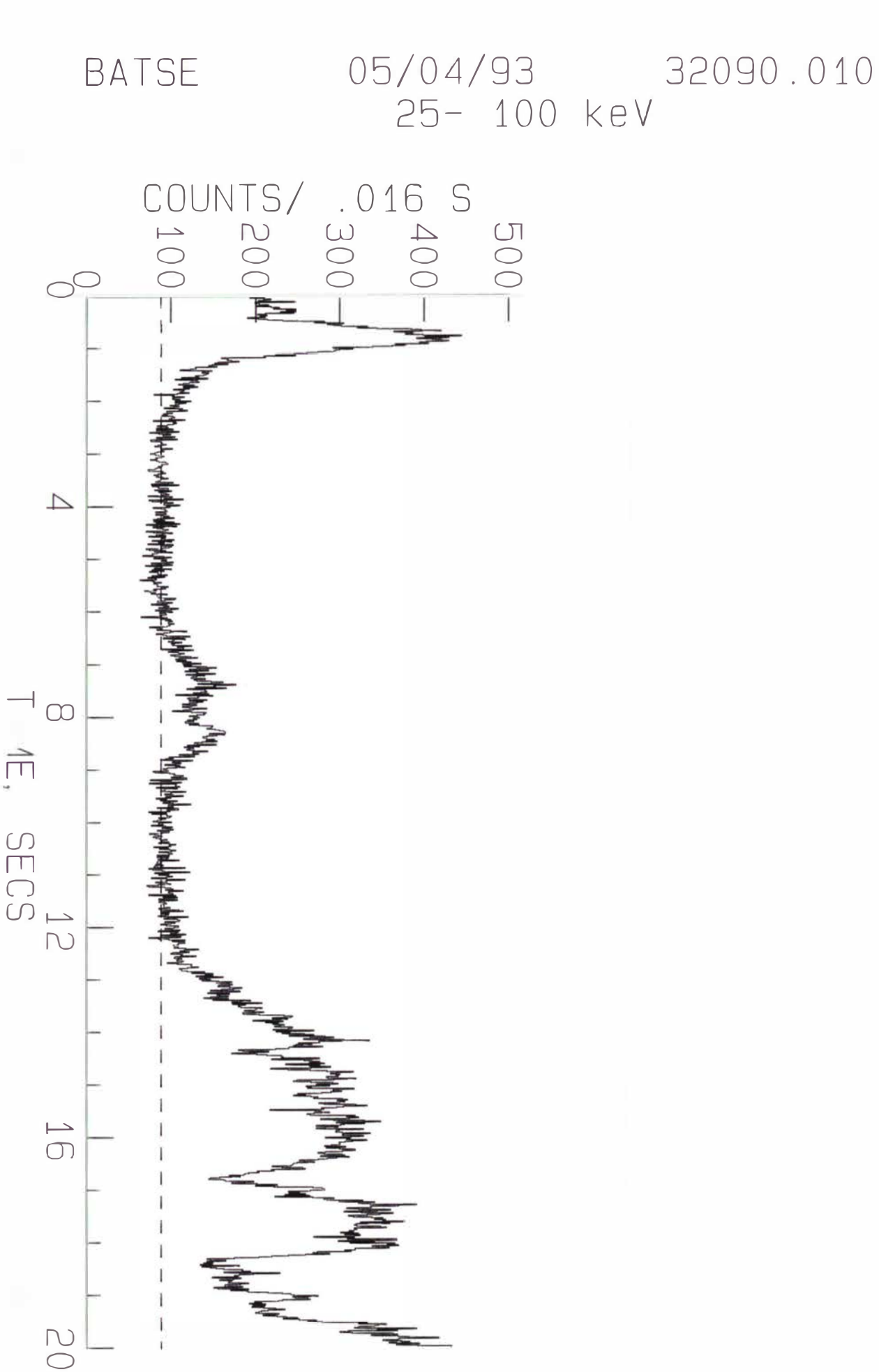
18/12/97

5/ 4/93 30528.138 s

0.250 S INTERVALS REGROUPED BY 2

21- 145 keV

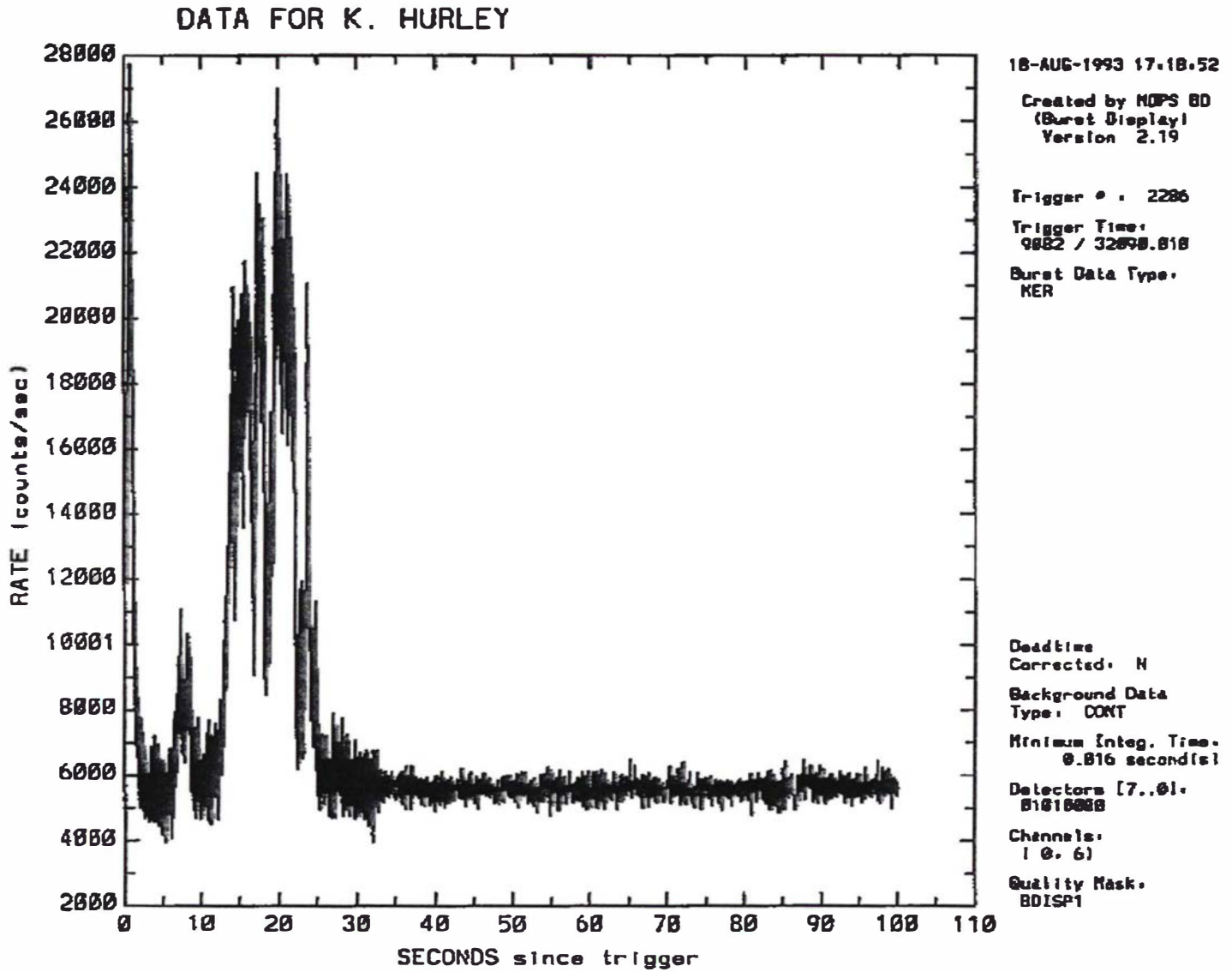



BATSE 05/04/93 32090.010
25- 100 keV
COUNTS/ .016 S
0
100
200
300
400
500
0
4
8
12
16
20
T 4E, SECS

BATSE 05/04/93 32090.010

25- 100 keV

4/ 9/93


DATA FOR K. HURLEY
RATE (counts/sec)
28000
26000
24000
22000
20000
18000
16000
14000
12000
10001
8000
6000
4000
2000
0
10
20
30
40
50
60
70
80
90
100
110
SECONDS since trigger
18-AUG-1993 17:18:52
Created by MDPS BD
(Burst Display)
Version 2.19
Trigger # : 2286
Trigger Time:
9882 / 32898.818
Burst Data Type:
MER
Deadtime
Corrected: N
Background Data
Type: CONT
Minimum Integ. Time:
0.816 second(s)
Detectors [7..0]:
Channels:
(0, 6)
Quality Mask:
BDISP1

Added to MBL
12 Feb

From root Fri Feb 11 11:04 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA04796; Fri, 11 Feb 94 11:04:56
Received: from SSTDP2.LANL.GOV by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
id AA08305; Fri, 11 Feb 1994 10:08:42 +0800
Date: Fri, 11 Feb 1994 11:10:15 -0700 (MST)
From: 046369@SSTDP2.LANL.GOV
To: KHURLEY@space6.ssl.berkeley.edu
Message-Id: <940211111015.23c0a354@SSTDP2.LANL.GOV>
Subject: DMSP OBSERVATIONS OF GRB
Content-Length: 2047
Status: R

FROM: SMTP%"TERRELL@ESSDP2.LANL.GOV" (ESSDP2::TERRELL) (JAMES TERRELL 94/02/11)
TO: SMTP%"KHURLEY@SPACE6.SSL.BERKELEY.EDU" (KEVIN HURLEY)
CC:
SUBJ: DMSP OBSERVATIONS OF GRB

Kevin:
Here are some corrections, additions, or questions re your list of GRB as sent to me on 940106:

DATE	UT	COMMENTS---
920110	33478	DMSP SHOULD BE NA (NOT APPARENT), NOT NO (I.E., OMIT "NO") What is the difference?
920125	33247	DMSP ND (NO DATA, N/O IN YOUR NOTATION) ✓
920315	17694	ULYSSES TIME, BUT GRO DETECTED A GRB AT 15569!? NO RECORD YET
920414	84166	(PVO TIME) GRO DETECTED A GRB AT 84163!? NO RECORD YET
920714	47069	DMSP SHOULD BE NA, NOT NO (I.E., OMIT "NO") What is the difference?
920726	2066	ULYSSES TIME, BUT ULYSSES IS "NO"!? DMSP10,11 @0165 (SOFT) ✓
920727	43347	ULYSSES TIME, BUT BATSE SAW IT!? (WHEN?) ✓
921004	49107	ULYSSES TIME, BUT EURECA SAW IT!? (WHEN?) ✓
930106	56259	DMSP YES (NOT AT 55260) ✓
930201	60115	DMSP8 YES (PEAKS AT 60129.0,60211.0,60281.0 UT) ✓
930318	44993	ULYSSES TIME, BUT BATSE AND EURECA SAW IT! (WHEN?) ✓
930405	32089	DMSP YES (8,10,11 AT 32105 AND 32110) ✓
930410	51547	DMSP NO ✓
930506	53571	DMSP8 YES AT 53577,10ND,11YES AT 53580 ✓
930506	57060	(ULYSSES TIME) DMSP8 YES AT 57669,10NO,11YES AT 57670,57688,57704 ✓
930510	41935	(ULYSSES TIME) NOT APPARENT IN FULL DMSP DATA ✓
930511	892	(ULYSSES TIME) NOT APPARENT IN FULL DMSP DATA ✓
930612	2657	DMSP10 YES AT 2662 (8SAA, 11NA) ✓
930825	31643	(ULYSSES TIME) 8NA,10NA,11? (SOFT PEAK ~33500) ✓
930922	12830	(ULYSSES TIME) NOT APPARENT IN DMSP DATA (DMSP11 GLITCH?) ✓
930922	23086	ULYSSES TIME, BUT BATSE SAW IT! (WHEN?) (DMSP8NA,11NA,10~23000?) ✓
930925	73995	(ULYSSES TIME) DMSP NA (NOT APPARENT) ✓
931006	18653	(ULYSSES TIME, 18062?CORR) DMSP NA ✓
931006	69587	(ULYSSES TIME, 68961?CORR) DMSP NA ✓
931006	77510	ULYSSES TIME, BUT BATSE YES! (WHEN?) (DMSP NA) ✓
931007	72864	(ULYSSES TIME, 72239?CORR) DMSP NA ✓
921011	45034	(ULYSSES TIME, 45200?CORR) DMSP NA ✓

I would appreciate any clarifications or comments, and especially more event times to check against DMSP data. We now have data processed thru 931118. --Jim

920622	25504	8SA 10NR 11SA
920627	46956	NA
920711	53140	YES--58157
920718	77563	8NA 10SA 11NA
920720	11524	8NA/OBSC 10NA/OBSC 11SR
920824	39183	YES--39186
920902	1736	YES--1743
921009	24070	YES--24073
921022	55259	8ND 10NA 11NA
921123	22711	YES--22727
921123	46583	YES--46542
921207	57647	YES--57649
921209	41738	8NR 10NA 11NR
930106	56259	YES--56260
930110	6698	8NA 10NR 11NA
930120	84700	YES--84779
930131	68231	YES--68231
930201	60115	YES--60129
930309	11269	NA
930329	11365	8NA 10SR 11NA
930405	32089	YES--32105
930406	26185	8NA 10NR 11NA
930428	04032	8NA 10NA 11SR
930506	53571	YES--53578
930506	65631	NA

From root Thu Feb 3 13:55 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA00852; Thu, 3 Feb 94 13:55:12
Received: from SSTDP2.LANL.GOV by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
id AA13978; Thu, 3 Feb 1994 12:59:12 +0800
Date: Thu, 3 Feb 1994 14:00:37 -0700 (MST)
From: 046369@SSTDP2.LANL.GOV
To: KHURLEY@space6.ssl.berkeley.edu
Message-Id: <940203140037.23c05074@SSTDP2.LANL.GOV>
Subject: DMSP OBSERVATIONS OF GRO GRB
Content-Length: 2739
Status: R

FROM: SMTP%"TERRELL@ESSDP2.LANL.GOV" (ESSDP2::TERRELL) (JAMES TERRELL 94/02/03)
TO: SSL::KOUVELIOTOU AND GIBSON::COLE (CHRYSSA KOUVELIOTOU AND STAYCE COLE)
CC: SMTP%"KHURLEY@SPACE6.SSL.BERKELEY.EDU" (KEVIN HURLEY)
SUBJ: DMSP OBSERVATIONS OF GRO GRB

Chryssa and Stayce:
Thanks very much for the listing of strong Batse bursts sent to me 11/1/93.
I have now managed to check all of them against DMSP data, and find that
many of them were also detected by DMSP8,9,10, or 11. Probably the higher percent
of detections in recent data is due to more extraction of full data. In many
cases such added effort would not be necessary if source direction
(and consequent obscuration of some DMSP satellites) were known to me.
I would appreciate data on more strong events. Here is the present list:

NOTES:
NA: Not apparent in 20-second averaged data (extracting the 2-sec data is
a more time-consuming task, not undertaken in every case).
NA?: Some slight indication of a peak in 20-second averaged data.
SA: South Atlantic Anomaly, obscuring data with high background rates.
SR: South Radiation Belt background.
NR: North Radiation Belt background.
ND: No data for this time.
YES: Burst definitely detected by one or more DMSP satellites (8,9,10,11).
NO: No evidence of a peak in 2-sec data. (NO/OBSC: Obscured by Earth)

DATE	UT	DMSP
910421	33245	8NO 9SR 10NR
910627	16159	8NA 9NR 10ND
910629	71750	8NA 9SR 10NA
910703	18225	8NA 9NA? 10SR
910717	16386	8NA 9SA 10SR
910718	76051	8NA 9SA 10SA
910802	2718	ND
910814	69275	ND
911024	76208	ND
911104	54283	YES--54286 PEAK
911109	12459	8NO 9NR 10NO
911118	68260	ND
911119	23343	YES--23342
911126	46129	8SR 9SR 10NO
911127	15730	YES--15739
911202	73731	YES--73733
911209	66959	8SR 9SR 10NR 11ND
920226	29730	8SA 9NA? 10SA 11SA
920229	69769	8SR 9ND 10NA 11NA
920311	8246	YES--8431
920315	15569	8NA 9NR 10NA 11NA
920325	62258	YES--62256
920404	47506	8NA 10NA? 11NR
920406	9855	8NO/OBSC 10SR 11SR/OBSC
920414	84163	NA
920517	11877	YES--11883
920525	12423	YES--12427

```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2287
EVENT OF 1993 APR  5 DAY OF YEAR= 95
EVENT CROSSING TIME AT BATSE      : 50390. S. OR 13:59:50.0
COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 201.000     5.000
BATSE PEAK COUNTING RATE:    6500     C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
POSITION OF ULYSSES ON  5/ 4/  93 IS:
RA=  146.213 DEC=  -13.105 DIST=     4.105 AU
BATSE-ULYSSES DISTANCE =  614152880. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=122.66 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1105.63 SECS.
CROSSING TIME AT ULYSSES     IS 49284. S. OR   13:41:24 +/-  332.63 SECONDS




Apr  7 15:38 1993  standard input Page 1


From KOSHUT@fender.msfc.nasa.gov Wed Apr  7 08:57:34 1993
Date:    Wed, 7 Apr 1993 11:01:03 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s   RA    Dec
   2287    930405    9082    50390      6500    201    +05
```

No

```
                BATSE BURST TRIGGER
NO.: 02287

TIME: TJD=9082 SECONDS=50390

TYPE: BURST                      SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:        SIGMA

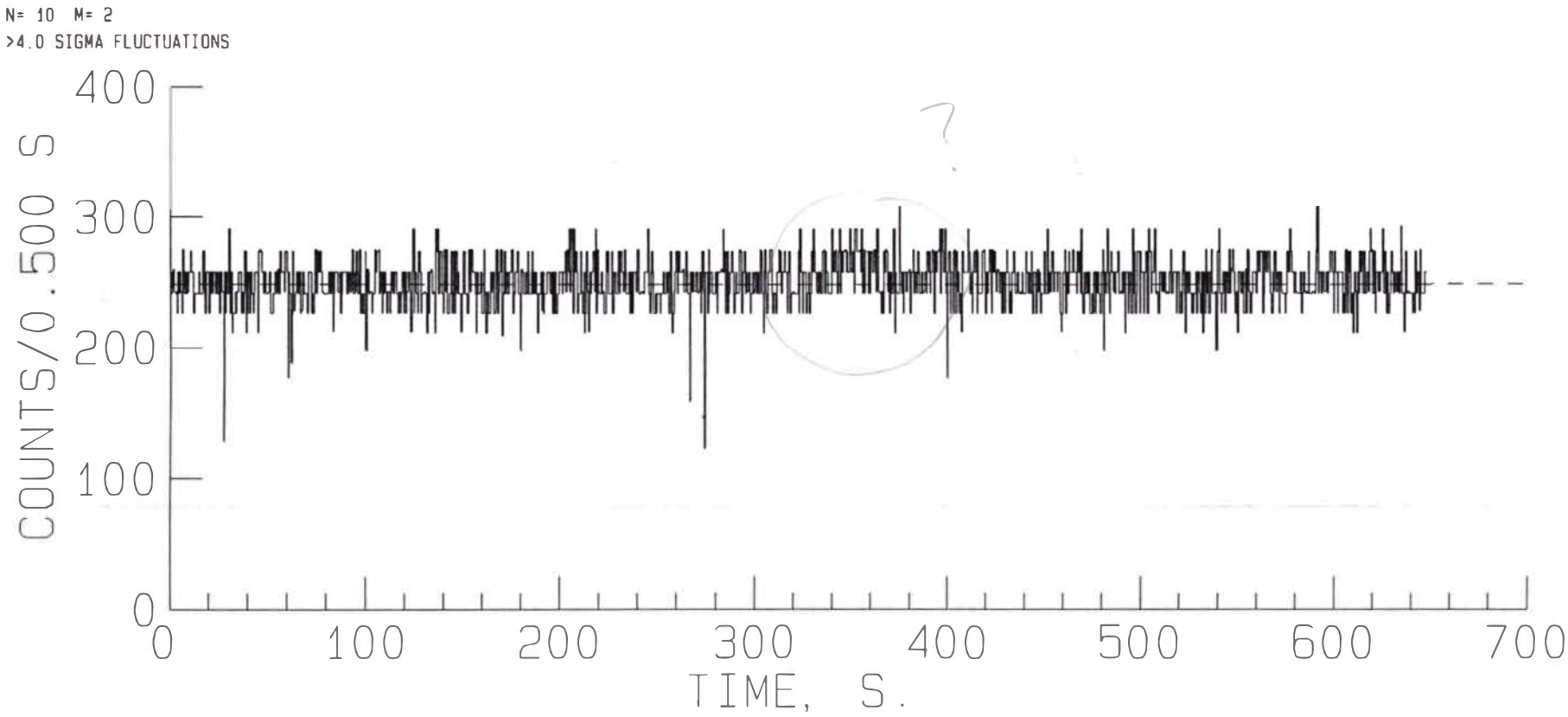
INTENSITY:           COUNTS/CM2

LOCATION: ZENITH=45.     AZIMUTH=203.    ERROR=       DEGREES

COMMENTS:
BURST OF ~ 600 SECONDS DURATION, OBSERVED ABOVE 300 KEV.  BACKGROUND
SUBTRACTED PEAK RATE OF ~ 7000 C/S OBSERVED AT ~ TRIGGER + 20 SECONDS.
```

13/ 4/93

ULYSSES RT
5/ 4/93 48960.176 s
0.250 S INTERVALS REGROUPED BY 2
0- 0 keV



```
          ******************
          *BATSEARCH PROGRAM*
          ******************

BATSE BURST #     2288
EVENT OF 1993 APR  5 DAY OF YEAR= 95
EVENT CROSSING TIME AT BATSE      : 76223. S. OR 21:10:23.0
COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 216.000   47.000
BATSE PEAK COUNTING RATE:   3500    C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
POSITION OF ULYSSES ON  5/ 4/  93 IS:
RA=  146.213 DEC=  -13.105 DIST=     4.105 AU
BATSE-ULYSSES DISTANCE =  614152880. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 93.65 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -130.44 SECS.
CROSSING TIME AT ULYSSES     IS 76093. S. OR   21:08:12 +/-  402.97 SECONDS
```



```
From KOSHUT@fender.msfc.nasa.gov Wed Apr  7 08:58:45 1993
Date:    Wed, 7 Apr 1993 11:02:14 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec    Max ct/s   RA   Dec
   2288   930405    9082   76223      3500   216   +47
```

NO

```
                BATSE BURST TRIGGER
NO.: 02288

TIME: TJD=9082 SECONDS=76223

TYPE: BURST                        SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:       SIGMA

INTENSITY:          COUNTS/CM2

LOCATION: ZENITH=87      AZIMUTH=191     ERROR=       DEGREES

COMMENTS:
WEAK BURST OF ~ 0.5 SECONDS DURATION, NO EMISSION OBSERVED ABOVE 300 KEV.
```

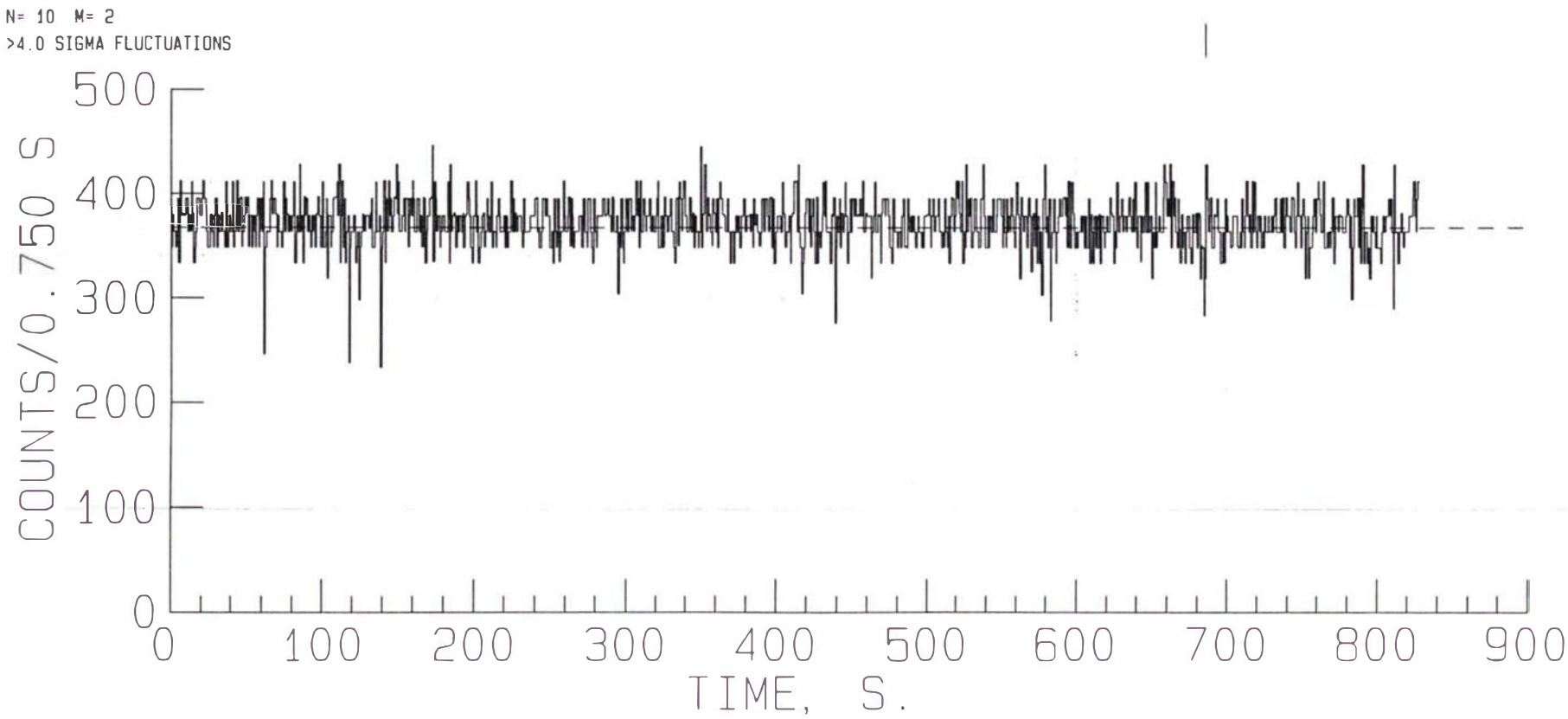
13/ 4/93

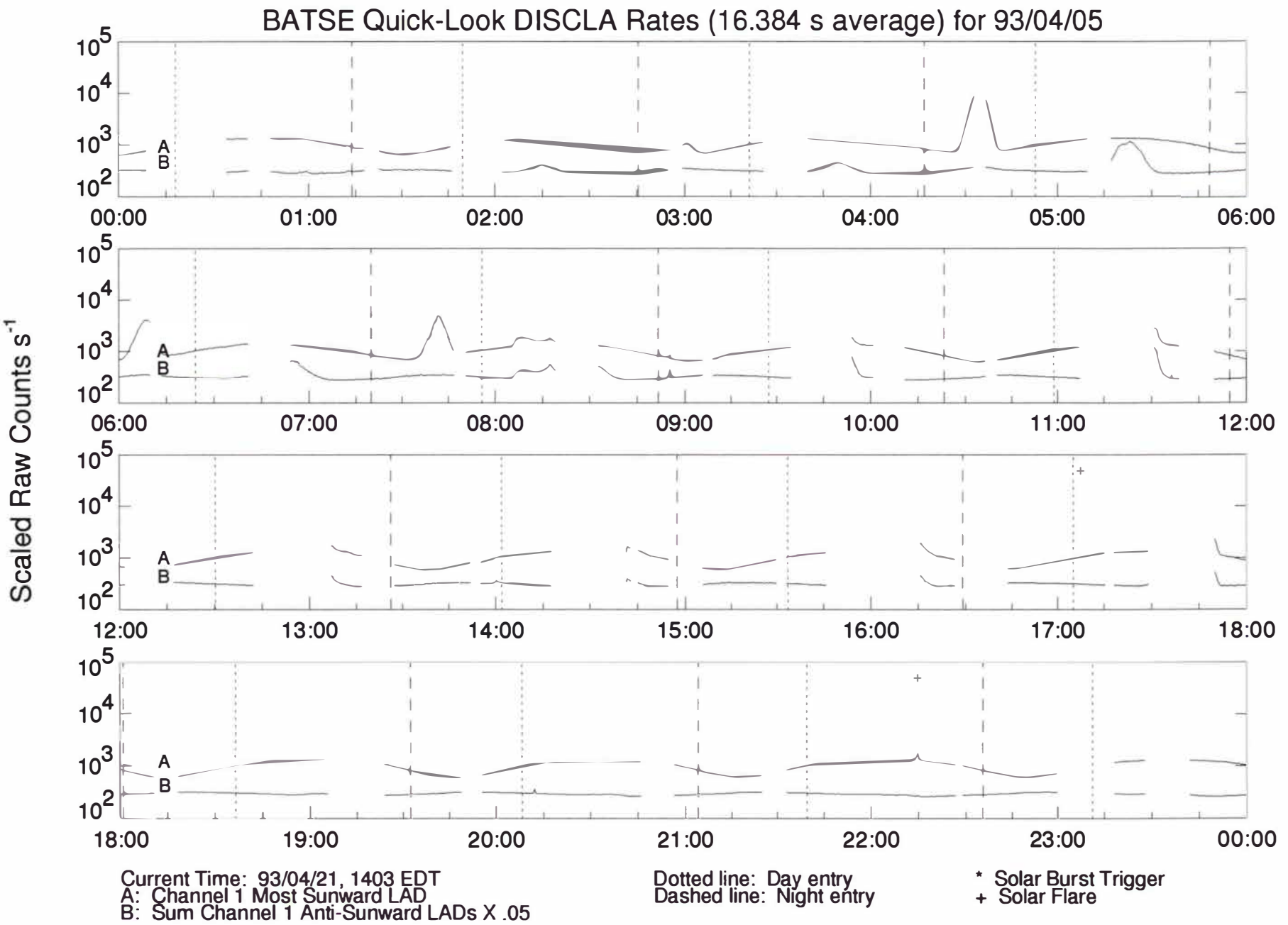
ULYSSES RT

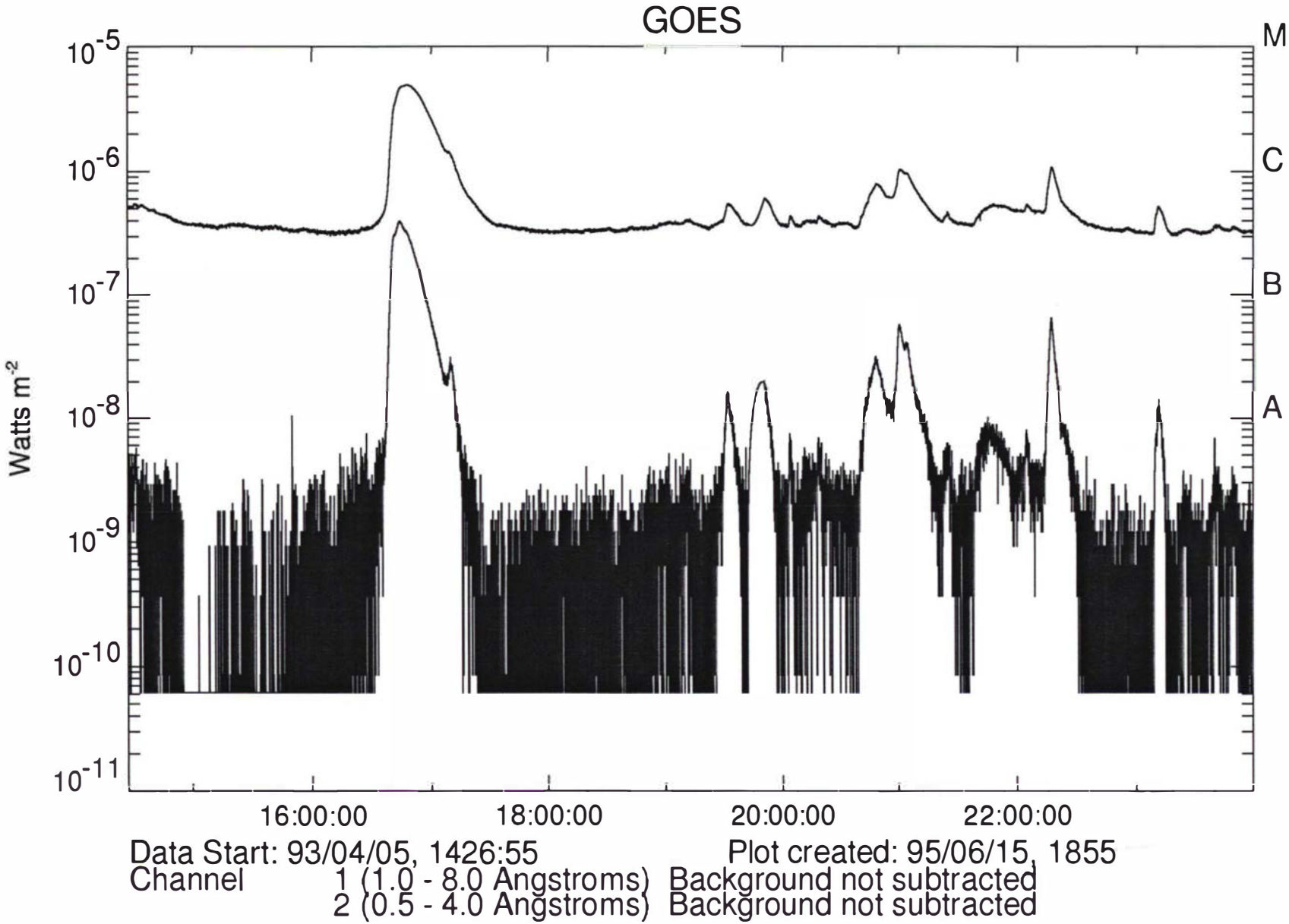
5/ 4/93 75672.094 s

0.250 S INTERVALS REGROUPED BY 3

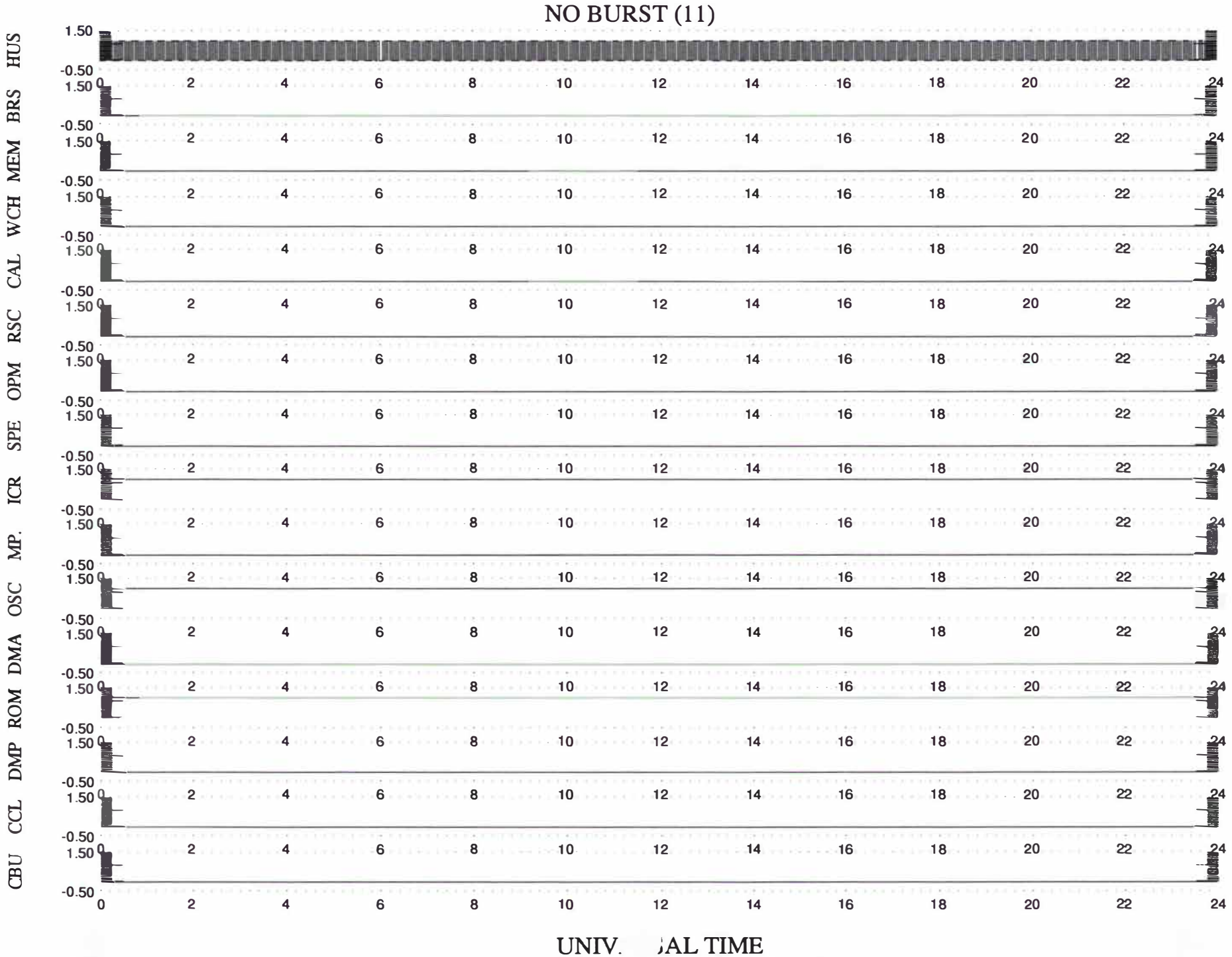
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/05
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1403 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

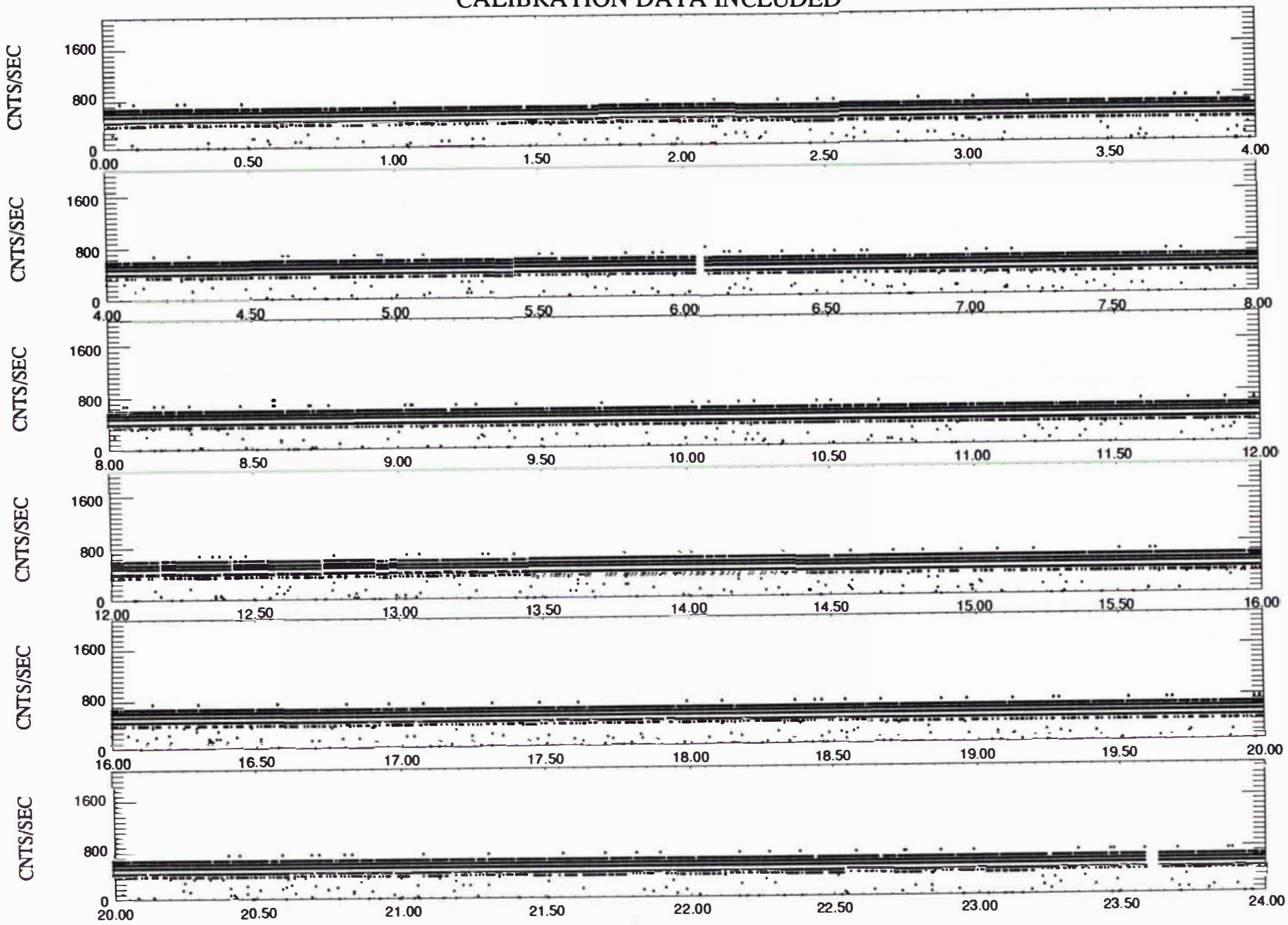

GOES
M
C
B
A
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
16:00:00
18:00:00
20:00:00
22:00:00
Data Start: 93/04/05, 1426:55
Plot created: 95/06/15, 1855
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 95, year 1993 to day 95, year 1993 6/12/93



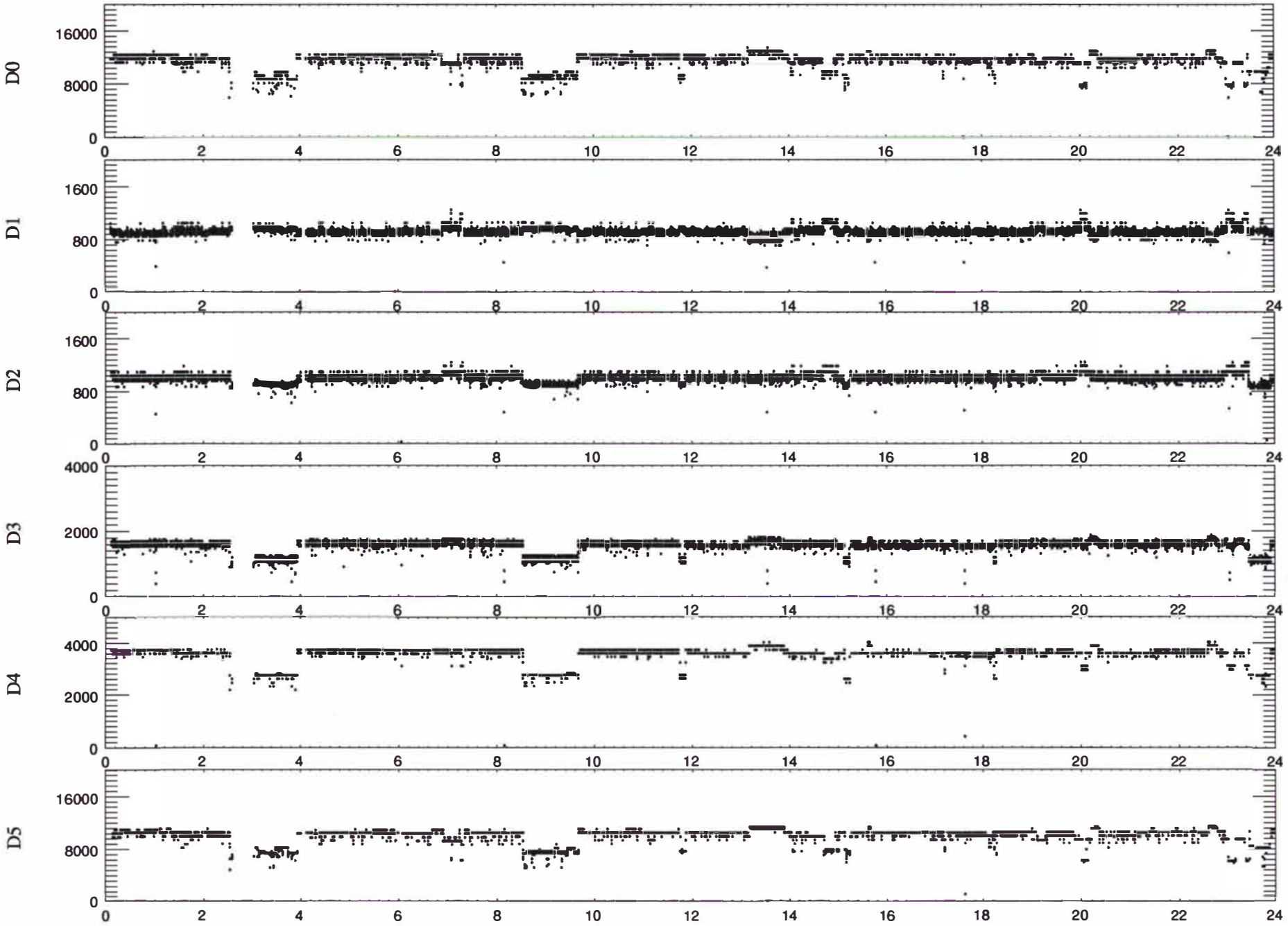
HUS 2A, MODE 1, NOT AVERAGED EDR day 95, year 1993 to day 95, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIVERSAL TIME

HUS 2B COUNTS / SEC QEDR day 95, year 1993 to day 95, year 1993 4/6/93



RT data files which may contain ~ 0.5 s timing error because they follow a trigger

2 hour time range from beginning of burst that extract falls in:			DATA USED ?	
b02:0126	extract beg time:0244	e91270_2A1_02.73_02.84.ascii.Z	N	
b03:0219	extract beg time:0244	e91270_2A1_02.73_02.84.ascii.Z	N	
b01:0121	extract beg time:0310	e91360_2A1_03.16_03.37.ascii.Z	N	
:0932	extract beg time:1025	e92010_2A1_10.42_10.48.ascii.Z	Y	(TRIGGER)
b01:0845	extract beg time:1015	e92058_2A1_10.25_10.75.ascii.Z	N	&
b01:0609	extract beg time:0723	e92111_2A1_07.38_07.54.ascii.Z	N	
b01:0629	extract beg time:0634	e92174_2A1_06.57_06.87.ascii.Z	N	
b01:0541	extract beg time:0549	e92190_2A1_5.76_5.90.ascii.Z	Y	(SGR 1900)
b02:2032	extract beg time:2058	e92205_2A1_20.97_22.66.ascii.Z	Y	(TRIGGER)
b01:1202	extract beg time:1240	e92209_2A1_12.67_12.85.ascii.Z	N	
b01:1717	extract beg time:1831	e92213_2A1_18.51_18.82.ascii.Z	N	
b01:1142	extract beg time:1301	e92303_2A1_13.02_13.28.ascii	Y	
b03:0736	extract beg time:0844	q92313_2A1_8.70_8.96.ascii.Z	N	
b03:0736	extract beg time:0844	e92313_2A1_08.74_09.02.ascii.Z	N	
b14:1730	extract beg time:1905	q92314_2A1_19.08_19.30.ascii.Z	N	
b15:1825	extract beg time:1905	q92314_2A1_19.08_19.30.ascii.Z	N	
b02:0156	extract beg time:0344	e92315_2A1_3.10_3.36.ascii.Z	N	
b03:0322	extract beg time:0344	e92315_2A1_3.10_3.36.ascii.Z	N	
b06:0819	extract beg time:0844	e92315_2A1_8.71_8.85.ascii.Z	N	
b08:1211	extract beg time:1340	e92315_2A1_13.66_13.96.ascii.Z	N	
b08:1211	extract beg time:1344	e92315_2A1_13.74_14.03.ascii.Z	N	
b02:0600	extract beg time:0644	e92316_2A1_6.76_7.04.ascii.Z	N	
b02:0135	extract beg time:0329	e93012_2A1_3.50_3.72.ascii.Z	Y	
b03:0227	extract beg time:0329	e93012_2A1_3.50_3.72.ascii.Z	Y	
b04:0315	extract beg time:0329	e93012_2A1_3.50_3.72.ascii.Z	Y	
b01:1105	extract beg time:1150	q93077_2A1_11.83_12.05.ascii.Z	Y	
b01:0745	extract beg time:0756	q93096_2A1_7.71_7.85.ascii.Z	Y	(TRIGGER) - OK - no error in RT file. Triggered file used for triangulation anyway
b01:0745	extract beg time:0856	q93096_2A1_8.40_8.50.ascii.Z	N	
1:1445	extract beg time:1530	e93126_2A1_15.50_15.65.ascii.Z	N	
01:1445	extract beg time:1548	e93126_2A1_15.80_15.95.ascii.Z	N	
b01:0334	extract beg time:0434	e93265_2A1_04.56_04.64.ascii.Z	N	
b01:0900	extract beg time:0943	e93272_2A1_09.71_09.98.ascii.Z	Y	(SGR 1806)
b01:1654	extract beg time:1707	e93287_2A1_17.11_17.37.ascii.Z	Y	
b01:2215	extract beg time:2240	e93294_2A1_22.67_22.85.ascii.Z	N	
b01:0824	extract beg time:0840	e93303_2A1_08.66_08.81.ascii.Z	N	
b01:0352	extract beg time:0510	e93318_2A1_05.17_05.42.ascii.Z	N	
b01:0641	extract beg time:0824	e93340_2A1_08.40_08.61.ascii.Z	N	
b02:0602	extract beg time:0733	e94026_2A1_07.55_07.71.ascii.Z	N	
b05:1140	extract beg time:1240	e94044_2A1_12.66_12.76.ascii.Z	Y	
b01:0204	extract beg time:0326	e94047_2A1_03.44_03.62.ascii.Z	N	
b01:0113	extract beg time:0124	e94049_2A1_01.40_02.50.ascii.Z	N	
b03:1943	extract beg time:2123	e94058_2A1_21.38_21.49.ascii.Z	N	
b01:0346	extract beg time:0505	e94061_2A1_05.08_05.25.ascii.Z	Y	(Trigger; but RT data probably used)
b01:0047	extract beg time:0128	e94062_2A1_01.47_01.63.ascii.Z	N	
b01:2113	extract beg time:2142	e94202_2A1_21.70_21.98.ascii.Z	N	
b01:2113	extract beg time:2144	e94202_2A1_21.74_22.14.ascii.Z	N	
b01:1047	extract beg time:1143	e94242_2A1_11.71_11.86.ascii.Z	N	
b01:0647	extract beg time:0728	e94298_2A1_07.47_07.51.ascii.Z	N	
b01:0128	extract beg time:0241	e94299_2A1_02.68_02.80.ascii.Z	Y	
b09:1148	extract beg time:1348	e94321_2A1_13.80_14.47.ascii.Z	N	
b10:1238	extract beg time:1348	e94321_2A1_13.80_14.47.ascii.Z	N	
b11:1328	extract beg time:1348	e94321_2A1_13.80_14.47.ascii.Z	N	
b01:1952	extract beg time:2040	e94326_2A1_20.66_20.78.ascii.Z	N	
b01:0223	extract beg time:0406	e95042_2A1_04.10_04.76.ascii.Z	N	
1:0640	extract beg time:0740	e95072_2A1_07.67_07.81.ascii.Z	N	
01:0144	extract beg time:0158	e95216_2A1_01.96_02.09.ascii.Z	Y	(Trigger)
b02:1628	extract beg time:1718	e95339_2A1_17.30_17.45.ascii.Z	N	
b03:1718	extract beg time:1718	e95339_2A1_17.30_17.45.ascii.Z	N	
b01:1124	extract beg time:1205	e95362_2A1_12.09_12.87.ascii.Z	N	

```
b04:1343  extract beg time:1540  e95362_2A1_15.67_15.84.ascii.Z Y
b04:1343  extract beg time:1541  e95362_2A1_15.69_15.85.ascii.Z Y
b05:1516  extract beg time:1540  e95362_2A1_15.67_15.84.ascii.Z Y
b05:1516  extract beg time:1541  e95362_2A1_15.69_15.85.ascii.Z Y
b01:0053  extract beg time:0251  e96002_2A1_02.85_03.62.ascii   N
b02:0216  extract beg time:0251  e96002_2A1_02.85_03.62.ascii   N
b20:1956  extract beg time:2041  e96002_2A1_20.68_20.76.ascii   N
b20:1956  extract beg time:2041  e96002_2A1_20.69_20.76.ascii   N
b02:0128  extract beg time:0305  e96004_2A1_03.09_03.87.ascii.Z N
b03:0235  extract beg time:0305  e96004_2A1_03.09_03.87.ascii.Z N
b05:1621  extract beg time:1656  e96006_2A1_16.93_17.08.ascii.Z N
b01:0116  extract beg time:0150  e96007_2A1_01.84_01.95.ascii    N
b01:0116  extract beg time:0152  e96007_2A1_01.87_01.99.ascii    N
b01:1819  extract beg time:1935  e96028_2A1_19.59_19.87.ascii.Z Y  (GR 1747 ? - MAYBE USED FOR NLETSYN?)
b01:0208  extract beg time:0233  e96030_2A1_02.55_02.66.ascii.Z Y      "       "       "
b01:0208  extract beg time:0235  e96030_2A1_02.58_02.73.ascii.Z Y      "       "       "
b01:0208  extract beg time:0235  e96030_2A1_02.59_02.73.ascii.Z Y      "       "       "
b01:0849  extract beg time:0949  qp96032_2A1_09.81_09.94.ascii.Z Y     "       "       "
b02:2011  extract beg time:2144  qp96032_2A1_21.74_21.90.ascii.Z Y
b01:1929  extract beg time:2049  qp96051_2A1_20.82_20.85.ascii.Z N
b01:1929  extract beg time:2049  qp96051_2A1_20.82_20.86.ascii.Z N
b01:1529  extract beg time:1719  qp96094_2A1_17.32_17.48.ascii.Z N
b01:1529  extract beg time:1722  qp96094_2A1_17.36_17.52.ascii.Z N
b01:1652  extract beg time:1752  qp96168_2A1_17.87_17.97.ascii.Z N
b01:1652  extract beg time:1755  qp96168_2A1_17.91_18.05.ascii.Z N
```

```
          ******************
          *BATSEARCH PROGRAM*
          ******************

BATSE BURST #     2289
EVENT OF 1993 APR  6 DAY OF YEAR= 96
EVENT CROSSING TIME AT BATSE      : 26185. S. OR 07:16:25.0
COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 300.000   29.000
BATSE PEAK COUNTING RATE:  54000    C/S
EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
POSITION OF ULYSSES ON  6/ 4/  93 IS:
RA=  146.042 DEC=  -13.048 DIST=    4.113 AU
BATSE-ULYSSES DISTANCE =  615319760. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 28.96 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1795.90 SECS.
CROSSING TIME AT ULYSSES    IS 27981. S. OR   07:46:20 +/-  249.80 SECONDS
```

Yoc

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Apr  8 15:25 1993  standard input Page 22


From HAGEDON@ssl.msfc.nasa.gov Thu Apr  8 12:48:30 1993
Date:    Thu, 8 Apr 1993 14:52:01 -0500 (CDT)
From: HAGEDON@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2289   930406    9083   26185    54000   300   +29


                BATSE BURST TRIGGER
NO.: 02289

TIME: TJD=9083 SECONDS=26185

TYPE: BURST                     SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:       SIGMA

INTENSITY:          COUNTS/CM2

LOCATION: ZENITH=112    AZIMUTH=130    ERROR=      DEGREES

COMMENTS:
GRB. SINGLE SPIKE WITH SUBSTRUCTURE. DUR.~10S. VISIBLE ABOVE 300KEV.
```

Helio corr removed

Date: Dec 18 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

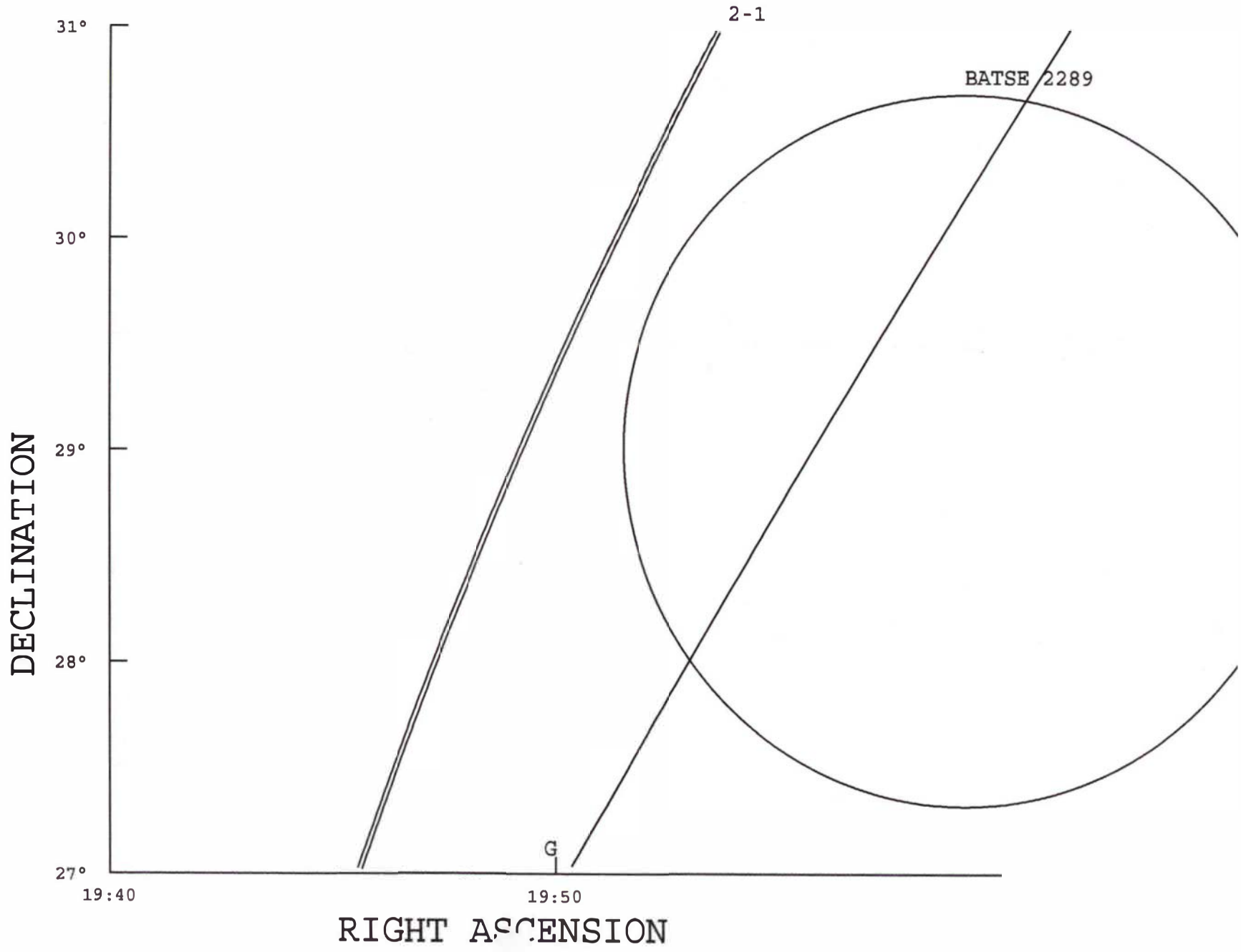
☐ 2000 coordinates used?

☐ Geocentric time used?

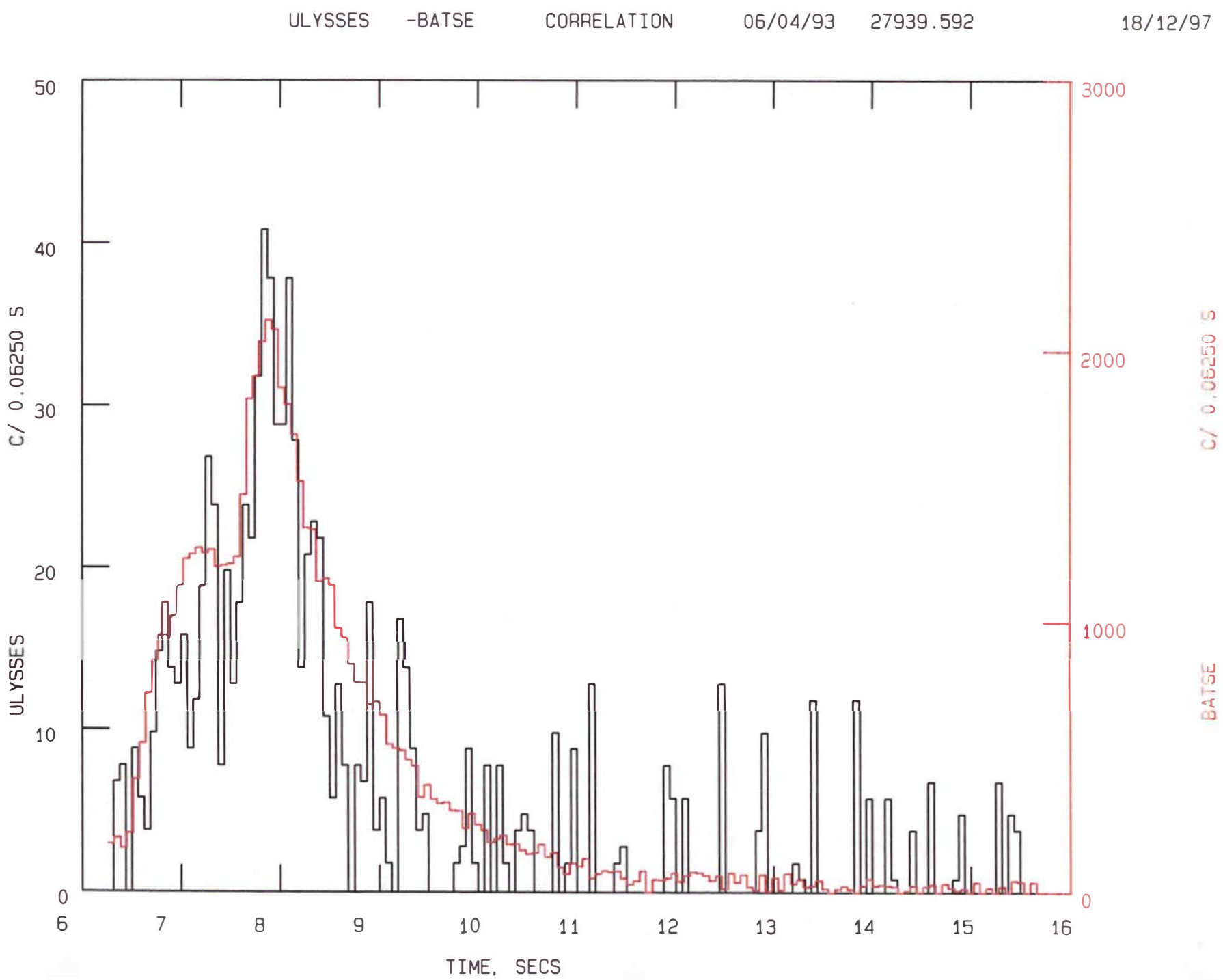
☑ ACCESS database updated?

EVENT OF APR 6, 1993 7:45

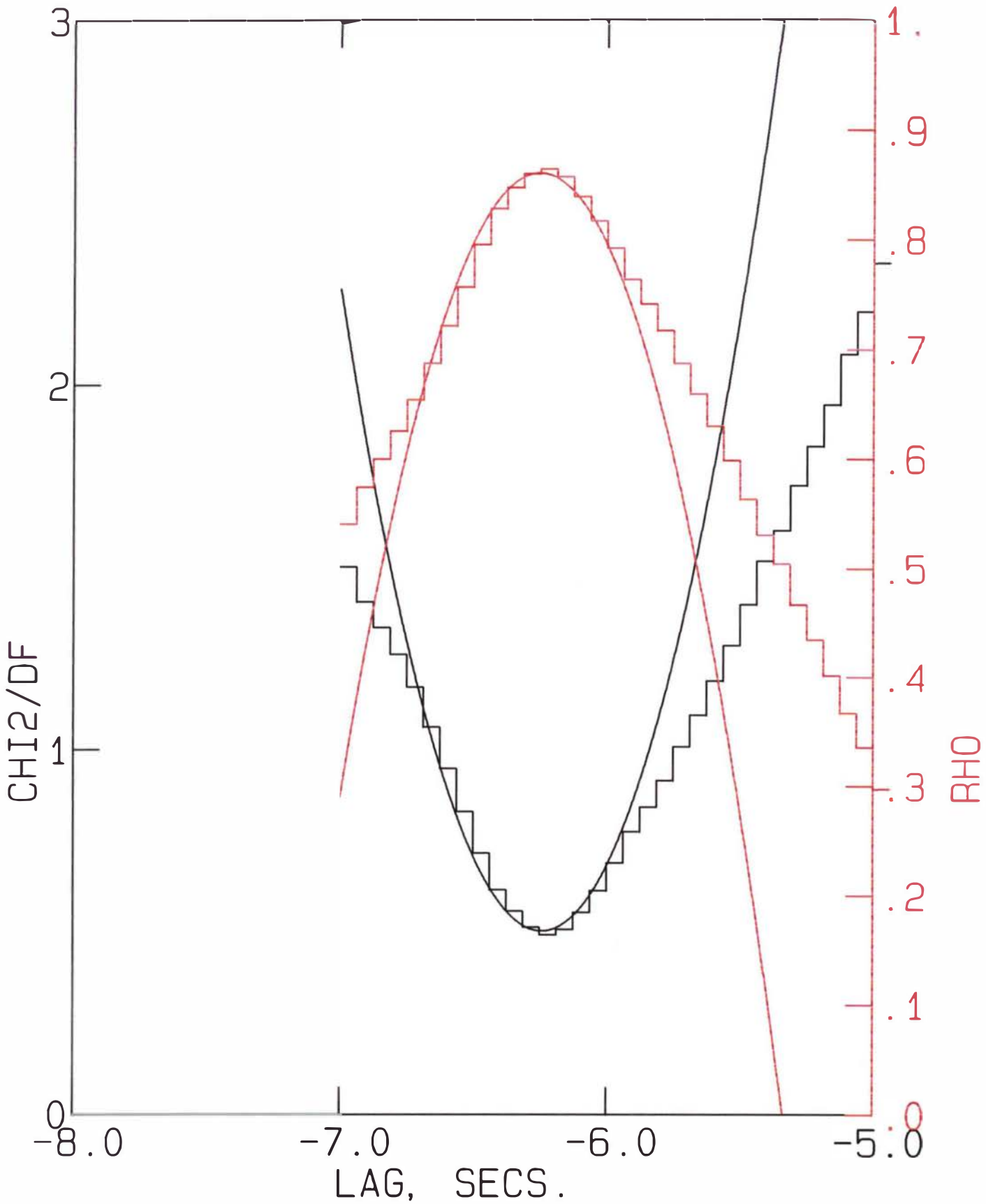
18/12/97

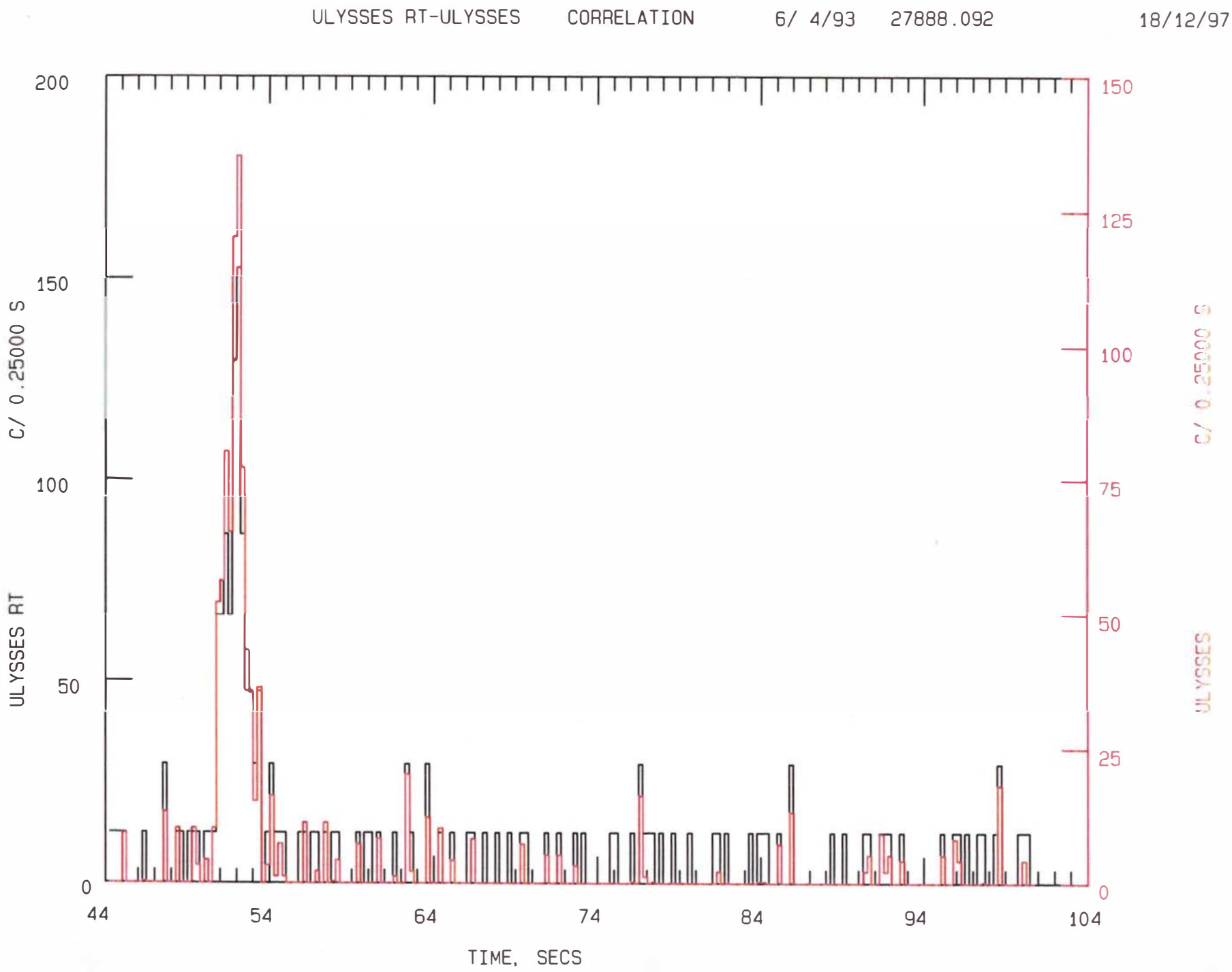


N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE

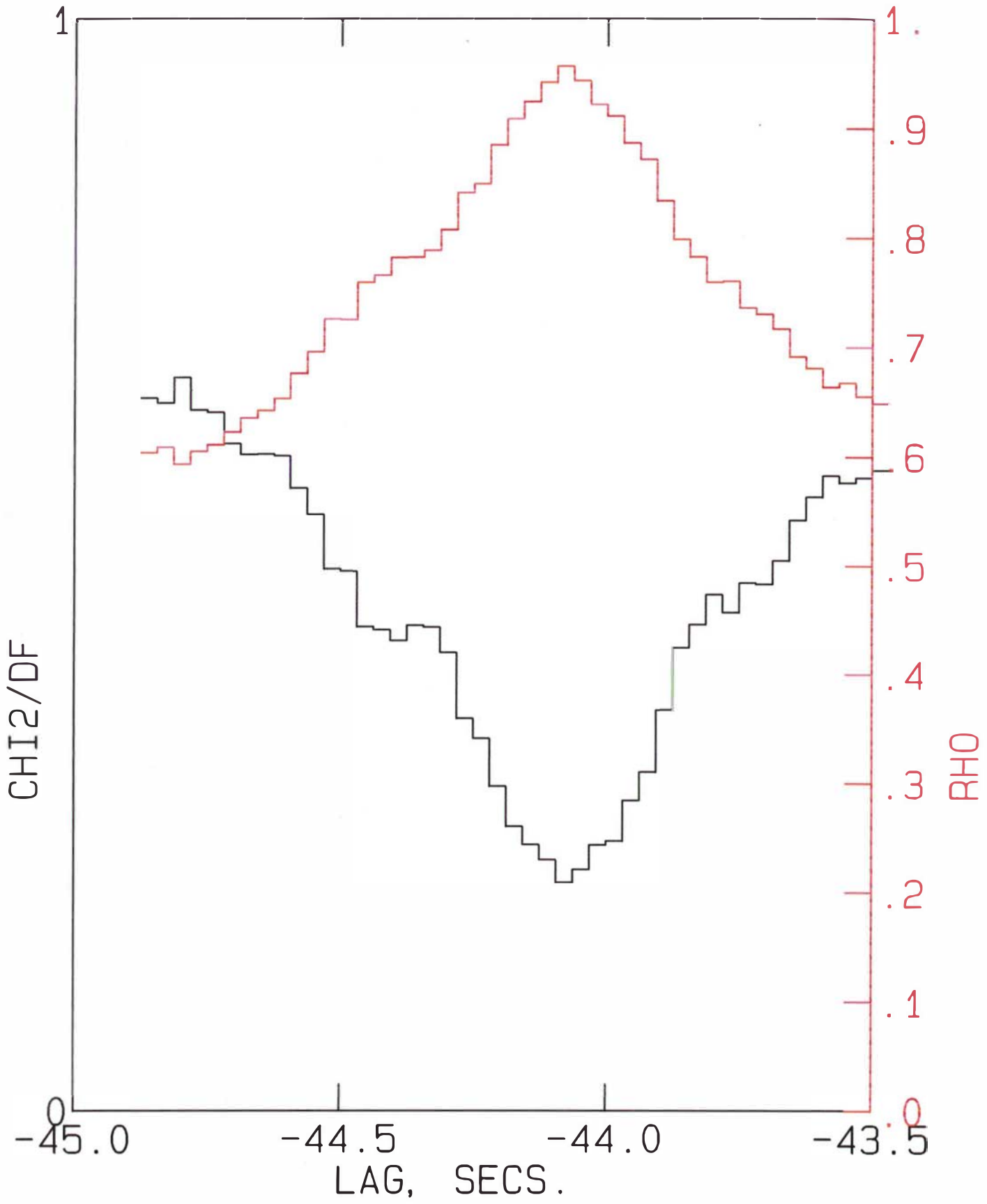

ULYSSES -BATSE CORRELATION 06/04/93 27939.592 18/12/97
50
40
30
20
10
0
C/ 0.06250 S
ULYSSES
3000
2000
1000
0
C/ 0.06250 S
BATSE
6
7
8
9
10
11
12
13
14
15
16
TIME, SECS

ULYSSES -BATSE CORRELATION 06/04/93 27939.592




ULYSSES RT-ULYSSES CORRELATION 6/ 4/93 27888.092 18/12/97
200
150
100
50
0
C/ 0.25000 S
ULYSSES RT
150
125
100
75
50
25
0
C/ 0.25000 S
ULYSSES
44
54
64
74
84
94
104
TIME, SECS

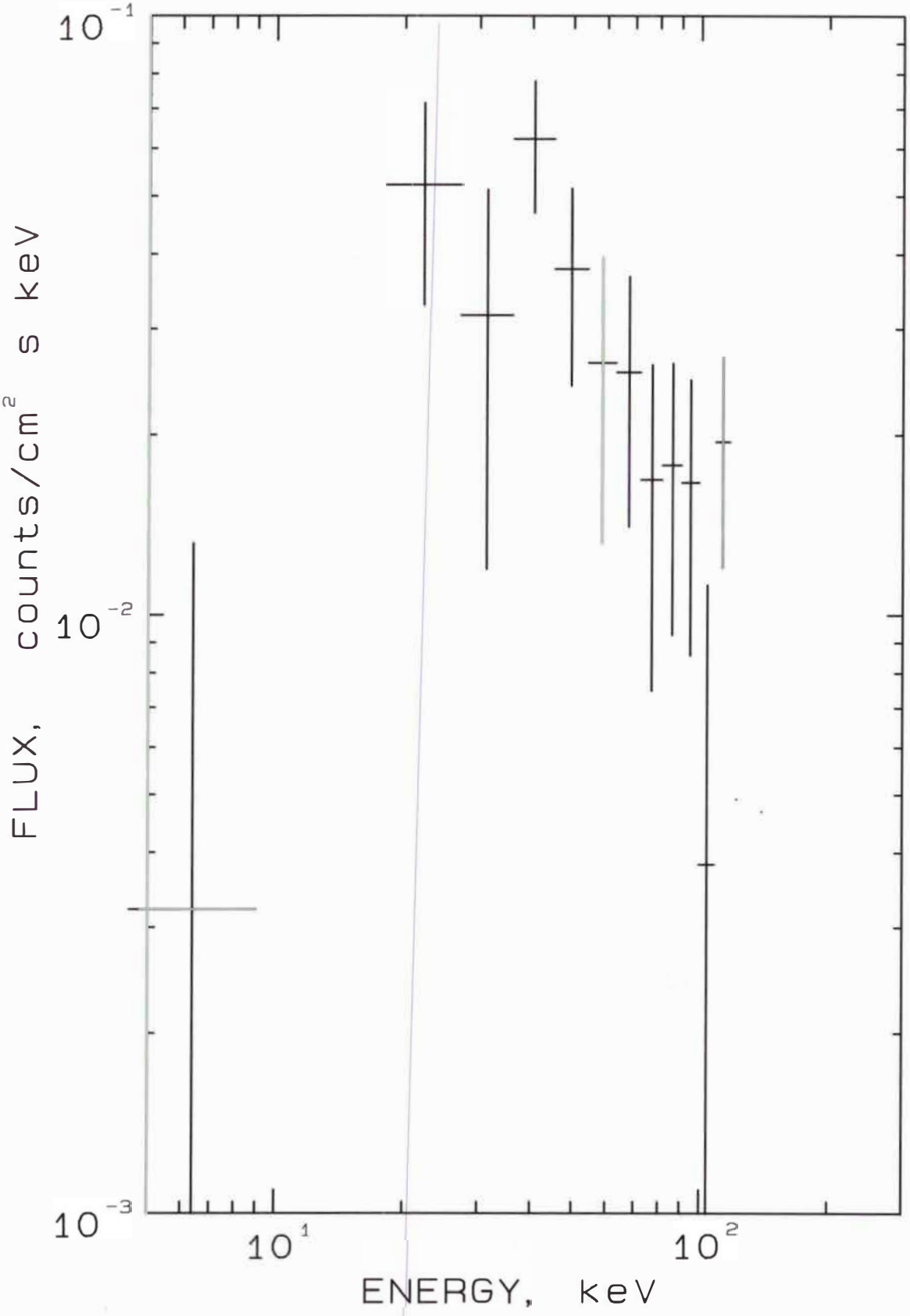
ULYSSES RT-ULYSSES CORRELATION 6/ 4/93 27888.092

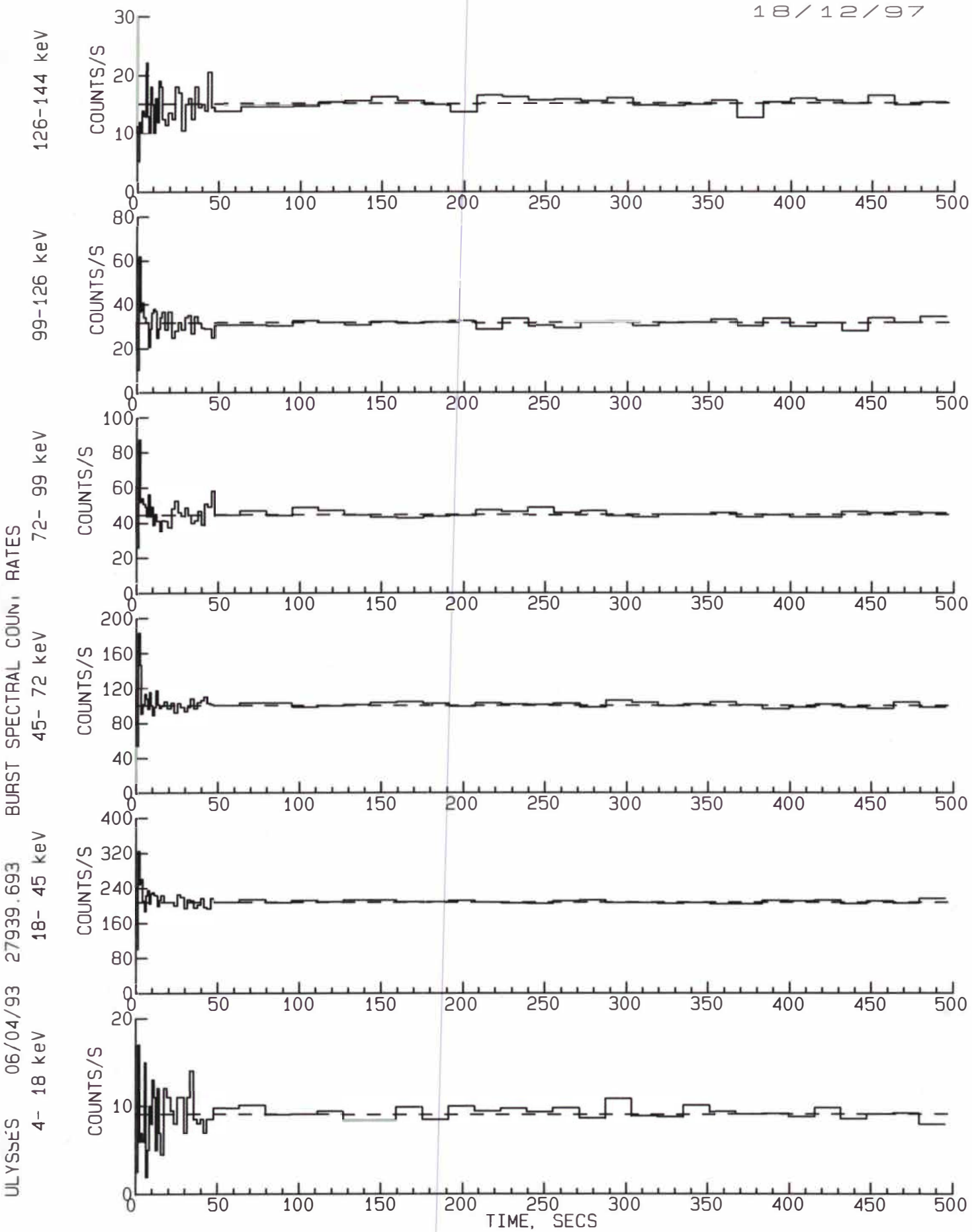


ULYSSES 06/04/93 27939.693

18/12/97

SPECTRUM INTEGRATED OVER 10.3 SECONDS, INTERVALS 2 TO 12




18/12/97
ULYSSES 06/04/93 27939.693 BURST SPECTRAL COUNT RATES
126-144 keV
99-126 keV
72- 99 keV
45- 72 keV
18- 45 keV
4- 18 keV
COUNTS/S
TIME, SECS

ULYSSES 06/04/93 Ttrig=27939.592

21- 144 keV

COUNTS/0.031 S

COUNTS/0.125 S

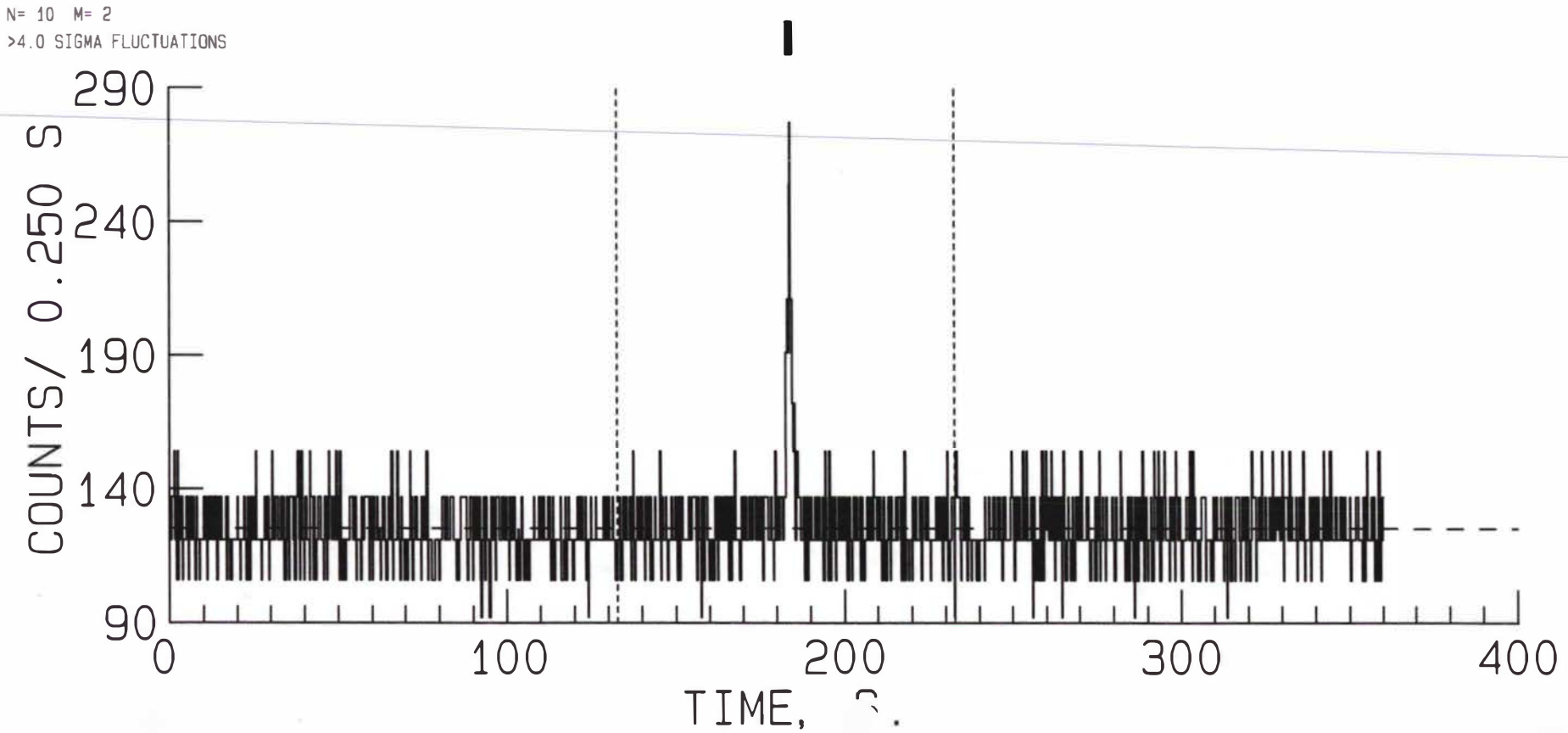
18/12/**

ULYSSES RT

18/12/97

6/ 4/93 27756.196 s

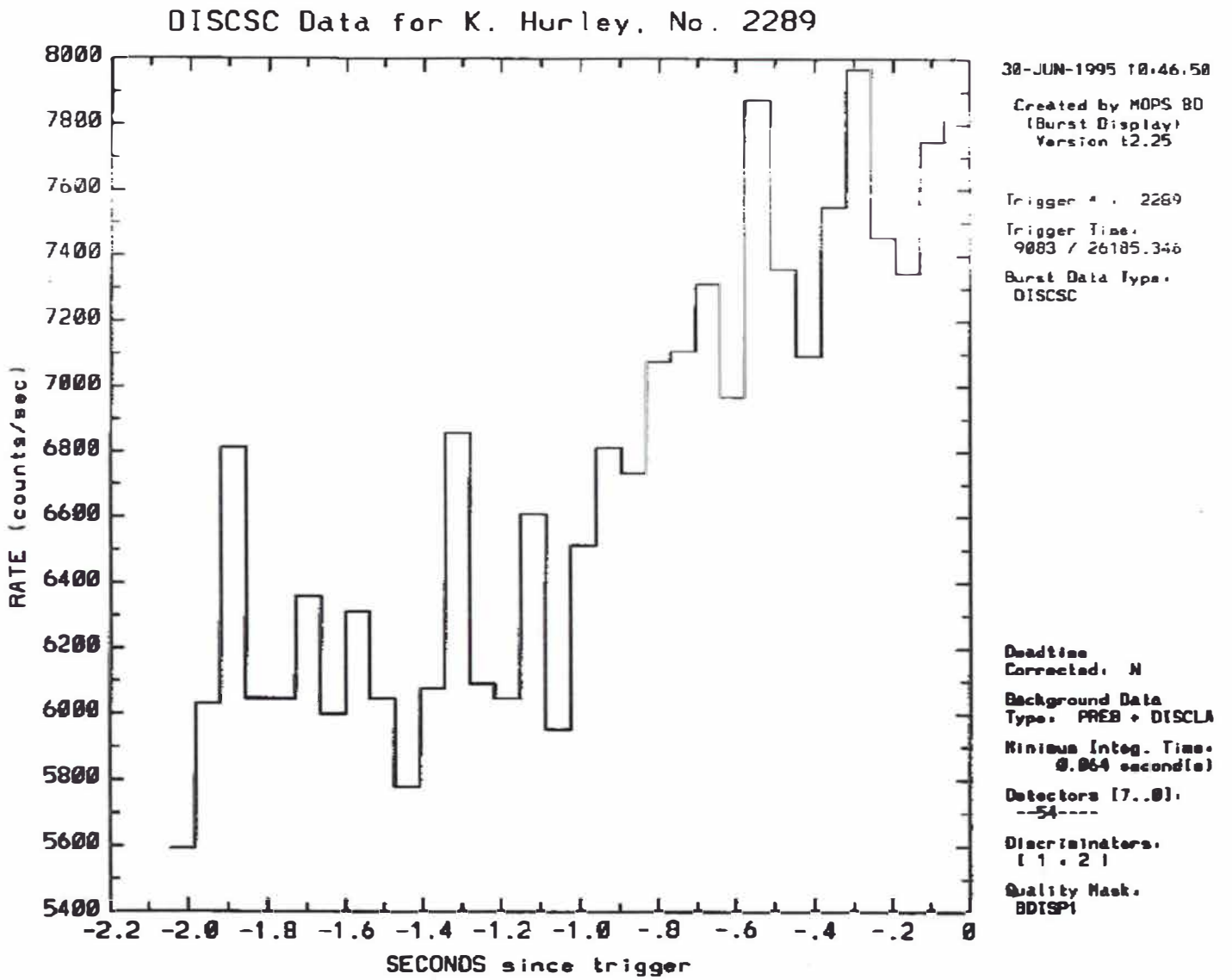
21- 144 keV

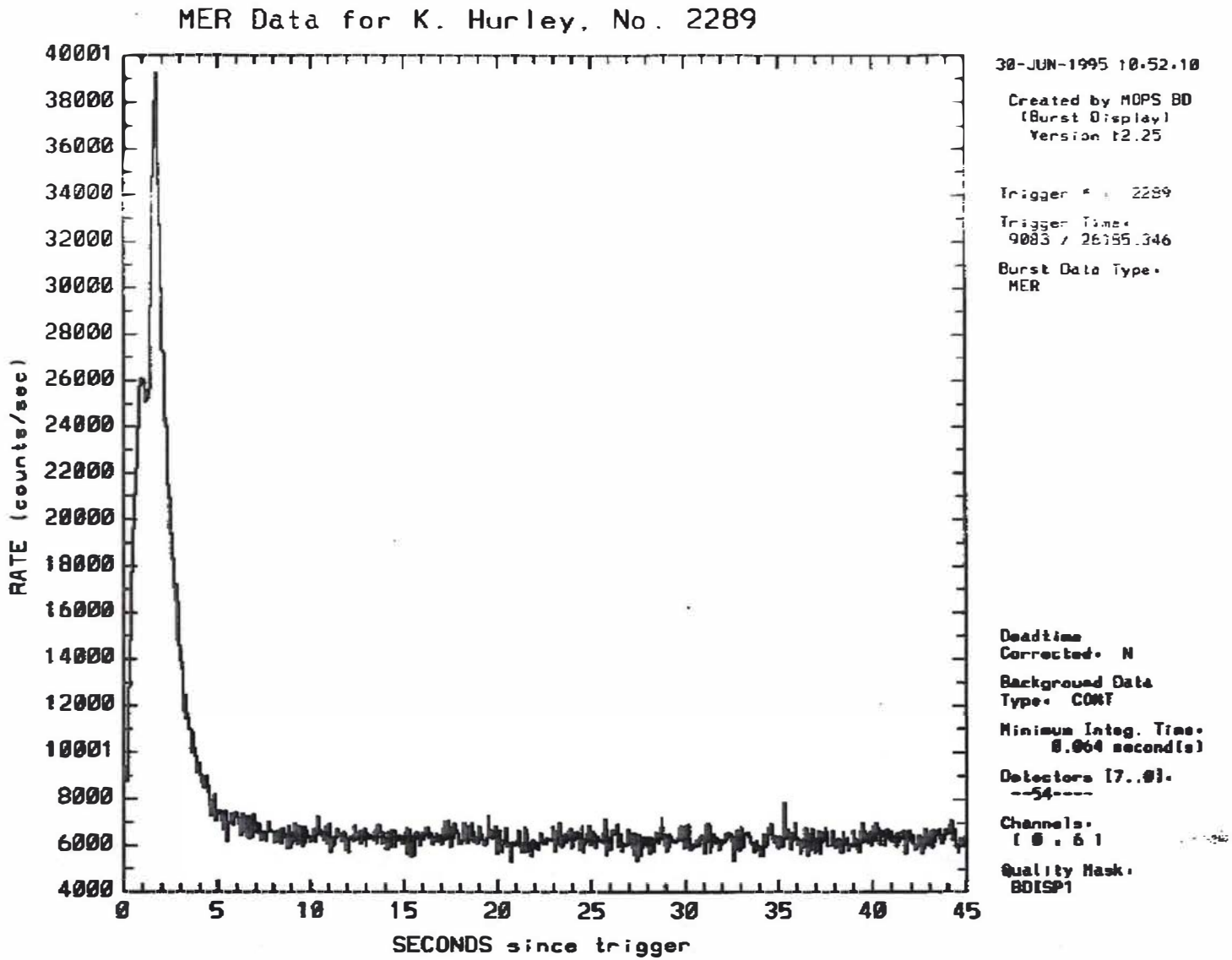


BATSE 06/04/93 26185.346

25- 100 keV

30 / 9 / 95


DISCSC Data for K. Hurley, No. 2289
RATE (counts/sec)
8000
7800
7600
7400
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
-2.2 -2.0 -1.8 -1.6 -1.4 -1.2 -1.0 -.8 -.6 -.4 -.2 0
SECONDS since trigger
30-JUN-1995 10:46.50
Created by MOPS BD
(Burst Display)
Version t2.25
Trigger # : 2289
Trigger Time:
9083 / 26185.346
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
--54----
Discriminators:
[1 , 2]
Quality Mask:
BDISP1


MER Data for K. Hurley, No. 2289
RATE (counts/sec)
40001
38000
36000
34000
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
10001
8000
6000
4000
0
5
10
15
20
25
30
35
40
45
SECONDS since trigger
30-JUN-1995 10:52.10
Created by MOPS BD
(Burst Display)
Version 2.25
Trigger # : 2289
Trigger Time:
9083 / 26155.346
Burst Data Type:
MER
Deadtime
Corrected: N
Background Data
Type: COMT
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
--54----
Channels:
[0 , 6]
Quality Mask:
BDISP1

From root Thu Mar 10 14:22 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
          id AA05865; Thu, 10 Mar 94 14:22:44
Received: from SSTDP2.LANL.GOV by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
        id AA23477; Thu, 10 Mar 1994 13:30:14 +0800
Date: Thu, 10 Mar 1994 14:30:44 -0700 (MST)
From: 046369@SSTDP2.LANL.GOV
To: khurley@space6.ssl.berkeley.edu
Message-Id: <940310143044.25e02930@SSTDP2.LANL.GOV>
Subject: dmsp observations
Content-Length: 2472
Status: R

FROM: SMTP%"JTERRELL.LANL.GOV" (JAMES TERRELL) 3/10/04
TO: SMTP%"KHURLEY@SPACE6.SSL.BERKELEY.EDU"
SUBJ: DMSP OBSERVATIONS

Kevin:
Here are more additions, questions, or corrections for your GRB list of 930217.
Some of the errors for DMSP data seem to be the matter of interpreting
"NA" as used by me. It means, unless otherwise specified, no peak
apparent in the 20-sec averaged data, but 2-sec data not obtained
and examined. Thus it is not an absolute NO (or N/O unless it is known
that the spacecraft view was obscured by the earth).
Thus NA means that any peak which might show up in full data is
pretty weak, anyway. In your list NA should be left blank, I believe.
We now have data processed through 930128! Thus we will be needing
more events to look for in the DMSP data.--Jim

DATE	UT	DMSP
910208	32238U	DMSP8YES AT 32415.7, 9YES AT 32415.5, 10SAA
910421	33245	DMSP NA (NOT NO) (I.E., SHOULD BE BLANK IN YOUR LIST)
910627	16159	DMSP NA (NOT NO)
910717	16386	DMSP N/O (NOT NO)
911118	68260	DMSP N/O (NO DATA)
920110	33478	DMSP NA (NOT NO)
920229	69677	DMSP NA (NOT N/O)
920404	47506	DMSP NA (NOT N/O)
920414	84166	DMSP NA (NOT N/O) (GRO GRB AT 84163!)
920714	47069	DMSP NA (NOT NO)
920718	77563	DMSP NA (NOT N/O)
920727	43145U	(ULYSSES TIME) BATSE YES AT ? (DMSP NA)
921022	55259	DMSP NA (NOT N/O)
921209	41738	DMSP NA (NOT N/O)
930106	56259	WHY LISTED TWICE (56260)?
930106	56260	DMSP10YES AT 55260.4 (8SAA,11SR)
930309	11269	DMSP NA (NOT NO)
930318	44993U	DMSP NA (BATSE YES! ULYSSES TIME?)
930329	11365	DMSP NA (NOT N/O)
930406	26185	DMSP NA (NOT N/O)
930428	4032	DMSP NA (NOT N/O)
930506	65631	DMSP NA (NOT NO)
930511	892U	(ULYSSES TIME) DMSP NO
930825	31643U	DMSP8YES AT 33477.4(100/S),11YES AT 33477.0(500/S), 10SR
930922	12830U	DMSP NA (NOT NO)
930922	23086U	(BATSE YES AT ?) DMSP10YES AT 23088.1(270/S),3?,11YES AT 22085.1
930925	73995U	DMSP NA (NOT NO)
930929	31751	(CORRECTED ULYSSES TIME) DMSP NO
931006	18161	(CORRECTED ULYSSES TIME) TO 931111 34178, NUMEROUS: DMSP NA
931006	69587U	DMSP NA (NOT NO)
931006	77510U	(ULYSSES TIME?)(BATSE YES AT ?) DMSP NA (NOT NO)
931031	14795	DMSP11YES AT 14796.8,14810.8 (8SAA,10SAA)
931103	59142	DMSP10YES AT 59152.4,158.4,11YES AT 59151.0,155.0 (8SR)
931131	60360	IS THIS DATE FOR SURE? (DMSP NA, 93/11/30)
931204	35290	DMSP8YES AT 35301.3,10NO AT 156DEG, 11NR
931217	65953U	10YES AT 64188.0,192.0,232.0, 11NO AT 64188 (8SR AT 64188)

920622	25504	8SA 10NR 11SA
920627	46956	NA
920711	53140	YES--58157
920718	77563	8NA 10SA 11NA
920720	11524	8NA/OBSC 10NA/OBSC 11SR
920824	39183	YES--39186
920902	1736	YES--1743
921009	24070	YES--24073
921022	55259	8ND 10NA 11NA
921123	22711	YES--22727
921123	46583	YES--46542
921207	57647	YES--57649
921209	41738	8NR 10NA 11NR
930106	56259	YES--56260
930110	6698	8NA 10NR 11NA
930120	84700	YES--84779
930131	68231	YES--68231
930201	60115	YES--60129
930309	11269	NA
930329	11365	8NA 10SR 11NA
930405	32089	YES--32105
930406	26185	8NA 10NR 11NA
930428	04032	8NA 10NA 11SR
930506	53571	YES--53578
930506	65631	NA

From root Thu Feb 3 13:55 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
          id AA00852; Thu, 3 Feb 94 13:55:12
Received: from SSTDP2.LANL.GOV by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
        id AA13978; Thu, 3 Feb 1994 12:59:12 +0800
Date: Thu, 3 Feb 1994 14:00:37 -0700 (MST)
From: 046369@SSTDP2.LANL.GOV
To: KHURLEY@space6.ssl.berkeley.edu
Message-Id: <940203140037.23c05074@SSTDP2.LANL.GOV>
Subject: DMSP OBSERVATIONS OF GRO GRB
Content-Length: 2739
Status: R

FROM: SMTP%"TERRELL@ESSDP2.LANL.GOV" (ESSDP2::TERRELL) (JAMES TERRELL 94/02/03)
TO: SSL::KOUVELIOTOU AND GIBSON::COLE (CHRYSSA KOUVELIOTOU AND STAYCE COLE)
CC: SMTP%"KHURLEY@SPACE6.SSL.BERKELEY.EDU" (KEVIN HURLEY)
SUBJ: DMSP OBSERVATIONS OF GRO GRB

Chryssa and Stayce:
Thanks very much for the listing of strong Batse bursts sent to me 11/1/93.
I have now managed to check all of them against DMSP data, and find that
many of them were also detected by DMSP8,9,10, or 11. Probably the higher percent
of detections in recent data is due to more extraction of full data. In many
cases such added effort would not be necessary if source direction
(and consequent obscuration of some DMSP satellites) were known to me.
I would appreciate data on more strong events. Here is the present list:

NOTES:
NA: Not apparent in 20-second averaged data (extracting the 2-sec data is
    a more time-consuming task, not undertaken in every case).
NA?: Some slight indication of a peak in 20-second averaged data.
SA: South Atlantic Anomaly, obscuring data with high background rates.
SR: South Radiation Belt background.
NR: North Radiation Belt background.
ND: No data for this time.
YES: Burst definitely detected by one or more DMSP satellites (8,9,10,11).
NO: No evidence of a peak in 2-sec data. (NO/OBSC: Obscured by Earth)

DATE	UT	DMSP
910421	33245	8NO 9SR 10NR
910627	16159	8NA 9NR 10ND
910629	71750	8NA 9SR 10NA
910703	18225	8NA 9NA? 10SR
910717	16386	8NA 9SA 10SR
910718	76051	8NA 9SA 10SA
910802	2718	ND
910814	69275	ND
911024	76208	ND
911104	54283	YES--54286 PEAK
911109	12459	8NO 9NR 10NO
911118	68260	ND
911119	23343	YES--23342
911126	46129	8SR 9SR 10NO
911127	15730	YES--15739
911202	73731	YES--73733
911209	66959	8SR 9SR 10NR 11ND
920226	29730	8SA 9NA? 10SA 11SA
920229	69769	8SR 9ND 10NA 11NA
920311	8246	YES--8431
920315	15569	8NA 9NR 10NA 11NA
920325	62258	YES--62256
920404	47506	8NA 10NA? 11NR
920406	9855	8NO/OBSC 10SR 11SR/OBSC
920414	84163	NA
920517	11877	YES--11883
920525	12423	YES--12427

```
         ********************
         *BATSEARCH PROGRAM*
         ********************

BATSE BURST #    2290
EVENT OF 1993 APR  6 DAY OF YEAR= 96
EVENT CROSSING TIME AT BATSE      : 61680. S. OR 17:08:00.0
COORDINATES ARE    .000    .000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 135.000  -48.000
BATSE PEAK COUNTING RATE:   8000    C/S
EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
POSITION OF ULYSSES ON  6/ 4/  93 IS:
RA=  146.042 DEC=  -13.048 DIST=    4.113 AU
BATSE-ULYSSES DISTANCE =  615319760. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=143.86 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1657.51 SECS.
CROSSING TIME AT ULYSSES    IS 60022. S. OR   16:40:22 +/-  234.99 SECONDS




Apr  8 15:25 1993  standard input Page 24


From HAGEDON@ssl.msfc.nasa.gov Thu Apr  8 12:50:56 1993
Date:    Thu, 8 Apr 1993 14:54:26 -0500 (CDT)
From: HAGEDON@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2290   930406    9083   61680     8000   135   -48

                                                    10


                BATSE BURST TRIGGER
NO.: 02290

TIME: TJD=9083 SECONDS=61680

TYPE: BURST                    SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:       SIGMA

INTENSITY:          COUNTS/CM2

LOCATION: ZENITH=49     AZIMUTH=324    ERROR=      DEGREES

COMMENTS:
GRB. DOUBLE PEAK. TOTAL DUR.~15S. FIRST PEAK IS MAX. VISIBLE ABOVE 300KEV.
```

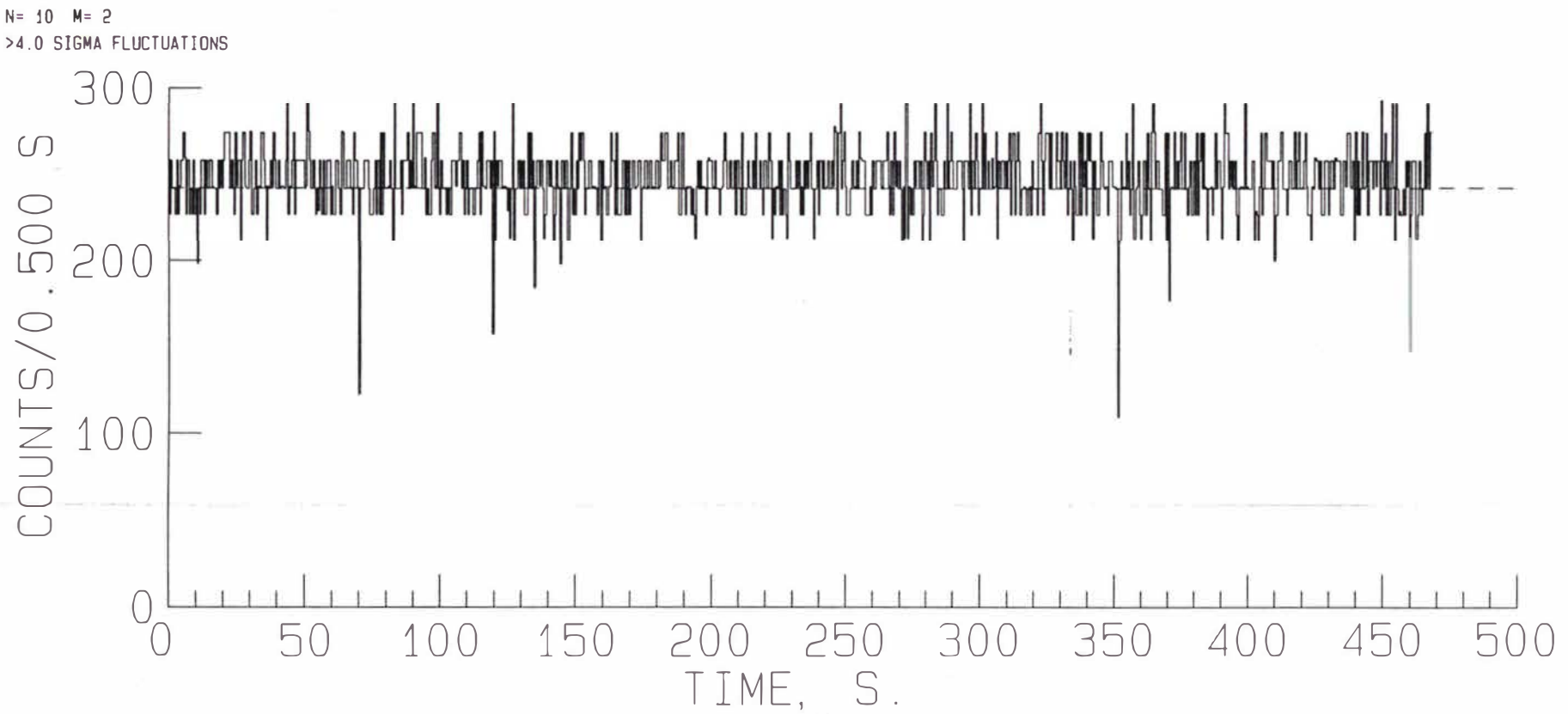
13/ 4/93

ULYSSES RT

6/ 4/93 59796.195 s

0.250 S INTERVALS REGROUPED BY 2

0- 0 keV



****
BATSEARCH PROGRAM
****

BATSE BURST # 2291
EVENT OF 1993 APR 6 DAY OF YEAR= 96
EVENT CROSSING TIME AT BATSE : 79397. S. OR 22:03:17.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 13.000 -73.000
BATSE PEAK COUNTING RATE: 2700 C/S
EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 6/ 4/ 93 IS:
RA= 146.042 DEC= -13.048 DIST= 4.113 AU
BATSE-ULYSSES DISTANCE = 615319760. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 91.23 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -44.12 SECS.
CROSSING TIME AT ULYSSES IS 79353. S. OR 22:02:32 +/- 405.59 SECONDS

Apr 8 15:25 1993 standard input Page 25

From HAGEDON@ssl.msfc.nasa.gov Thu Apr 8 12:52:49 1993
Date: Thu, 8 Apr 1993 14:56:21 -0500 (CDT)
From: HAGEDON@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2291	930406	9083	79397	2700	013	-73

NO

BATSE BURST TRIGGER
NO.: 02291

TIME: TJD=9083 SECONDS=79397

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=165. AZIMUTH=81. ERROR= DEGREES

COMMENTS:
GRB. SINGLE SPIKE. DUR.~0.1S. MARGINALLY VISIBLE ABOVE 300KEV.

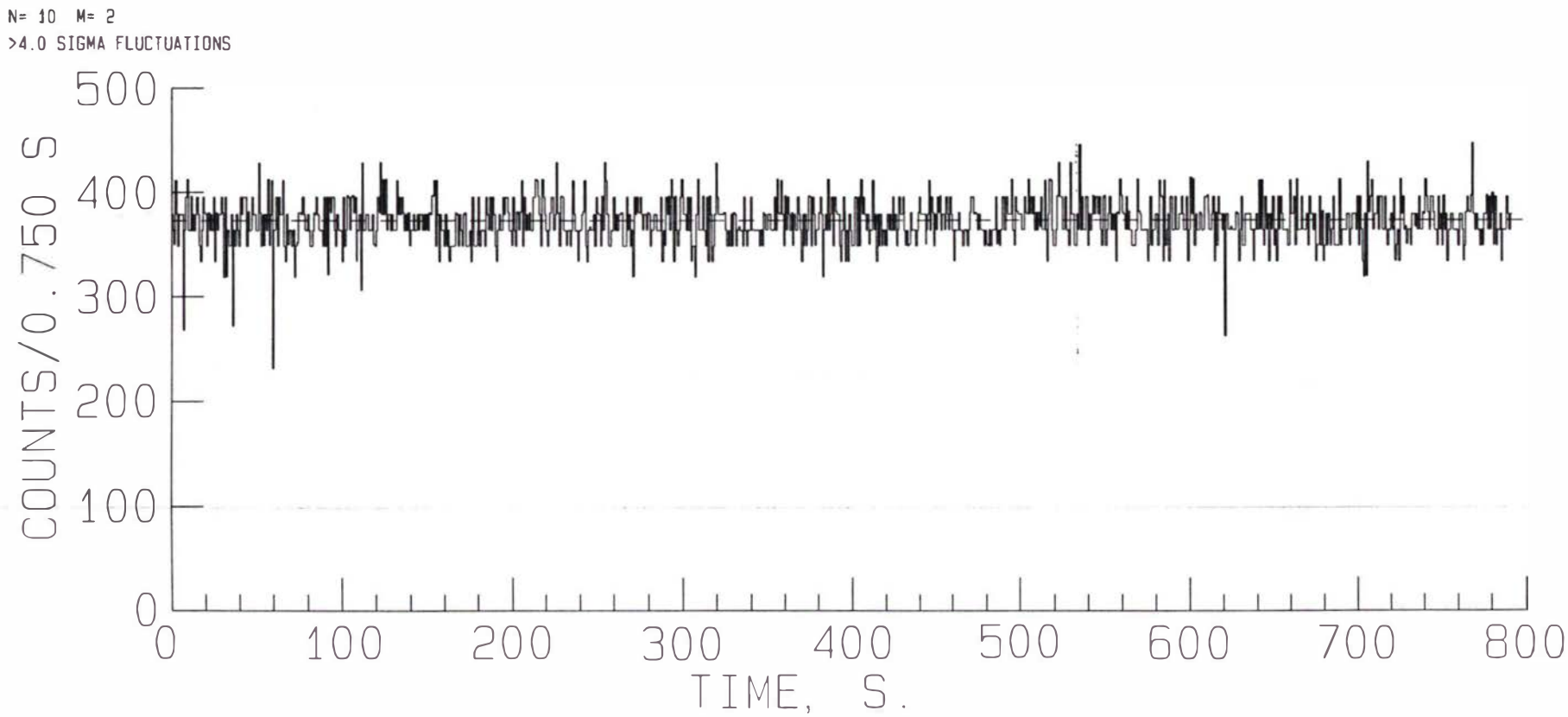
13/ 4/93

ULYSSES RT

6/ 4/93 78948.250 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV



From HAGEDON@ssl.msfc.nasa.gov Thu Apr 8 12:30:47 1993
Date: Thu, 8 Apr 1993 14:33:39 -0500 (CDT)
From: HAGEDON@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1215

BATSE BURST TRIGGER
NO.: 02292

TIME: TJD=9083 SECONDS=85465

TYPE: FLARE   SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

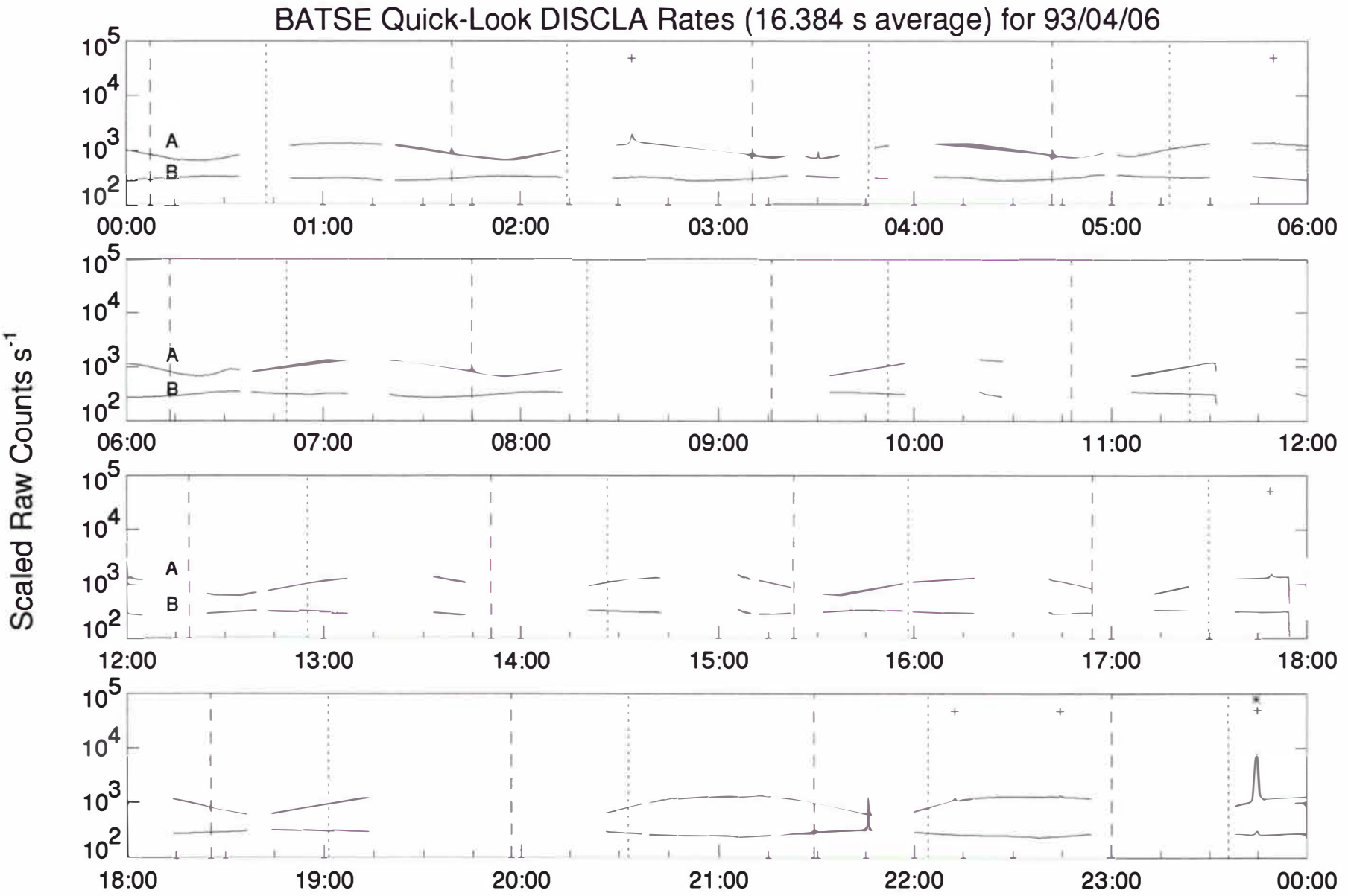
INTENSITY: COUNTS/CM2

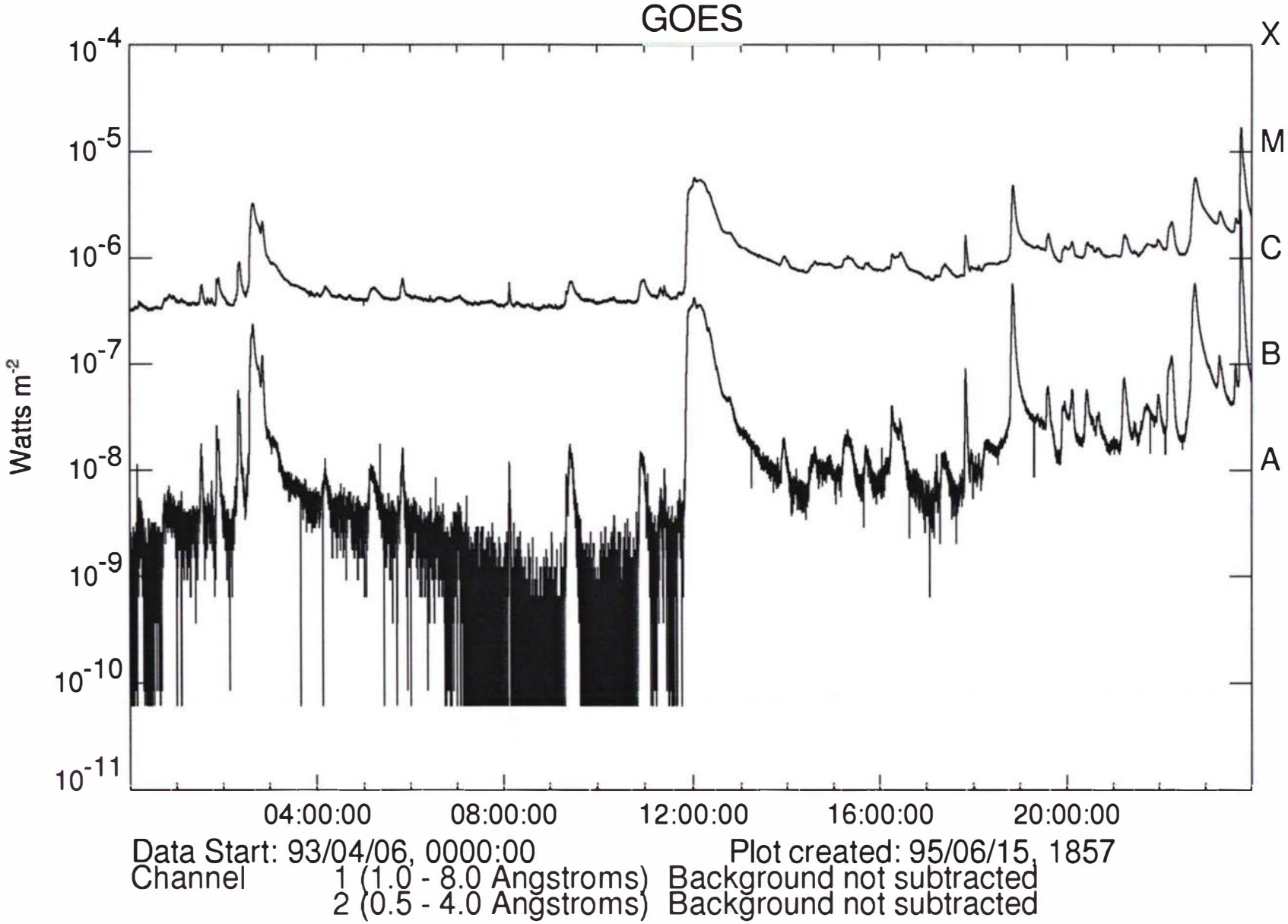
LOCATION: ZENITH=   AZIMUTH=   ERROR=   DEGREES

COMMENTS:
GOES M1.5 SOLAR FLARE. DUR.~120S. MARGINALLY VISIBLE ABOVE 300KEV.

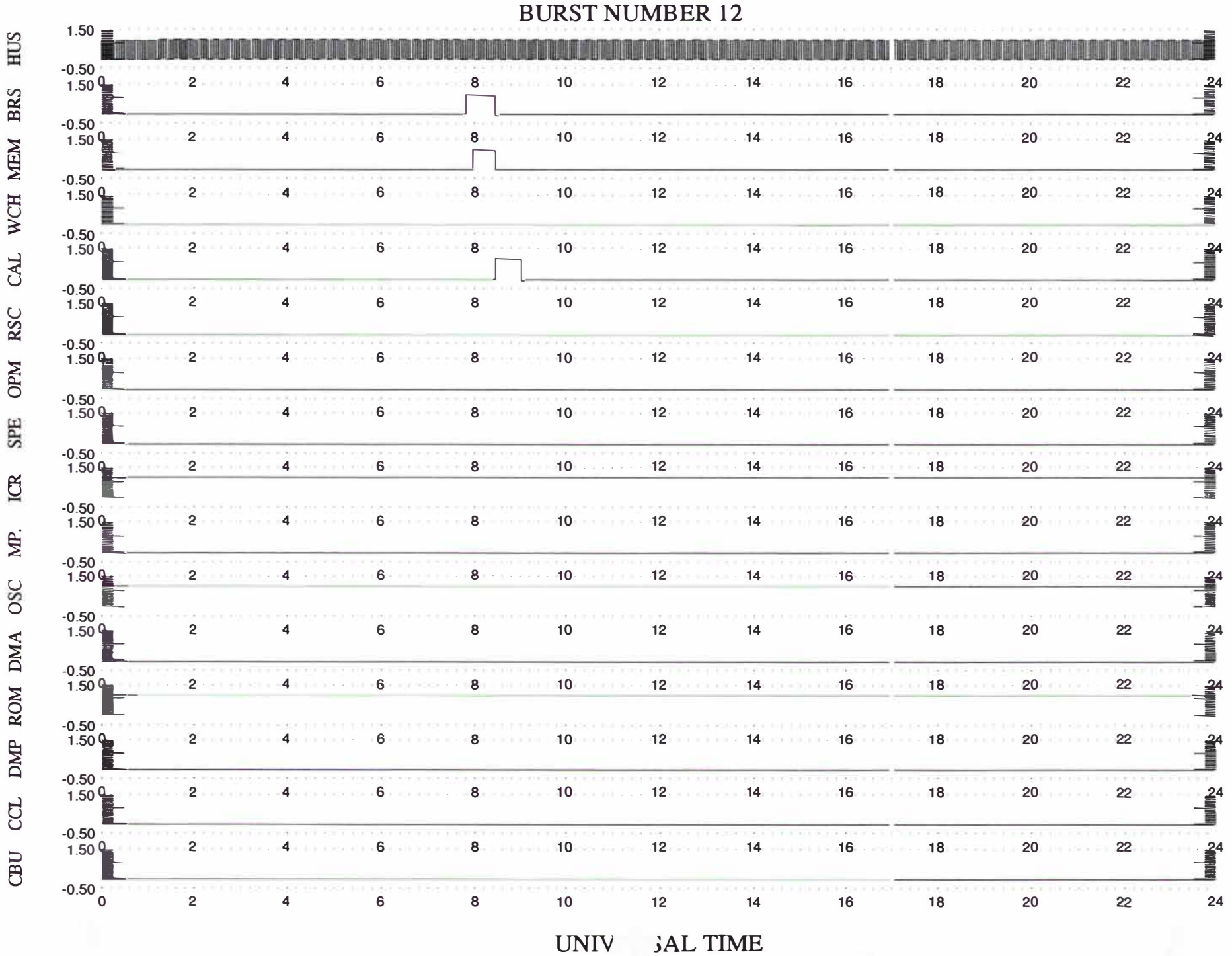
April 8 93

MO was off April 6 - or not in mode to transmit data


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/06
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1404 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

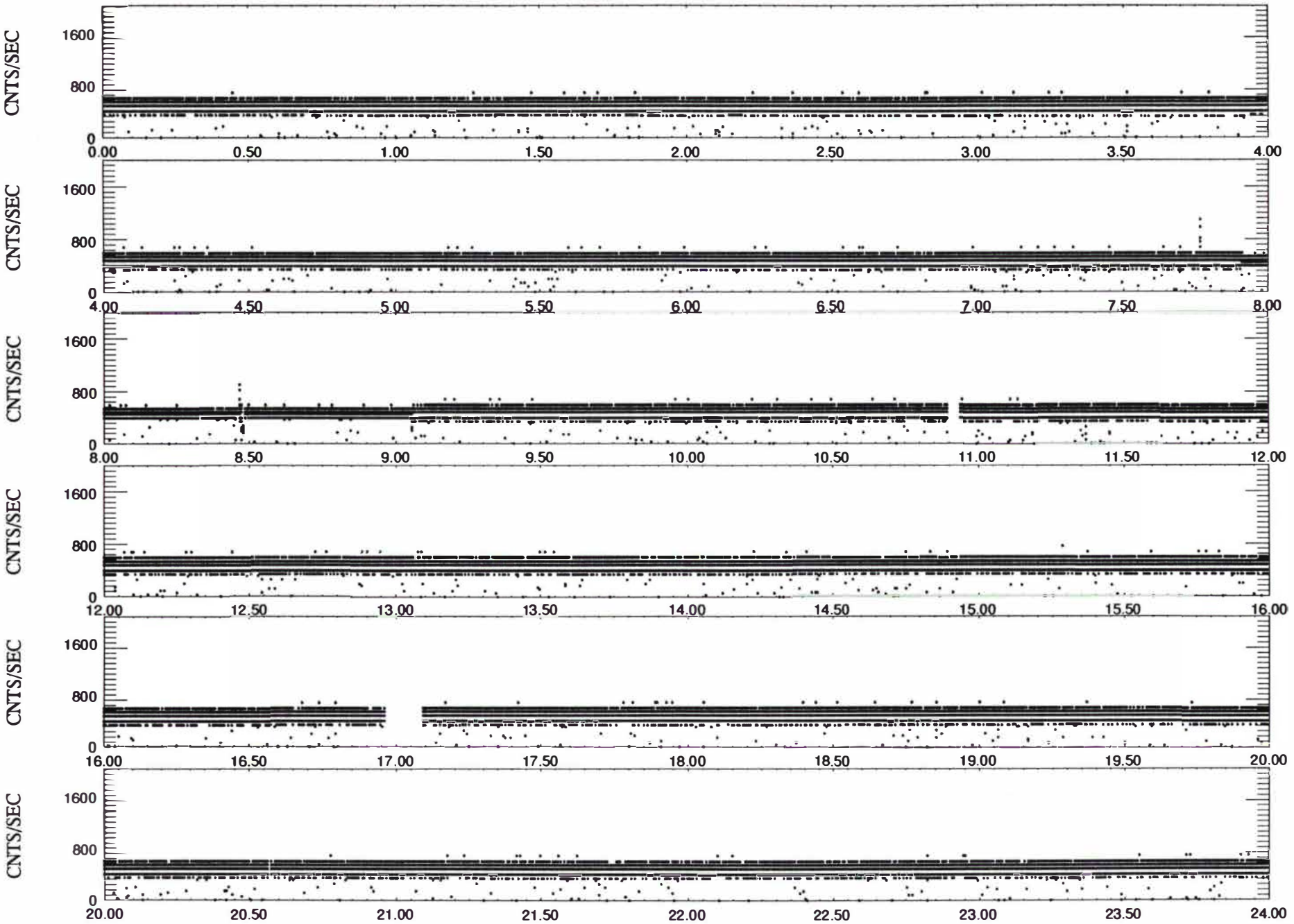

GOES
X
M
C
B
A
Watts m-2
10-4
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/06, 0000:00
Plot created: 95/06/15, 1857
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 96, year 1993 to day 96, year 1993 6/12/93



HUS 2A, MODE 1, NOT AVERAGED EDR day 96, year 1993 to day 96, year 1993 6/12/93

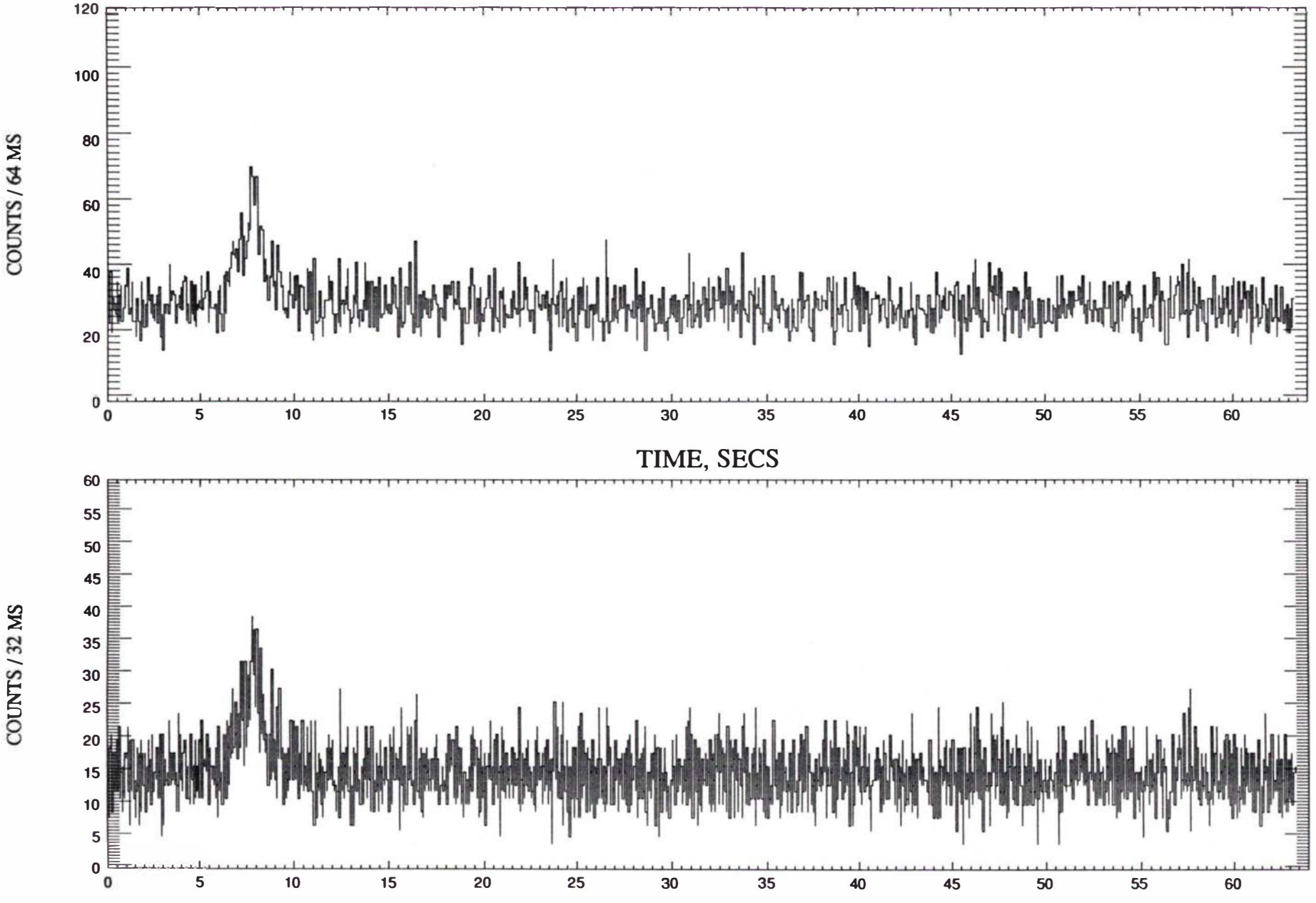
CALIBRATION DATA INCLUDED



UN ERSAL TIME

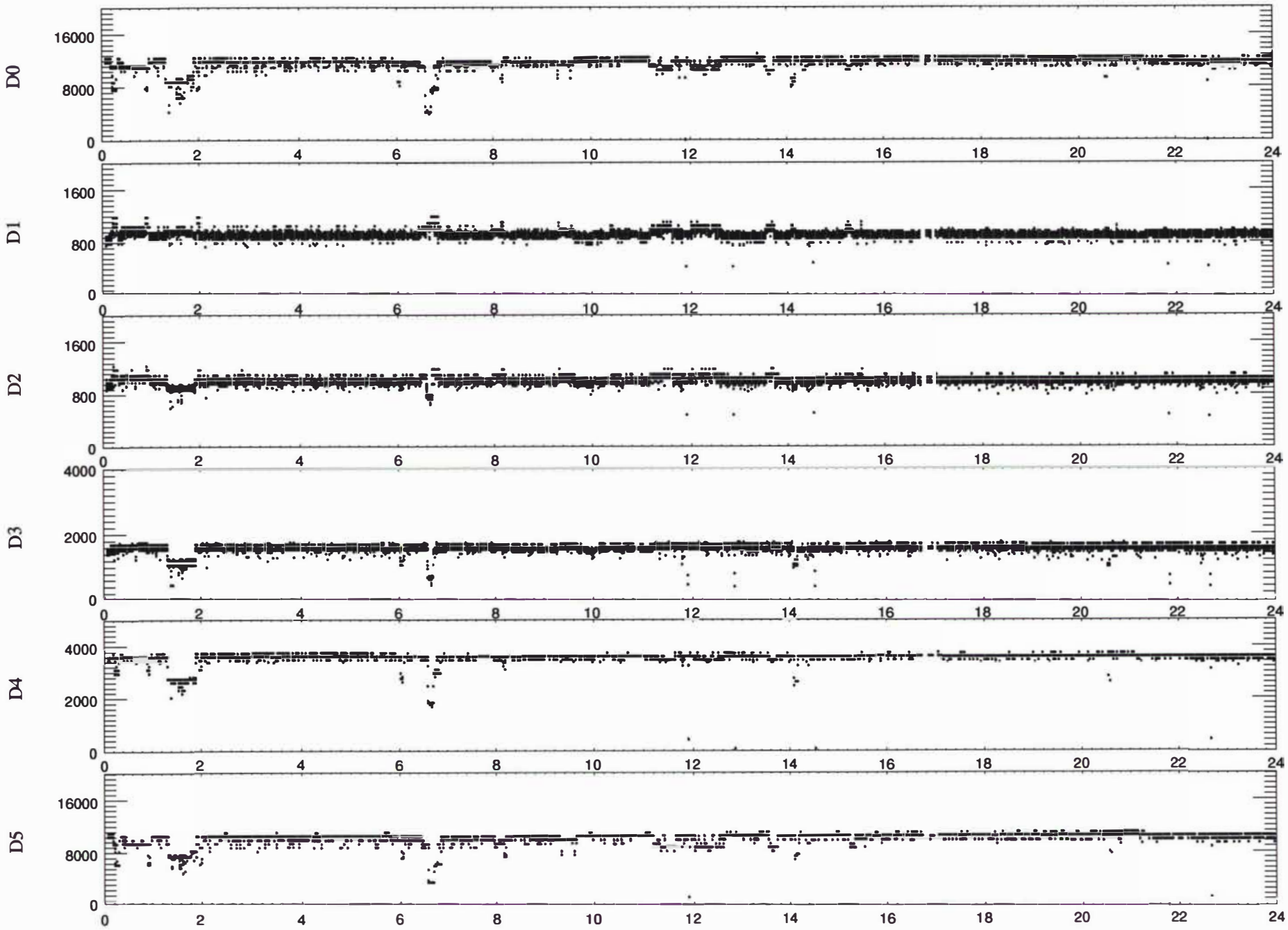
HUS 2A TRIGGERED DATA EDR day 96, year 1993 6/12/93

Burst Counter 12 at UT= 7.761025742425 h=27939.693 s 07:45:39.693



B# 1

HUS 2B COUNTS / SEC QEDR day 96, year 1993 to day 96, year 1993 4/7/93



From KOSHUT@fender.msfc.nasa.gov Thu Apr 8 10:39:15 1993
Date: Thu, 8 Apr 1993 12:42:18 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1296

BATSE BURST TRIGGER
NO.: 02293

TIME: TJD=9084 SECONDS=15564

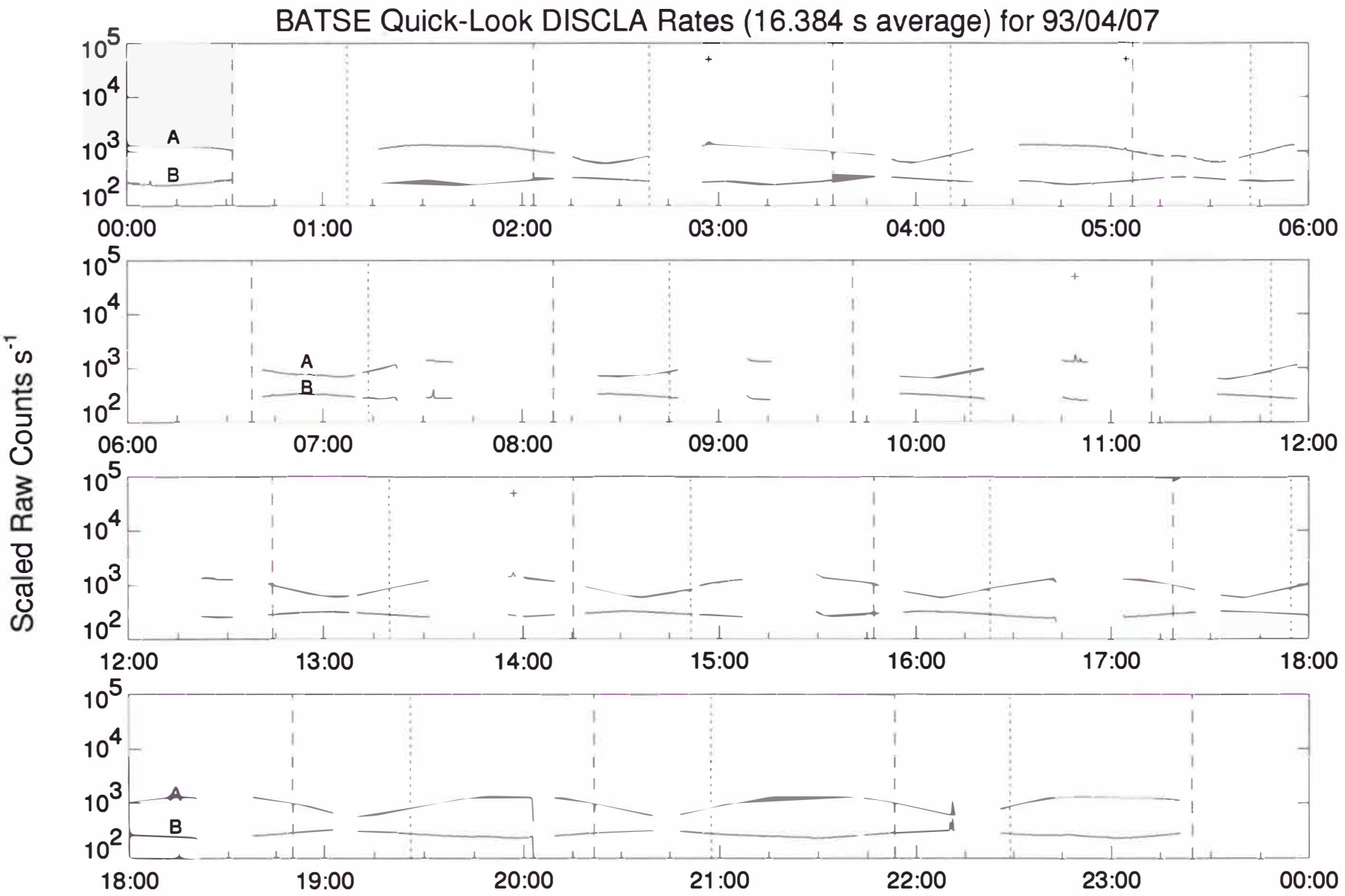
TYPE: FLARE SOLAR FLARE TRIGGER SIGNAL:N

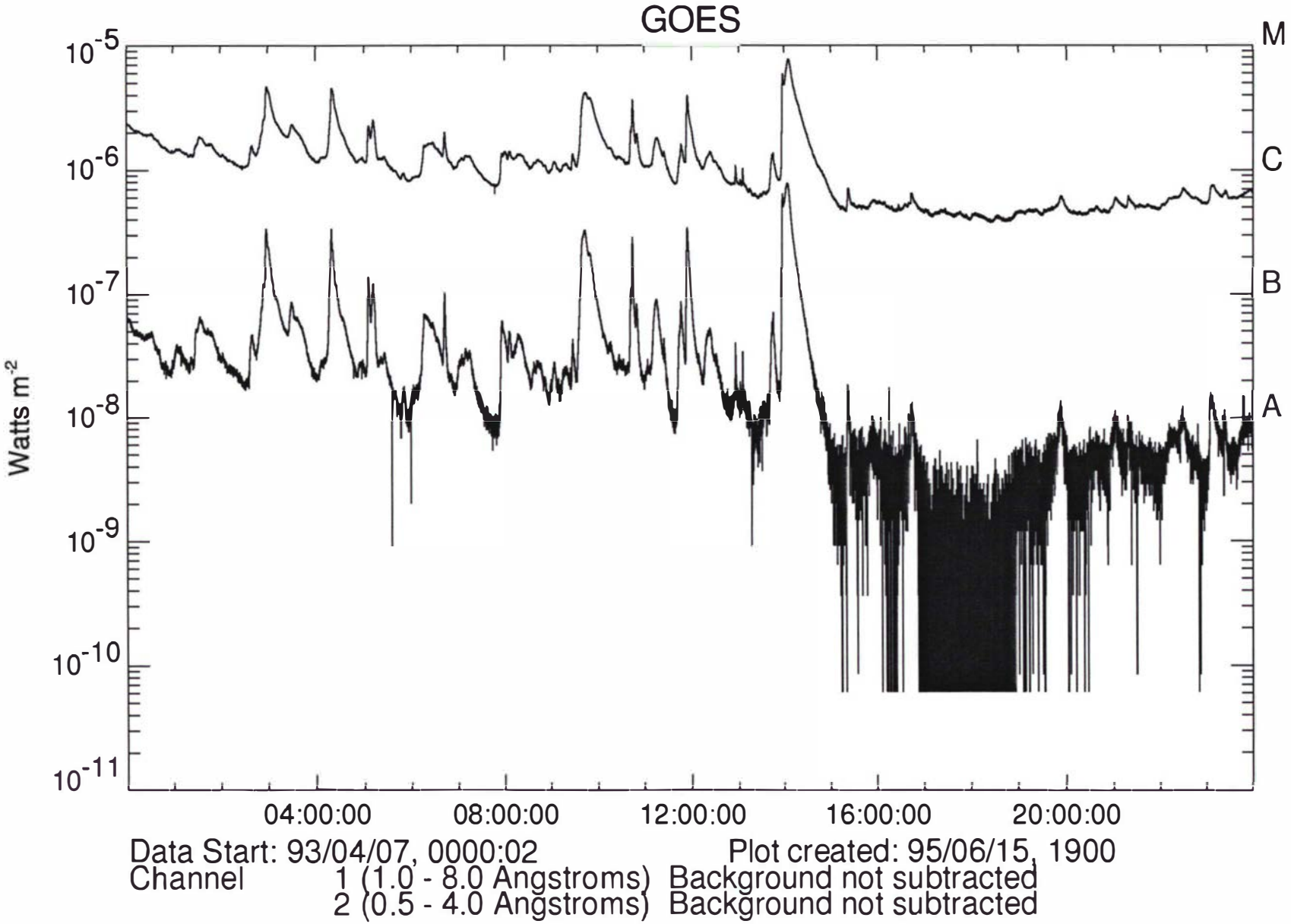
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

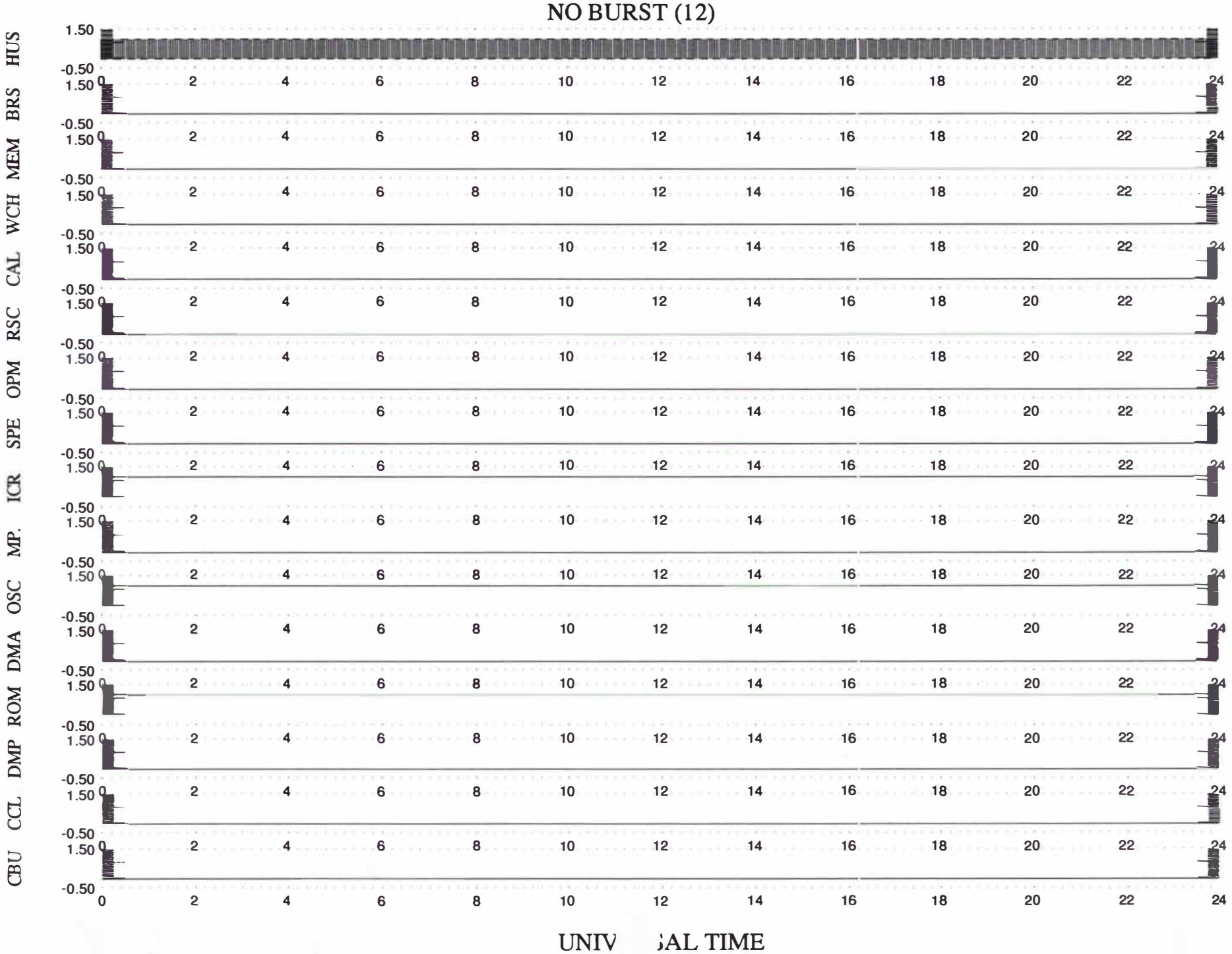
LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
SOLAR FLARE OF AT LEAST 25 SECONDS DURATION. NO EMISSION OBSERVED ABOVE 100 KEV. CLASSIFIED AS C4.1 FLARE IN GOES DATA.


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/07
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1406 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

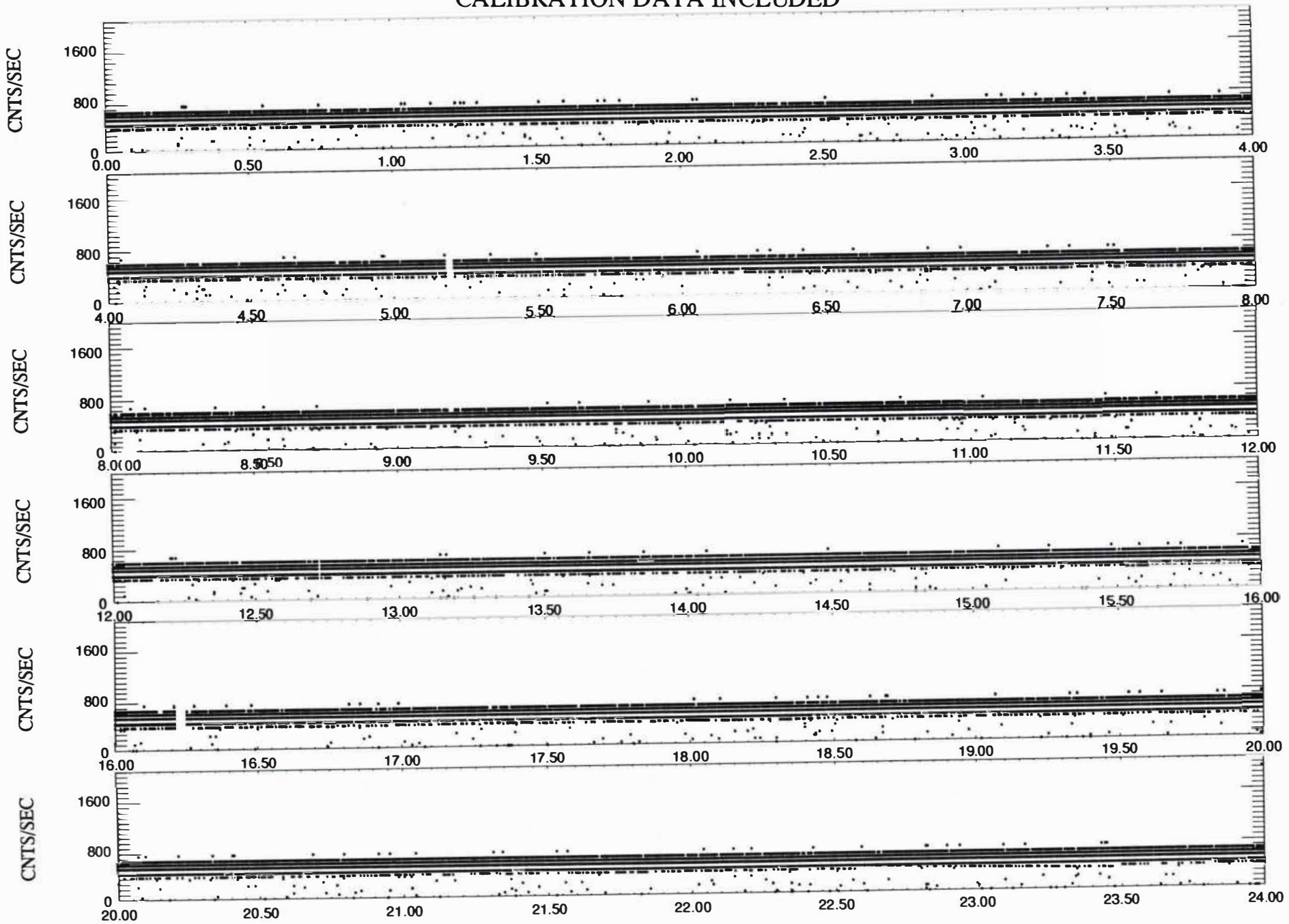

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/07, 0000:02
Plot created: 95/06/15, 1900
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 97, year 1993 to day 97, year 1993 6/12/93



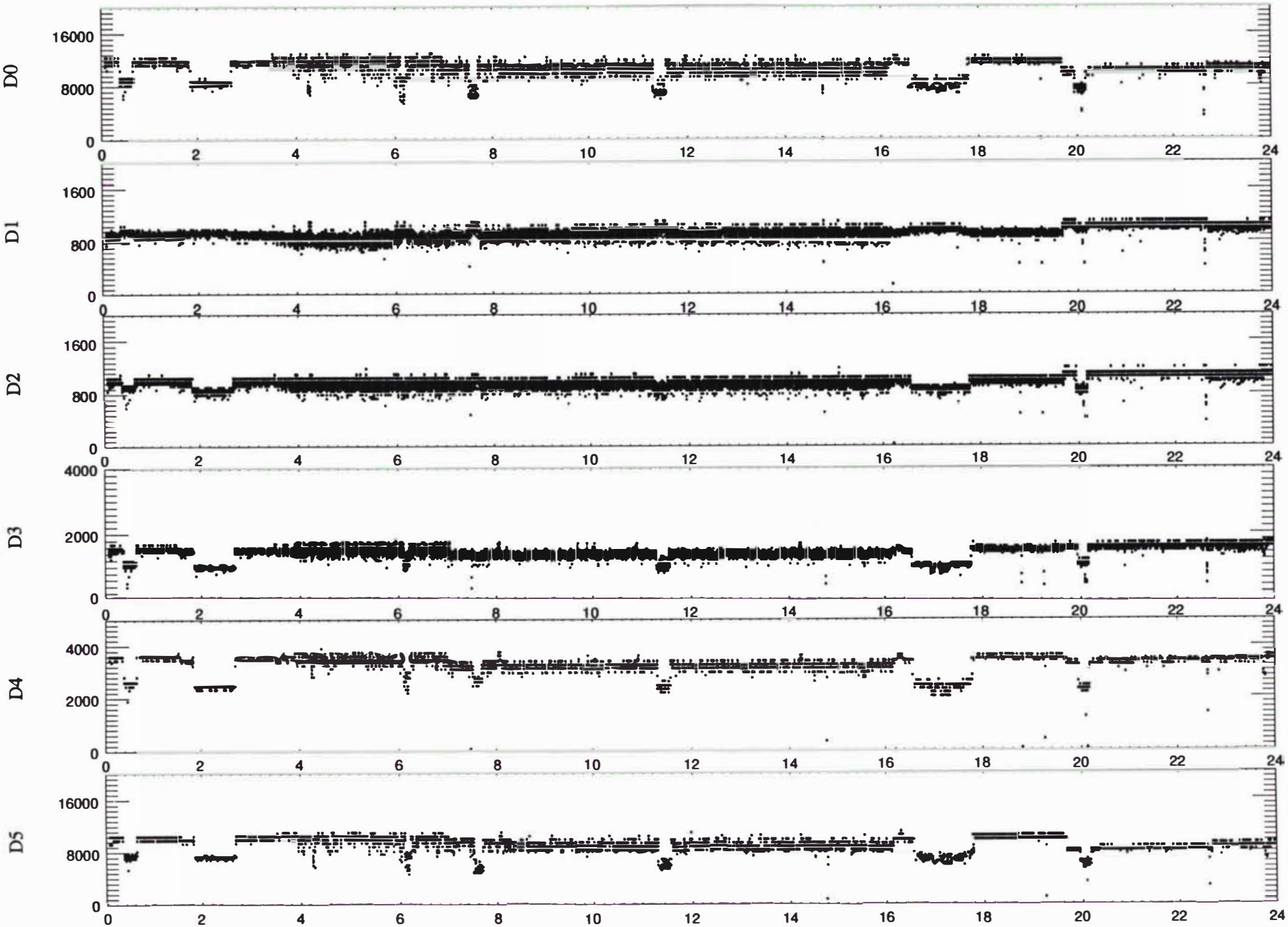
HUS 2A, MODE 1, NOT AVERAGED EDR day 97, year 1993 to day 97, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIVERSAL TIME

HUS 2B COUNTS / SEC QEDR day 97, year 1993 to day 97, year 1993 4/8/93



PHEBUS

+ Sternunting

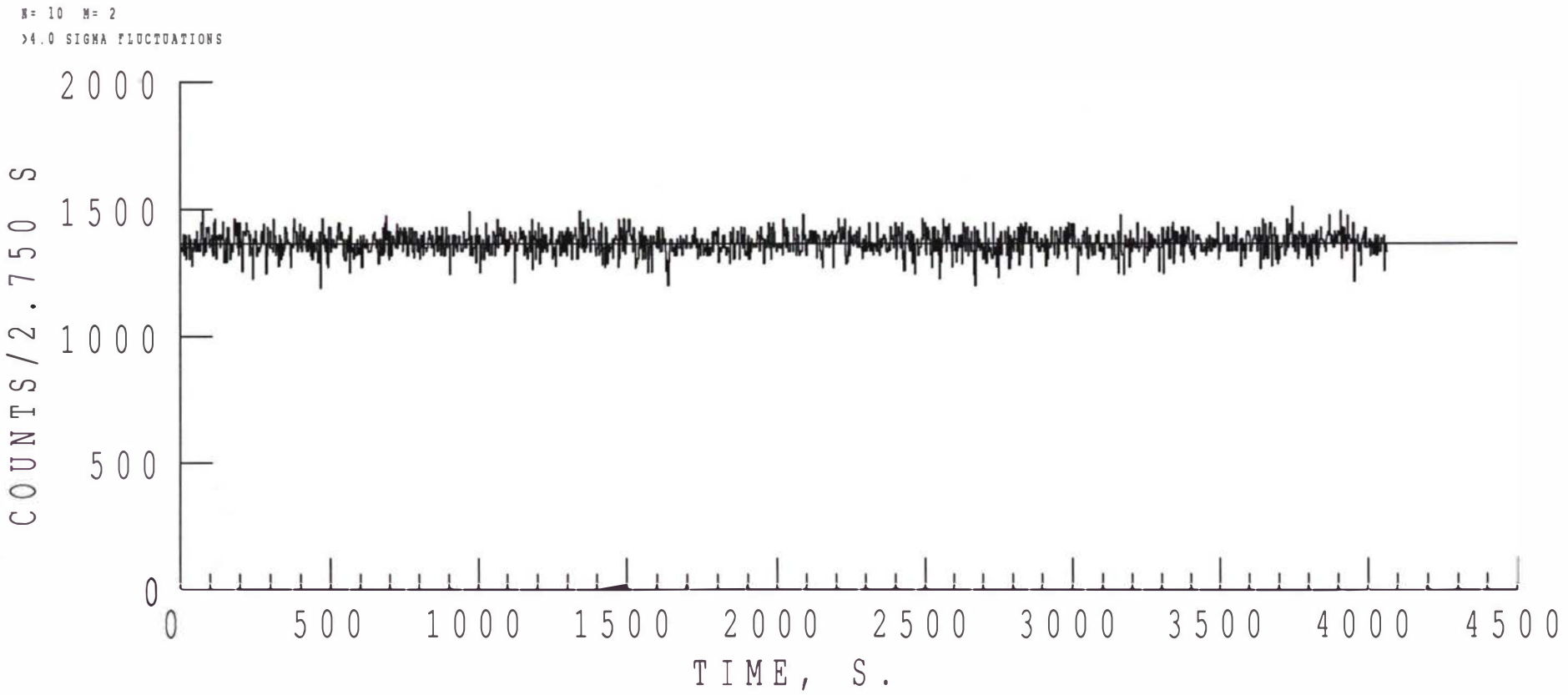
24/ 2/95

ULYSSES RT

8/ 4/93 4824.037 s

0.250 S INTERVALS REGROUPED BY 11

0- 0 keV



****
BATSEARCH PROGRAM
****

BATSE BURST # 2294
EVENT OF 1993 APR 8 DAY OF YEAR= 98
EVENT CROSSING TIME AT BATSE : 16696. S. OR 04:38:16.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 239.000 -38.000
BATSE PEAK COUNTING RATE: 3100 C/S
EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 8/ 4/ 93 IS:
RA= 145.712 DEC= -12.934 DIST= 4.129 AU
BATSE-ULYSSES DISTANCE = 617731813. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 95.38 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -193.16 SECS.
CROSSING TIME AT ULYSSES IS 16503. S. OR 04:35:02 +/- 403.23 SECONDS

Apr 9 14:23 1993 standard input Page 60

From MALLOZZI@ssl.msfc.nasa.gov Fri Apr 9 11:56:29 1993
Date: Fri, 9 Apr 1993 14:00:01 -0500 (CDT)
From: MALLOZZI@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2294	930408	9085	16696	3100	239	-38

NO

BATSE BURST TRIGGER
NO.: 02294

TIME: TJD=9085 SECONDS=16696

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=139.0 AZIMUTH=224.1 ERROR= DEGREES

COMMENTS:
BURST WITH VERY COMPLEX STRUCTURE LASTING FOR APPROX. 75 SEC, FOLLOWED
BY A SECOND, SIGNIFICANT EPISODE AT 300 SEC AFTER TRIGGER.
TOTAL DURATION GREATER THAN 400 SEC.

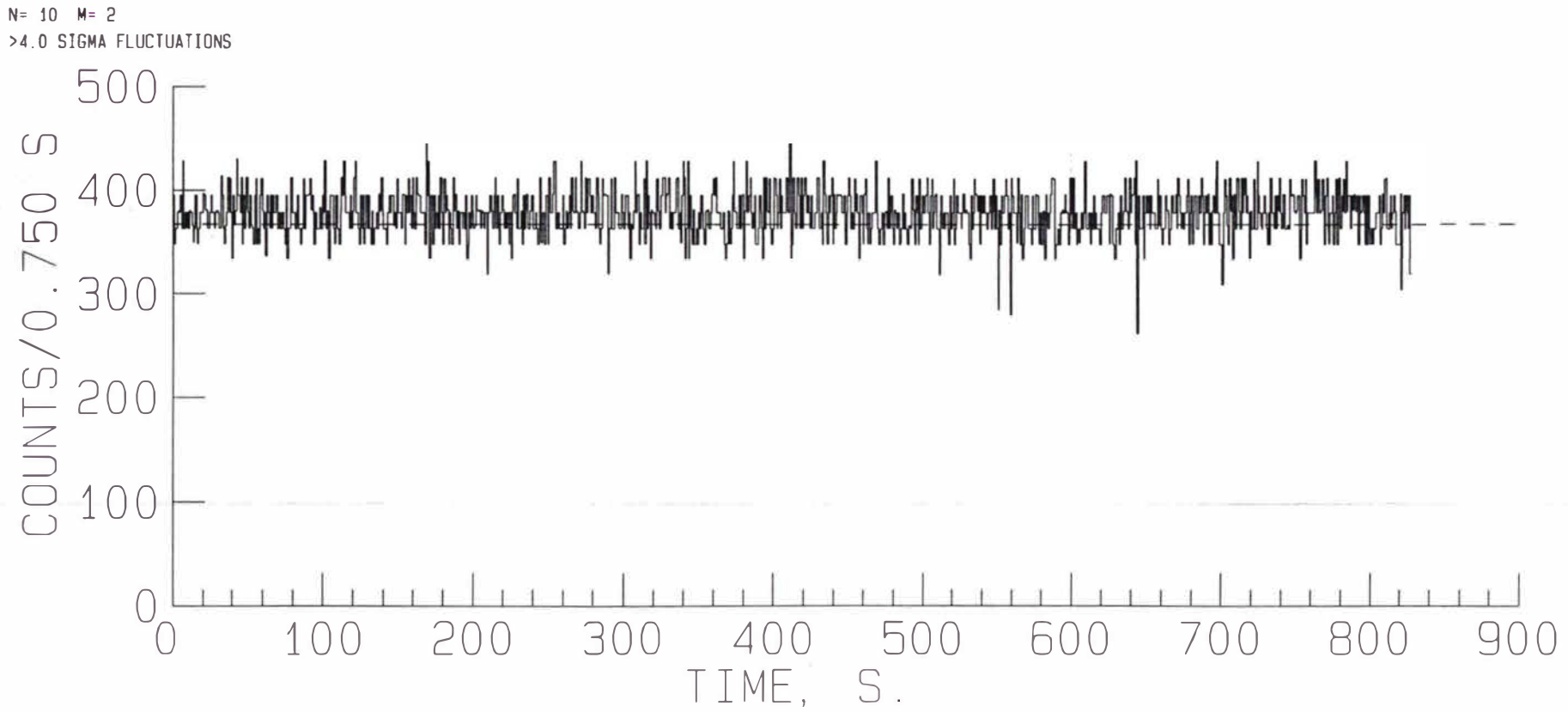
13/ 4/93

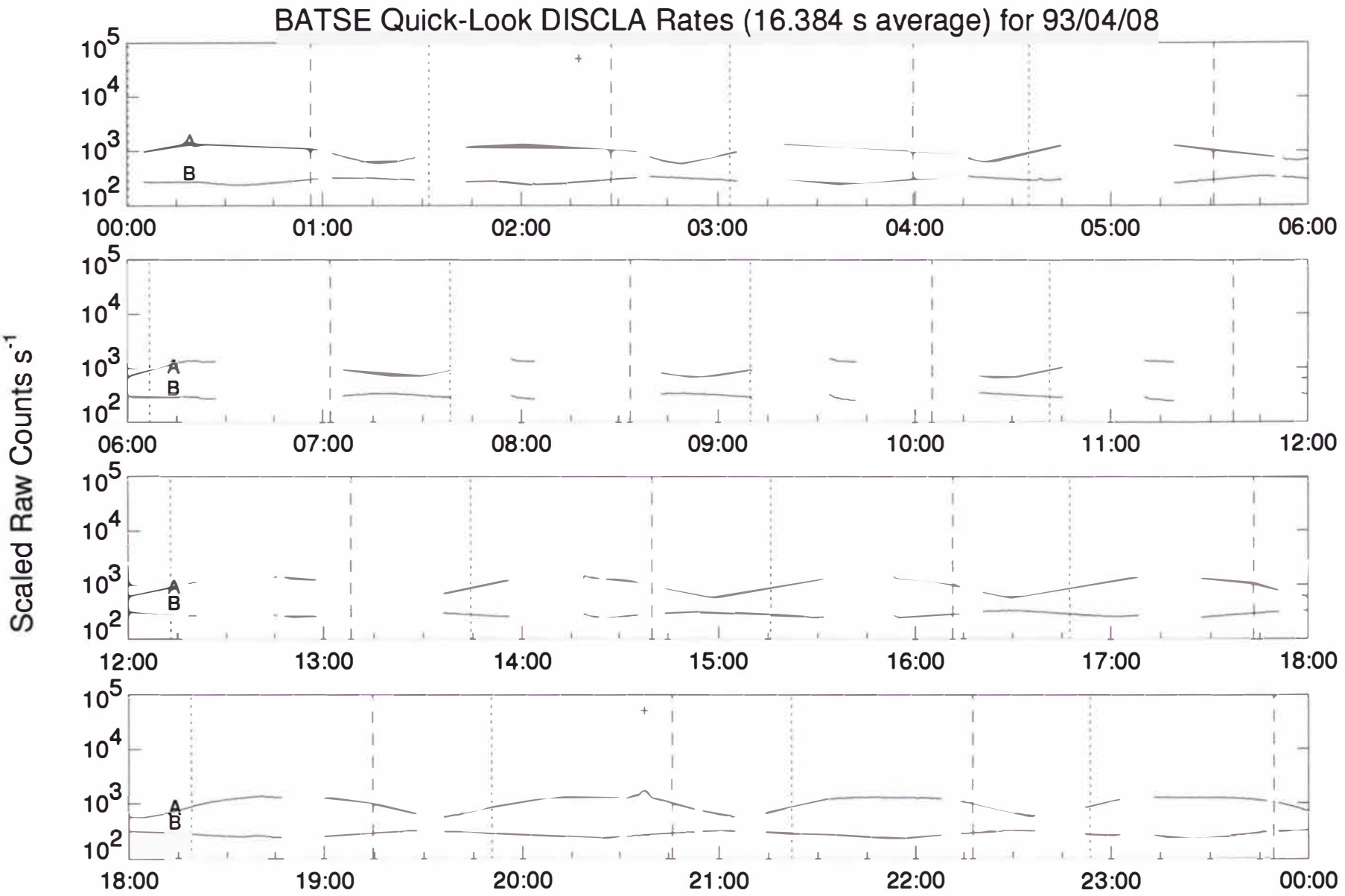
ULYSSES RT

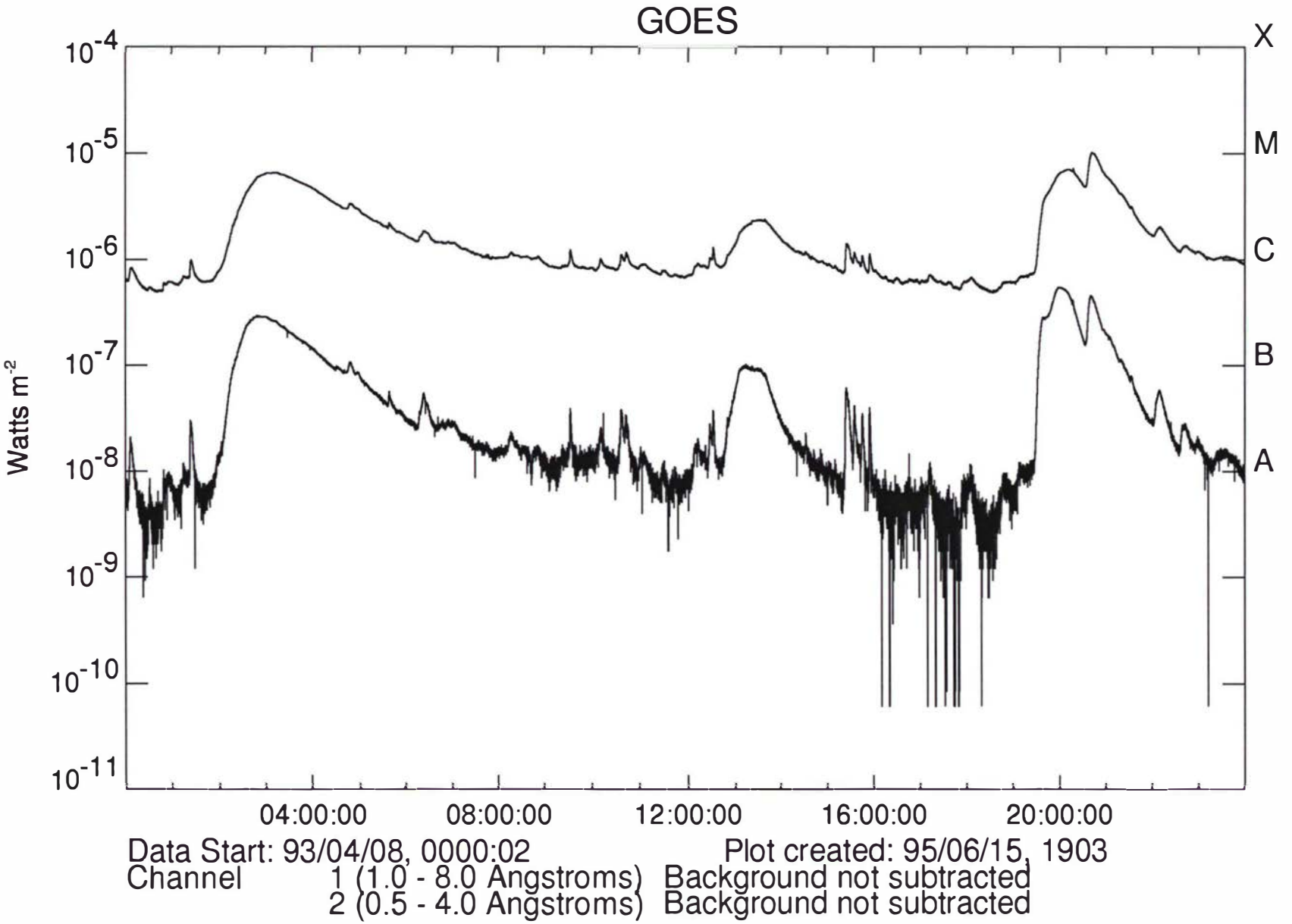
8/ 4/93 16092.214 s

0.250 S INTERVALS REGROUPED BY 3

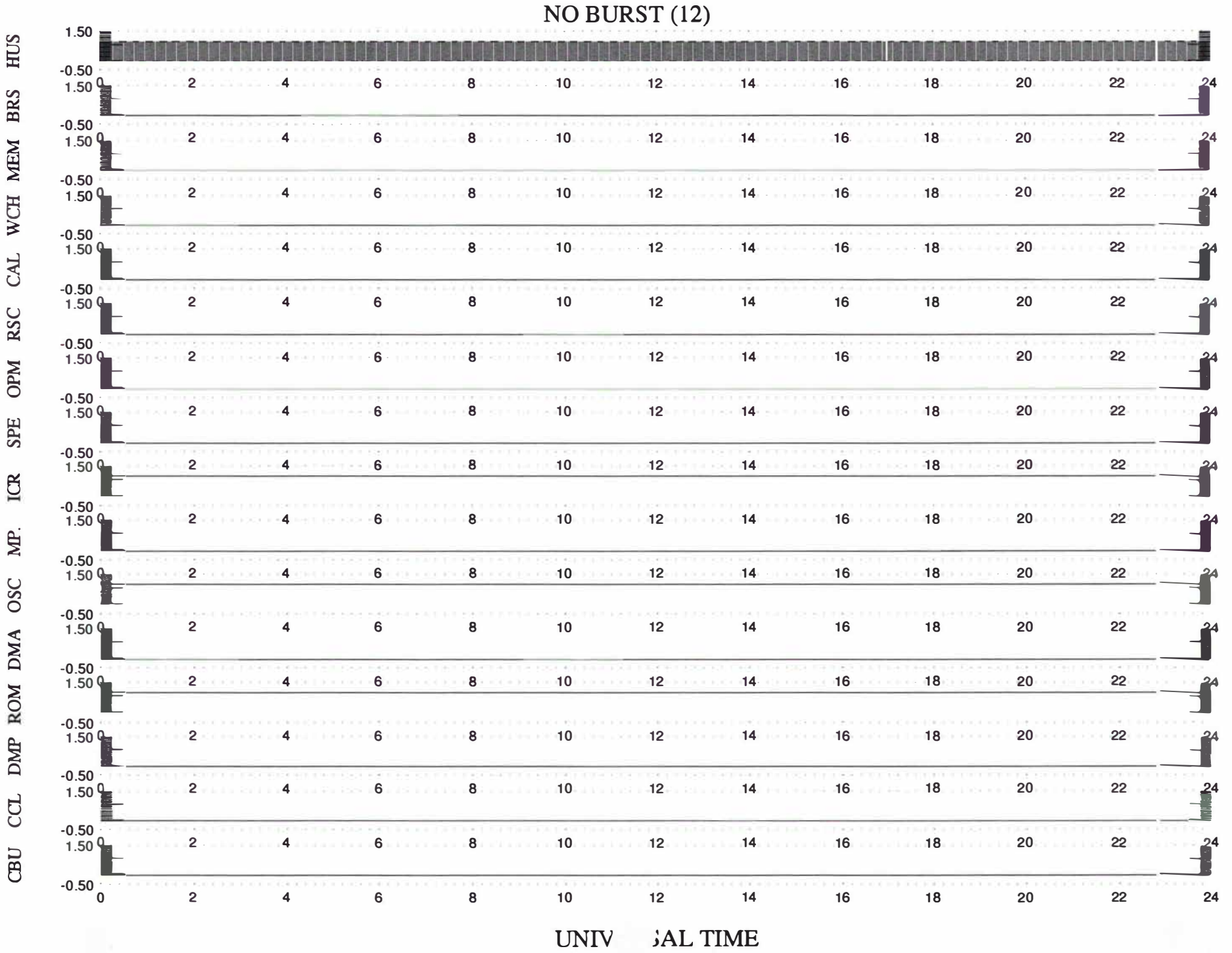
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/08
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1407 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

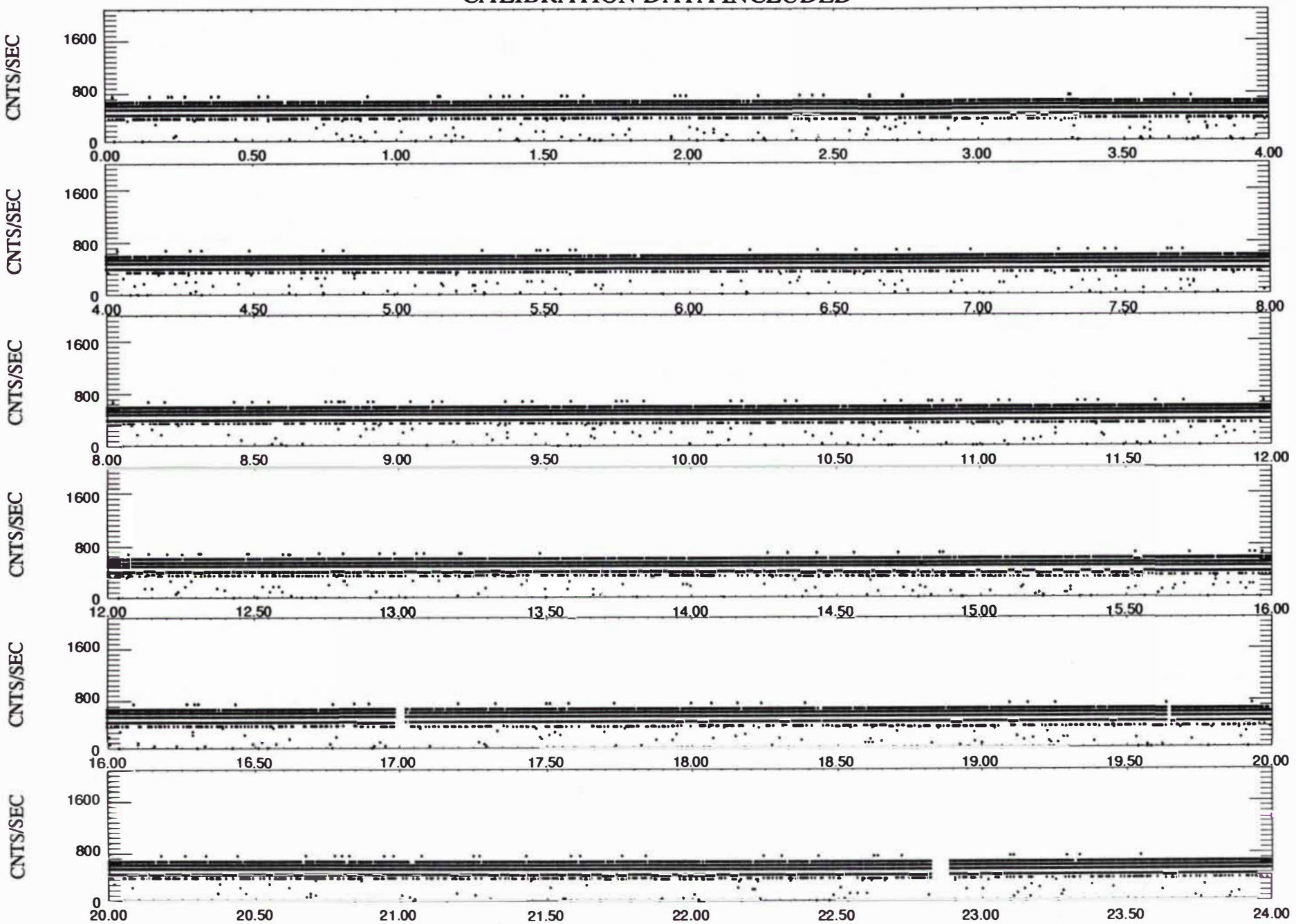

GOES
Watts m-2
10-4
10-5
10-6
10-7
10-8
10-9
10-10
10-11
X
M
C
B
A
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/08, 0000:02
Plot created: 95/06/15, 1903
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 98, year 1993 to day 98, year 1993 6/12/93



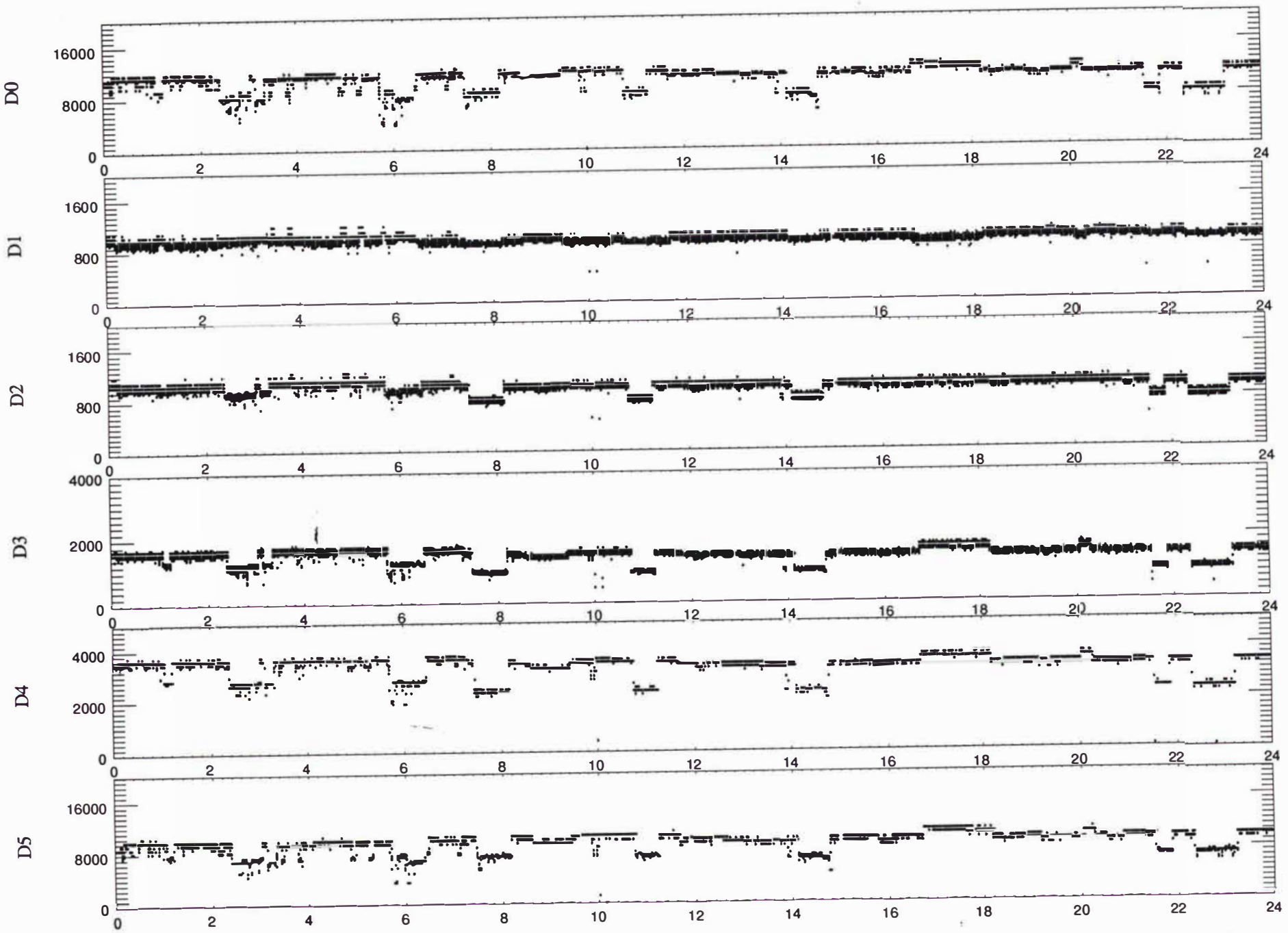
HUS 2A, MODE 1, NOT AVERAGED EDR day 98, year 1993 to day 98, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UN RSAL TIME

HUS 2B COUNTS / SEC QEDR day 98, year 1993 to day 98, year 1993 4/9/93



Kommers

UNTRIGGERED

ULYSSES RT

21/ 5/97

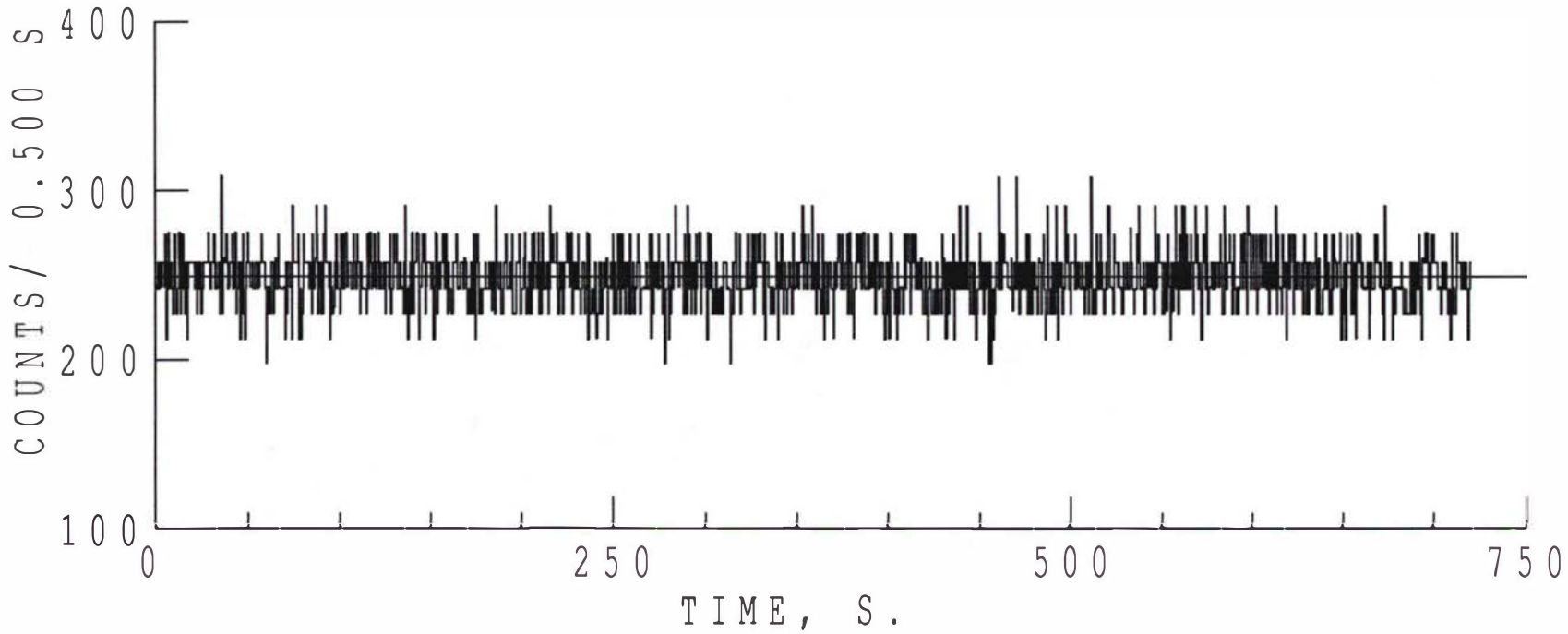
9/ 4/93 12240.003 s

0.250 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



Kommers

UNTRIGGERED

ULYSSES RT

21/ 5/97

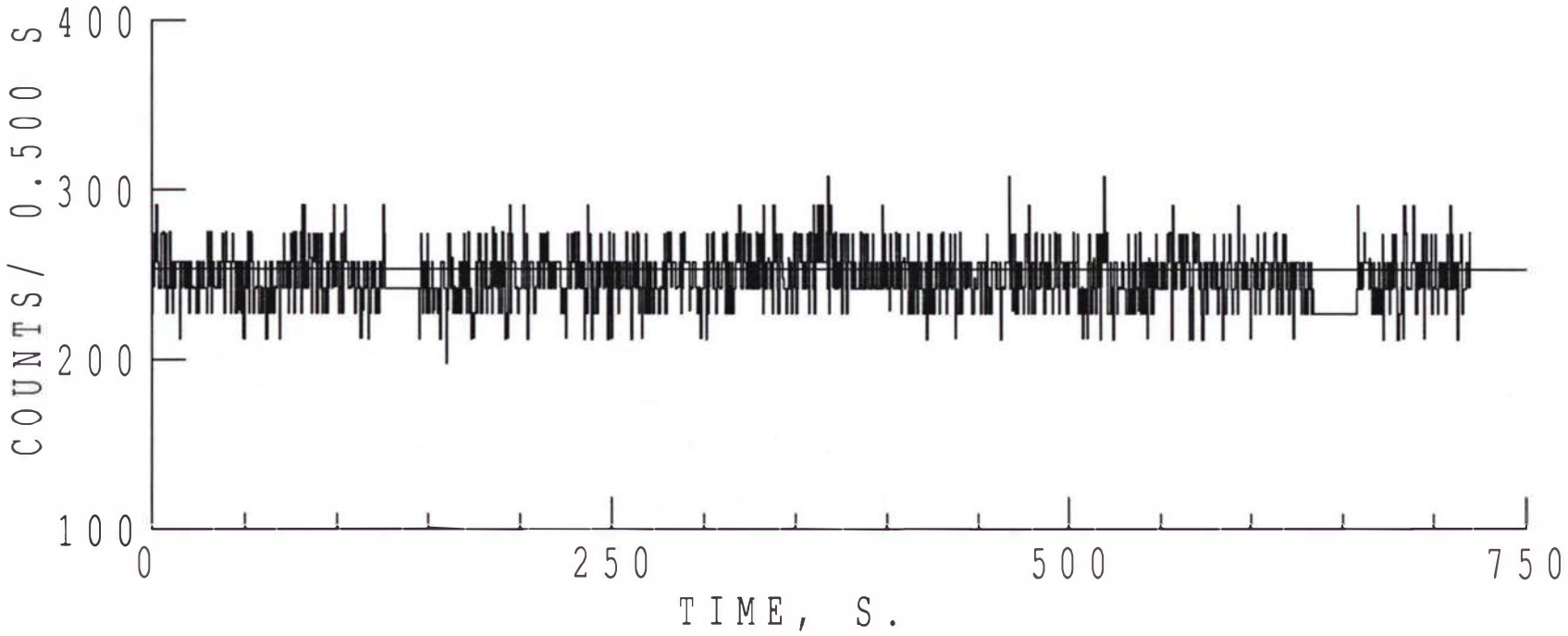
9/ 4/93 79380.055 s

0.250 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



****
BATSEARCH PROGRAM
****

KT

BATSE BURST # 2295
EVENT OF 1993 APR 9 DAY OF YEAR= 99
EVENT CROSSING TIME AT BATSE : 17410. S. OR 04:50:10.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 299.000 42.000
BATSE PEAK COUNTING RATE: 5300 C/S
EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 9/ 4/ 93 IS:
RA= 145.553 DEC= -12.877 DIST= 4.138 AU
BATSE-ULYSSES DISTANCE = 618984960. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 37.14 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1645.91 SECS.
CROSSING TIME AT ULYSSES IS 19056. S. OR 05:17:35 +/- 291.42 SECONDS

Apr 15 17:53 1993 standard input Page 1

From MEEGAN@ssl.msfc.nasa.gov Thu Apr 15 14:43:54 1993
Date: Thu, 15 Apr 1993 16:47:48 -0500 (CDT)
From: MEEGAN@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2295	930409	9086	17410	5300	299	+42

BATSE BURST TRIGGER
NO.: 02295

TIME: TJD=9086 SECONDS=17410

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= 64. AZIMUTH=310. ERROR= DEGREES

COMMENTS:
DOUBLE PEAKED, 40 S LONG.

Helio corr removed

Date: Dec 18 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☐ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☐ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☐ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☐ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution? No - bad stats

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

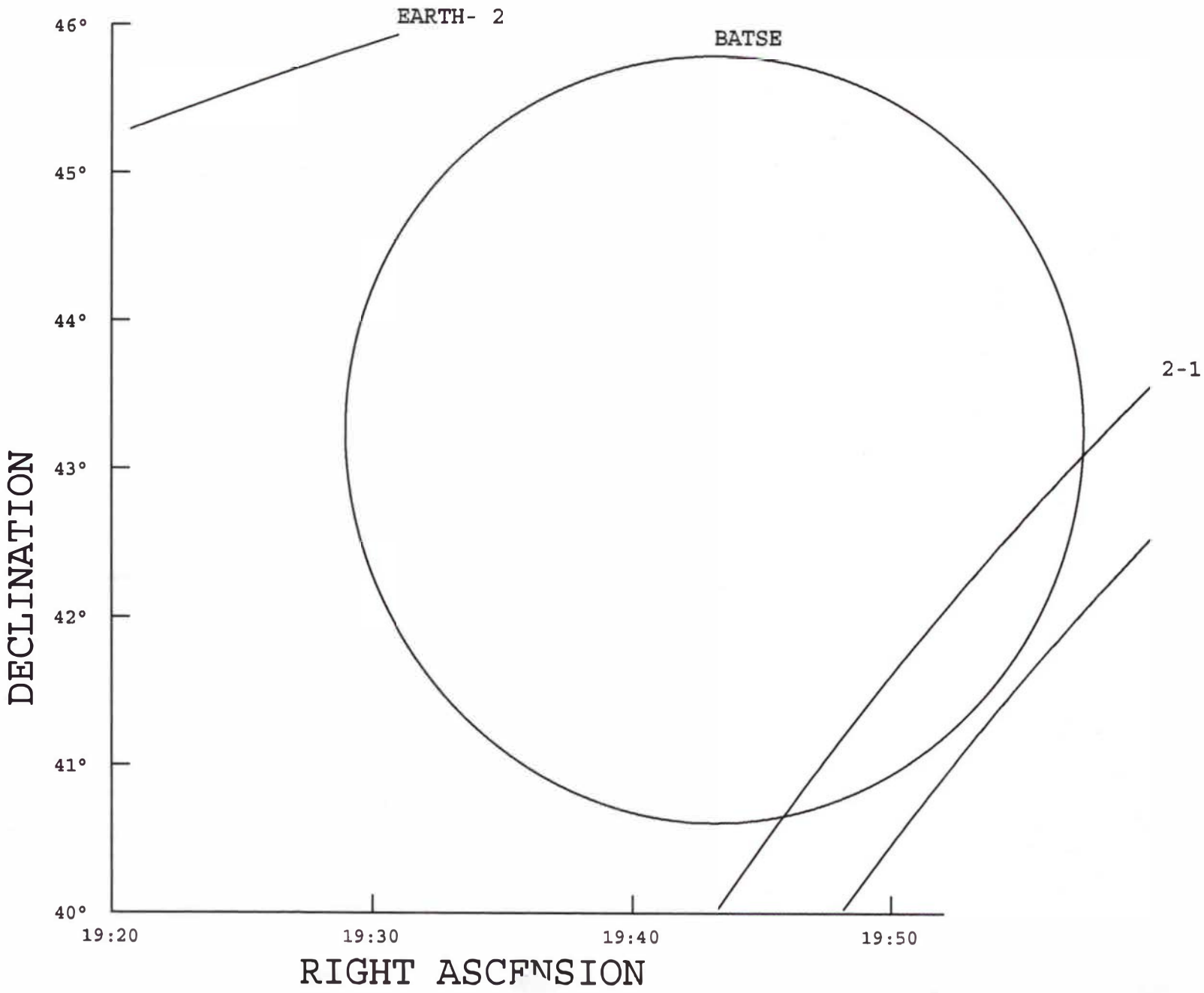
☐ 2000 coordinates used?

☐ Geocentric time used?

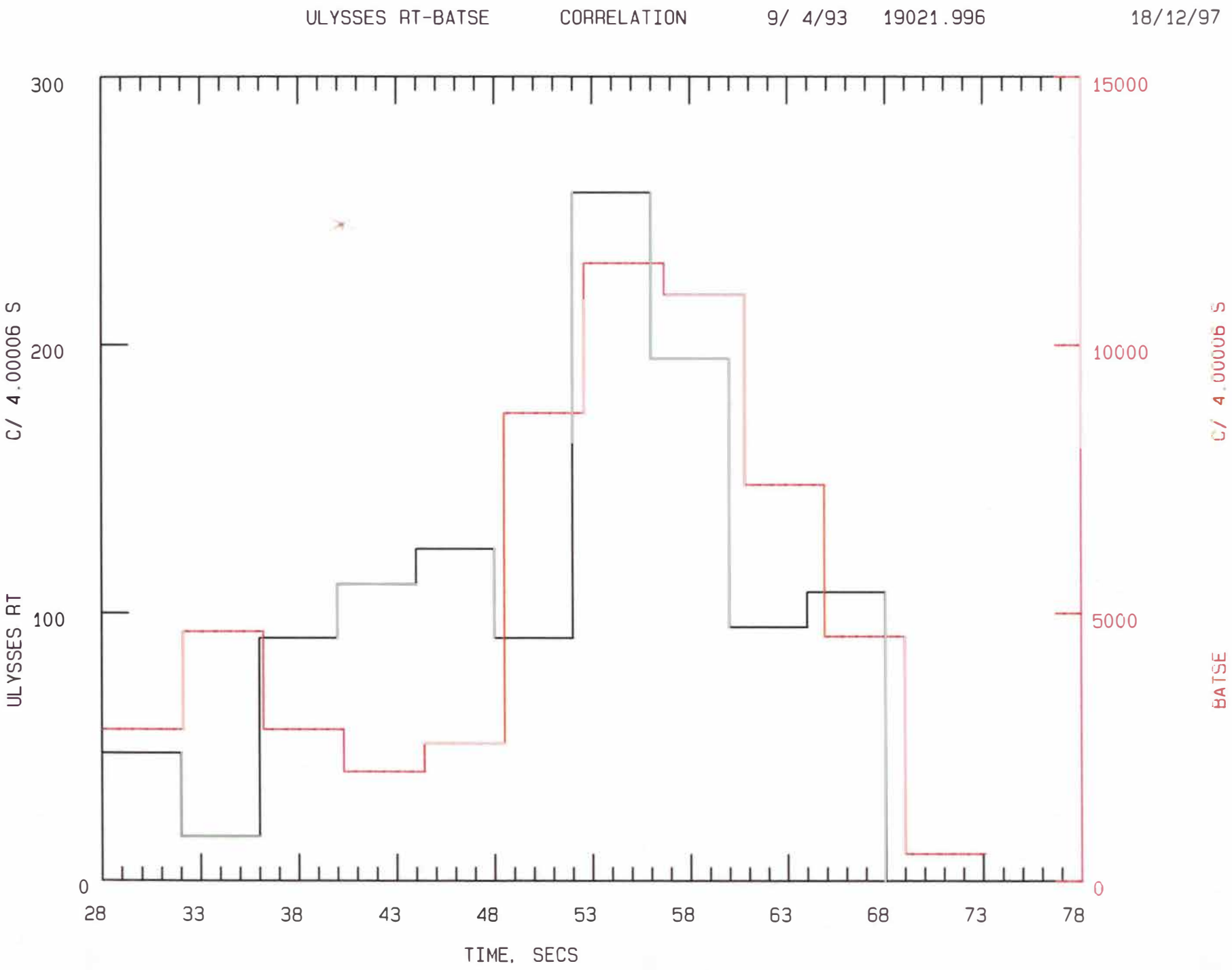
☐ ACCESS database updated?

EVENT OF APR 9, 1993 5:17

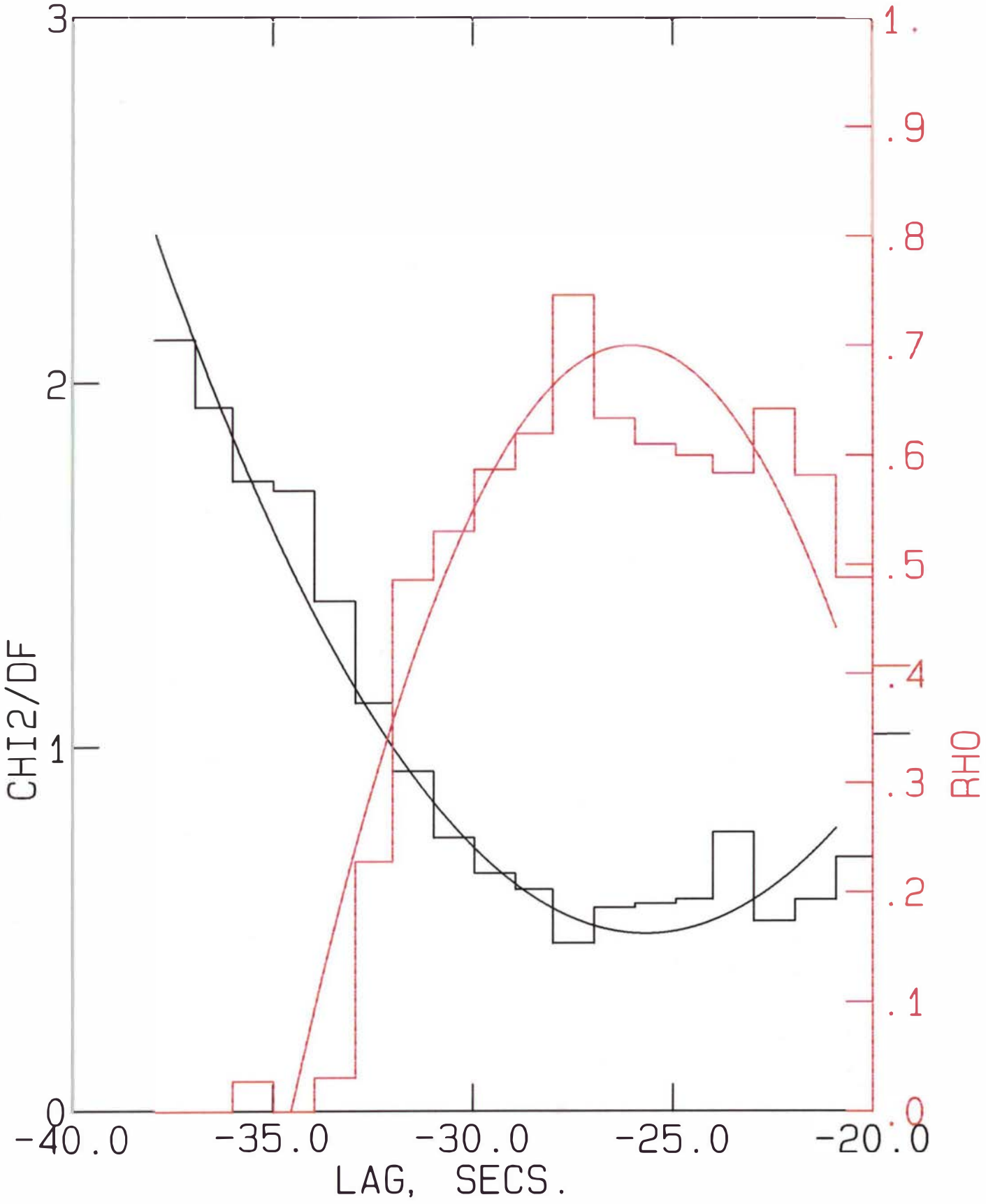
18/12/97



N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE


ULYSSES RT-BATSE CORRELATION 9/ 4/93 19021.996 18/12/97
300
200
100
0
C/ 4.00006 S
ULYSSES RT
15000
10000
5000
0
C/ 4.00006 S
BATSE
28
33
38
43
48
53
58
63
68
73
78
TIME, SECS

ULYSSES RT-BATSE CORRELATION 9/ 4/93 19021.996



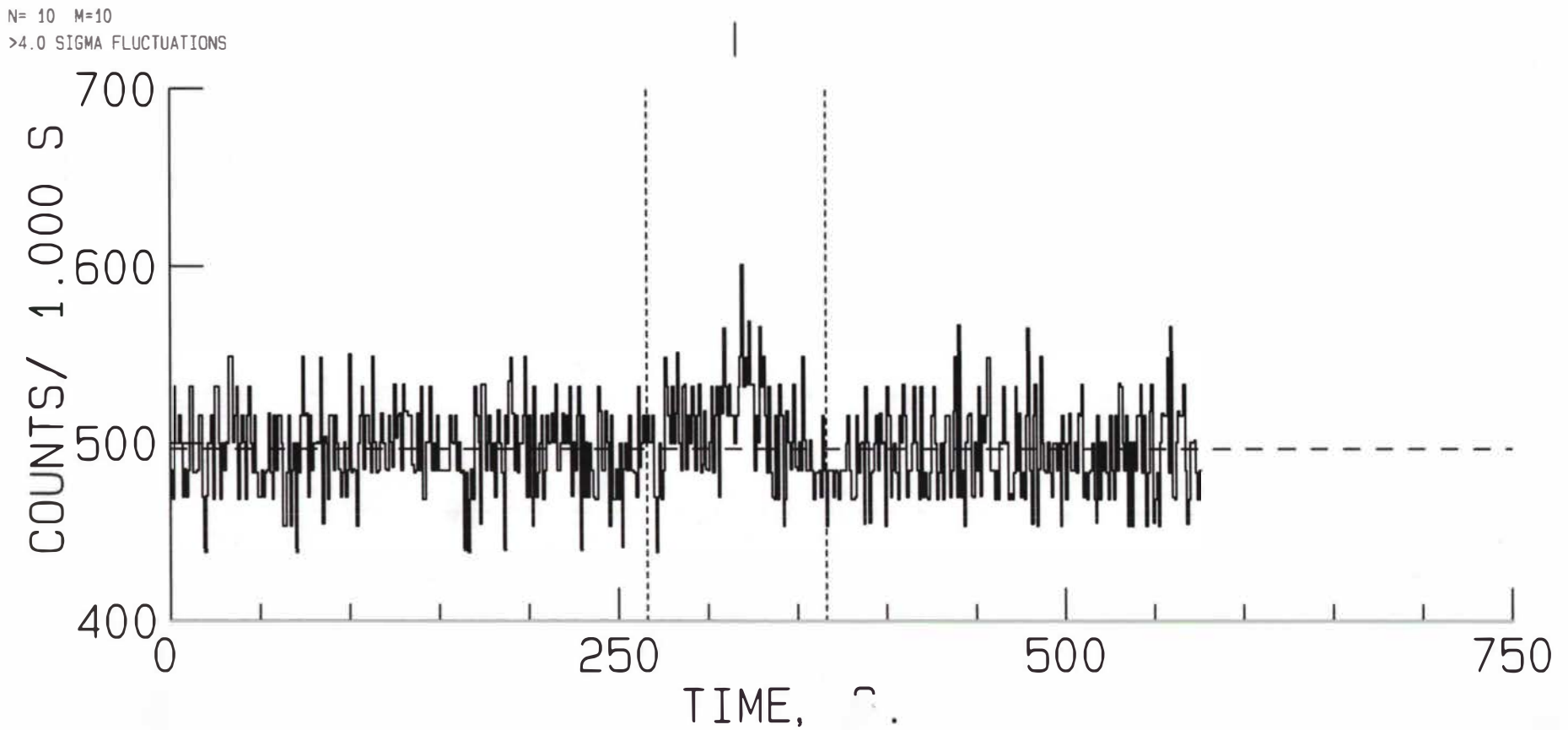
ULYSSES RT

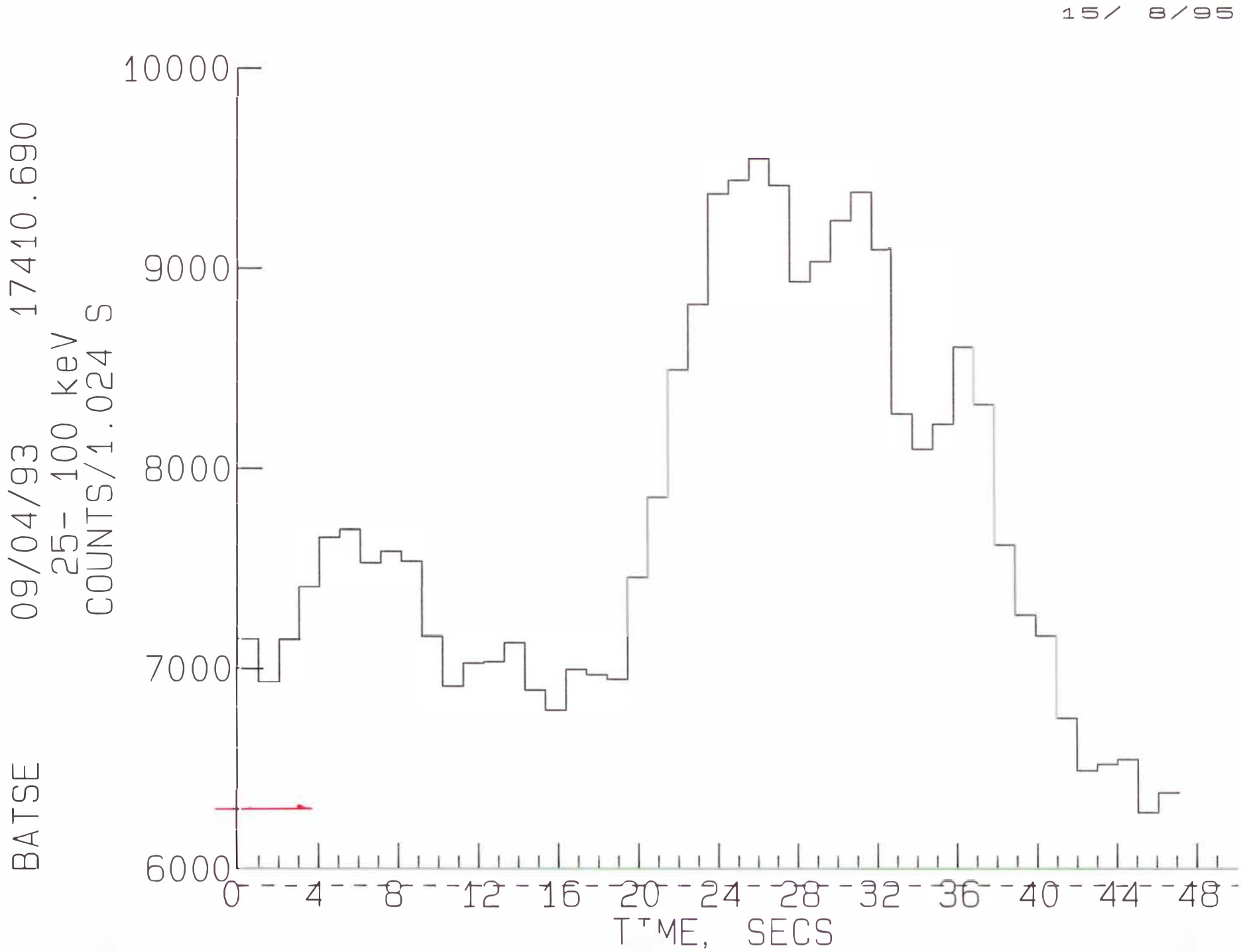
18/12/97

9/ 4/93 18756.107 s

0.250 S INTERVALS REGROUPED BY 4

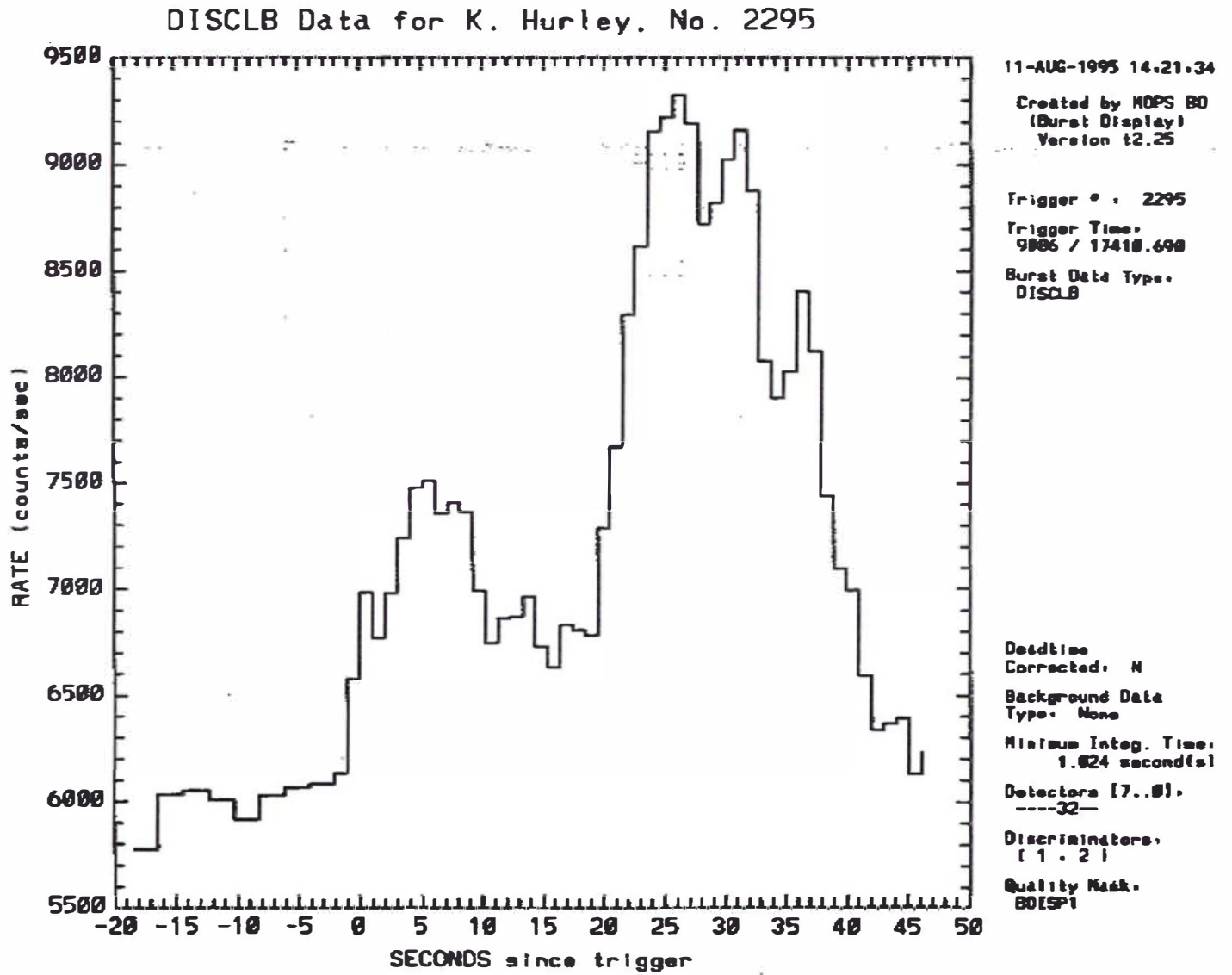
21- 145 keV



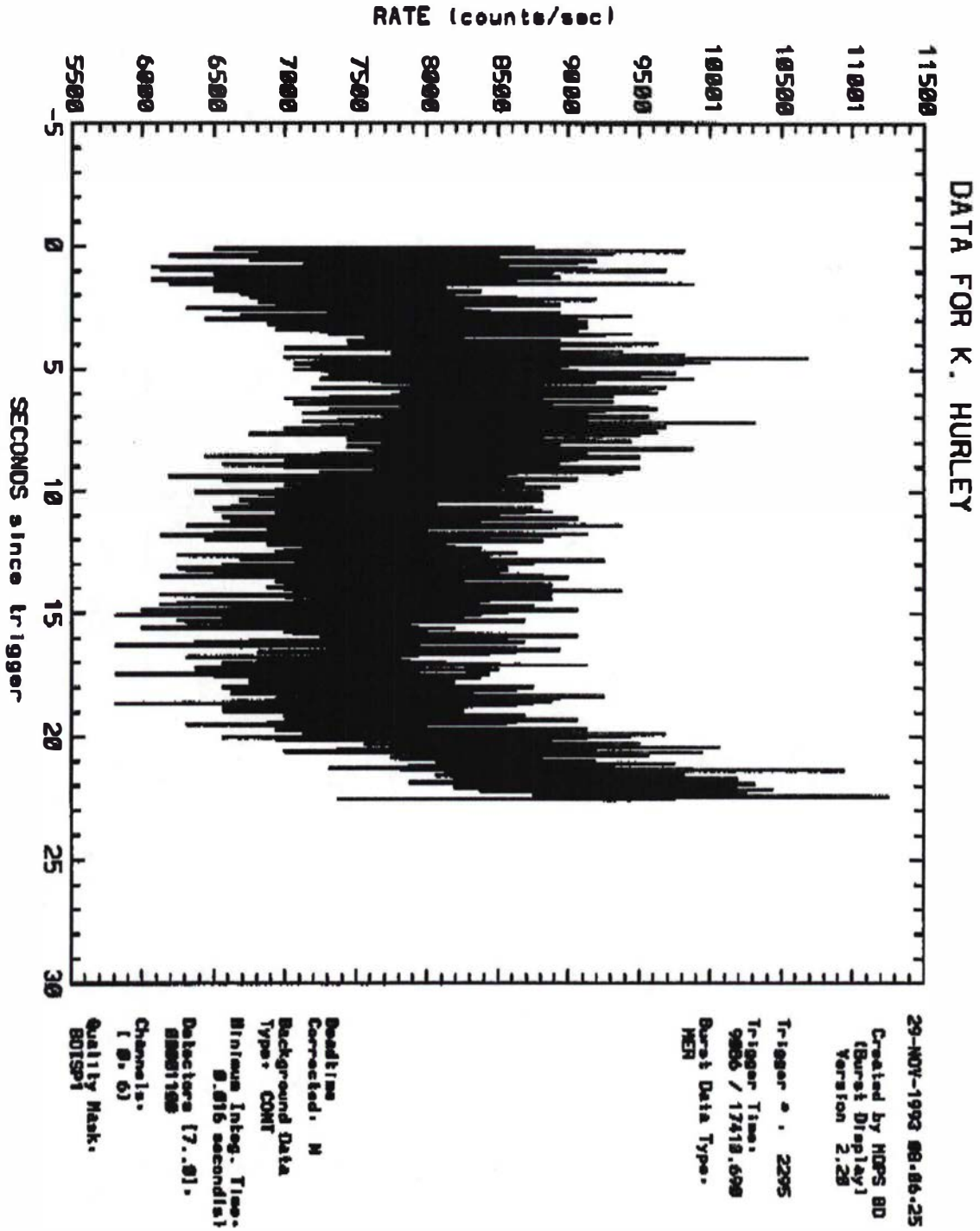

15/ 8/95
BATSE 09/04/93 17410.690
25- 100 keV
COUNTS/1.024 S
10000
9000
8000
7000
6000
0 4 8 12 16 20 24 28 32 36 40 44 48
TIME, SECS

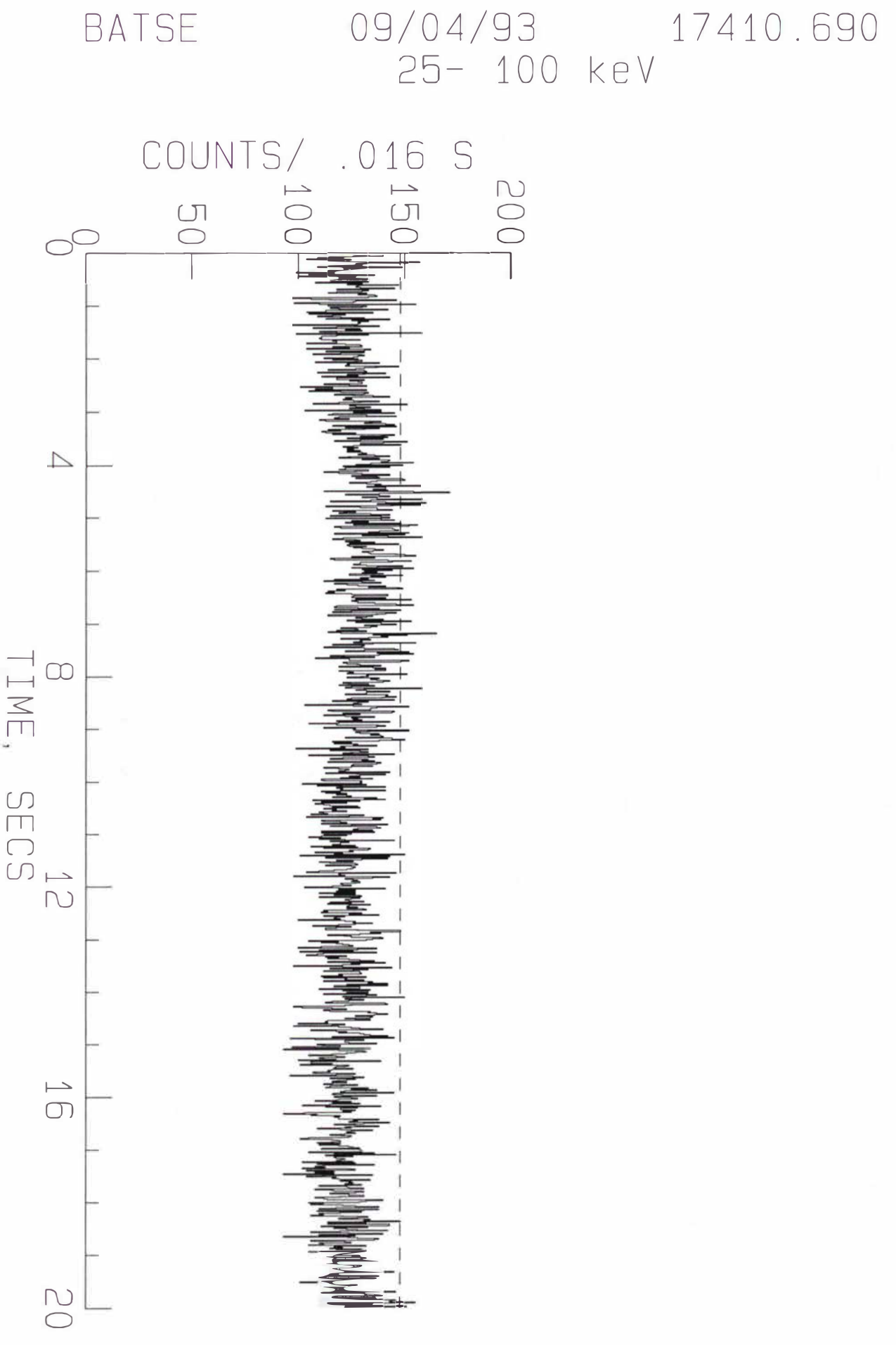
R=95%

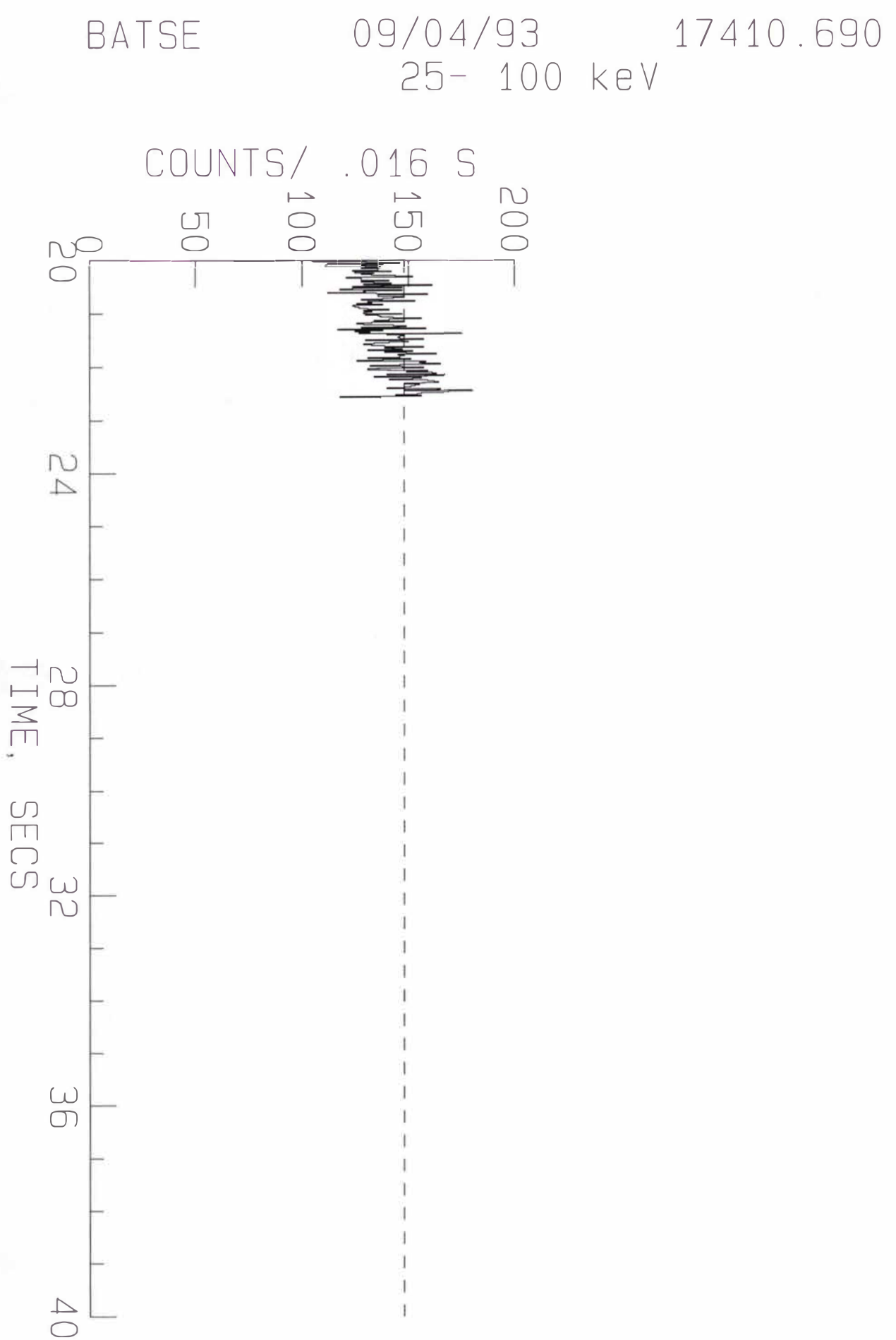
08-11-1995 14:15 205 544 5800 BATSE P.03



205 544 5800 08-11-95 12:46PM P003 #17


DATA FOR K. HURLEY
RATE (counts/sec)
11500
11001
10500
10001
9500
9000
8500
8000
7500
7000
6500
6000
5500
-5
0
5
10
15
20
25
30
SECONDS since trigger
29-NOV-1993 08:06:25
Created by HDPS BD
(Burst Display)
Version 2.28
Trigger # . 2295
Trigger Time:
9886 / 17418.698
Burst Data Type:
MER
Deadtime
Corrected. N
Background Data
Type: CONT
Minimum Integ. Time:
0.016 seconds)
Detectors (7..0):
00000100
Channels:
(0. 6)
Quality Mask:
BDISP1


BATSE 09/04/93 17410.690
25- 100 keV
COUNTS/ .016 S
0
50
100
150
200
0
4
8
12
16
20
TIME, SECS


BATSE 09/04/93 17410.690
25- 100 keV
COUNTS/ .016 S
0
50
100
150
200
20
24
28
32
36
40
TIME, SECS

4/12/93

From MEEGAN@ssl.msfc.nasa.gov Mon Apr 12 08:16:58 1993
Date: Mon, 12 Apr 1993 10:20:26 -0500 (CDT)
From: MEEGAN@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1215

BATSE BURST TRIGGER
NO.: 02296

TIME: TJD=9086 SECONDS=70102

TYPE: FLARE SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
GOES B8.6 FLARE. SINGLE 10 SECOND PULSE. MARGINAL ABOVE 100 KEV.

```
          ******************
          *BATSEARCH PROGRAM*
          ******************

 BATSE BURST #     2297
 EVENT OF 1993 APR  9 DAY OF YEAR= 99
 EVENT CROSSING TIME AT BATSE      : 77140. S. OR 21:25:40.0
 COORDINATES ARE    .000    .000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 182.000  -36.000
 BATSE PEAK COUNTING RATE:   5800    C/S
 EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
 POSITION OF ULYSSES ON  9/ 4/  93 IS:
 RA=  145.553 DEC=  -12.877 DIST=    4.138 AU
 BATSE-ULYSSES DISTANCE =  618984960. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=139.94 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1580.34 SECS.
 CROSSING TIME AT ULYSSES    IS 75560. S. OR   20:59:19 +/-  256.69 SECONDS
```



```
From MEEGAN@ssl.msfc.nasa.gov Thu Apr 15 14:45:45 1993
Date:    Thu, 15 Apr 1993 16:49:41 -0500 (CDT)
From: MEEGAN@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2297   930409    9086   77140     5800   182   -36
```

RI

BATSE BURST TRIGGER

NO.: 02297

TIME: TJD=9086 SECONDS=77140

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=110. AZIMUTH=174. ERROR= DEGREES

COMMENTS:
SINGLE PULSE, 40 SECONDS LONG. NOT SEEN ABOVE 300 KEV.

Helio corr removed

Date: Dec 18 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution? NO - both stats

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

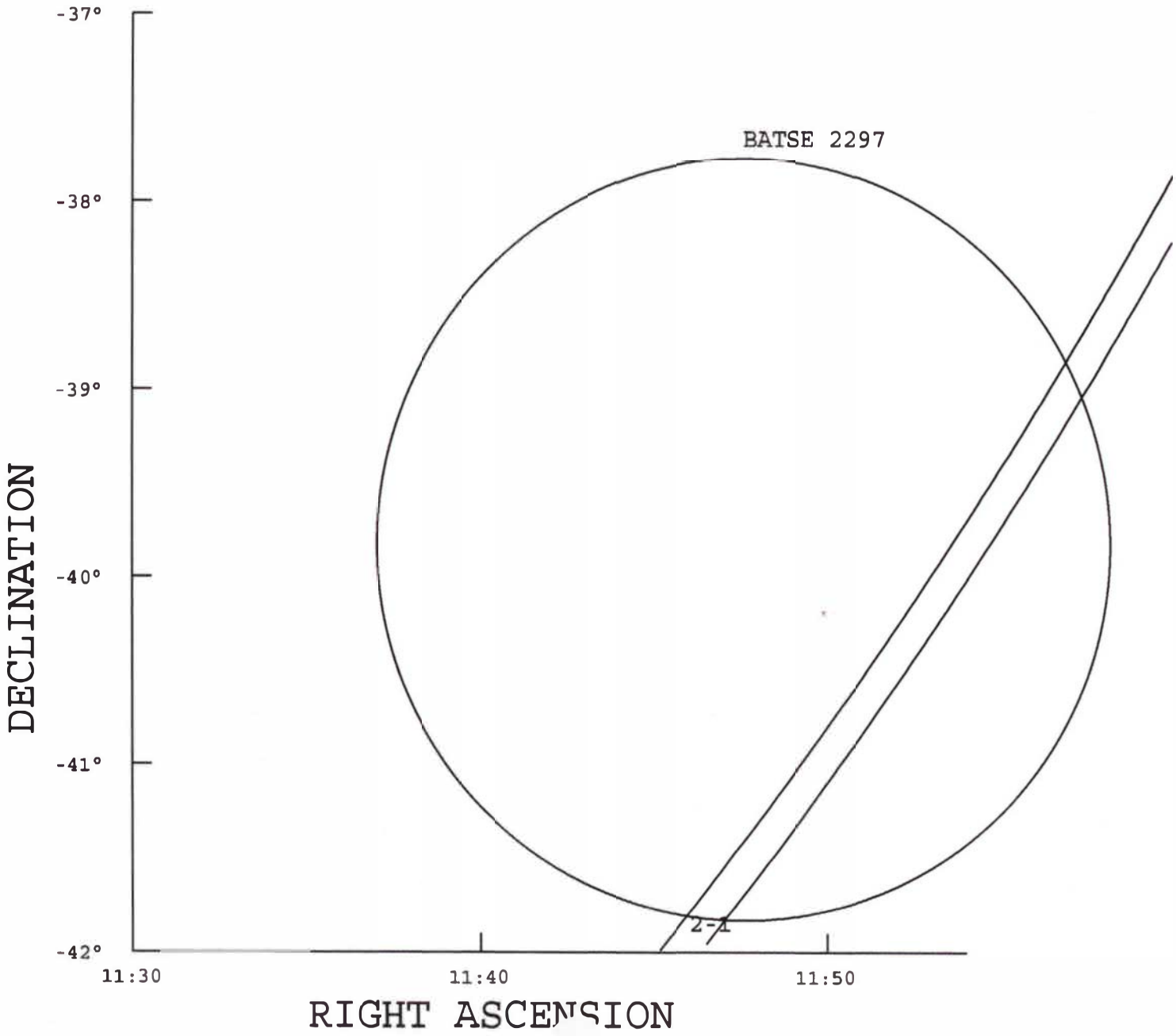
☐ Geocentric time used?

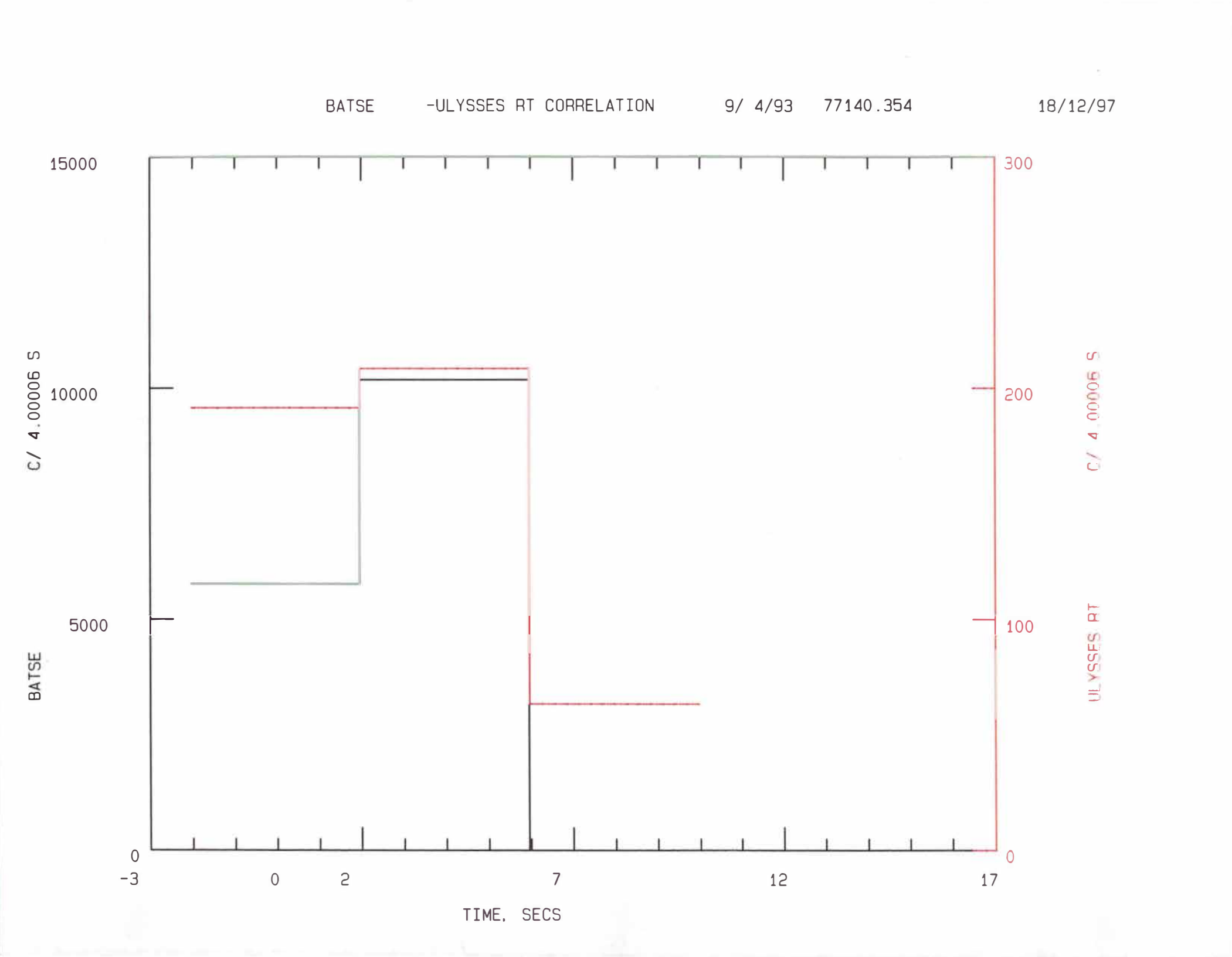
☑ ACCESS database updated?

EVENT OF APR 9, 1993 20:57

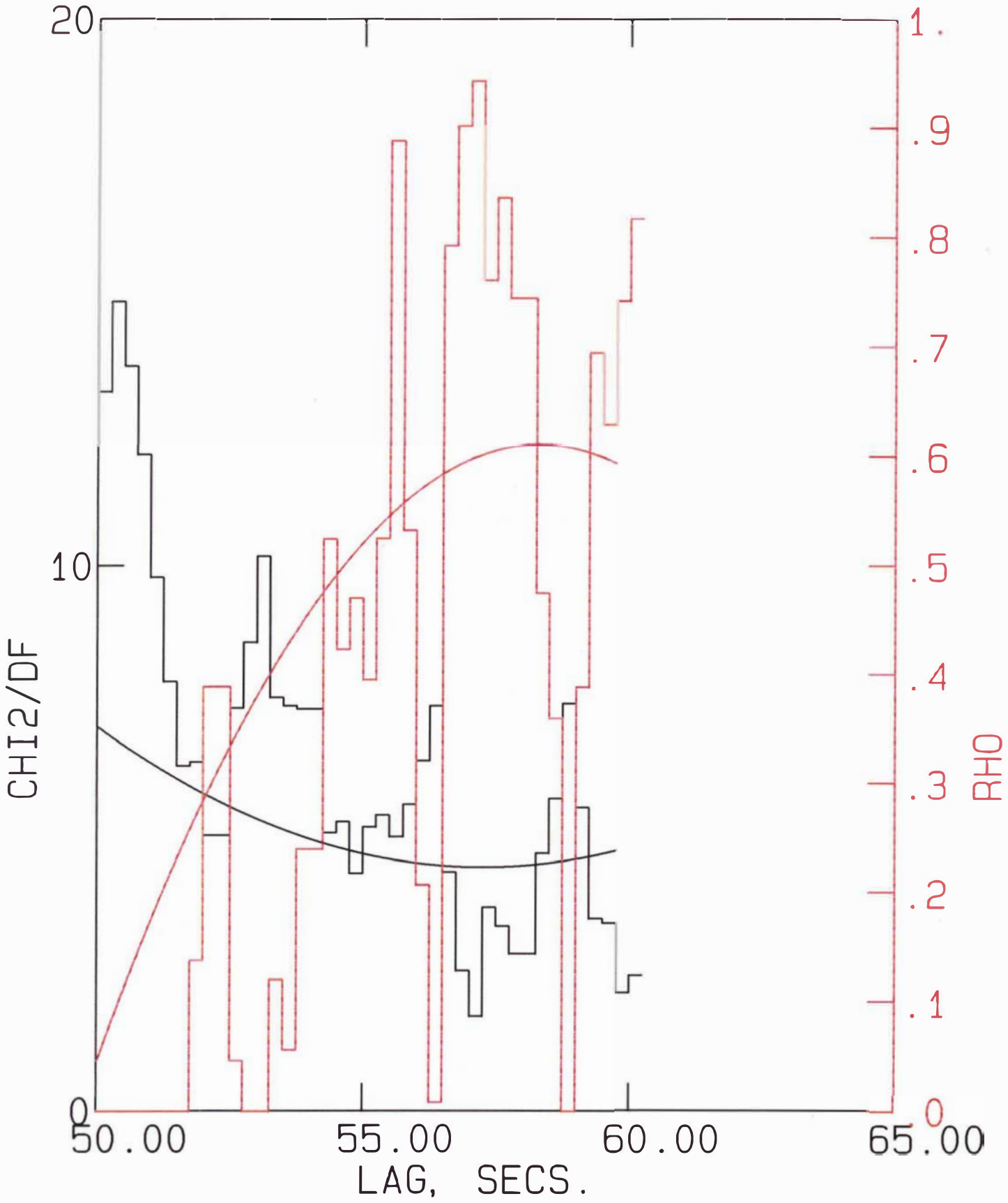
18/12/97

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE




BATSE -ULYSSES RT CORRELATION 9/ 4/93 77140.354 18/12/97
15000
10000
5000
0
300
200
100
0
C/ 4.00006 S
BATSE
C/ 4.00006 S
ULYSSES RT
-3
0
2
7
12
17
TIME, SECS

BATSE -ULYSSES RT CORRELATION 9/ 4/93 77140.354



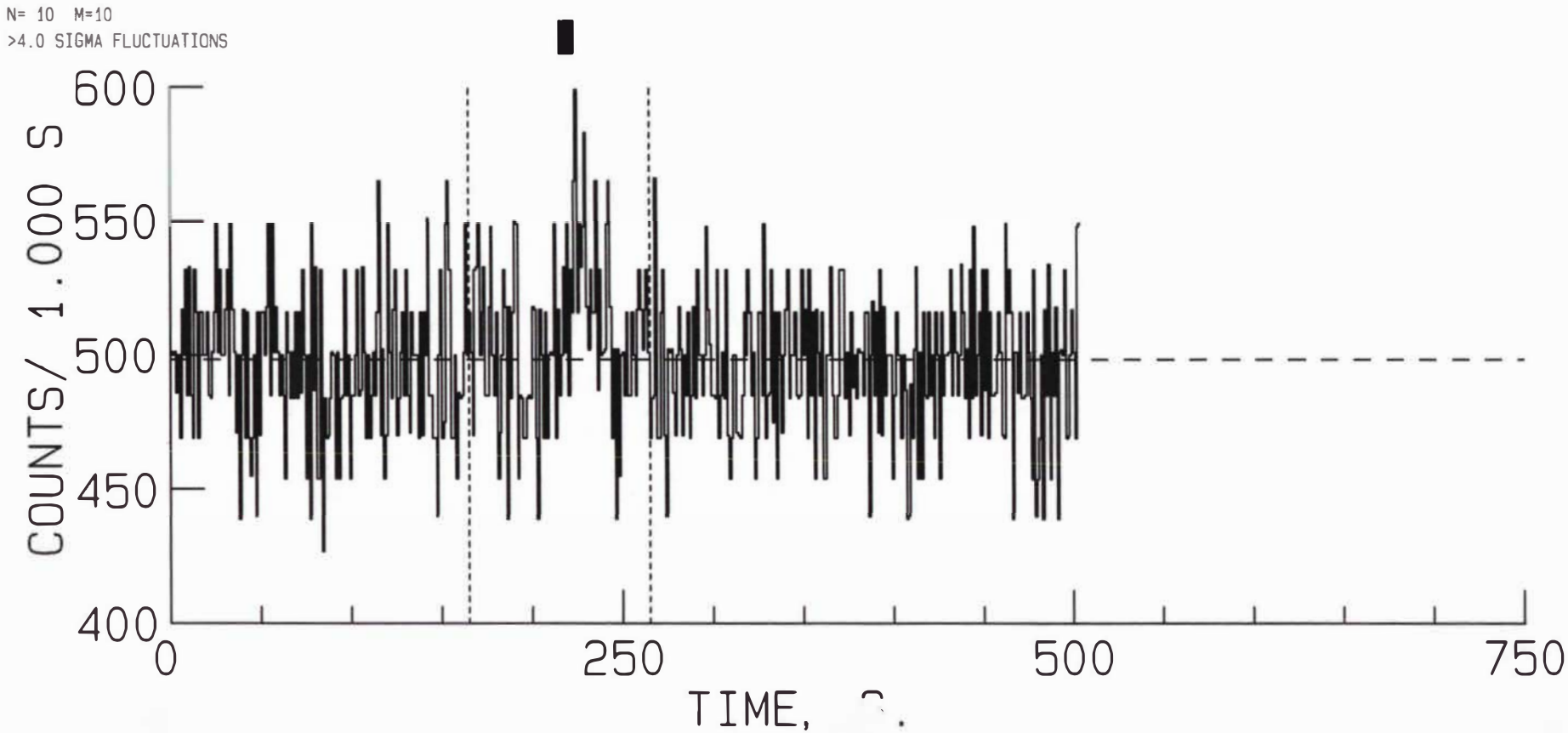
ULYSSES RT

18/12/97

9/ 4/93 75312.239 s

0.250 S INTERVALS REGROUPED BY 4

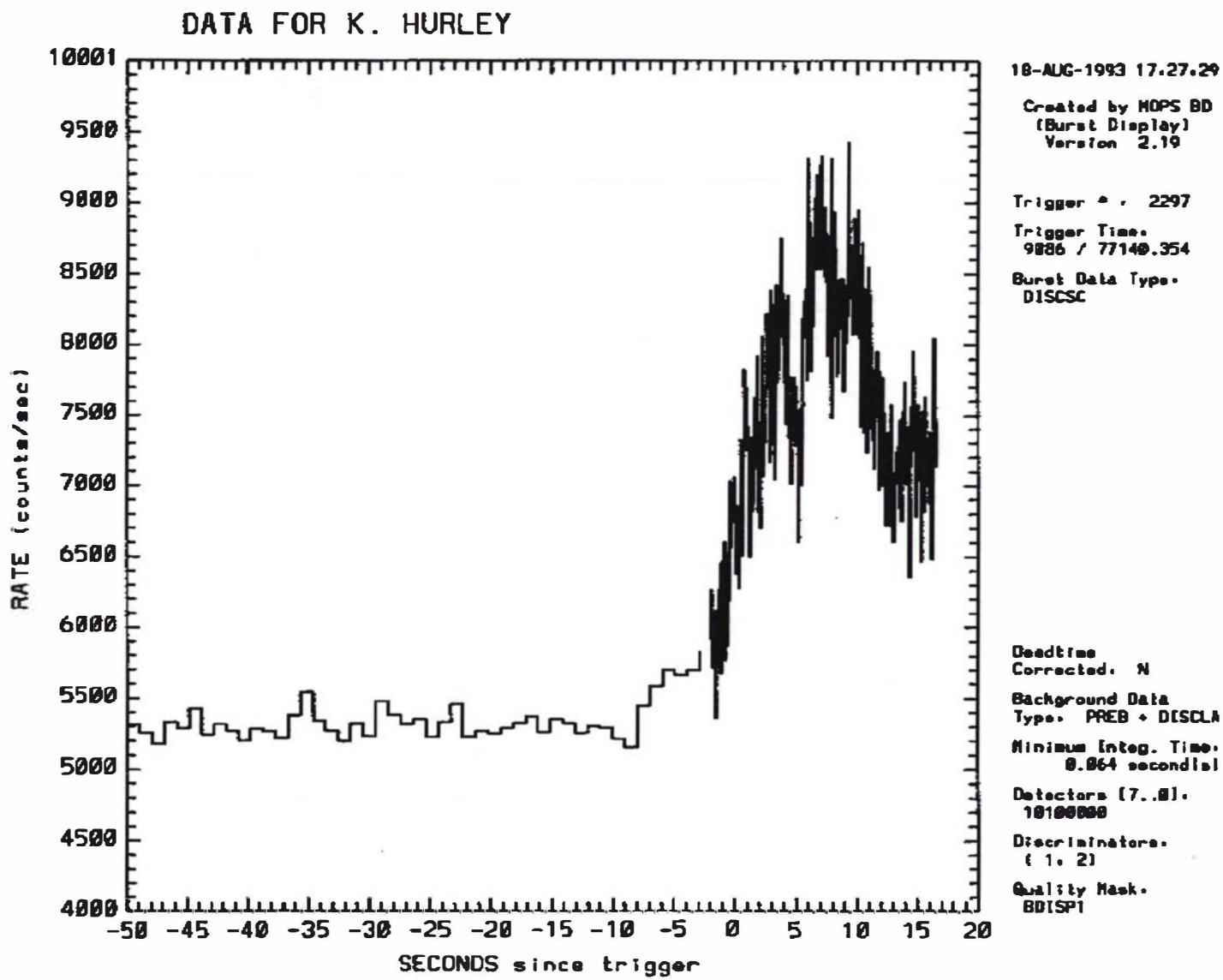
21- 145 keV

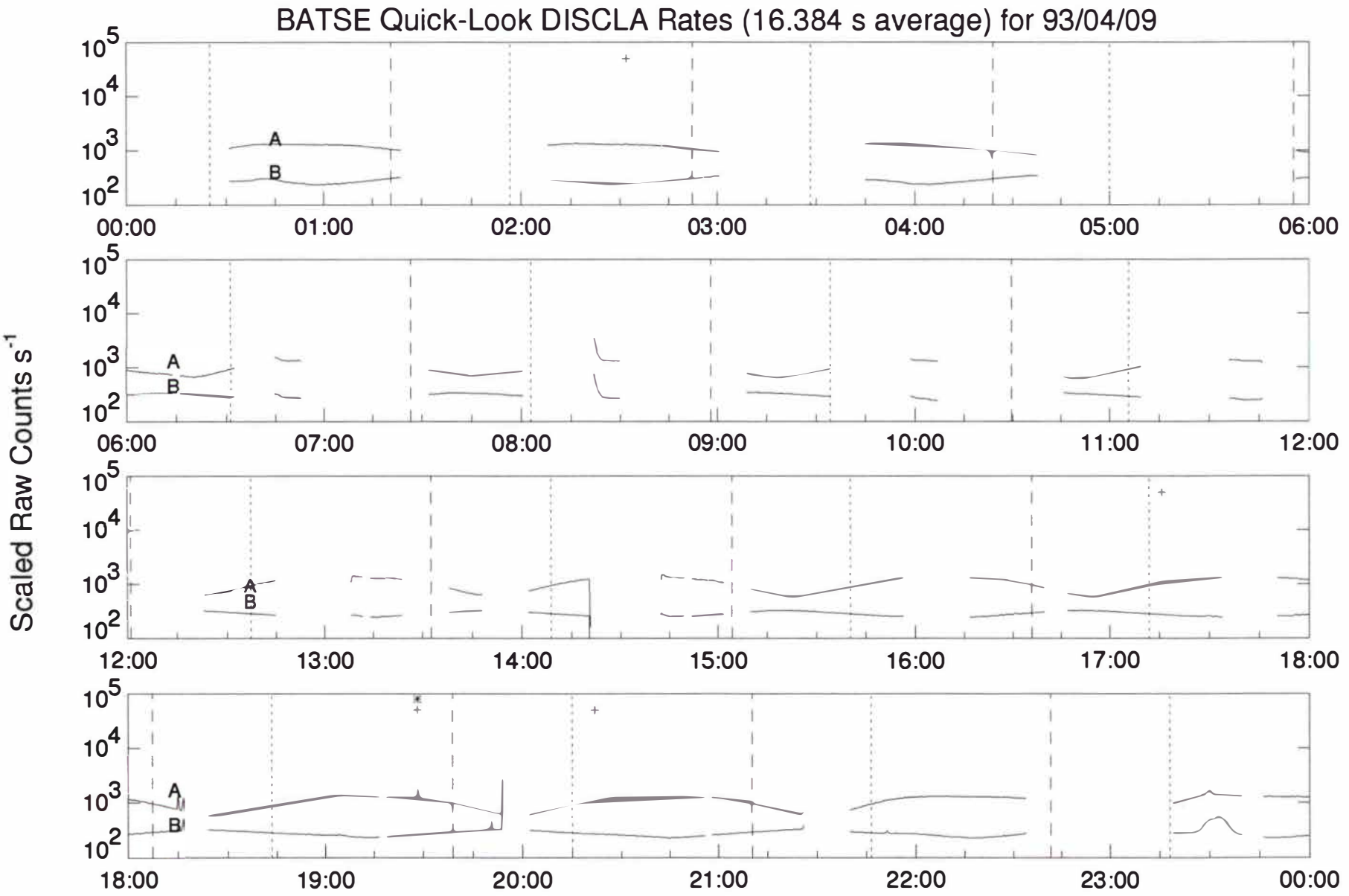


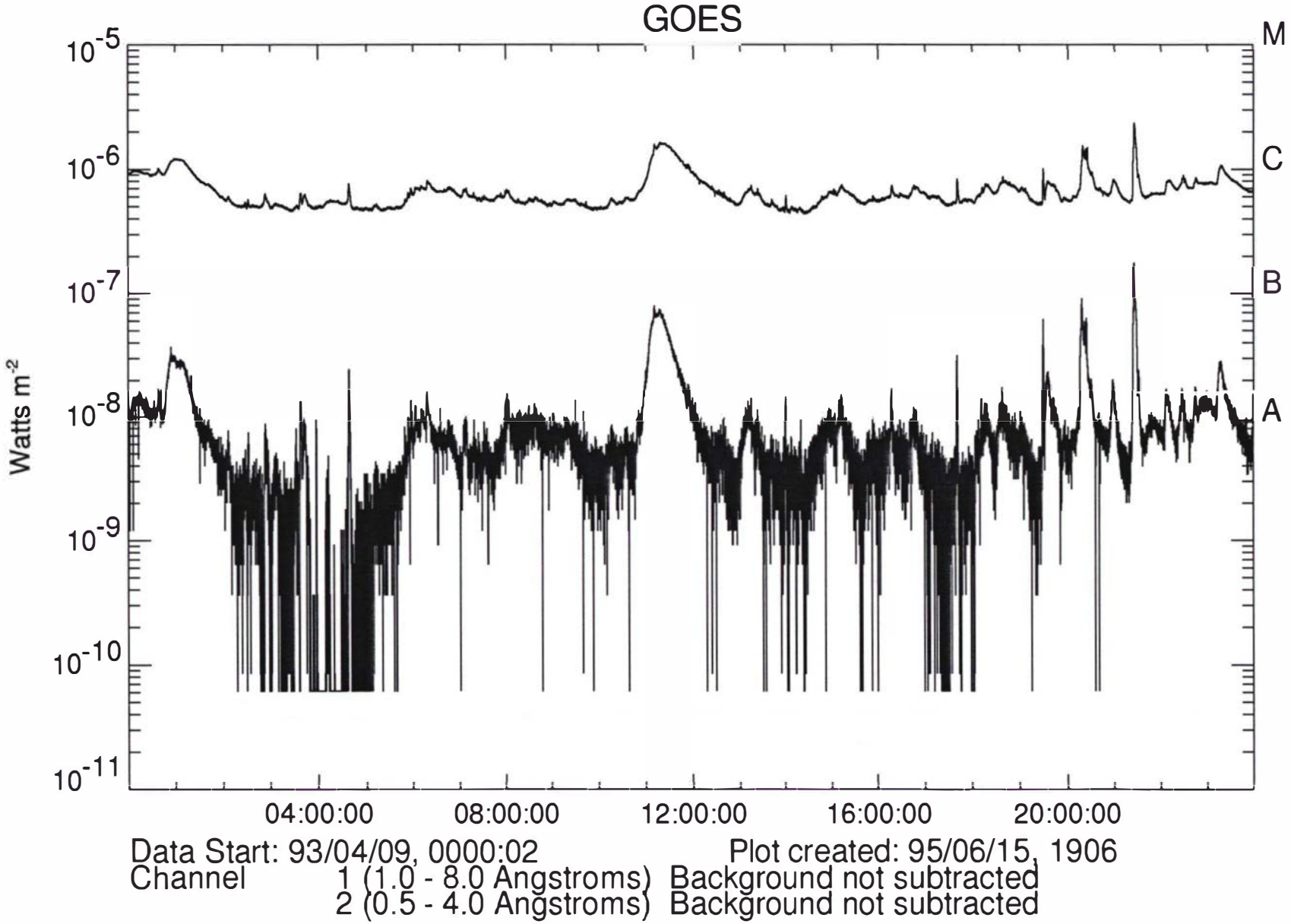
BATSE 09/04/93 77140.354

25- 100 keV

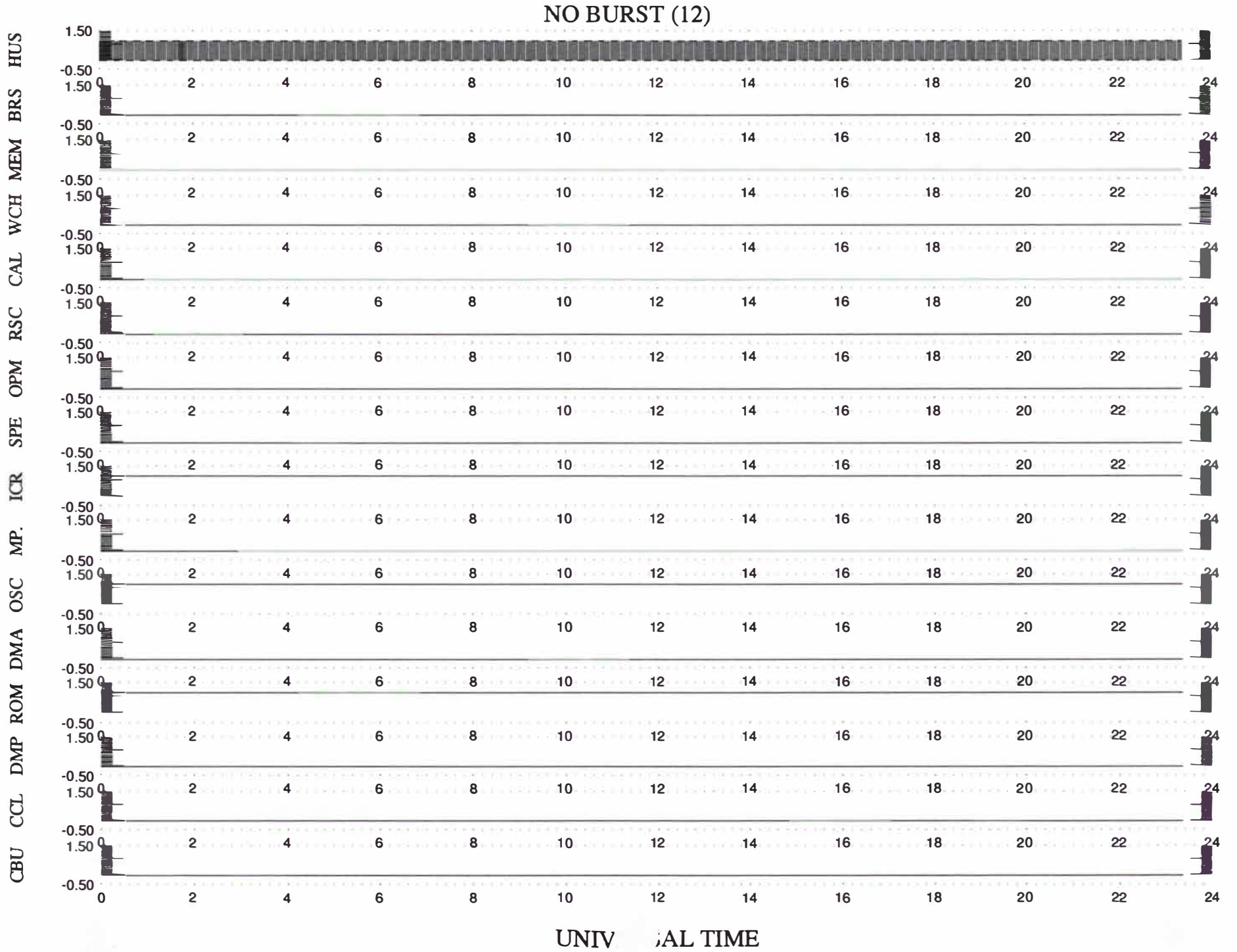
11/ 9/93


DATA FOR K. HURLEY
RATE (counts/sec)
10001
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
-50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20
SECONDS since trigger
18-AUG-1993 17:27:29
Created by HOPS BD
(Burst Display)
Version 2.19
Trigger # : 2297
Trigger Time:
9886 / 77140.354
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 seconds
Detectors (7..0):
10100000
Discriminators:
(1, 2)
Quality Mask:
BDISP1


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/09
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1408 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

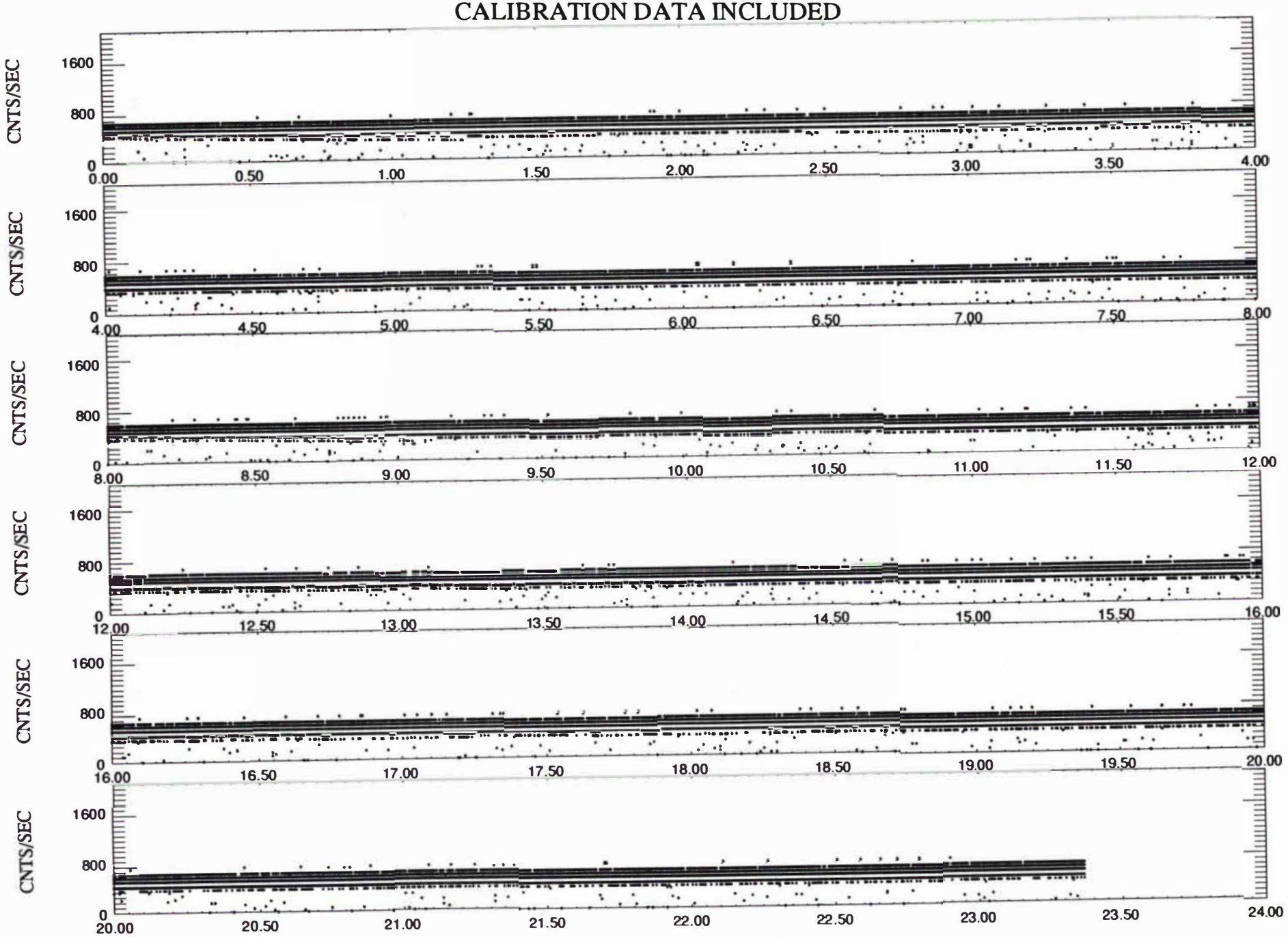

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/09, 0000:02
Plot created: 95/06/15, 1906
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 99, year 1993 to day 99, year 1993 6/12/93



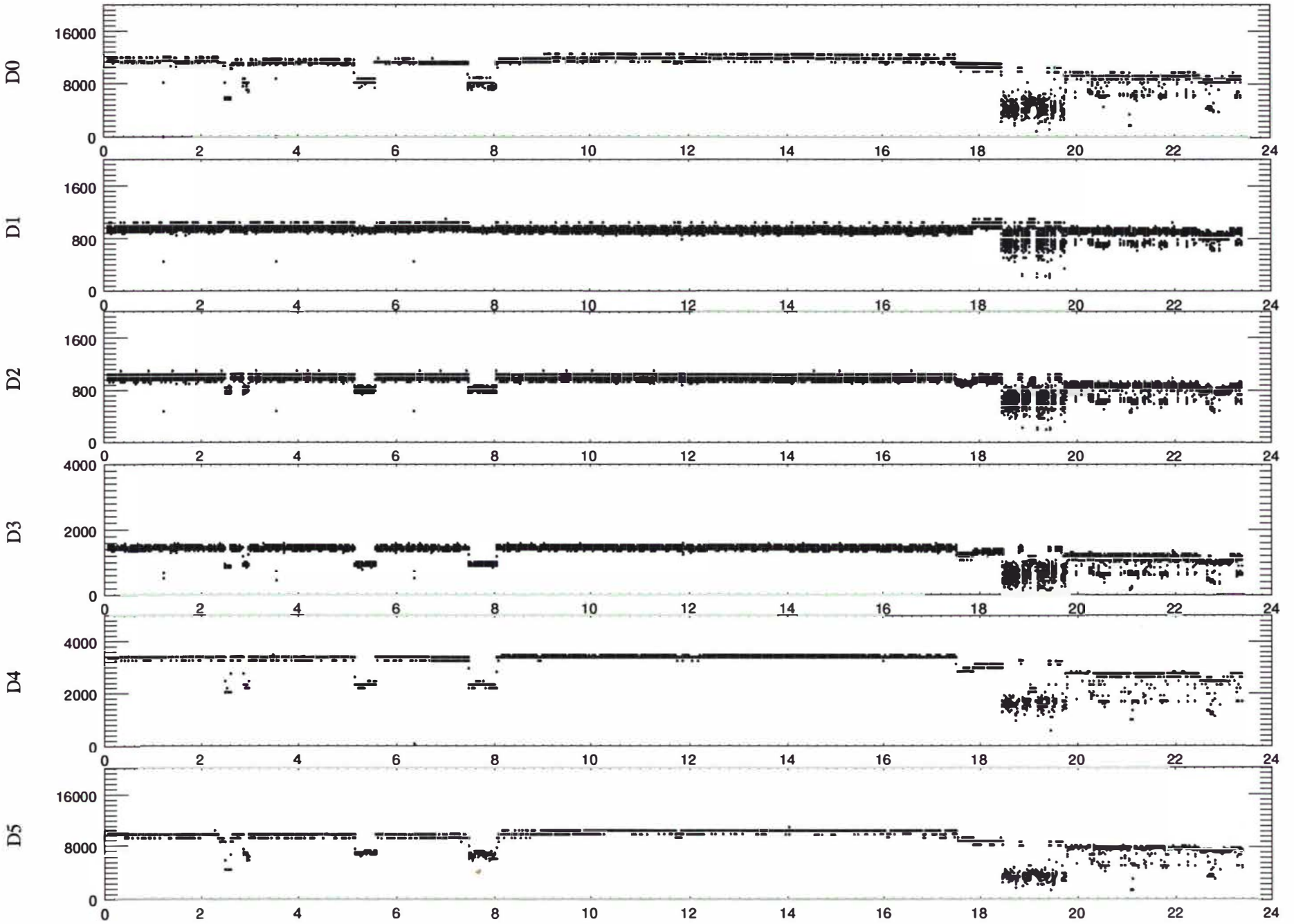
HUS 2A, MODE 1, NOT AVERAGED EDR day 99, year 1993 to day 99, year 1993 6/12/93

CALIBRATION DATA INCLUDED



U ERSAL TIME

HUS 2B COUNTS / SEC QEDR day 99, year 1993 to day 99, year 1993 4/13/93



Kommers

UNTRIGGERED

ULYSSES RT

21/ 5/97

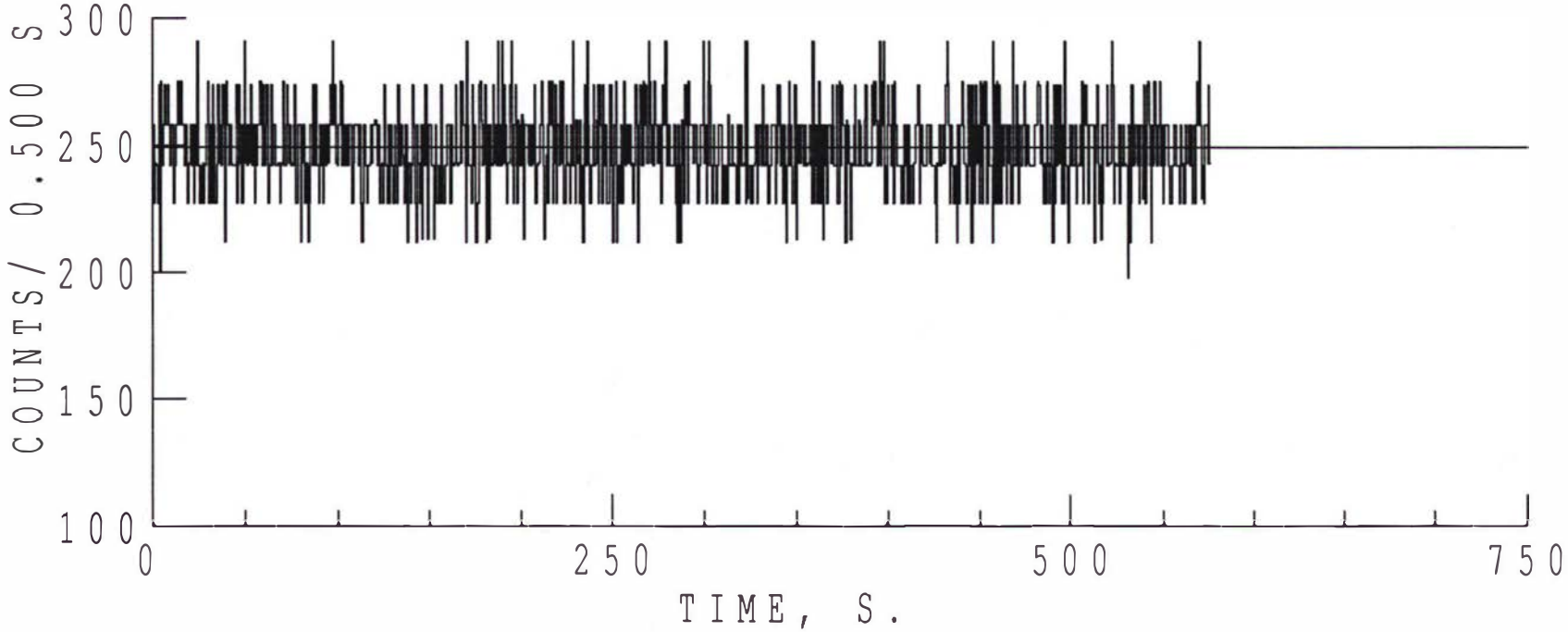
10/ 4/93 63972.160 s

0.250 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



****
BATSEARCH PROGRAM
****

BATSE BURST # 2298
EVENT OF 1993 APR 10 DAY OF YEAR=100
EVENT CROSSING TIME AT BATSE : 10713. S. OR 02:58:33.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 27.000 -19.000
BATSE PEAK COUNTING RATE: 1400 C/S
EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 10/ 4/ 93 IS:
RA= 145.398 DEC= -12.820 DIST= 4.146 AU
BATSE-ULYSSES DISTANCE = 620271520. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 68.52 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 757.74 SECS.
CROSSING TIME AT ULYSSES IS 11471. S. OR 03:11:10 +/- 395.76 SECONDS

Apr 12 15:35 1993 standard input Page 14

From SHARIFF@ssl.msfc.nasa.gov Mon Apr 12 11:30:40 1993
Date: Mon, 12 Apr 1993 13:34:24 -0500 (CDT)
From: SHARIFF@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2298	930410	9087	10713	1400	027	-19

ND

BATSE BURST TRIGGER
NO.: 02298

TIME: TJD=9087 SECONDS=10713

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=116.8 AZIMUTH=031.7 ERROR= DEGREES

COMMENTS:
SINGLE PEAK WITH SUBSTRUCTURE, LASTING ~100S. MARGINALLY VISIBLE ABOVE 300KEV.

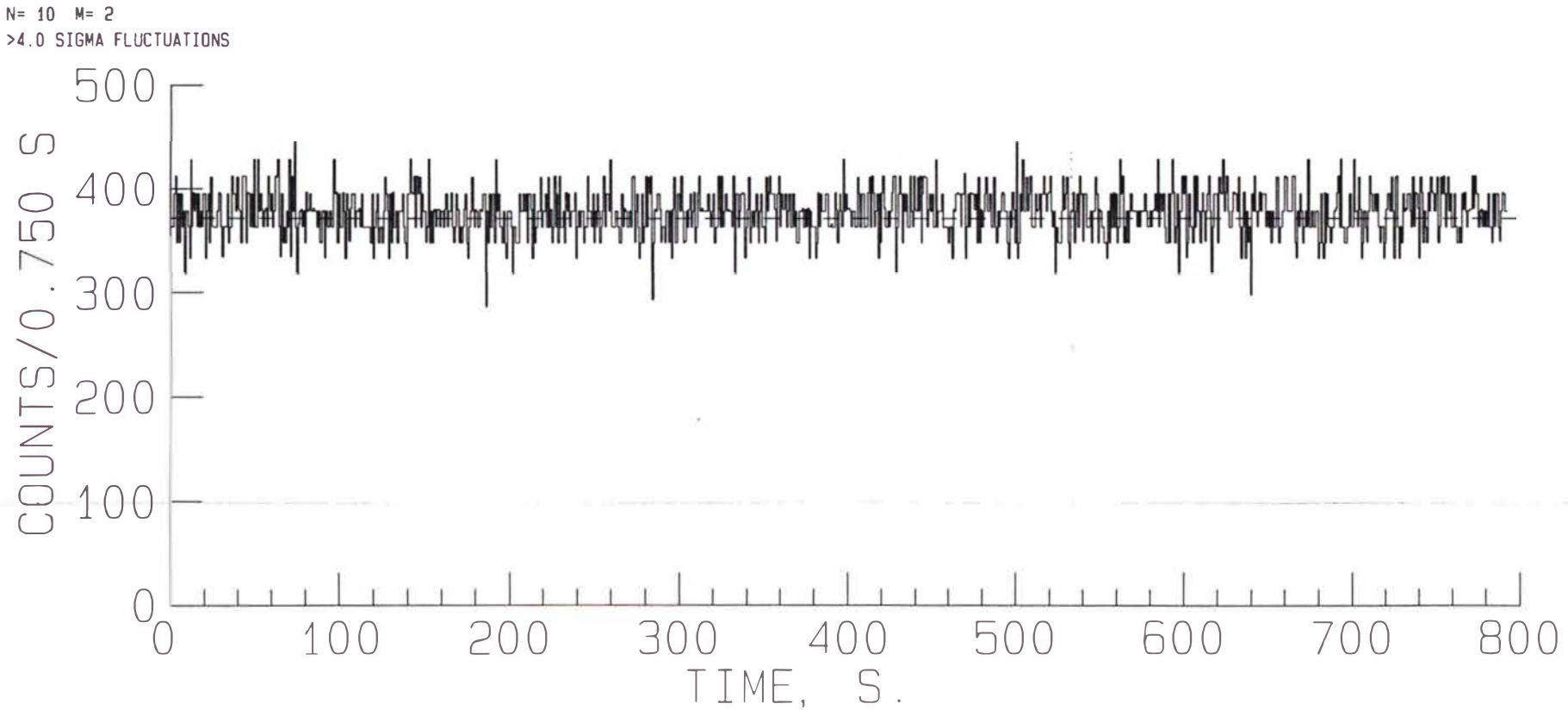
13/ 4/93

ULYSSES RT

10/ 4/93 11088.086 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV



From SHARIFF@ssl.msfc.nasa.gov Mon Apr 12 11:26:18 1993
Date: Mon, 12 Apr 1993 13:29:46 -0500 (CDT)
From: SHARIFF@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1296

BATSE BURST TRIGGER
NO.: 02299

TIME: TJD=9087 SECONDS=76727

TYPE: FLARE SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
FLARE WITH MULTIPLE PEAKS, LASTING ~50S. CLASSIFIED AS C4.4 ON GOES.
NOT VISIBLE ABOVE 300KEV.

From root Fri Feb 11 11:04 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
          id AA04796; Fri, 11 Feb 94 11:04:56
Received: from SSTDP2.LANL.GOV by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
        id AA08305; Fri, 11 Feb 1994 10:08:42 +0800
Date: Fri, 11 Feb 1994 11:10:15 -0700 (MST)
From: 046369@SSTDP2.LANL.GOV
To: KHURLEY@space6.ssl.berkeley.edu
Message-Id: <940211111015.23c0a354@SSTDP2.LANL.GOV>
Subject: DMSP OBSERVATIONS OF GRB
Content-Length: 2047
Status: R

FROM: SMTP%"TERRELL@ESSDP2.LANL.GOV" (ESSDP2::TERRELL) (JAMES TERRELL 94/02/11)
TO: SMTP%"KHURLEY@SPACE6.SSL.BERKELEY.EDU" (KEVIN HURLEY)
CC:
SUBJ: DMSP OBSERVATIONS OF GRB

Kevin:
Here are some corrections, additions, or questions re your list of GRB as
sent to me on 940106:

DATE	UT	COMMENTS---
920110	33478	DMSP SHOULD BE NA (NOT APPARENT), NOT NO (I.E., OMIT "NO") What's the difference?
920125	33247	DMSP ND (NO DATA, N/O IN YOUR NOTATION) ✓
920315	17694	ULYSSES TIME, BUT GRO DETECTED A GRB AT 15569!? NO RECORD YET
920414	84166	(PVO TIME) GRO DETECTED A GRB AT 84163!? NO RECORD YET
920714	47069	DMSP SHOULD BE NA, NOT NO (I.E., OMIT "NO") What's the difference?
920726	2066	ULYSSES TIME, BUT ULYSSES IS "NO"!? DMSP10,11 @0165 (SOFT) ✓
920727	43347	ULYSSES TIME, BUT BATSE SAW IT!? (WHEN?) ✓
921004	49107	ULYSSES TIME, BUT EURECA SAW IT!? (WHEN?) ✓
930106	56259	DMSP YES (NOT AT 55260) ✓
930201	60115	DMSP8 YES (PEAKS AT 60129.0,60211.0,60281.0 UT) ✓
930318	44993	ULYSSES TIME, BUT BATSE AND EURECA SAW IT! (WHEN?) ✓
930405	32089	DMSP YES (8,10,11 AT 32105 AND 32110) ✓
930410	51547	DMSP NO ✓
930506	53571	DMSP8 YES AT 53577,10ND,11YES AT 53580 ✓
930506	57060	(ULYSSES TIME) DMSP8 YES AT 57669,10NO,11YES AT 57670,57688,57704 ✓
930510	41935	(ULYSSES TIME) NOT APPARENT IN FULL DMSP DATA ✓
930511	892	(ULYSSES TIME) NOT APPARENT IN FULL DMSP DATA ✓
930612	2657	DMSP10 YES AT 2662 (8SAA, 11NA) ✓
930825	31643	(ULYSSES TIME) 8NA,10NA,11? (SOFT PEAK ~33500) ✓
930922	12830	(ULYSSES TIME) NOT APPARENT IN DMSP DATA (DMSP11 GLITCH?) ✓
930922	23086	ULYSSES TIME, BUT BATSE SAW IT! (WHEN?) (DMSP8NA,11NA,10~23000?) ✓
930925	73995	(ULYSSES TIME) DMSP NA (NOT APPARENT) ✓
931006	18653	(ULYSSES TIME, 18062?CORR) DMSP NA ✓
931006	69587	(ULYSSES TIME, 68961?CORR) DMSP NA ✓
931006	77510	ULYSSES TIME, BUT BATSE YES! (WHEN?) (DMSP NA) ✓
931007	72864	(ULYSSES TIME, 72239?CORR) DMSP NA ✓
921011	45034	(ULYSSES TIME, 45200?CORR) DMSP NA ✓

I would appreciate any clarifications or comments, and especially more
event times to check against DMSP data. We now have data processed
thru 931118. --Jim

Date: Apr 1 '99

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied? No helio corr. applied

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☐ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☐ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution? N/A

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)?

☐ BATSE ephemeris for T_0?

☐ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included?

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

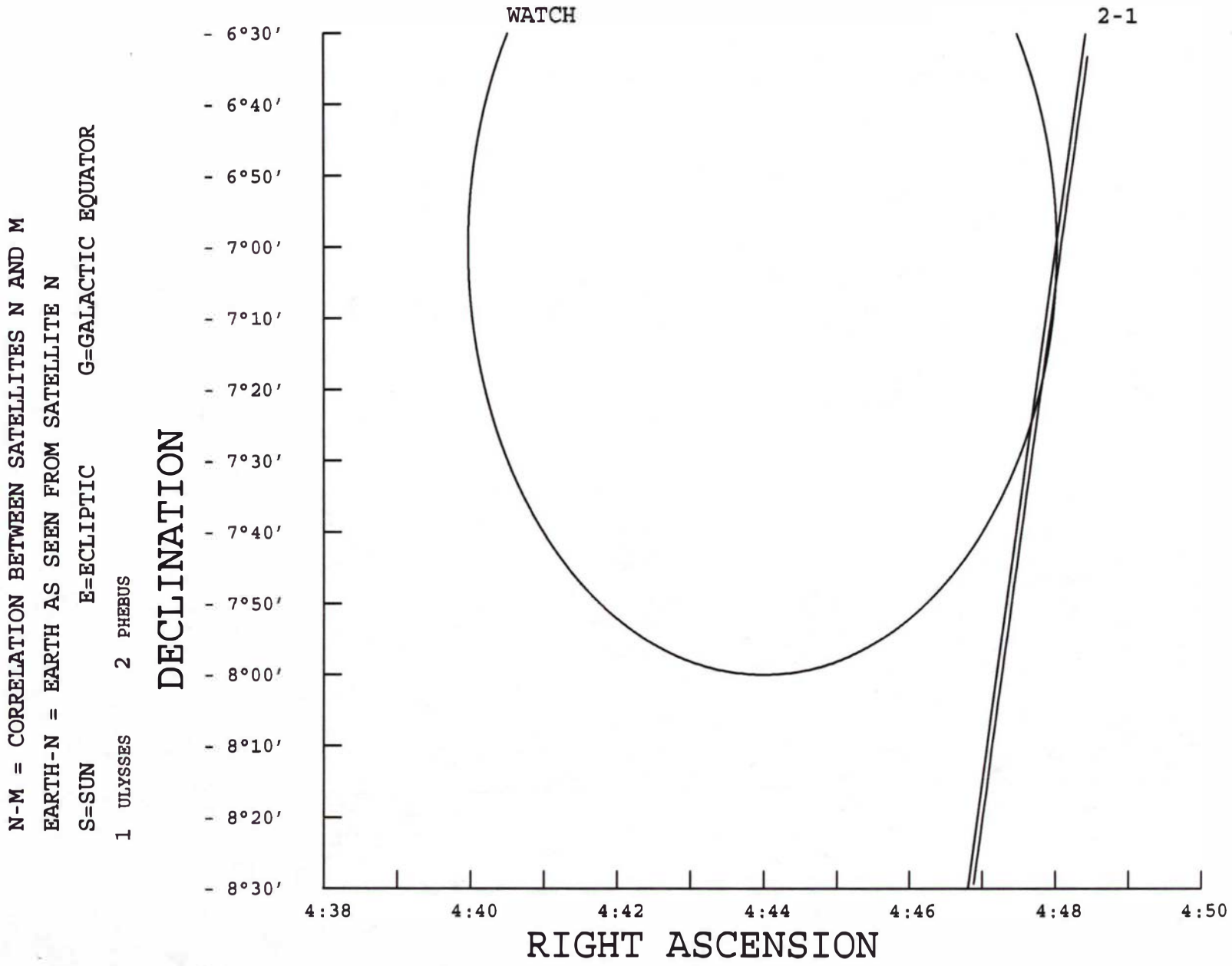
☐ 2000 coordinates used?

☐ Geocentric time used?

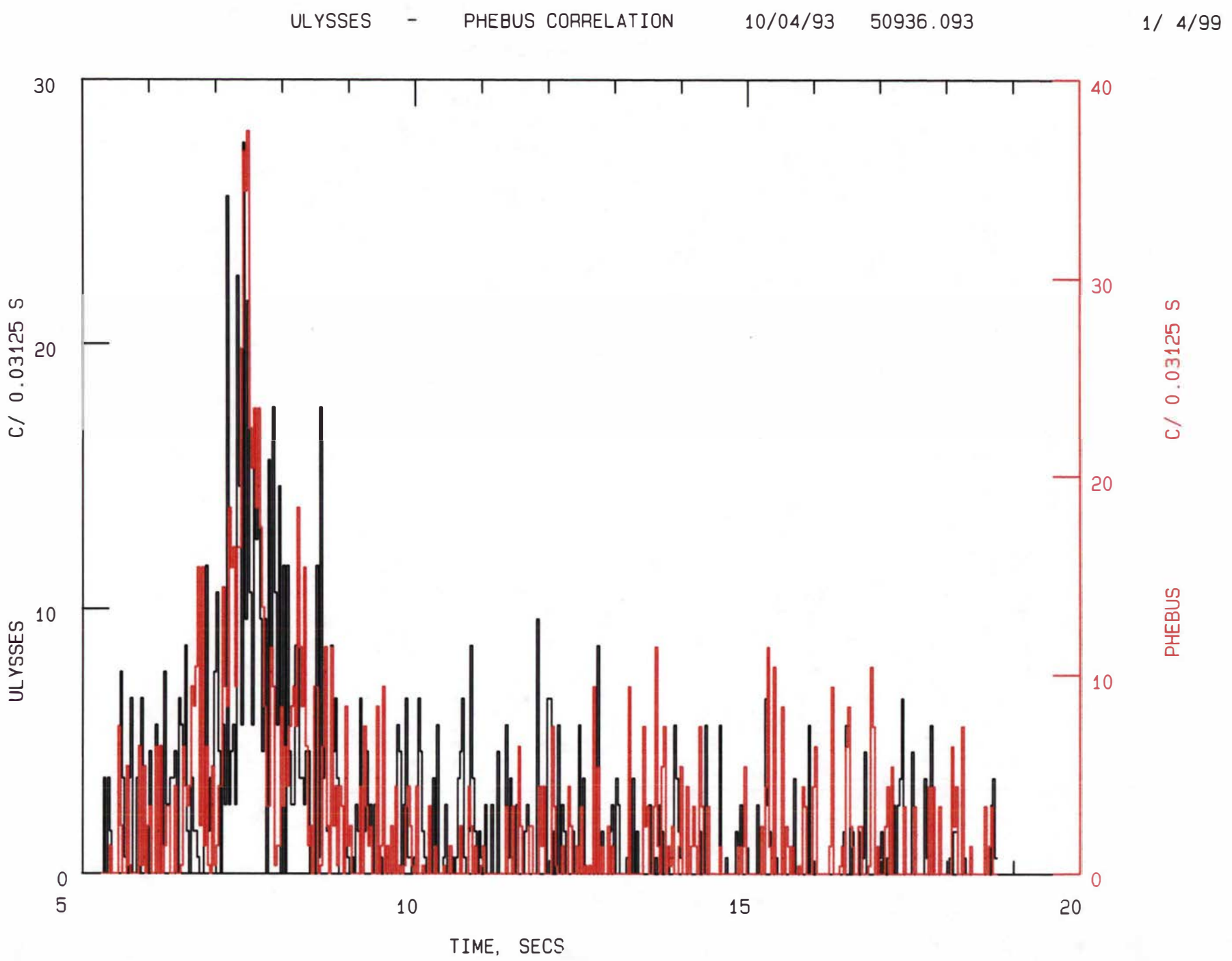
☐ ACCESS database updated?

EVENT OF APR 10, 1993 14:08

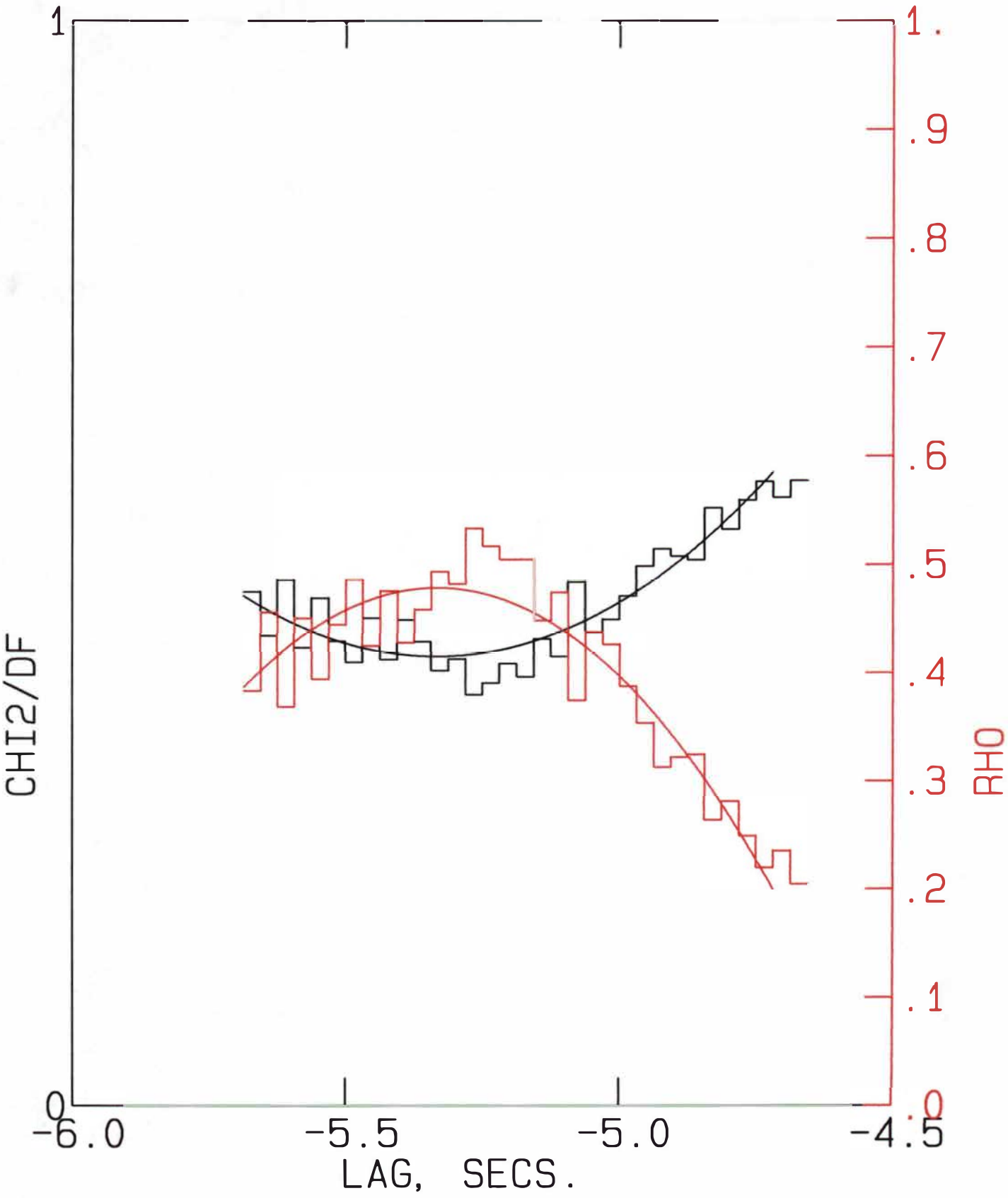
1/ 4/99

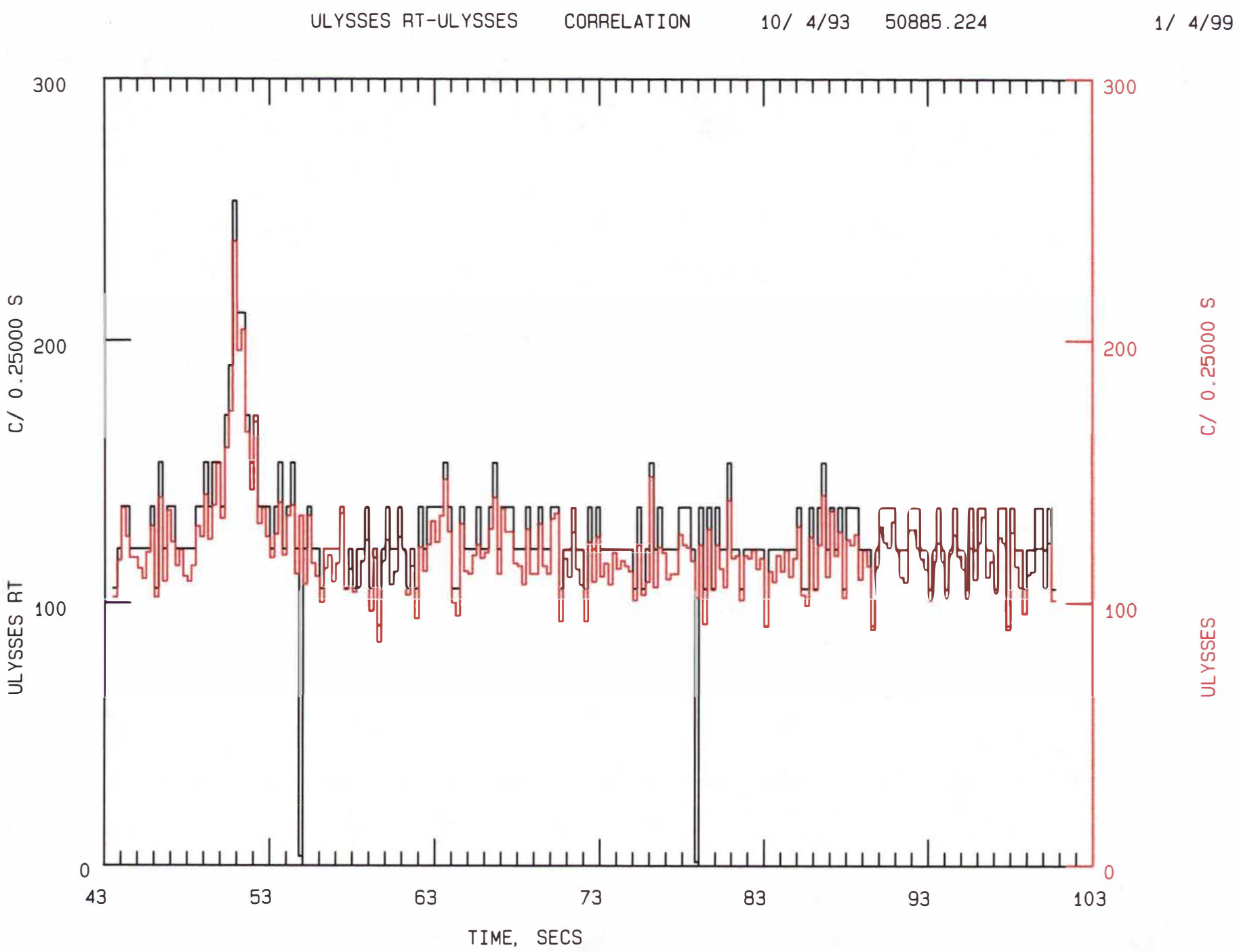


N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 PHEBUS

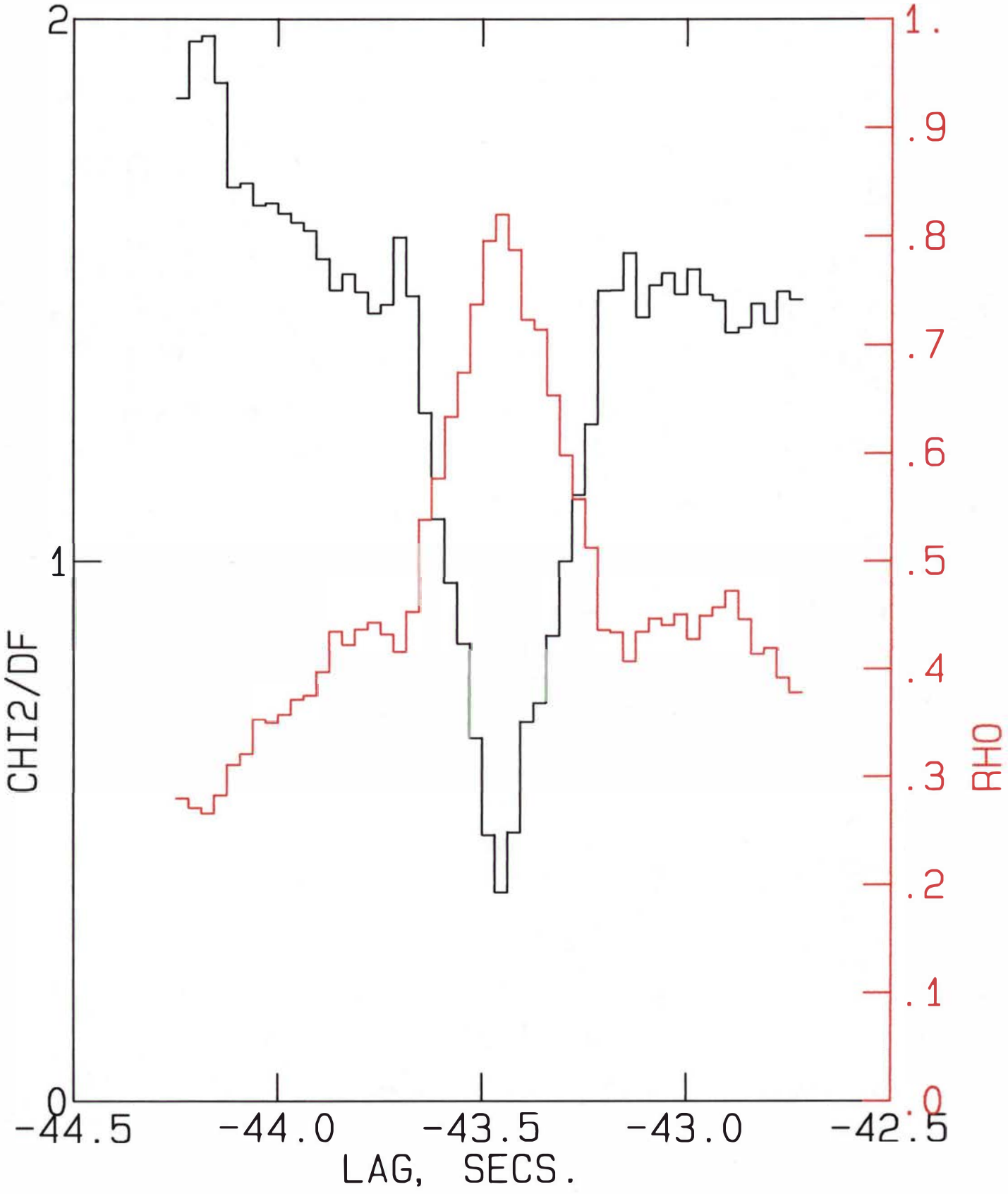

ULYSSES - PHEBUS CORRELATION 10/04/93 50936.093 1/ 4/99
30
20
10
0
C/ 0.03125 S
ULYSSES
40
30
20
10
0
C/ 0.03125 S
PHEBUS
5
10
15
20
TIME, SECS

ULYSSES - PHEBUS CORRELATION 10/04/93 50936.093



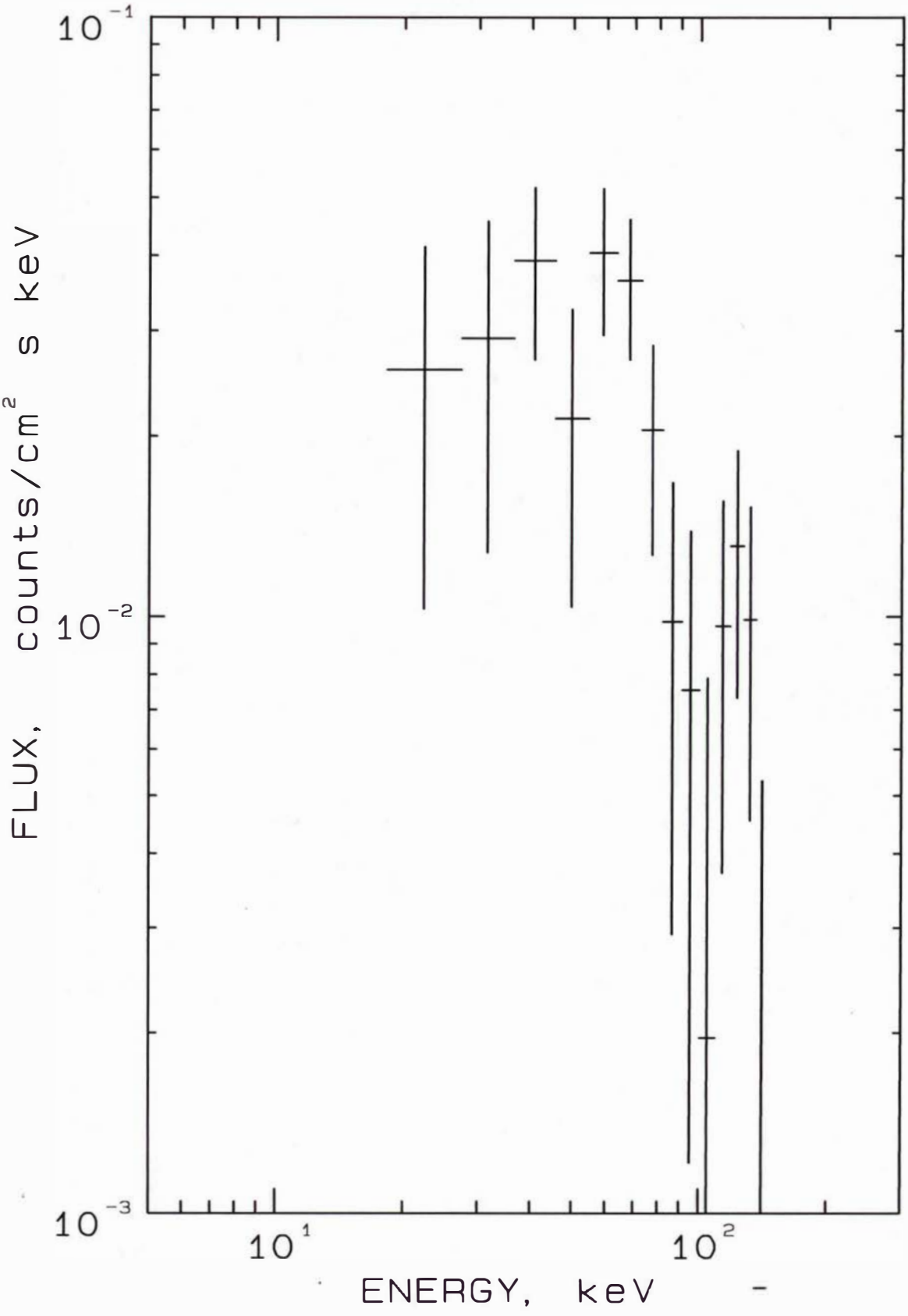

ULYSSES RT-ULYSSES CORRELATION 10/ 4/93 50885.224 1/ 4/99
300
200
100
0
C/ 0.25000 S
ULYSSES RT
43
53
63
73
83
93
103
TIME, SECS
ULYSSES

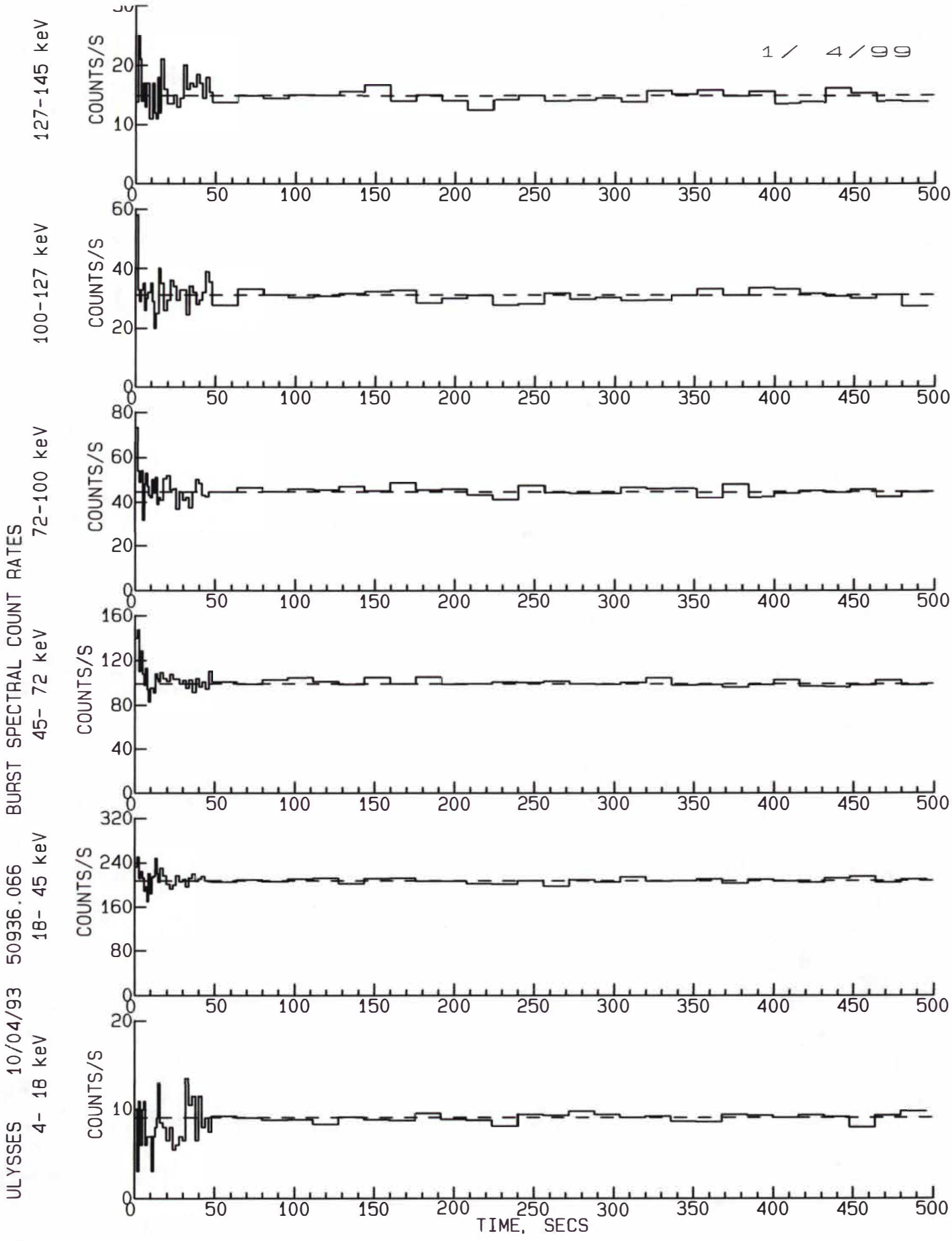
ULYSSES RT-ULYSSES CORRELATION 10/ 4/93 50885.224

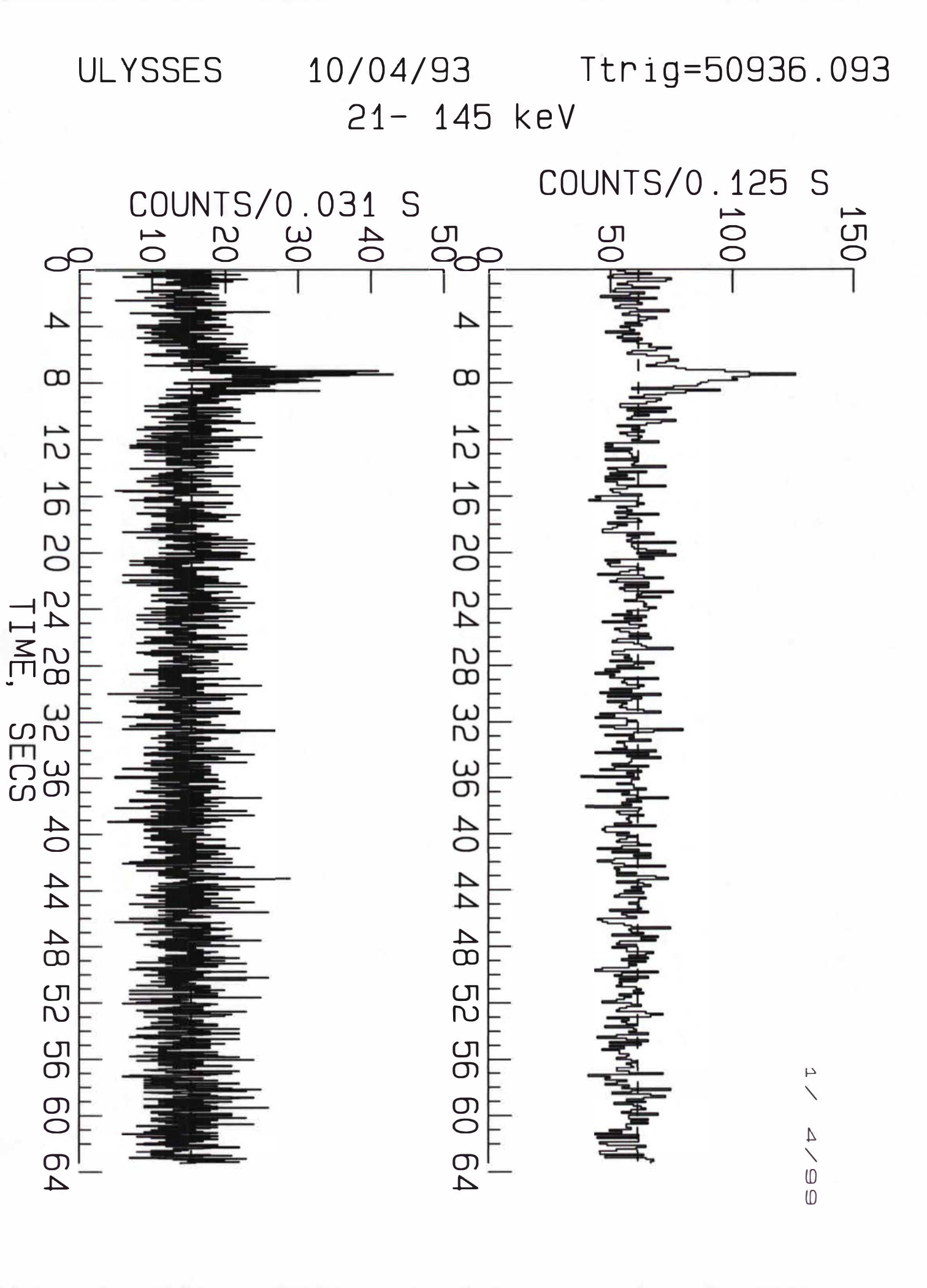


ULYSSES 10/04/93 50936.066

SPECTRUM INTEGRATED OVER 15.7 SECONDS, INTERVALS 2 TO 17




ULYSSES 10/04/93 50936.066 BURST SPECTRAL COUNT RATES
4- 18 keV
18- 45 keV
45- 72 keV
72-100 keV
100-127 keV
127-145 keV
COUNTS/S
TIME, SECS
1/ 4/99

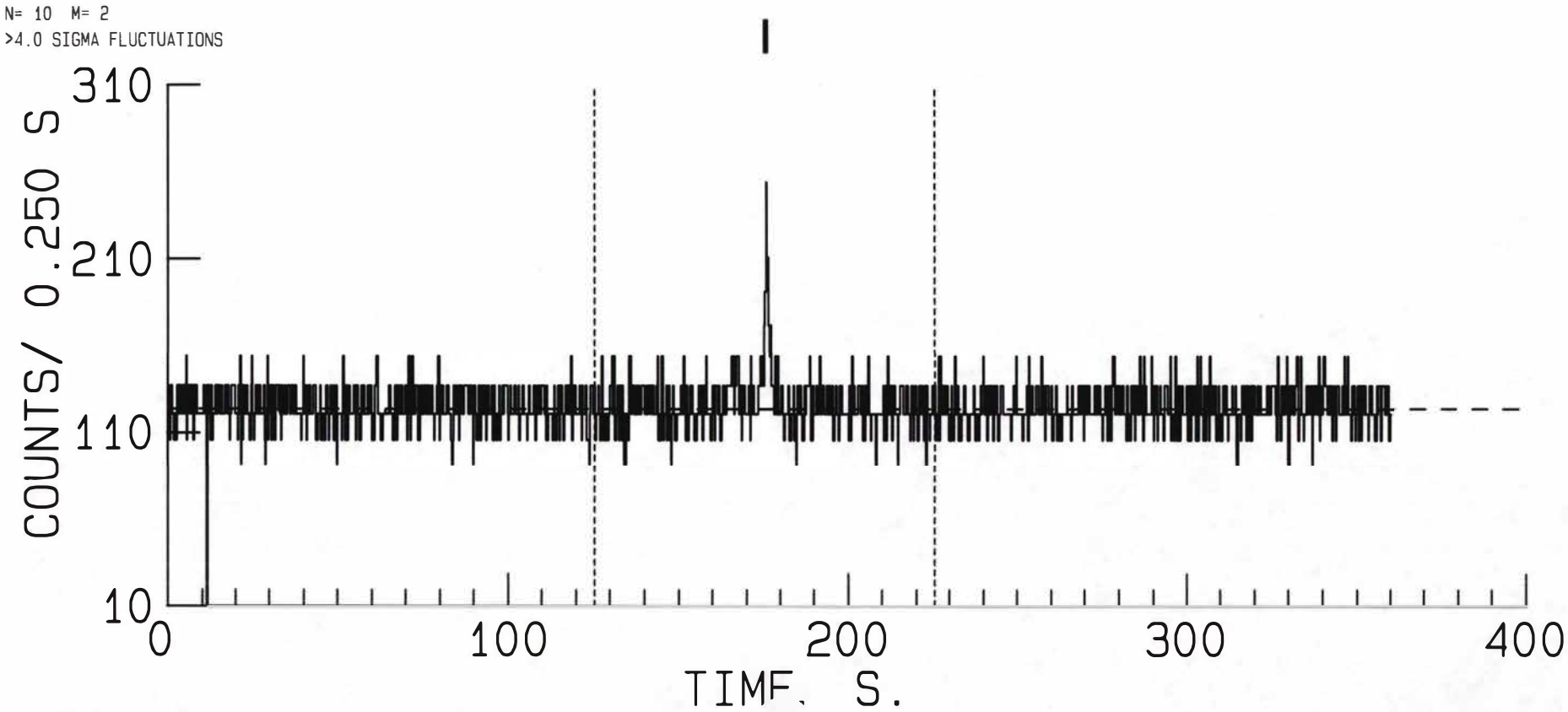

ULYSSES 10/04/93 Ttrig=50936.093
21- 145 keV
COUNTS/0.031 S
COUNTS/0.125 S
TIME, SECS
1/ 4/99

ULYSSES RT

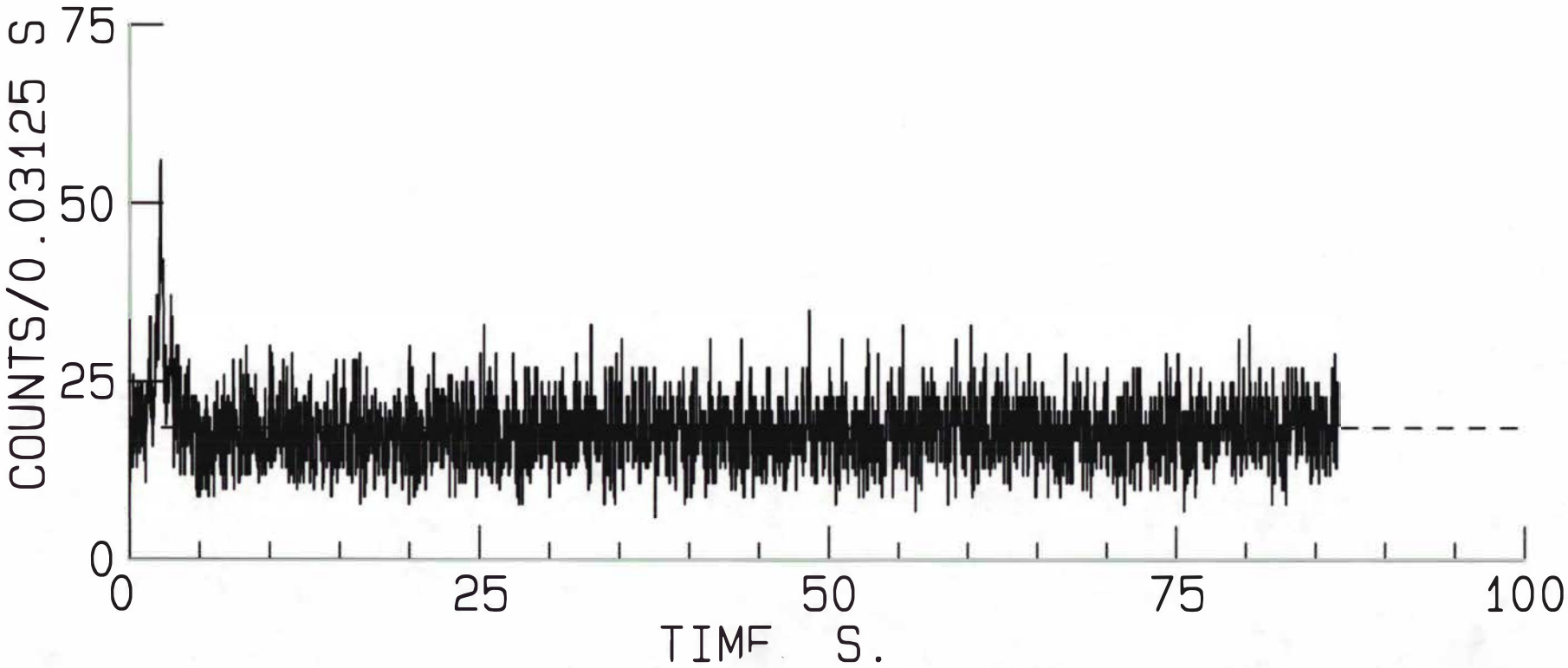
1/ 4/99

10/ 4/93 50760.206 s

21- 145 keV



PHEBUS
10/ 4/93 51546.511 s
100- 1600 keV



WATCH-EURECA Gamma Ray Bursts. Niels Lund, Soren Brandt & Alberto Castro-Tira
Danish Space Research Institute.

Version 1.0 Aug. 9. 1993.

The data given below is pre-publication data. The data should not be quoted without prior consultations with the above authors. The list is prepared in support of searches for counterparts or multi-spacecraft identifications.
The positional uncertainty is 1 degree error circle radius.

#	date	UT-time	sd	l(s)	m(s)	m/l	position(J2000)		t	comments	#Wm	sdp	theta	phi
1	920824	10:53					--------	-------	2	Weak (BATSE)				
2	921004	14:00:21		?	15	>5	14h37.5m	34.1d	1	Two peaks			63.2	222.1
3	921022	15:20:57		60	55	>5	16h56.7m	-09.5d	2	Two peaks				
4	921118	22:11					--------	-------	2	Weak (BATSE)				
5	921207	16:00:48		?	16	>5	20h36.1m	-41.8d	1	Two peaks			65.9	136.3
6	921218	02:30					--------	-------	2	Weak (BATSE)				
7	930106	15:37					--------	-------	2	Weak (BATSE)				
8	930201	16:42:1?					--------	-------	2	Weak (BATSE?)				
7	930217	14:44					--------	-------	2	Weak (BATSE)				
8	930318	12:31:28		?	30	>5	10h03.3m*	-20.0d*	2	BATSE trig 95s early?				
9	930410	14:19							1					
10	930426	12:40:35		?	18	>5			1					
11	930502	13:52					--------	-------	2	Weak (BATSE)				
12	930610								1					
13	930614	03:40:32		11	9	2	11h20.7m	+23.1d	1					

#	date	UT-time	sd	l(s)	m(s)	m/l	position(J2000)	t	comments	#Wm

comments:
UT-time: Time for peak count rate in Med CsI band. Note time resolution!
*) Times marked with an asterisk are not yet well calibrated to UT.
sd: Standard deviations above background (in count rates).
l(s): Duration in 6-10 keV band (Low NaI channel)
m(s): Duration in 10-180 keV band (Med CsI channel)
m/l: Hardness: (sd(Med NaI)+sd(Med CsI)) / sd(Low NaI) (NOTE: EURECA energy bands)
Positions marked with asterisk can not be determined more than once from the WATCH data!
t: Best time resolution available: 1, 4, 8, 16 motor rotations (approx. 0.9 s)
m: 1 motor rotation in 4 ms steps
r: raw memory (4 ms steps)
#Wm Telemetry session and WATCH unit identifier
sdp: Standard deviations above background in final modulation pattern used for source localization. As a rough guide, the statistical uncertainty in the source position is 240/sdp arcminutes. In most cases the systematic errors dominates the error budget.

theta and phi: Source position in WATCH instrument coordinates.

WATCH-GRANAT Gamma Ray Bursts. Niels Lund, Alberto Castro-Tirado & Soren Brandt,
Danish Space Research Institute.

Version 2.0 Aug. 9. 1993.

The data given below is pre-publication data. The data should not be quoted without prior

Apr 16 07:28 1993 standard input Page 15

From palmer@tgrs.gsfc.nasa.gov Fri Apr 16 06:39:31 1993
Sender: palmer@tgrs.ssl.berkeley.edu
Date: Fri, 16 Apr 1993 09:43:13 -0400
To: nl@danru.dk
From: palmer@tgrs.gsfc.nasa.gov
Subject: WATCH, Eureca, IPN, GRB930410
Cc: khurley@space6.ssl.berkeley.edu
Content-Length: 881

Niels,

Is the Eureca spacecraft to which WATCH is attatched the same as the European Retrievable Cargo payload that the shuttle sent up a few months ago?

If so, a Macintosh program (OrbiTrack) using elements from late March gives the satelite position as RA=9.9 degrees, dec=8.1 degrees in Epoch 1993.3 coords, height=483.7 km. (However, the position doesn't matter very much for the IPN arc since the timing resolution is less than the diameter of the orbit.)

Also, using a WATCH position of (4h43.8, -6d53) (1950) moves the WATCH position closer to the IPN arc. Since this bug seems to bite so often (e.g. the Jan 31 IPN arc in the IAU circular) it is probably worthwhile to check that the Eureca attitude position you have is in J2000 coordinates.

My observation is tomorrow afternoon, but I need to get a pointing plan in today.

Thank you,
David Palmer

Apr 16 14:34 1993 standard input Page 14

From palmer@tgrs.gsfc.nasa.gov Fri Apr 16 10:10:37 1993
Sender: palmer@tgrs.ssl.berkeley.edu
Date: Fri, 16 Apr 1993 13:15:03 -0400
To: khurley@space6.ssl.berkeley.edu
From: palmer@tgrs.gsfc.nasa.gov
Subject: Re:
Content-Length: 807

Here's what Niels sent me:

Dear David:

thanks for your mail. Yes EURECA is the European Retrieval Carrier and your ephemeris seems closely correct.
We are sure that the EURECA attitude is in J2000,
and we have also checked the pointing using the Crab which is in our FOV. I dont see how we can move our position sufficiently to match the timing arc. My suggestion is that you scan the timing arc and as much as you can of our error box near the center. (Unfortunately timing arcs are very accurate statistically speaking, but the systematic errors are very difficult to check even for us observers, because we rely on so many procedures and people out of our control).

best regards

Niels

Also, I have forwarded your IPN arc to Kevin Bennett (30535::kbennett) at Westerbork.

David

From khurley@space6.ssl.berkeley.edu Fri Apr 16 09:59:34 1993
Date: Fri, 16 Apr 93 08:52:12
From: khurley@space6.ssl.berkeley.edu
Content-Length: 1093

Dear Dave and Tom,

Well, it's 10 AM here, and about 6 PM in Denmark, and I haven't heard back from Niels about the April 10 error box. I have the feeling that it might not be such a good idea to unleash you and the VLA on this position, unless you can somehow cover both his error box and the region of the arc nearest to it. Needless to say, I tend to believe the timing arc more than the WATCH error box (but then I would, wouldn't I?) but I don't know how to resolve this without more input from Niels. Perhaps the 1950/2000 coordinate problem is the answer, but we can't assume it. Also, it is possible that since this was a short event, the WATCH location uncertainty is larger than quoted. And finally, it's possible that the EURECA attitude is just incorrect (a similar occurrence caused the WATCH/GRANAT and IPN locations for the Feburary 19 1991 event to be inconsistent for over a year - not very encouraging!) I'm leaving the country tomorrow morning for a week, and I'll have to leave this in Tom Cline's lap. But I'll be in all day today if you have any questions.

Kevin

From nl@dsri.dk Fri Apr 16 08:26:51 1993
Date: Fri, 16 Apr 93 17:29:21 +0200
From: Niels Lund <nl@dsri.dk>
To: khurley@ucbssl.berkeley.edu
Content-Length: 690

Dear Kevin:

thanks for your fax.
I just got a mail from David Palmer where he asks about the epoch
used for the EURECA attitude.
We are sure that the EURECA attitude is in J2000,
and we have also checked the pointing using the Crab which is
in our FOV. I dont see how we can move our position sufficiently
to match the timing arc. My suggestion to David is that he scans
the timing arc and as much as he can of the WATCH error box near
the center.
(Timing arcs are very accurate statistically speaking, but the
systematic errors on the timing are very difficult to check even for
us observers, because we rely on so many procedures and people
out of our control).

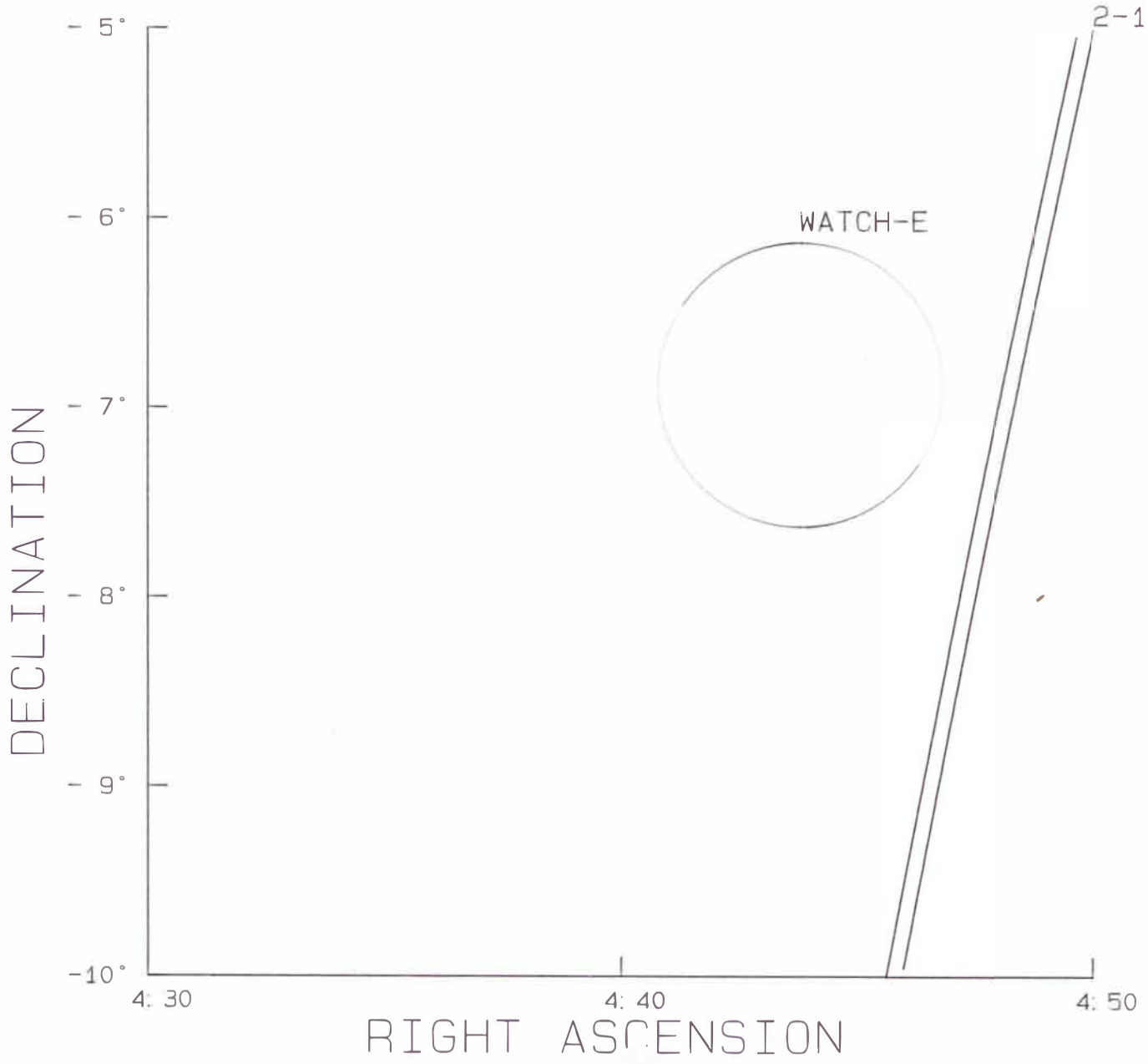
best regards

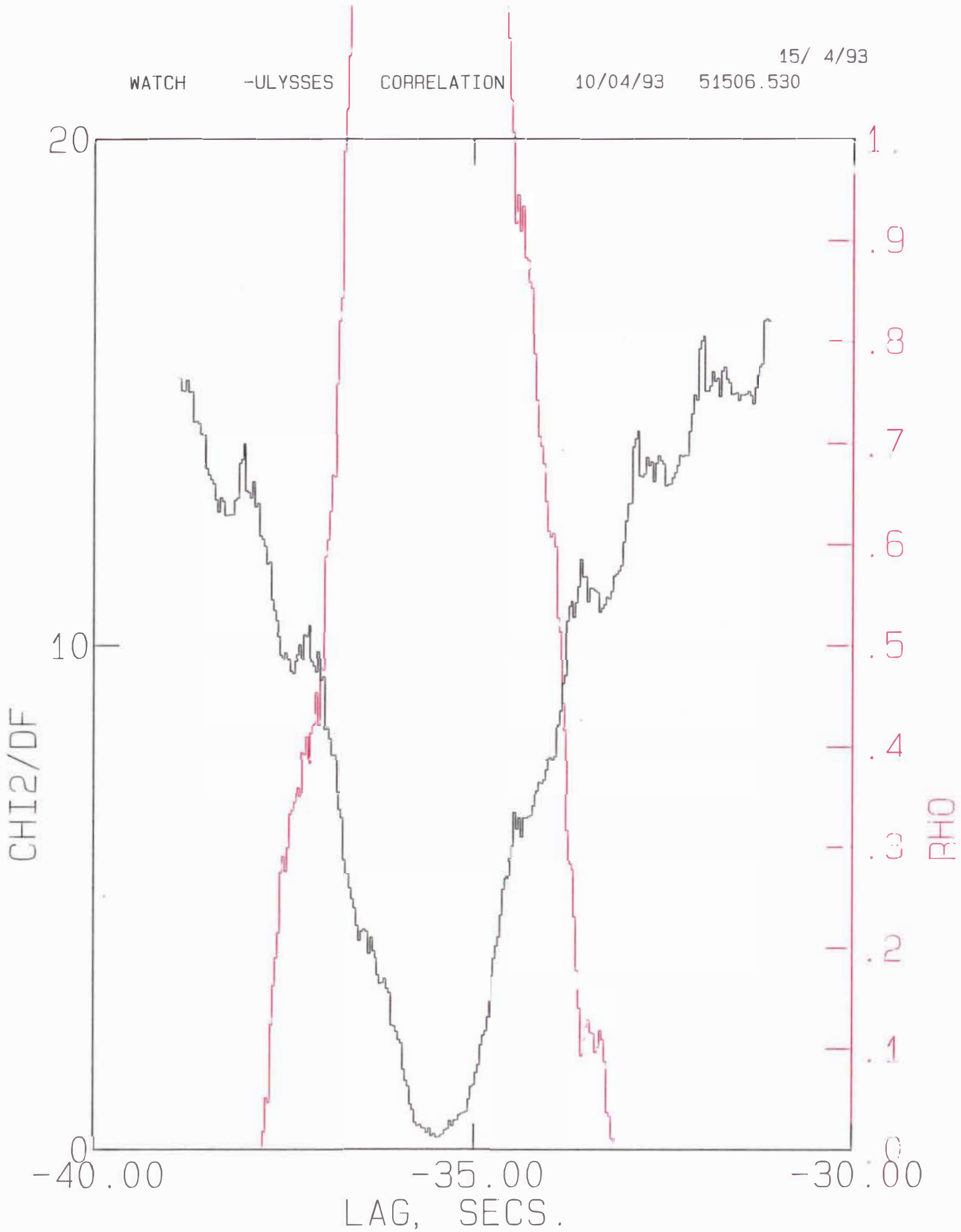
Niels

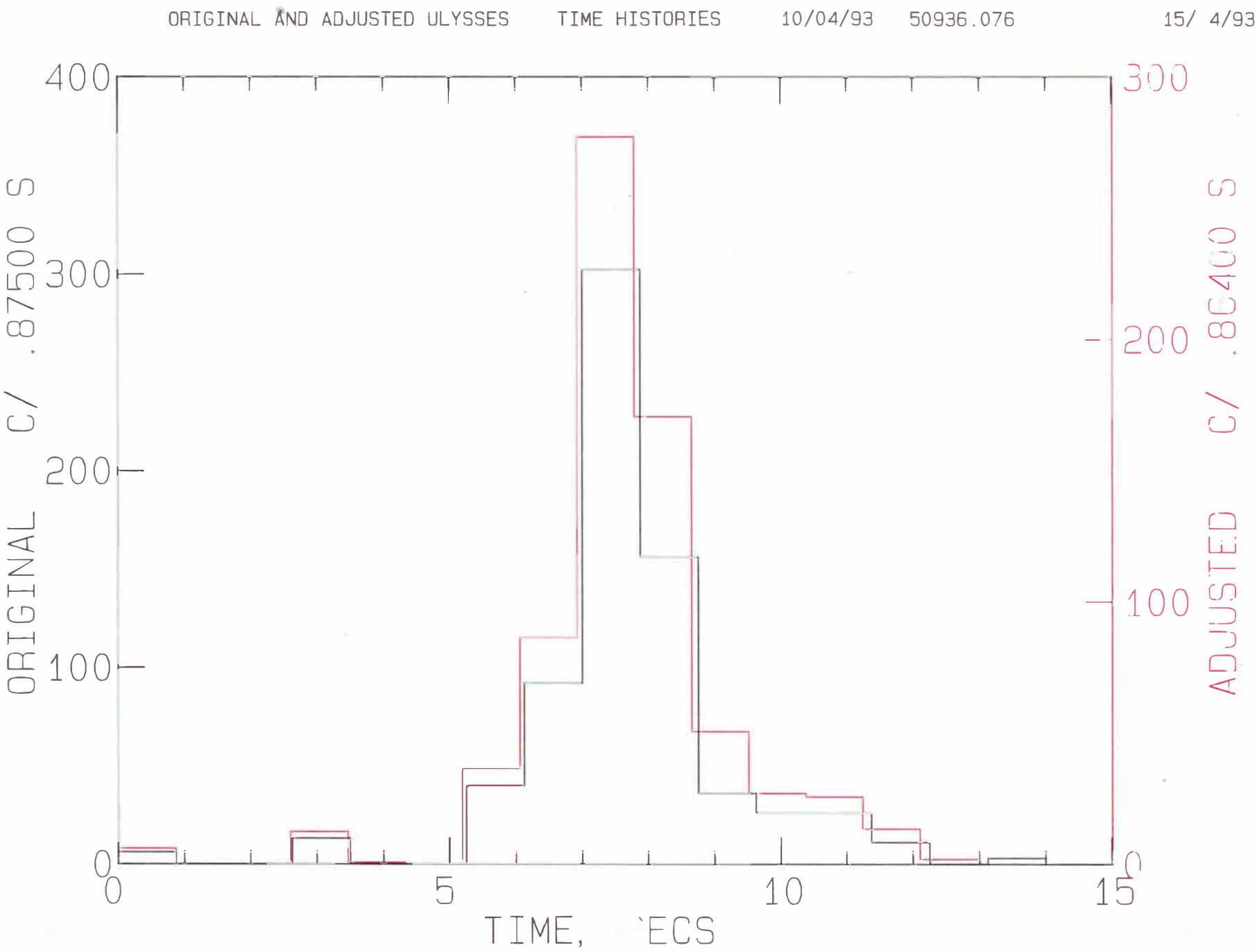
EVENT OF APR 10, 1993 14:08

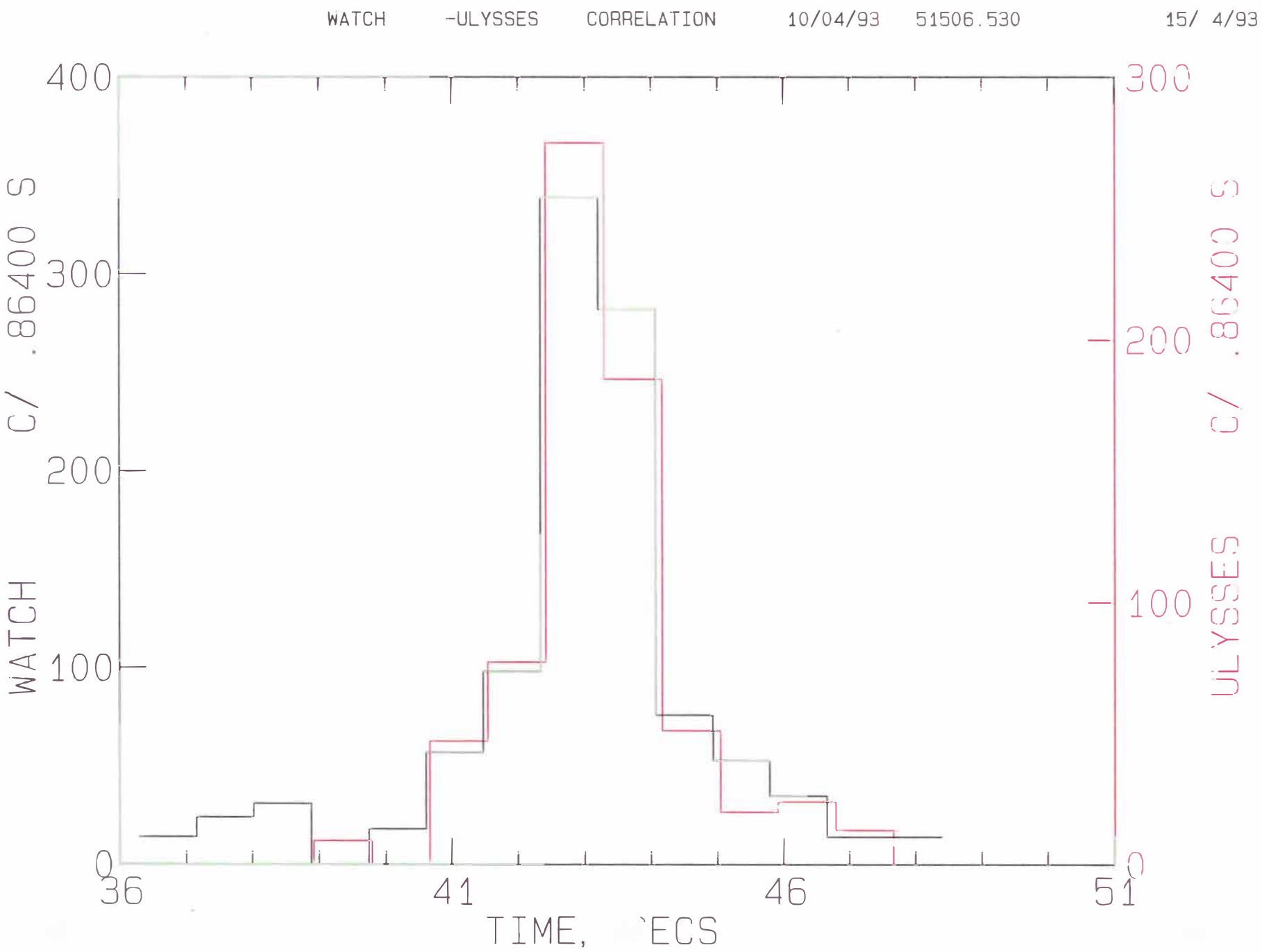
15/ 4/93

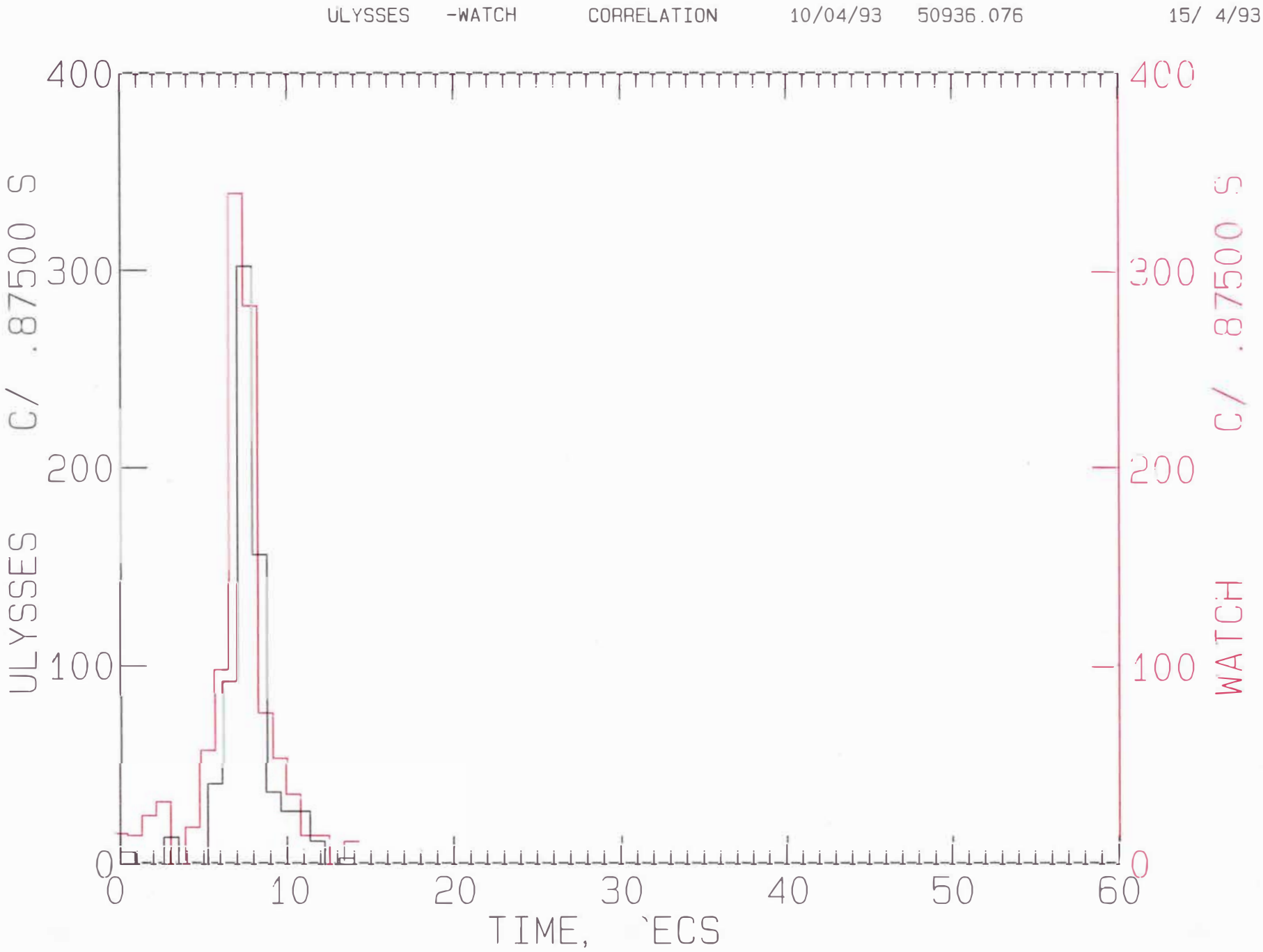
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 WATCH-E

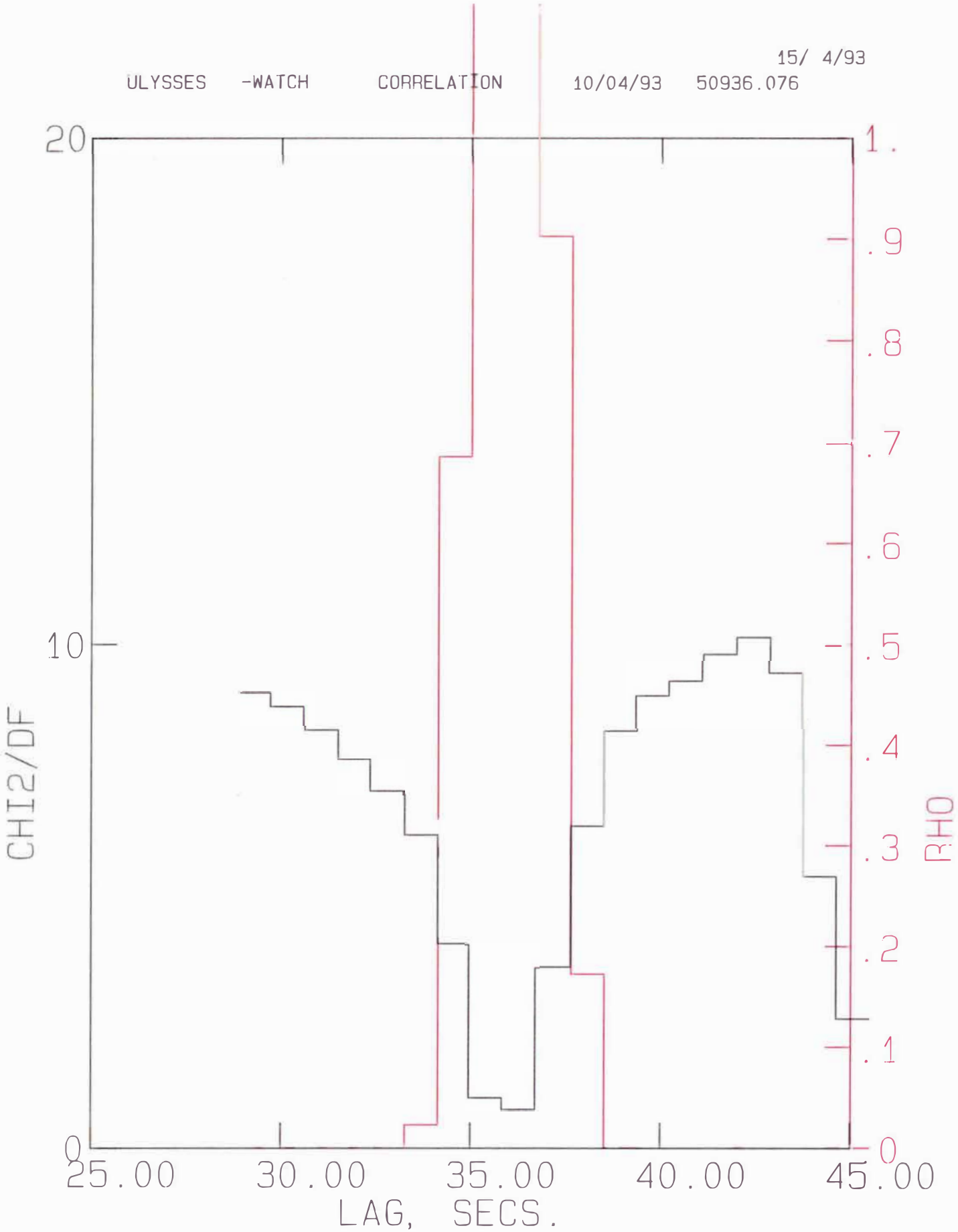


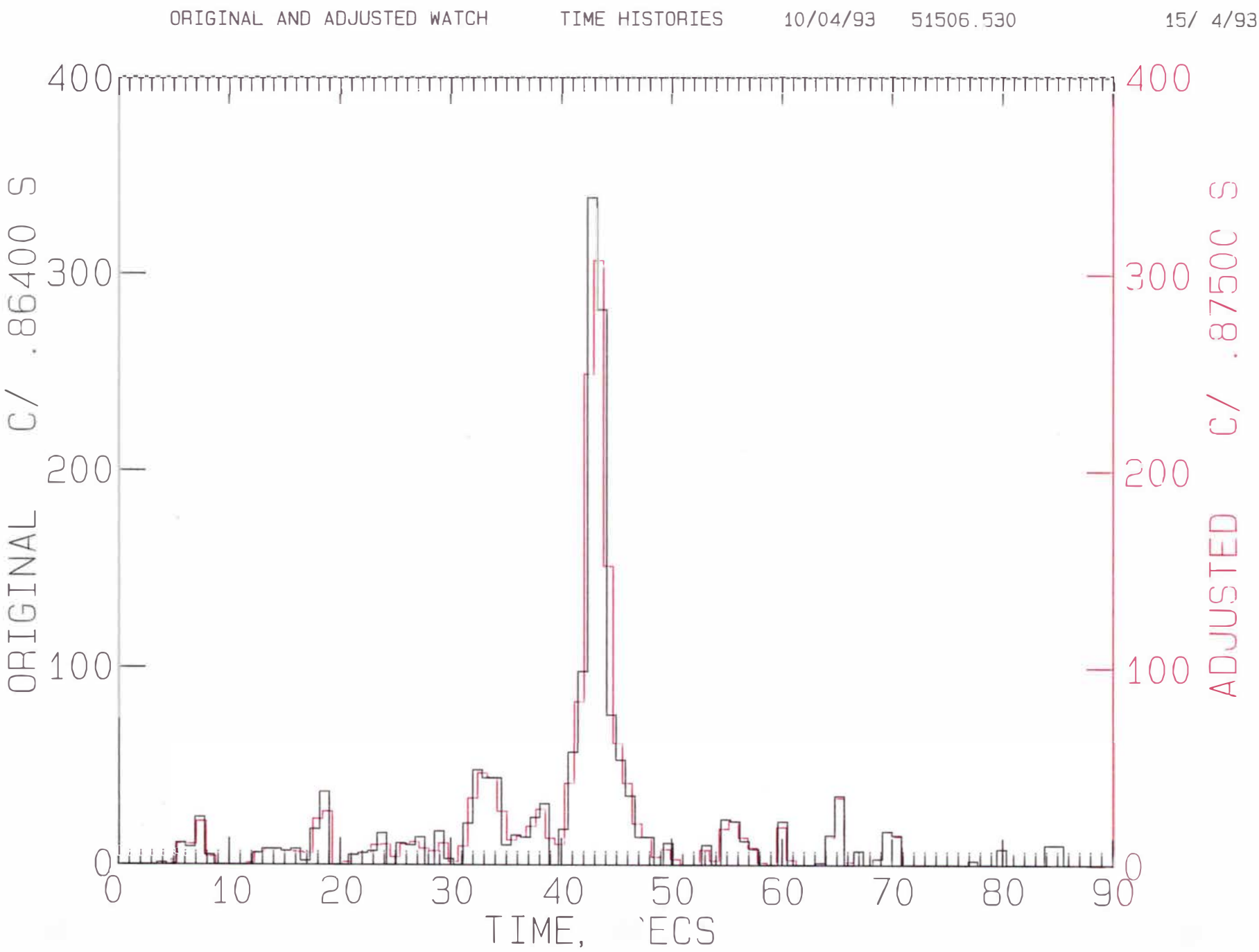

15/ 4/93
WATCH -ULYSSES CORRELATION 10/04/93 51506.530
20
10
0
CHI2/DF
1.
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
RHO
-40.00
-35.00
-30.00
LAG, SECS.


ORIGINAL AND ADJUSTED ULYSSES TIME HISTORIES 10/04/93 50936.076 15/ 4/93
ORIGINAL C/ .87500 S
ADJUSTED C/ .86400 S
TIME, ECS
0
100
200
300
400
0
5
10
15

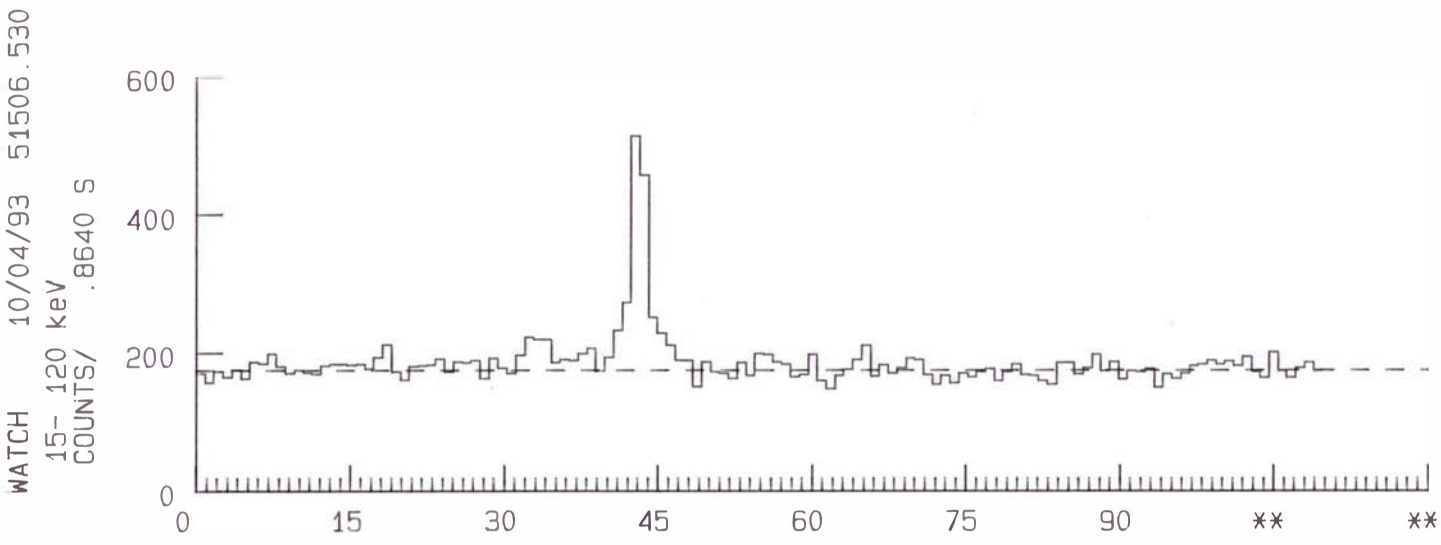

WATCH -ULYSSES CORRELATION 10/04/93 51506.530 15/ 4/93
400
300
200
100
0
WATCH C/ .86400 S
300
200
100
0
ULYSSES C/ .86400 S
36
41
46
51
TIME, `ECS


ULYSSES -WATCH CORRELATION 10/04/93 50936.076 15/ 4/93
400
300
200
100
0
ULYSSES C/ .87500 S
WATCH C/ .87500 S
0
10
20
30
40
50
60
TIME, `ECS


15/ 4/93
ULYSSES -WATCH CORRELATION 10/04/93 50936.076
20
10
0
CHI2/DF
1.
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
RHO
25.00
30.00
35.00
40.00
45.00
LAG, SECS.


ORIGINAL AND ADJUSTED WATCH TIME HISTORIES 10/04/93 51506.530 15/ 4/93
400
300
200
100
0
ORIGINAL C/ .86400 S
ADJUSTED C/ .8750C S
0
10
20
30
40
50
60
70
80
90
TIME, SECS

15/ 4/93

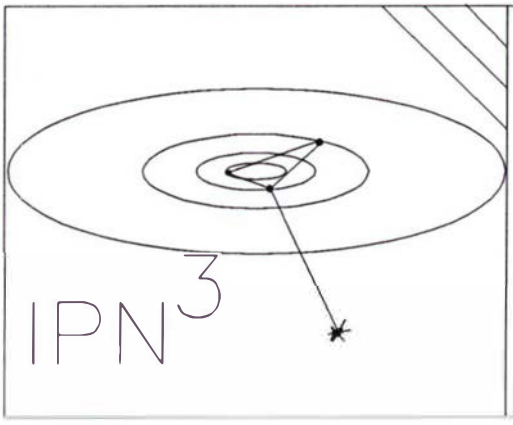

WATCH 10/04/93 51506.530
15- 120 keV
COUNTS/ .8640 S
600
400
200
0
0
15
30
45
60
75
90
**
**

From khurley@space6.ssl.berkeley.edu Thu Apr 15 17:00:36 1993
Date: Thu, 15 Apr 93 15:53:15
From: khurley@space6.ssl.berkeley.edu
Content-Length: 489

Dear Dave,

I've sent Tom a fax and an e-mail file for April 10. It doesn't look too consistent with the WATCH position, and I've asked Niels Lund for a clarification of his error box radius, i.e. whether it is 1 sigma or 3. If it's 1, we're OK. If it's 3, we've got problems. Note that the IPN arc is only about 4' wide. It turns out that this event was observed by WATCH on EURECA, and not on GRANAT, reducing the effect of the spacecraft positional uncertainty quite a bit.

Kevin



FAX FROM K. HURLEY
UNIVERSITY OF CALIFORNIA
SPACE SCIENCES LABORATORY
BERKELEY, CA. 94720
PHONE: (510) 643-9173
FAX: (510) 643 8640 (OFFICE)
FAX: (510) 643 8302 (SECRETARY)

TO: NIELS LUND
FAX: 011 45 45 930283 DSRI
DATE: April 15, 1993
TOTAL NUMBER OF PAGES: 3

HERE IS THE OUTPUT FROM MY TRIANGULATION PROGRAM. IT DOESN'T LOOK TOO GOOD, IF YOUR ERROR CIRCLE IS 45' 3 SIGMA. IF IT'S 1 SIGMA, WE'RE OK. YOU CAN CHECK THE NUMBERS TO SEE IF THERE'S ANY MISTAKE. I'VE GIVEN THIS ALL TO TOM CLINE, TOO. DAVE PALMER WILL NEED THE ERROR BOX TODAY.

FAXED 4/15/93

From nl@dsri.dk Thu Apr 15 14:14:32 1993
Date: Thu, 15 Apr 93 23:17:04 +0200
From: Niels Lund <nl@dsri.dk>
To: khurley@ucbssl.berkeley.edu
Content-Length: 672

Hello Kevin

Sorry about the ephemeris (and about your timing arc for
gb930309 too !)
The gb930410 event has been localized by Eureca-Watch, not by Granat.
Eureca is in a low Earth orbit (H approx 500 km) and therefore we
felt that the 20 msec error introduced by taking the Earth center
for the Eureca position was unimportant compared to the uncertainty
arising from our crude count rate record. But I should have said this
explicitly I agree. Please forward the result of your timing calcu-
lations also to me since several european radio observatories are
interested in the event too. Maybe their interest will diminish when
they read your nasty circular !

Niels

From nl@dsri.dk Tue Apr 13 15:42:20 1993
Date: Wed, 14 Apr 93 00:44:55 +0200
From: Niels Lund <nl@dsri.dk>
To: khurley@ucbssl.berkeley.edu
Content-Length: 1073

Hello Kevin

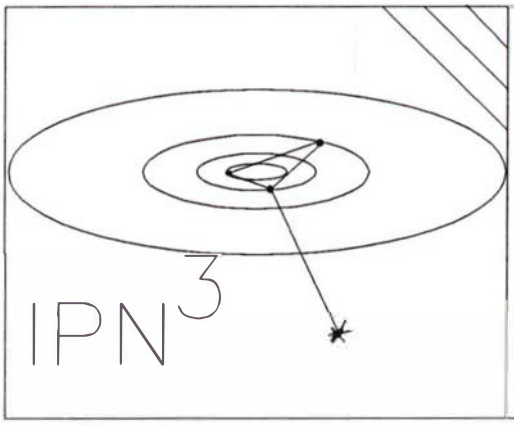
I have had a request from David Palmer at Goddard for an updated position of the gamma burst we detected on april 10. He will have a possibility to observe the source region with the VLA this friday.

Did you see this burst with ULYSSES ?
Our preliminary position is RA 04h 44m, dec -07d00m (J2000) the trigger time is 930410 14h19m07s. From this you should be able to calculate the ULYSSES crossing time. I will fax the time history to you tomorrow, it is pretty uninteresting: a single spike 2 seconds wide on a small symmetrically placed base about 5 seconds wide. The burst seems to be quite hard, we see only little in our low energy band (6 to 15 keV). In our high energy band the peak excess rate during the burts is about 2 times the background.

71°, -7°

It would be very nice if we could have an IPN position before the VLA observations start. I will also alert Tom Cline to check if the event have been seen by the Mars Observer. From our knowledge of the GRO orbit we expect them to have missed this burst due to Earth occultation.

best regards
Niels



FAX FROM K. HURLEY
UNIVERSITY OF CALIFORNIA
SPACE SCIENCES LABORATORY
BERKELEY, CA. 94720
PHONE: (510) 643-9173
FAX: (510) 643 8640 (OFFICE)
FAX: (510) 643 8302 (SECRETARY)

TO: NIELS LUND
FAX:
DATE: April 13, 1993
TOTAL NUMBER OF PAGES: 2

HERE IT IS! LET'S TRY TO GET AT LEAST AN ANNULUS TO DAVE PALMER FOR HIS OBSERVATIONS. THE BATSE PEOPLE SEEM TO AGREE THAT THEY WERE OCCULTED. I'M TRYING TO FIND OUT FROM JOHN LAROS WHETHER THERE WAS AN MO OBSERVATION. BUT IN THE MEANTIME, IF YOU CAN SEND ME THE WATCH DATA IN THE SAME FORMAT AS BEFORE, I CAN WORK OUT A POSITION QUICKLY.

From nl@dsri.dk Thu Apr 15 00:12:36 1993
Date: Thu, 15 Apr 93 09:15:02 +0200
From: Niels Lund <nl@dsri.dk>
To: khurley@ucbssl.berkeley.edu
Content-Length: 1975

Hello Kevin

Thanks for the fax. We should compare fluence calculations for this and other events too - maybe there is something to learn.

I attach the digital data.

Regarding the Ballerina. Yes I am open to US cooperation. Of course the idea must find support also in Europe otherwise it will not stand a chance in ESA, but if I can rally sufficient support here a few co-investigators from the US would only strengthen the case. I have had the opportunity to discuss the idea also with Josh Grindlay (he is on sabbathical in Florence) and he told me that as far as he knows there are no similar proposal in the NASA SMEX pile. Of course HETE may steal the thunder from Ballerina if sufficient UV emission is coming with the GRB's, but we will fortunately (unfortunately) know this before ESA will commit itself beyond the mission definition stage for any of the M3-proposals.

best regards
Niels

This is the WATCH medium energy time history of GRB 930410.
The start of the first bin is 14:18:26.53 UT and the duration per bin is 0.8640 second.

170	157	174	165	176	163	186	184	199	180
170	175	171	169	181	183	183	182	183	177
193	212	172	160	180	181	182	191	172	186
185	189	163	192	178	170	196	223	219	219
185	190	189	199	206	173	193	232	273	514
457	251	228	210	189	189	151	186	172	170
162	185	167	198	197	187	183	165	168	197
159	147	167	176	190	210	166	182	170	178
192	190	168	154	167	156	170	165	172	177
159	172	183	168	167	159	154	185	185	169
178	197	173	186	161	173	172	177	149	169
163	170	181	183	189	183	188	181	194	172
164	201	173	164	178	185	174	175		

(1)

FAXCOVER

DANISH SPACE RESEARCH INSTITUTE
GL. LUNDTOFTEVEJ 7
DK-2800 LYNGBY
DENMARK

PHONE: +45 42 88 22 77 TELEFAX: +45 45 93 02 83 TELEX: 37198 danru dk

DATE: 14/3 93 Page 1 of 3

From: NIELS LUND

TO : KEVIN HURLEY, SPACE SCIENCES LAB

FAX no: 009 1 510 643 8302
Name :

Dear Kevin

Attached find the time histories of GRB 930410 as recorded by EUREKA-WATCH. Unfortunately at this time we only have available the data with 0.84 s time resolution.

We have checked our position determination and our best position now is:

RA: $4^h\ 43^m.8$ $\delta = -6^\circ\ 53'$ (J2000)
70.95 −6.883

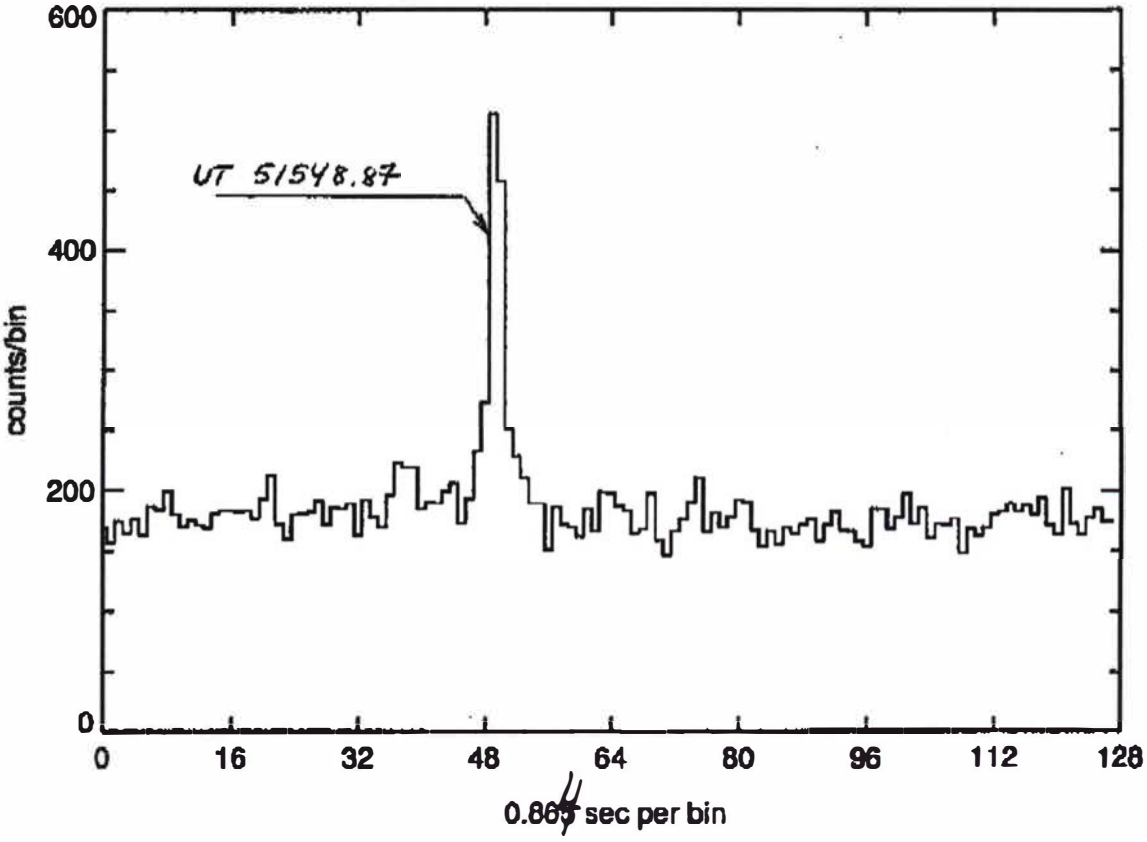
I have not received your FAX with the ULYSSES time history, please resend it.

Niels

(2)

WATCH-EURECA 10-04-1993

Medium energy count rate. 15-120 keV GRB 930410



Peak channel data collection starts at

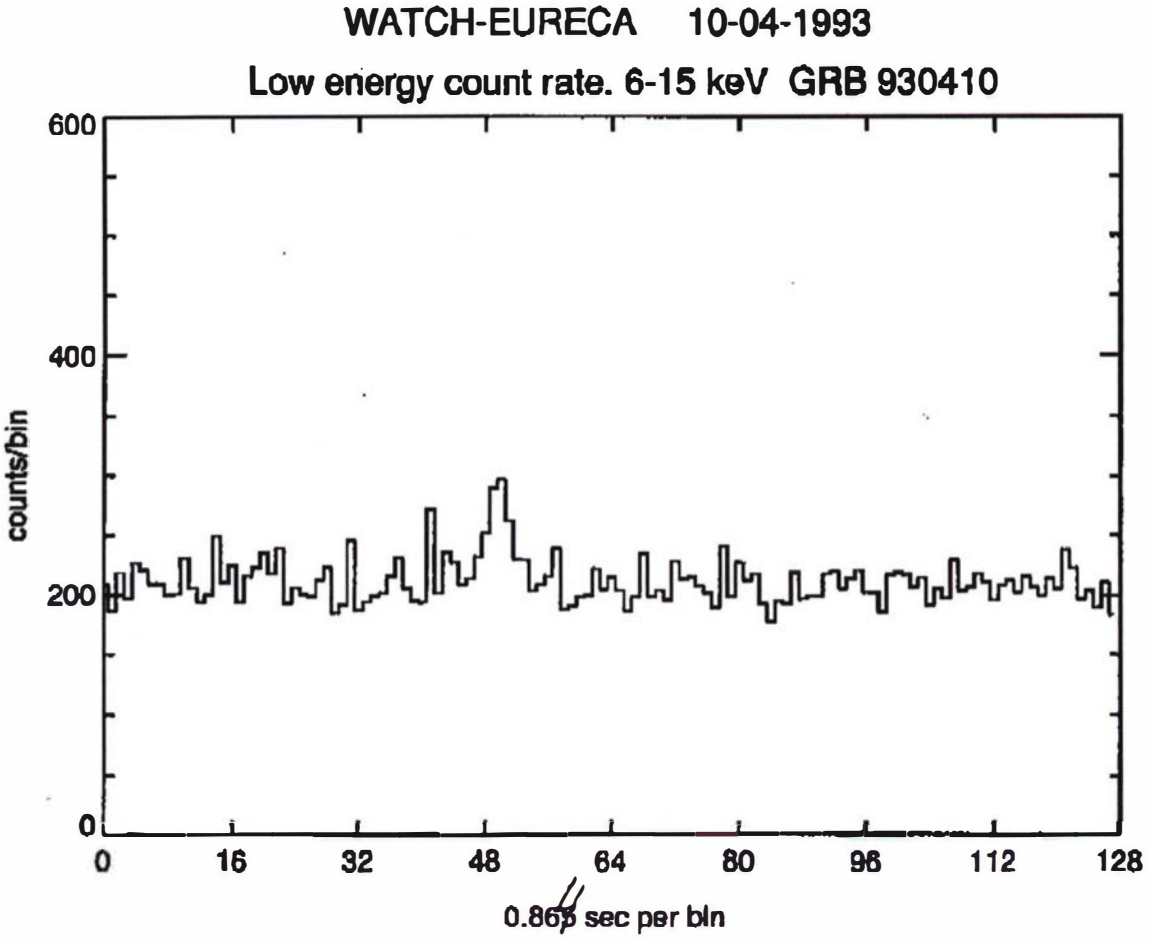
$14^h\ 19^m\ 8.87^s$ UT

and ends at

$14^h\ 19^m\ 9.73^s$ UT

(only 1 channel)

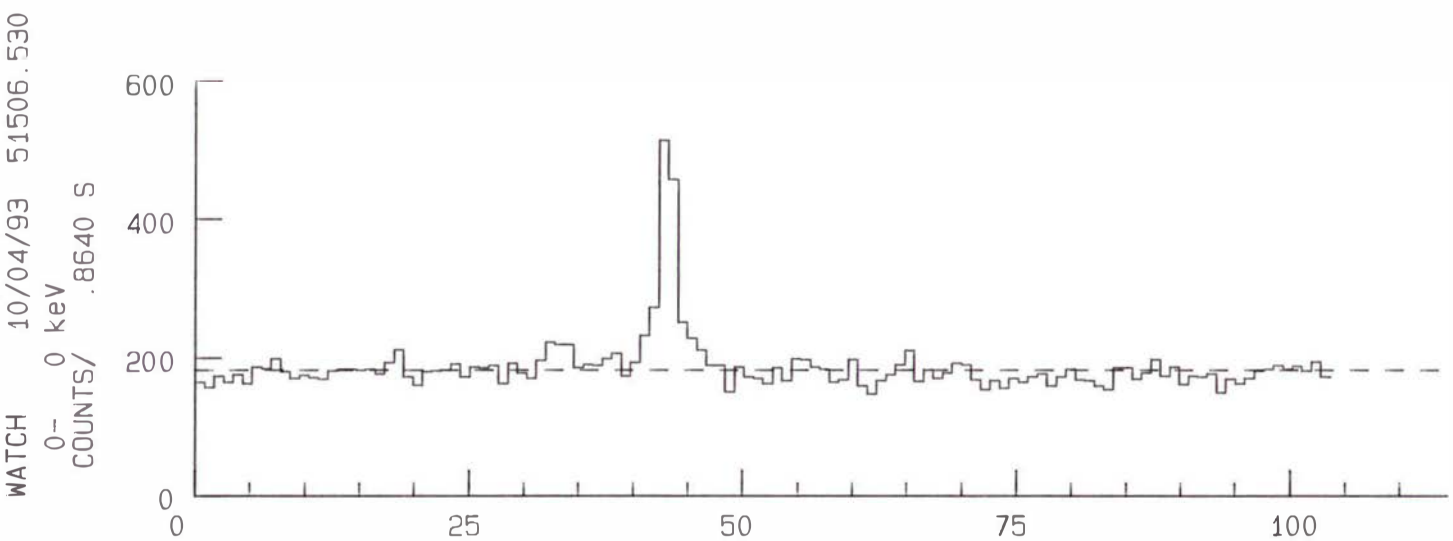
(3)


WATCH-EURECA 10-04-1993
Low energy count rate. 6-15 keV GRB 930410
600
400
200
0
counts/bin
0
16
32
48
64
80
96
112
128
0.865 sec per bin

WATCH
10/04/93
51506.530
0- 0 keV
COUNTS/ .864 S
0
200
400
600
0
25
50
75
100
T IME, SECS

2/10/93

2/10/93


WATCH 10/04/93 51506.530
0- 0 keV
COUNTS/ .8640 S
600
400
200
0
0
25
50
75
100

From root Fri Oct 1 06:50 1993
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA09141; Fri, 1 Oct 93 06:50:52
Received: from danpost.uni-c.dk by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA24250; Fri, 1 Oct 93 06:52:57 PDT
Received: from uhuru.dsri.dk (uhuru.dsri.dk [129.142.171.2]) by danpost.uni-c.dk (8.6.beta.10,
Received: by uhuru.dsri.dk (4.1/SMI-4.1)
id AA10424; Fri, 1 Oct 93 14:54:44 +0100
Date: Fri, 1 Oct 93 14:54:44 +0100
From: Soeren Brandt <sb@dsri.dk>
Message-Id: <9310011354.AA10424@uhuru.dsri.dk>
To: khurley@sunspot.ssl.berkeley.edu
Subject: GRBs
Status: R

Hello Kevin,

I have found an event in WATCH-EURECA data on Oct 01 1992.
The localization is somewhat marginal. Do you see anything
in Ulysses data consistent with the time and position given
below?
I also send the count rate data from GRB 930410.

Best regards,

Soren Brandt

==========

This is 128 bins of count rate data from WATCH-EURECA
of GRB 931001. 2
The start time of the first bin is 05:56:20.00 (21380.00 sec)
and the end time of the last bin is 05:58:15.18 (21495.18 sec)
The duration of one bin is 0.890 sec.
The position of the burst is:
alfa = 14h58m35s delta = 23.2 degr. (J2000)
224.6°

371	384	371	344	330	345	340	373	330	328
350	347	342	336	359	328	342	352	372	342
343	371	356	359	362	388	341	324	353	360
361	376	352	359	351	395	351	330	364	347
387	347	353	351	349	358	372	384	352	376
393	368	329	382	367	377	372	345	355	373
395	361	643	598	386	404	398	400	411	375
388	385	347	397	394	397	375	384	378	347
382	343	370	379	425	383	373	367	367	388
392	413	369	364	369	388	385	382	371	370
418	376	385	388	393	416	383	408	398	348
354	394	379	378	376	397	340	406	391	378
353	382	379	399	449	413	418	411		

==========

This is 128 bins of count rate data from WATCH-EURECA
of GRB 930410.
Same as before, except for 1st bin
The start time of the first bin is 14:18:26.53 (51506.53 sec)
and the end time of the last bin is 14:20:17.12 (51617.12 sec)
The duration of one bin is 0.864 sec

165	157	174	165	176	163	186	184	199	180
170	175	171	169	181	183	183	182	183	177
193	212	172	160	180	181	182	191	172	186
185	189	163	192	178	170	196	223	219	219
185	190	189	199	206	173	193	232	273	514
457	251	228	210	189	189	151	186	172	170
162	185	167	198	197	187	183	165	168	197
159	147	167	176	190	210	166	182	170	178

192	190	168	154	167	156	170	165	172	177
159	172	183	168	167	159	154	185	185	169
178	197	173	186	161	173	172	177	149	169
163	170	181	183	189	183	188	181	194	172
164	201	173	164	178	185	174	175		

From palmer@tgrs.gsfc.nasa.gov Wed Apr 14 20:02:22 1993
Sender: palmer@tgrs.ssl.berkeley.edu
Date: Wed, 14 Apr 1993 23:06:41 -0400
To: khurley@space6.ssl.berkeley.edu
From: palmer@tgrs.gsfc.nasa.gov
Subject: Re:
Content-Length: 507

Do you have a preliminary IPN arc for the WATCH burst yet (April 10)?

This would be a good burst to look at for my VLA observation on Saturday
(not Friday as I previously thought).

Have you been in contact with the Mars Observer people yet?
I know that they were being tracked at that time as part of the
gravity wave experiment, but I don't know whether they were
telemetering data at the same time. A few hours later the
spacecraft lost orientation (it was later recovered.)

David

From palmer@tgrs.gsfc.nasa.gov Thu Apr 15 05:35:48 1993
Sender: palmer@tgrs.ssl.berkeley.edu
Date: Thu, 15 Apr 1993 08:40:10 -0400
To: khurley@space6.ssl.berkeley.edu
From: palmer@tgrs.gsfc.nasa.gov
Subject: Re:
Content-Length: 789

>Dear Dave,
>
>I've redone the March 25 error box for your upcoming VLA run and passed the
>results to Tom Cline so that he can check them before giving them to you.
>There is not much difference between this new run and the old one, however.

Thank you, I got the fax.

>As you may know, there was a burst on April 10 which was observed by WATCH
>and Ulysses, but not MO or GRO. Niels Lund and I are trying to triangulate
>it, but it will never be much better than a several arcminute wide annulus
>running through his 45' radius error circle. Interested in this one for the
>VLA?

Looks like our mails crossed. Yes, I am definitely interested.
I will image field by field along this line. This takes 3 pointings,
but it would take 12 without the arc.

David

From @mitvma.mit.edu:green%cfaps2.span@cfa.bitnet Mon Apr 12 11:37:47 1993
X-Delivery-Notice: SMTP MAIL FROM does not correspond to sender.
Date: Mon, 12 Apr 93 14:04:31 EDT
From: green%cfaps2.span%cfa.BITNET@mitvma.mit.edu
Subject: IAUC 5759: SN 1993J; GRB J0444-0700
To: quaj%cfa.BITNET@mitvma.mit.edu
X-St-Vmsmail-To: ST%QUAJ
Content-Length: 2971

Circular No. 5759

Central Bureau for Astronomical Telegrams
INTERNATIONAL ASTRONOMICAL UNION
Postal Address: Central Bureau for Astronomical Telegrams
Smithsonian Astrophysical Observatory, Cambridge, MA 02138, U.S.A.
Telephone 617-495-7244/7440/7444 (for emergency use only)
TWX 710-320-6842 ASTROGRAM CAM EASYLINK 62794505
MARSDEN@CFA or GREEN@CFA (.SPAN, .BITNET or .HARVARD.EDU)

SUPERNOVA 1993J IN NGC 3031

S. D. Van Dyk and K. W. Weiler, Naval Research Laboratory; M. P. Rupen and R. A. Sramek, National Radio Astronomy Observatory; and N. Panagia, Space Telescope Science Institute, report: "New observations of SN 1993J made on Apr. 8.33 UT with the Very Large Array in 'B' configuration show that the source is now detectable in at least three frequency bands. This confirms the first weak detection (IAUC 5752) of the supernova at 1.3 cm (22.5 GHz) on Apr. 2.30. The source has now risen dramatically in flux density at 1.3 cm to 18.94 +/- 0.20 mJy at R.A. = 9h51m19s.042, Decl. = +69 15'26".45 (equinox 1950.0; +/- 0".2 in each coordinate), in excellent agreement with the previously reported position. The radio position for SN 1993J, compared with the radio position for the nucleus of NGC 3031 given on IAUC 5752, yields an offset for the supernova of 44".0 west, 161".8 south. The supernova is also detected at 2.0 cm (14.9 GHz) with flux density 8.04 +/- 0.18 mJy, confirming the previous detection made at this wavelength by Pooley and Green (IAUC 5751), and at 3.6 cm (8.4 GHz) with flux density 0.74 +/- 0.05 mJy. The radio spectrum of the supernova is optically thick, as is expected at this time. Comparison with the type-II linear radio supernovae 1979C and 1980K shows that SN 1993J has turned on in the radio significantly earlier than the two previous supernovae. This implies that there is less absorption external to the radio emitting source for SN 1993J and therefore, from modelling, that the progenitor of SN 1993J was probably less massive than the progenitors of the other two radio supernovae, assuming that SN 1993J is type-II/linear as were SNe 1979C and 1980K; if the supernova is type-II/plateau, then its behavior in the radio is unpredictable, since a supernova with this subtype has never been previously detected at radio wavelengths. Radio monitoring is continuing on a nearly daily basis at these and other wavelengths in order to follow the supernova's rapidly changing behavior."

GRB J0444-0700

S. Brandt, N. Lund, and A. J. Castro-Tirado, Danish Space Research Institute, report: "A bright gamma-ray burst was detected by he WATCH wide-field instrument on EURECA on Apr. 10.59661 UT. The

burst was located at R.A. = 4h44m, Decl. = −7 00′ (equinox 2000.0). The radius of the error circle is 45′. Follow-up observations in the optical and radio are encouraged."

1993 April 12 (5759) Daniel W. E. Green

From khurley@space6.ssl.berkeley.edu Wed Apr 14 14:39:28 1993
Date: Wed, 14 Apr 93 13:32:05
From: khurley@space6.ssl.berkeley.edu
Content-Length: 554

Dear Dave,

I've redone the March 25 error box for your upcoming VLA run and passed the results to Tom Cline so that he can check them before giving them to you. There is not much difference between this new run and the old one, however.

As you may know, there was a burst on April 10 which was observed by WATCH and Ulysses, but not MO or GRO. Niels Lund and I are trying to triangulate it, but it will never be much better than a several arcminute wide annulus running through his 45' radius error circle. Interested in this one for the VLA?

Kevin

From khurley@space6.ssl.berkeley.edu Wed Apr 14 08:24:44 1993
Date: Wed, 14 Apr 93 07:17:23
From: khurley@space6.ssl.berkeley.edu
Content-Length: 143

Dear Niels,

I just got word back from John Laros that MO was not on for our event. Too bad, but we can still get an annulus quickly.

Kevin

From nl@dsri.dk Wed Apr 14 02:58:28 1993
Date: Wed, 14 Apr 93 12:01:03 +0200
From: Niels Lund <nl@dsri.dk>
To: khurley@ucbssl.berkeley.edu
Content-Length: 592

Hello Kevin

I just send you a FAX with our time histories for GRB 930410. In the text of the fax I have quoted a wrong bin width for the plots, the correct value is 0.864 s. Please correct the text. The caption to the figures shows the correct updated value.

I did not receive your fax, so please resend it. My fax number is: +45 45 930283.

The recent detection of variable radio emission from inside the GRB 930309 error box have really excited people. I have received requests for more information about the new burst also from Meudon and from Pacini in Firenze.

best regards
Niels

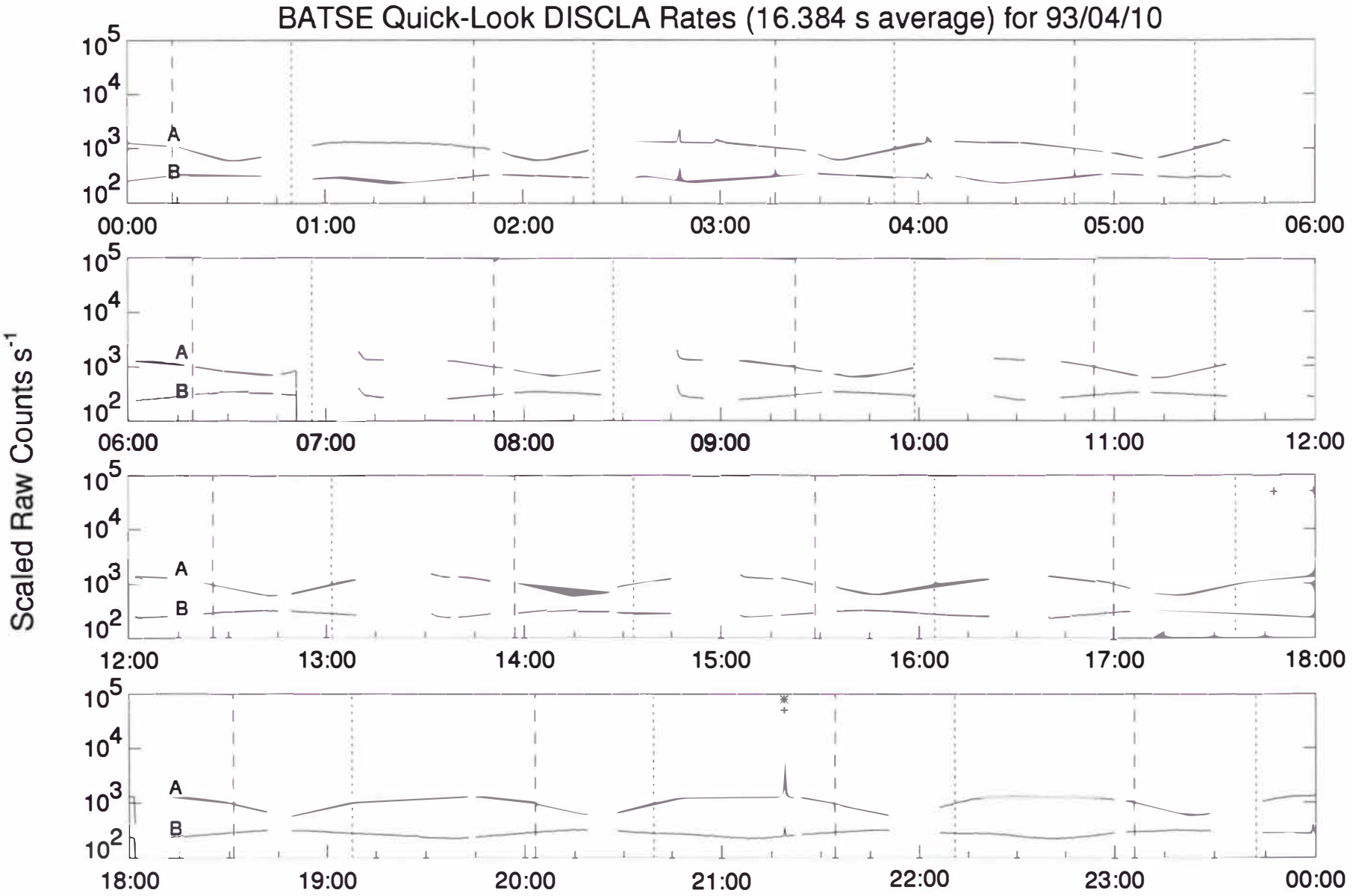
From 081877@SSTDP2.LANL.GOV Wed Apr 14 07:06:34 1993
Date: Wed, 14 Apr 1993 8:11:31 -0600 (MDT)
From: 081877@SSTDP2.LANL.GOV
To: khurley@sunspot.ssl.berkeley.edu
Subject: Mars Observer coverage
Content-Length: 482

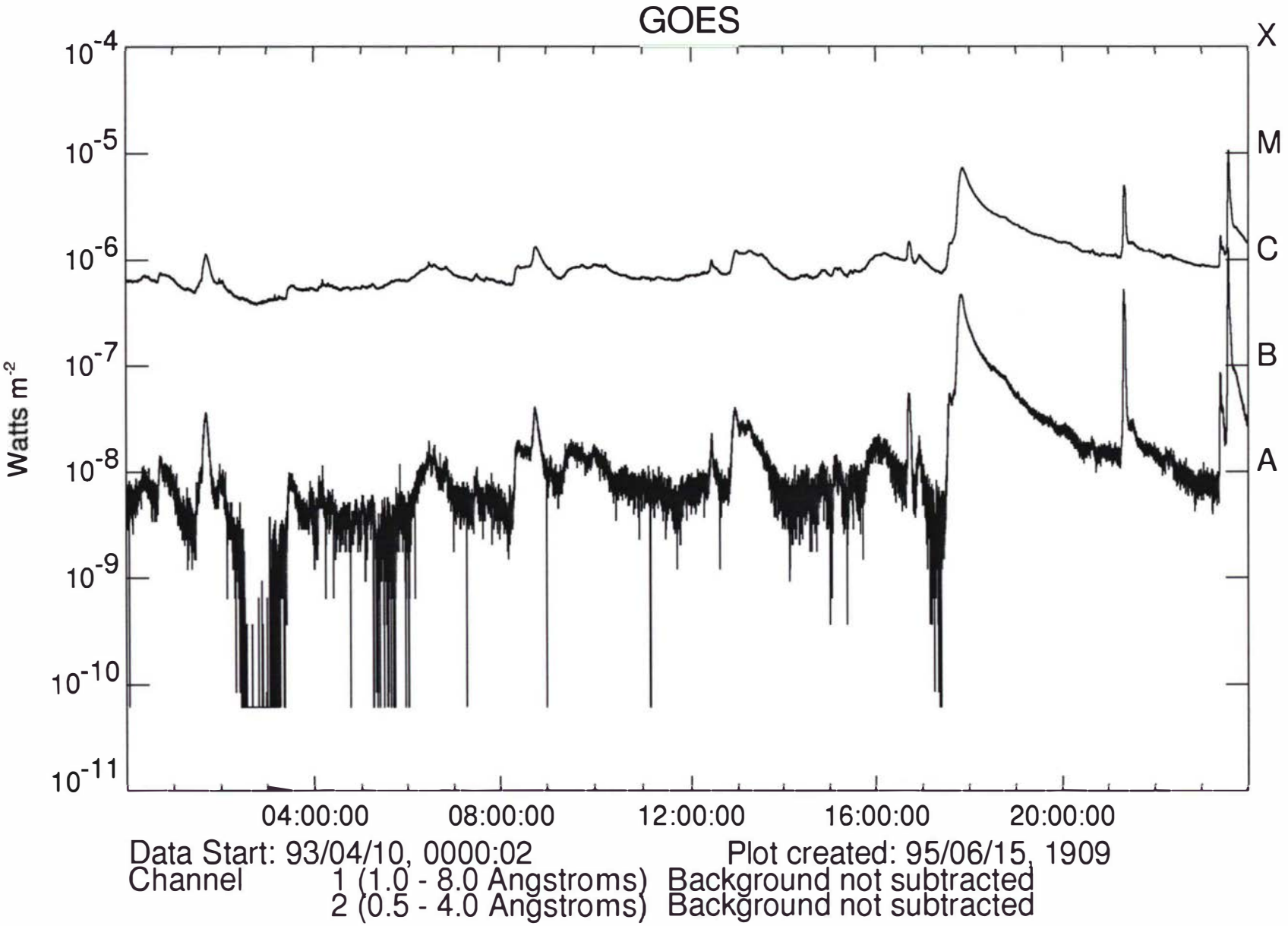
Kevin,

The combination of an SEU with lack of coverage resulted in GRS being in standby mode from March 13 to the present. Memory reload is scheduled for tomorrow, 4/15. If all goes well, we should be back in business by the 16th. (I'm beginning to have my doubts about microprocessor-based instruments.)

Also, your BIG burst file has 150 columns, which is a pain. May I suggest 2-letters for the detector and observation acronyms? I will email you a sample of what I mean.

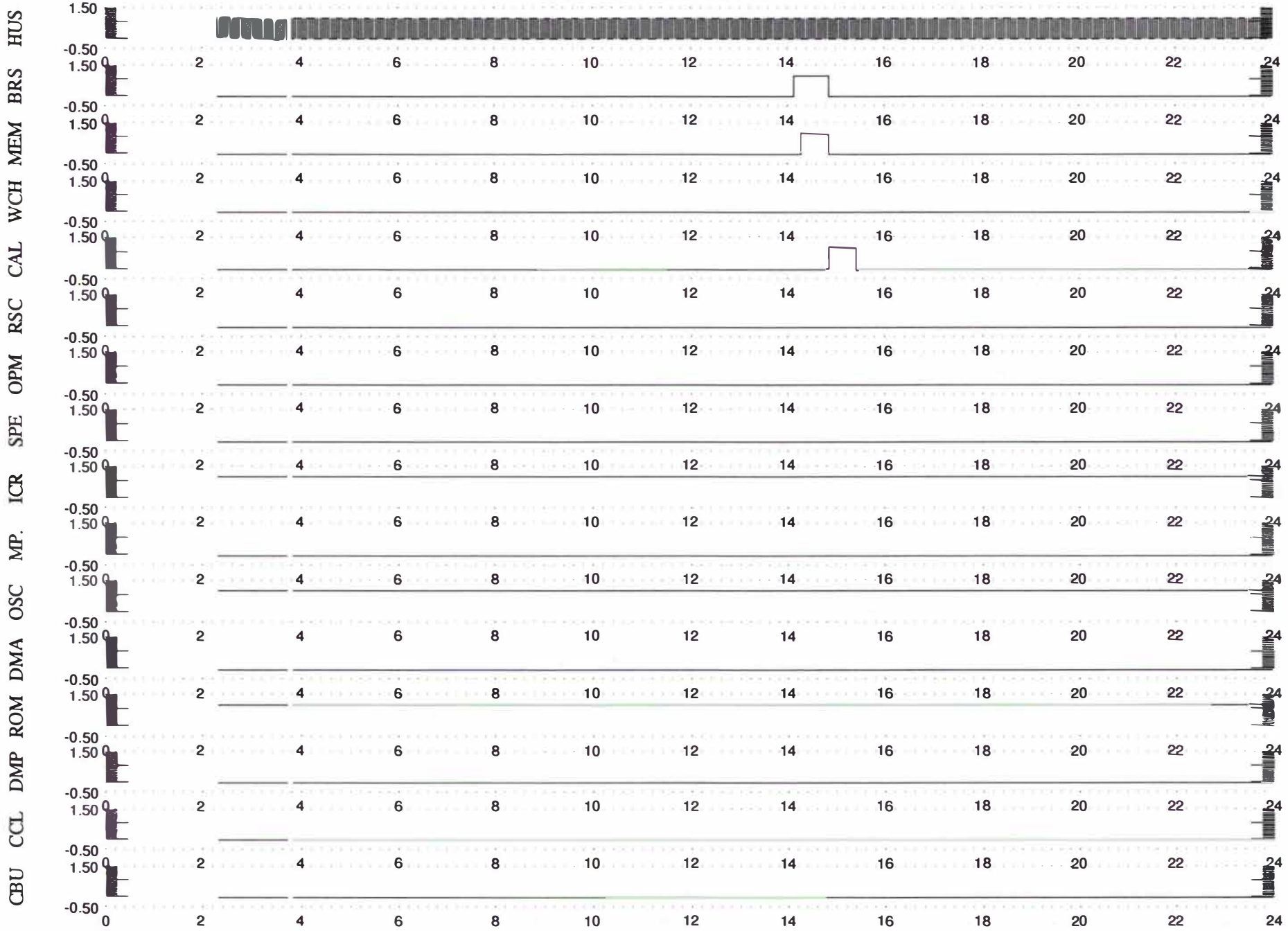
John


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/10
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1409 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare


GOES
X
M
C
B
A
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/10, 0000:02
Plot created: 95/06/15, 1909
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

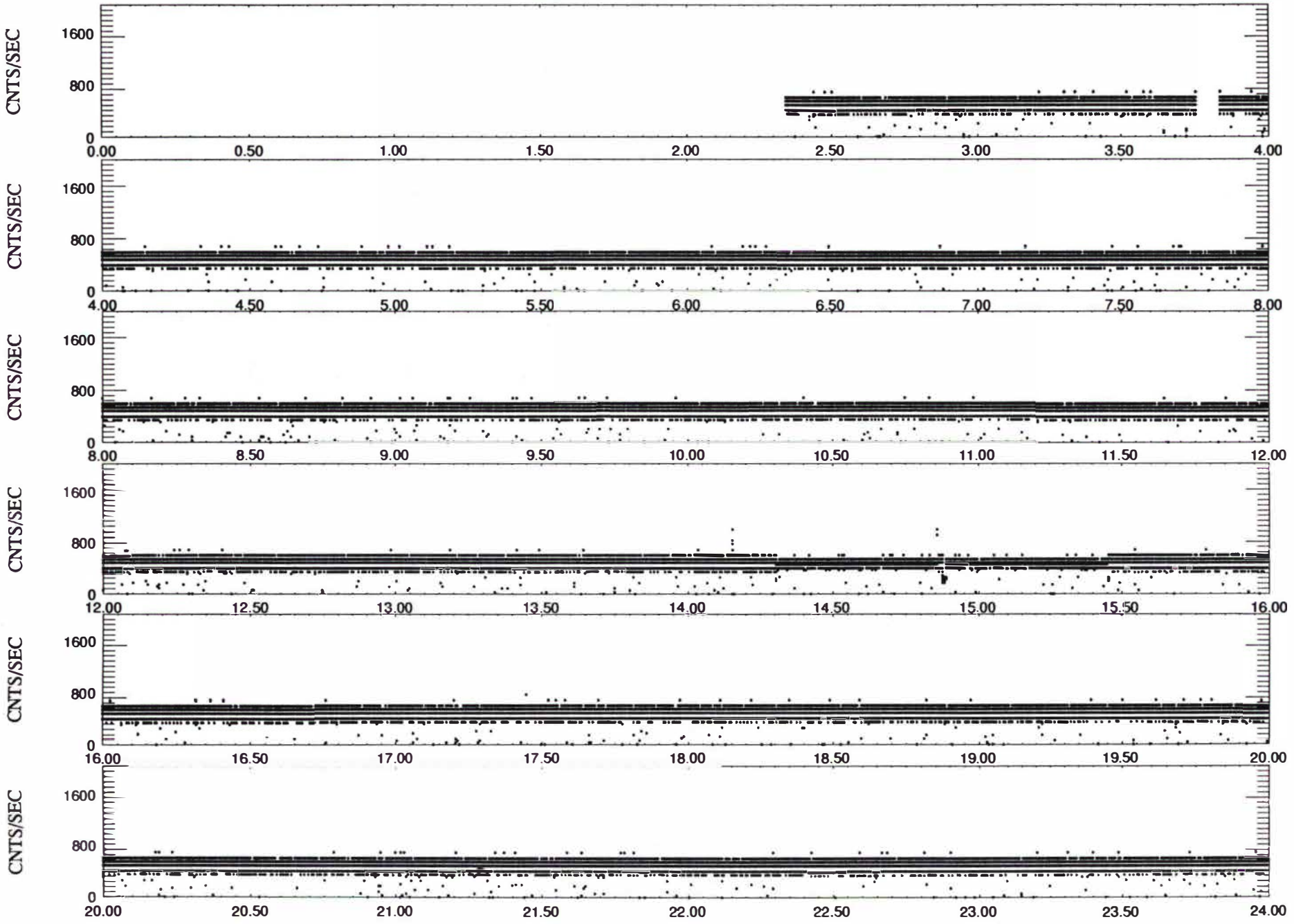
HUS MODES EDR day 100, year 1993 to day 100, year 1993 6/12/93

BURST NUMBER 13



HUS 2A, MODE 1, NOT AVERAGED EDR day 100, year 1993 to day 100, year 1993 6/12/93

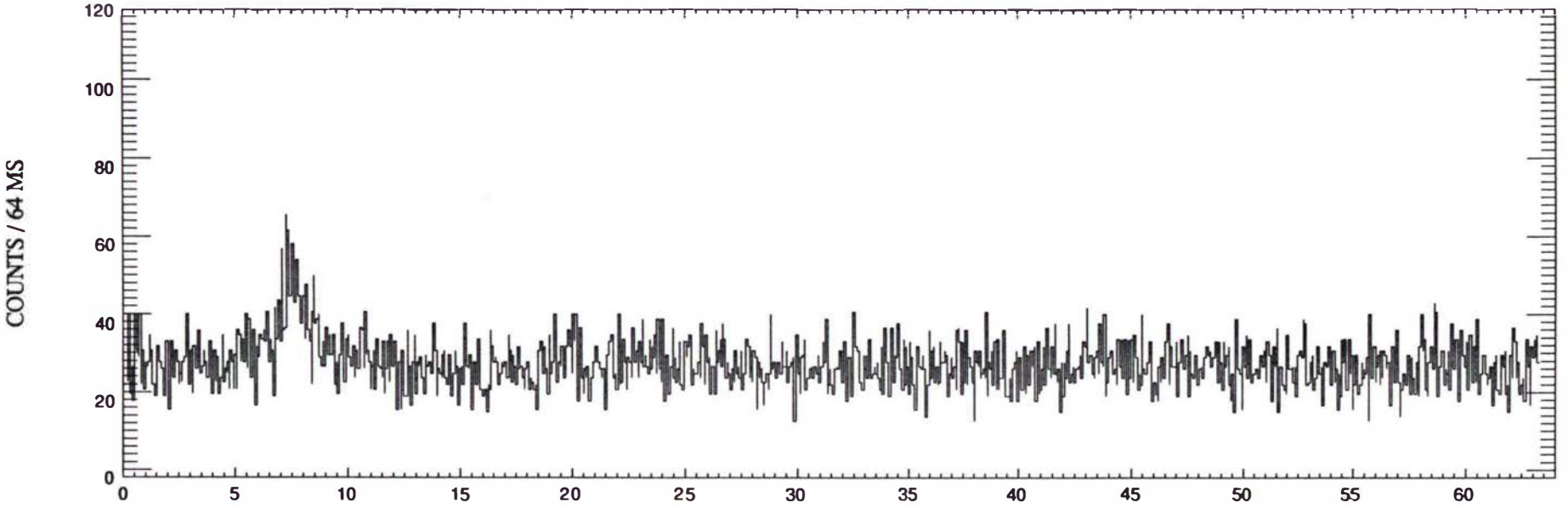
CALIBRATION DATA INCLUDED

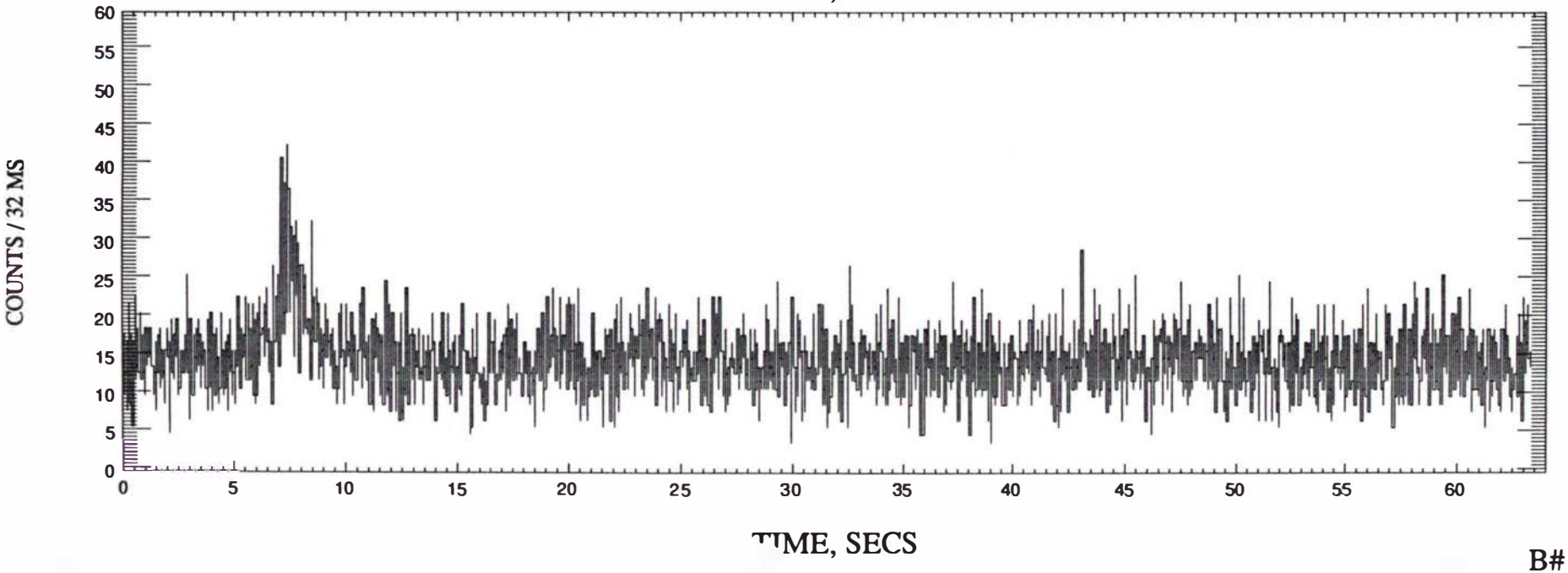


UNIVERSAL TIME

HUS 2A TRIGGERED DATA EDR day 100, year 1993 6/12/93

Burst Counter 13 at UT=14.148907288445 h=50936.066 s 14:08:56.066

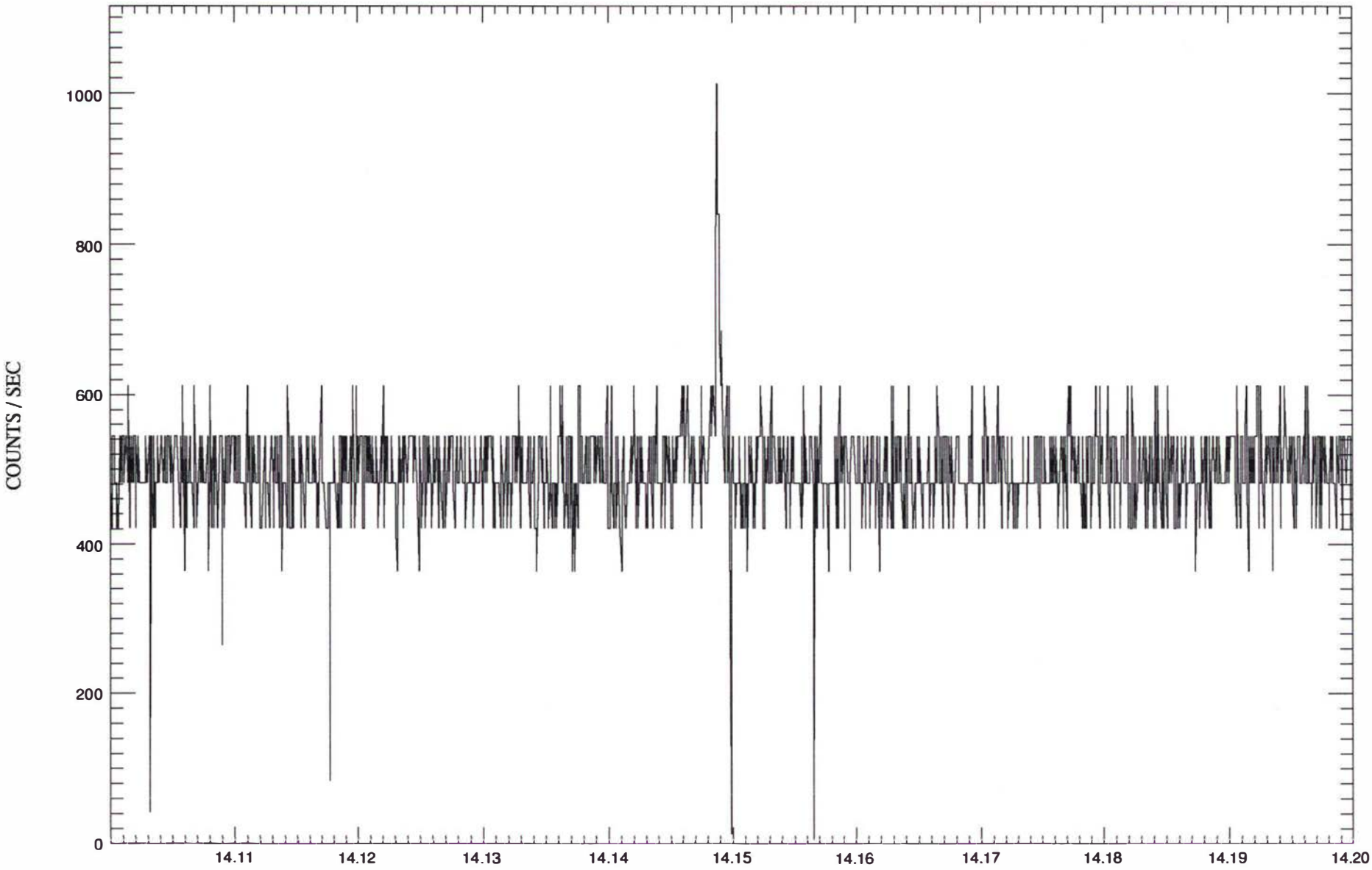




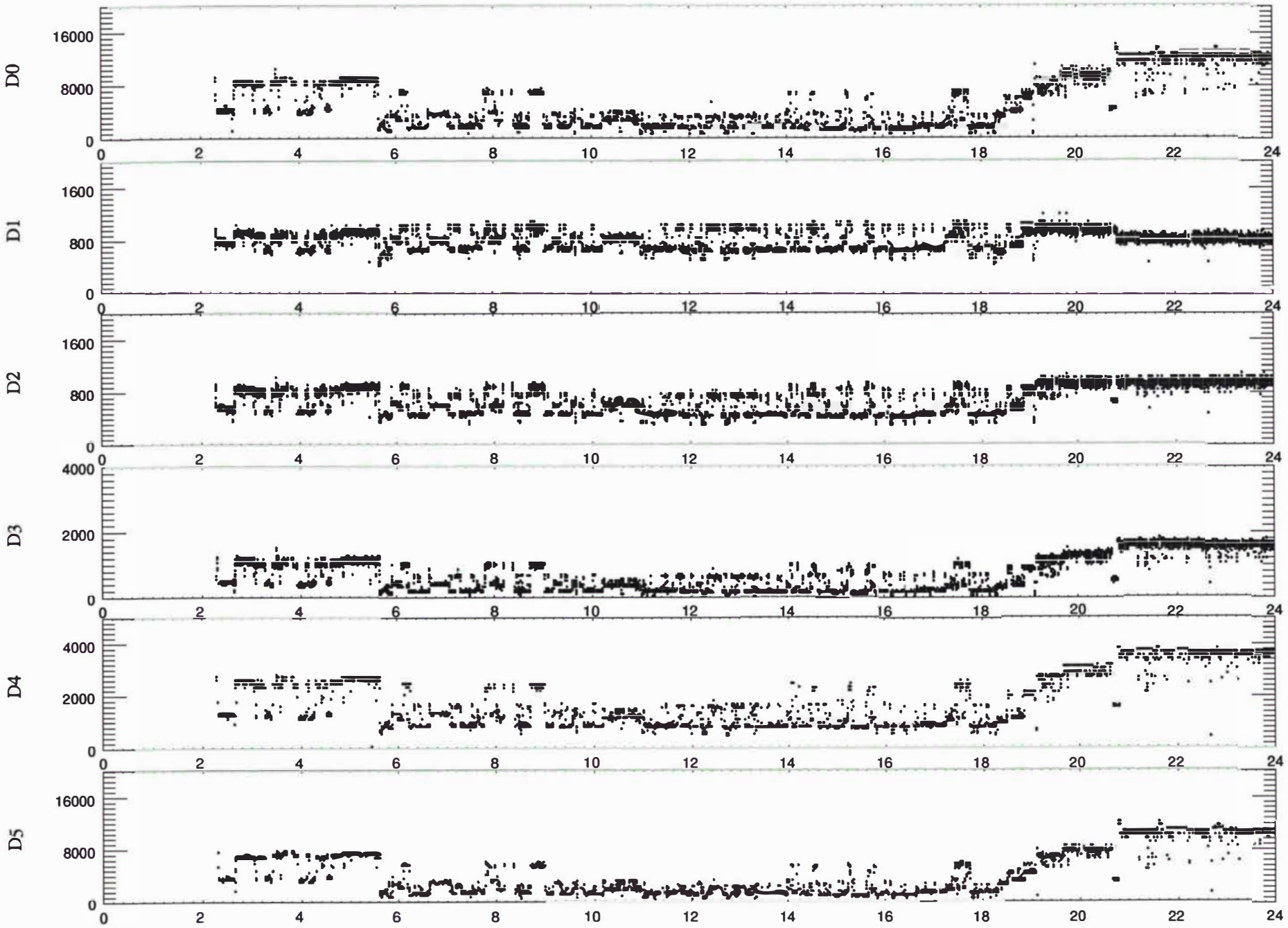
B# 1

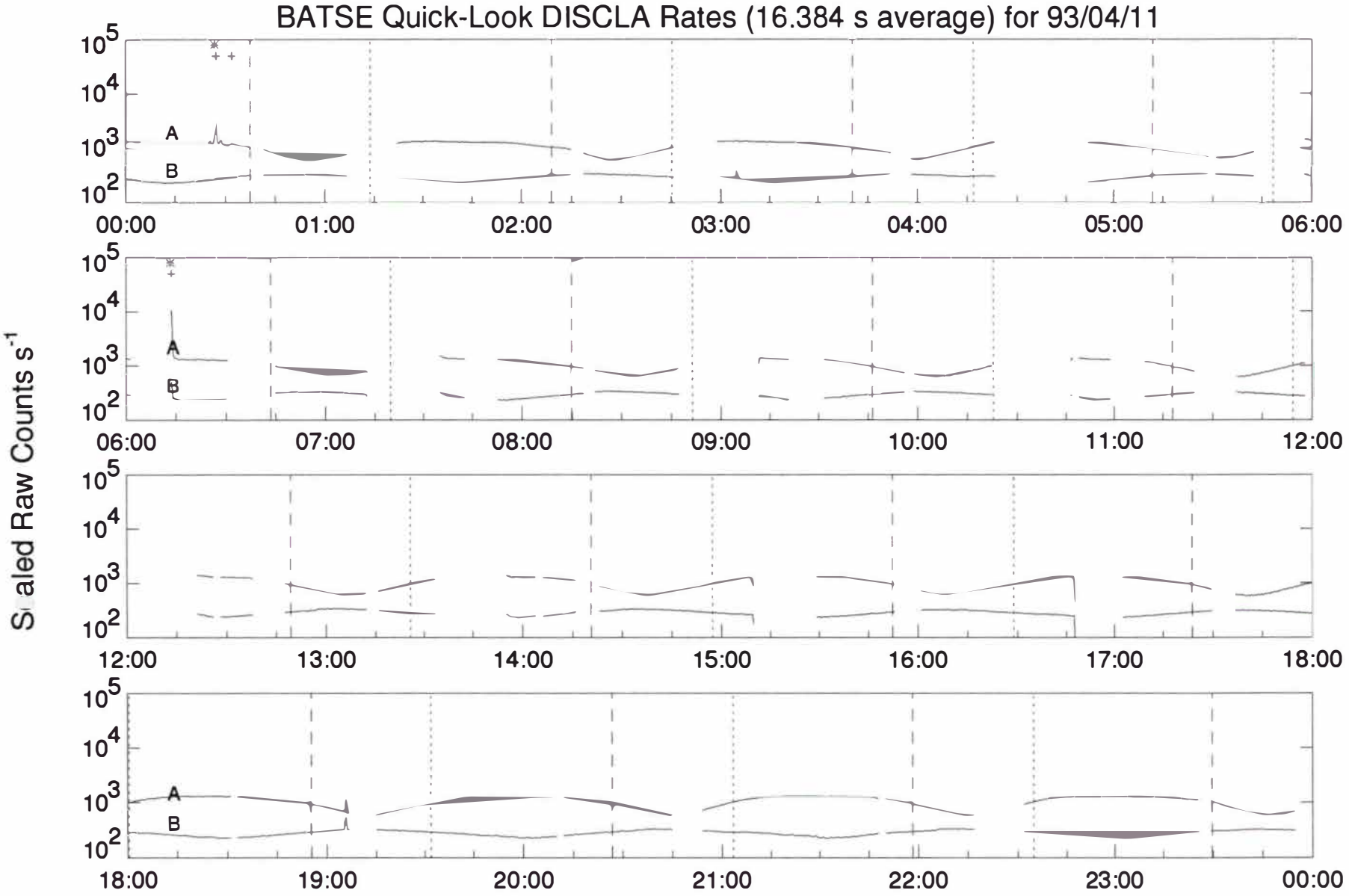
HUS 2A, MODE 1, NOT AVERAGED QEDR day 100, year 1993 to day 100, year 1993 4/13/93

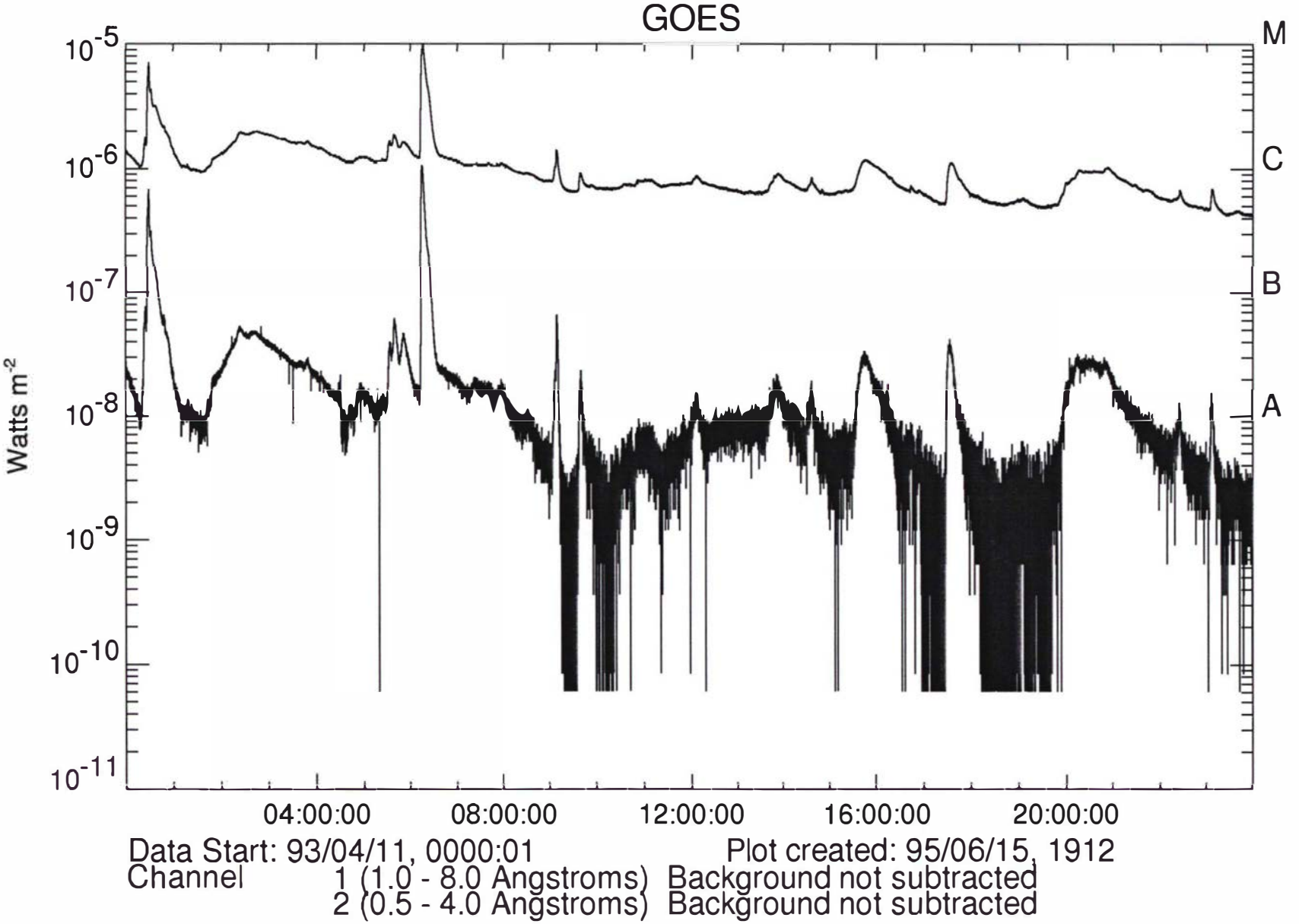
CALIBRATION DATA INCLUDED



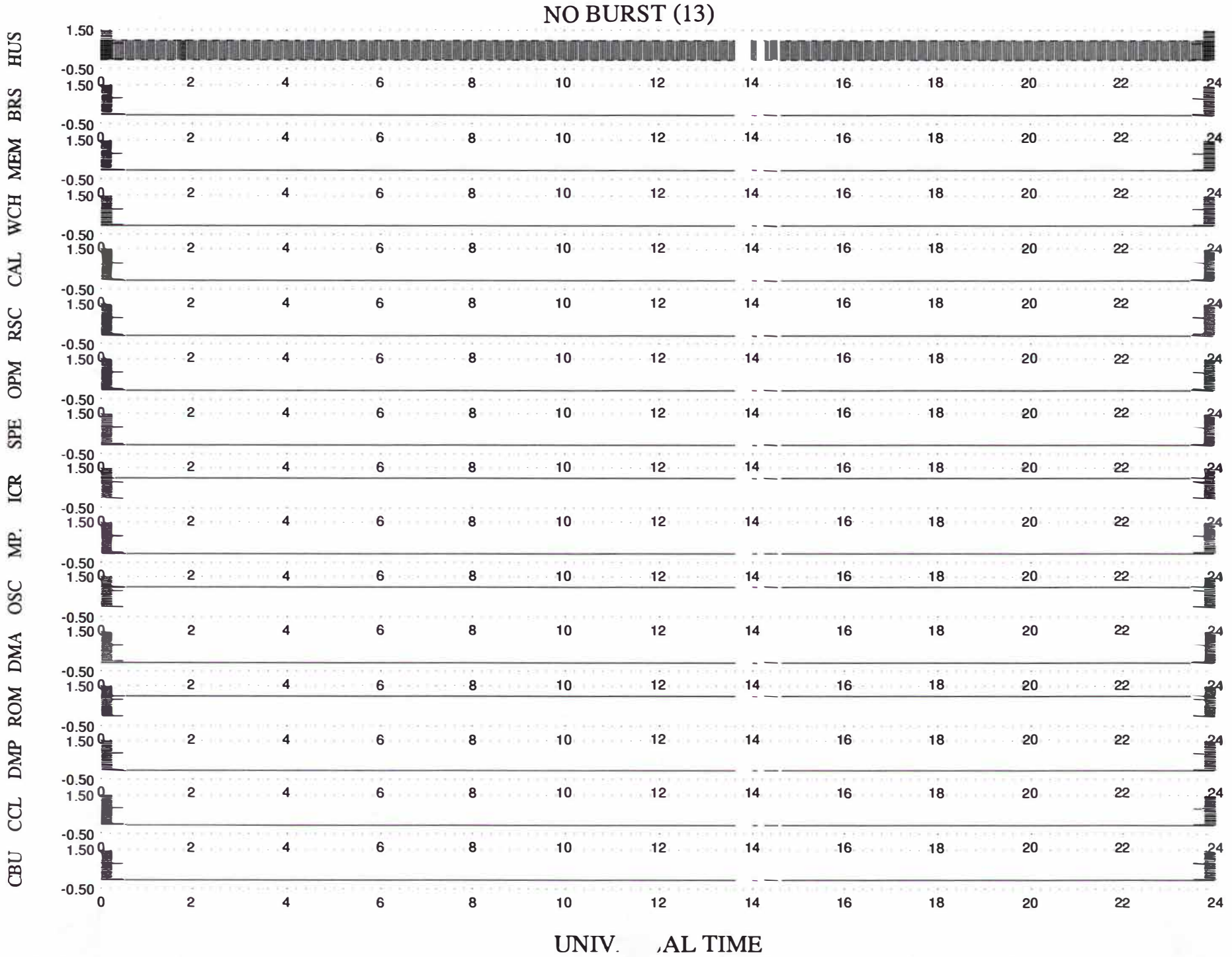
HUS 2B COUNTS / SEC QEDR day 100, year 1993 to day 100, year 1993 4/13/93




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/11
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1410 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

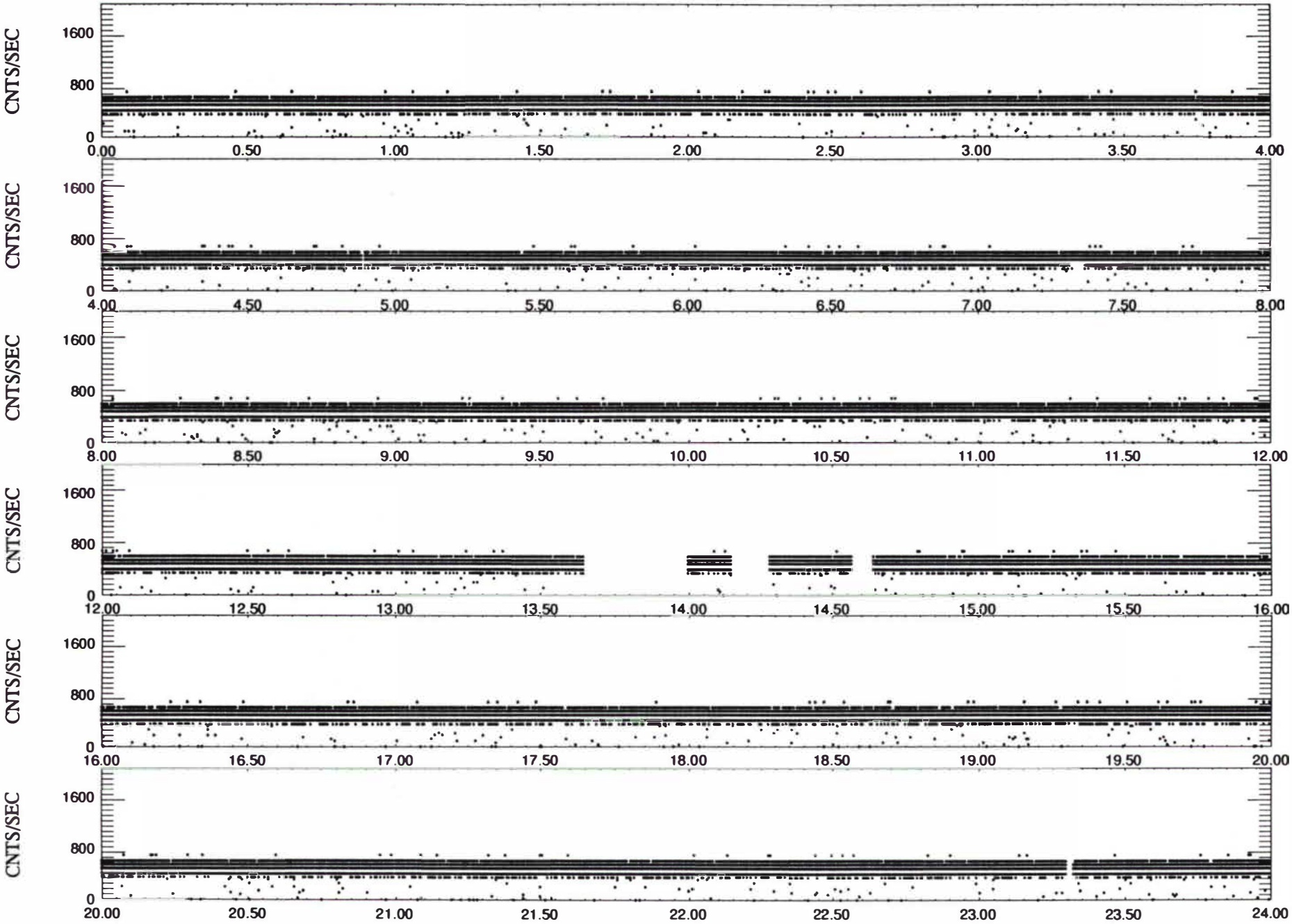

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/11, 0000:01
Plot created: 95/06/15, 1912
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 101, year 1993 to day 101, year 1993 6/12/93



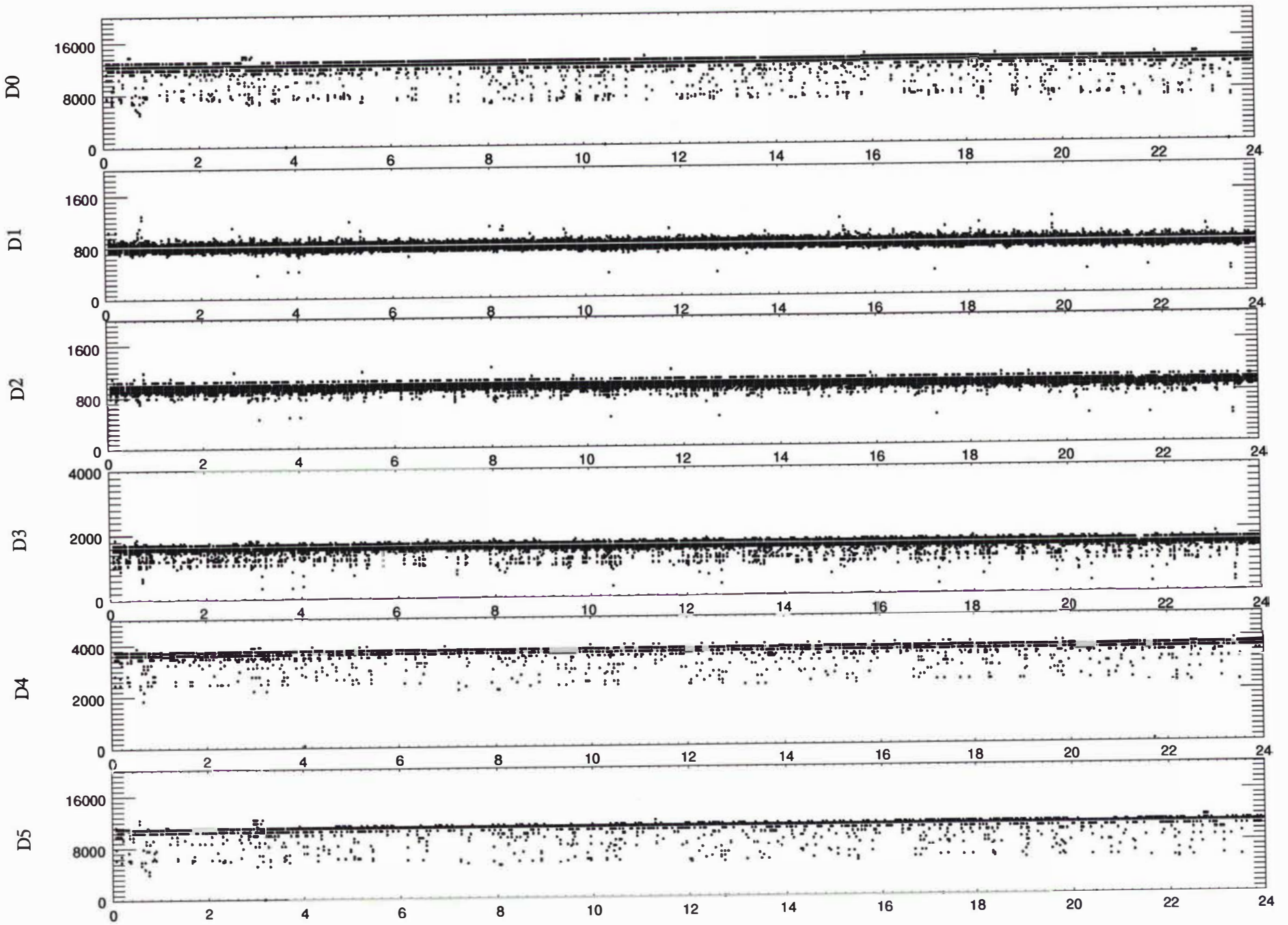
HUS 2A, MODE 1, NOT AVERAGED EDR day 101, year 1993 to day 101, year 1993 6/12/93

CALIBRATION DATA INCLUDED



U 'ERSAL TIME

HUS 2B COUNTS / SEC QEDR day 101, year 1993 to day 101, year 1993 4/14/93



From ZMYEWSKI@ssl.msfc.nasa.gov Wed Apr 14 11:52:03 1993
Date: Wed, 14 Apr 1993 13:55:17 -0500 (CDT)
From: ZMYEWSKI@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1296

BATSE BURST TRIGGER
NO.: 02300

TIME: TJD=9088 SECONDS=01606

TYPE: FLARE SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
GOES C6.2 SOLAR FLARE LASTING APPROX. 250 SECONDS. NOT VISIBLE
ABOVE 300KEV.

From ZMYEWSKI@ssl.msfc.nasa.gov Wed Apr 14 11:58:05 1993
Date: Wed, 14 Apr 1993 14:01:34 -0500 (CDT)
From: ZMYEWSKI@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1296

BATSE BURST TRIGGER
NO.: 02301

TIME: TJD=9088 SECONDS=22398

TYPE: FLARE SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
GOES C8.9 SOLAR FLARE LASTING APPROX. 60 SECONDS. NOT VISIBLE
ABOVE 300KEV.

From BRAINERD@ssl.msfc.nasa.gov Tue Apr 13 13:37:15 1993
Date: Tue, 13 Apr 1993 15:39:42 -0500 (CDT)
From: BRAINERD@ssl.msfc.nasa.gov (Jim Brainerd, (205) 544-4970)
Subject: Burst Trigger Message
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops$send_msg:BURST_SPAN.DIS
Content-Length: 1215

BATSE BURST TRIGGER

NO.: 02302

TIME: TJD=9089 SECONDS=17494

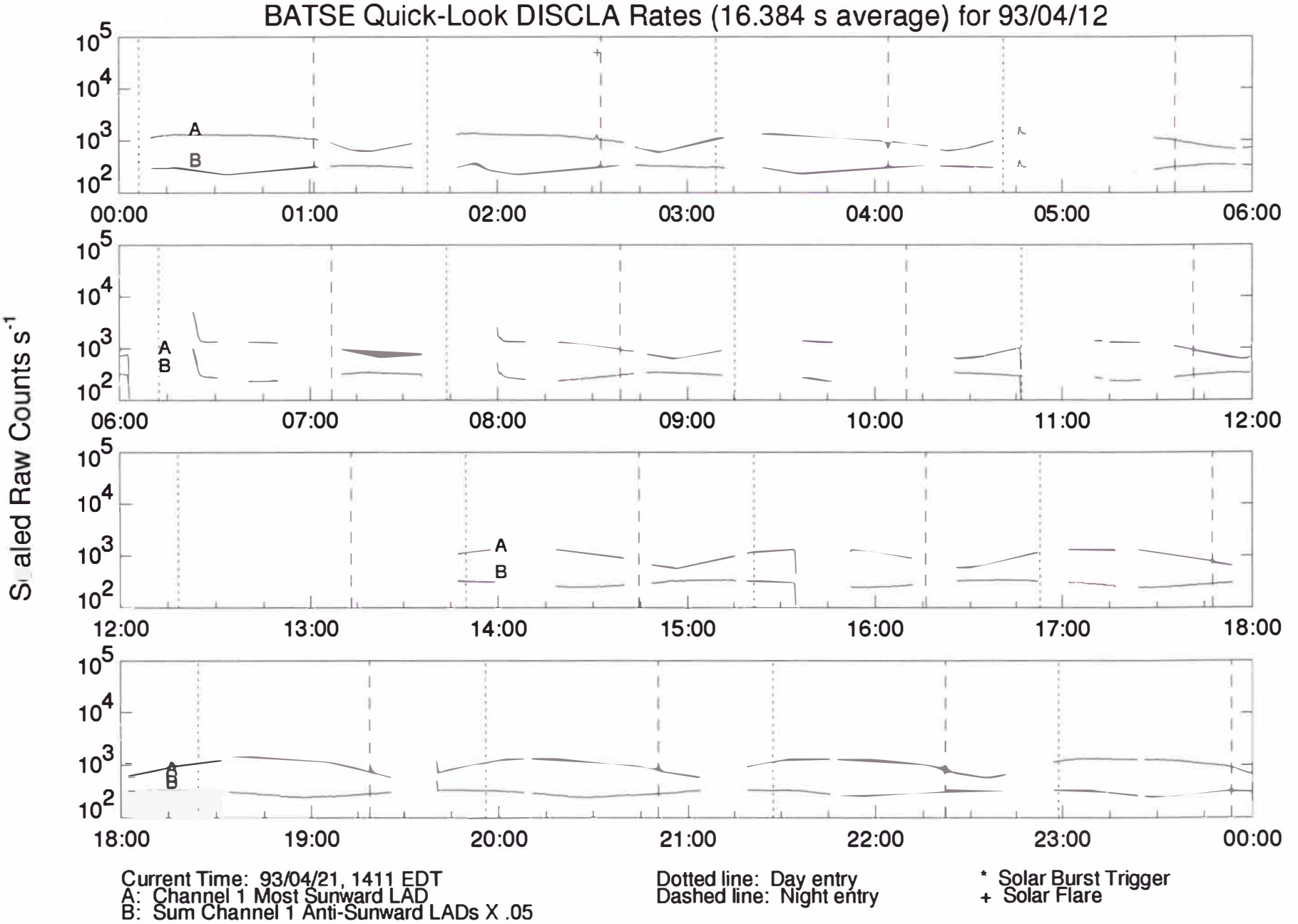
TYPE: PARTICL SOLAR FLARE TRIGGER SIGNAL:Y

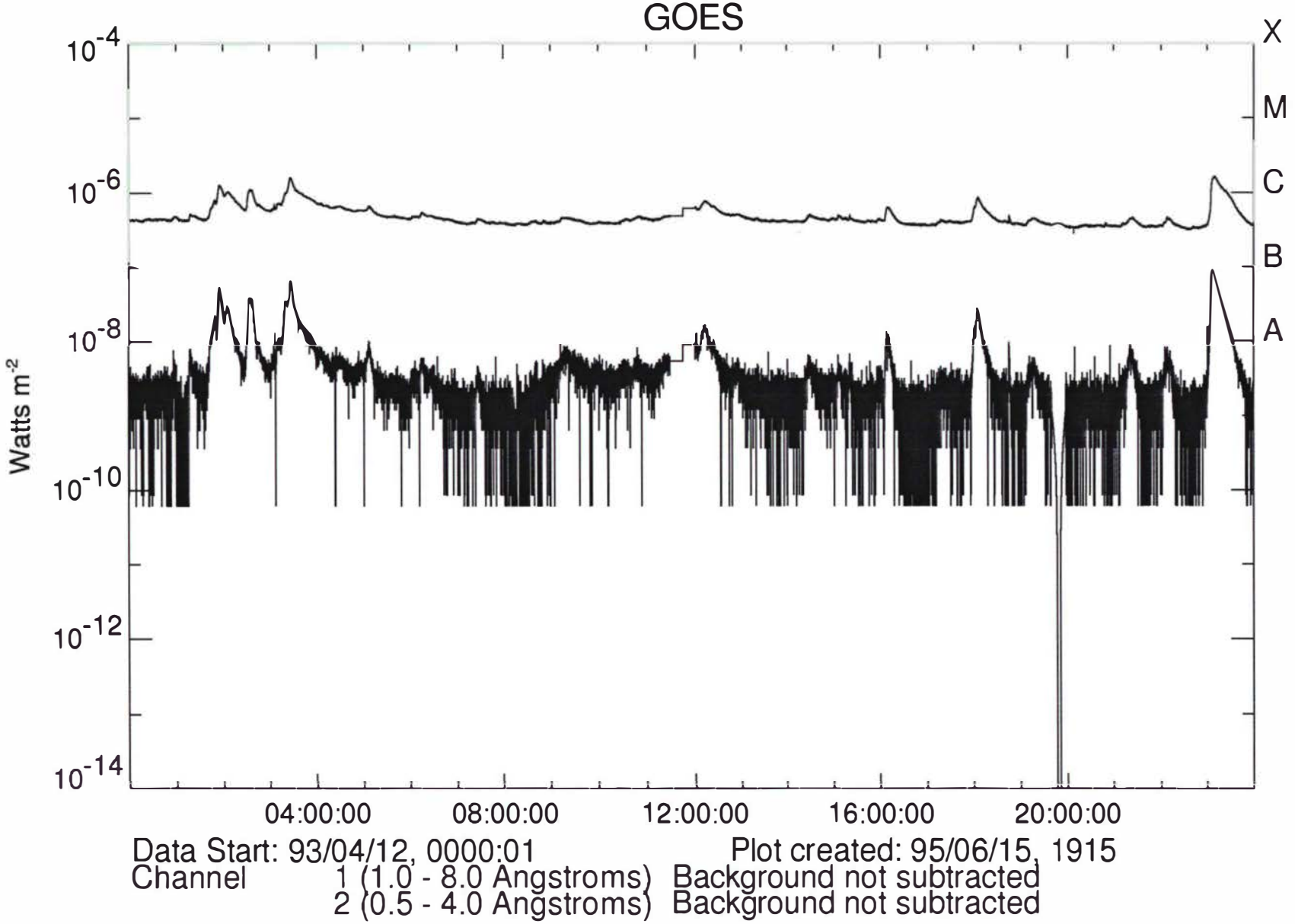
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

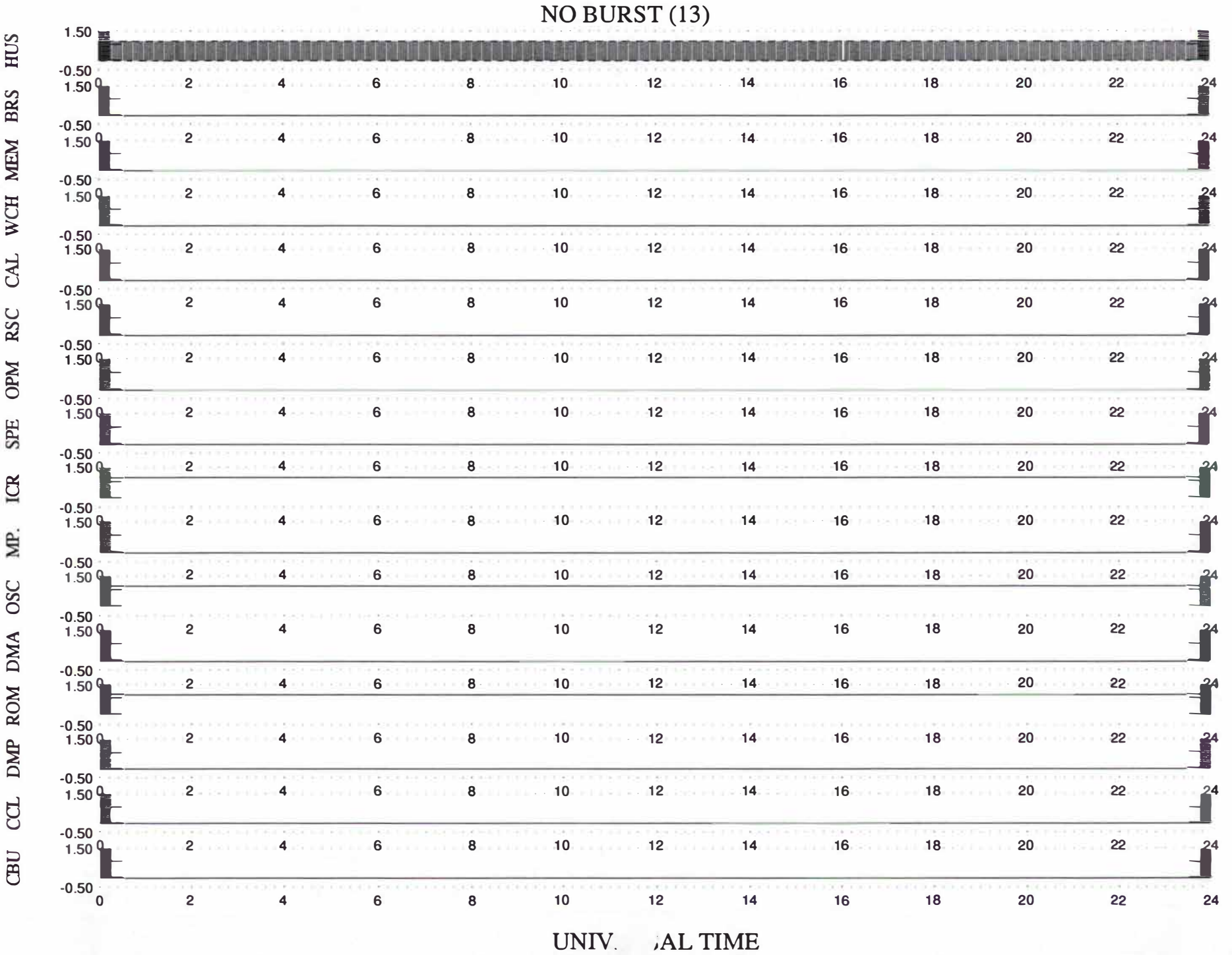
LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
PARTICLE EVENT


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/12
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1411 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

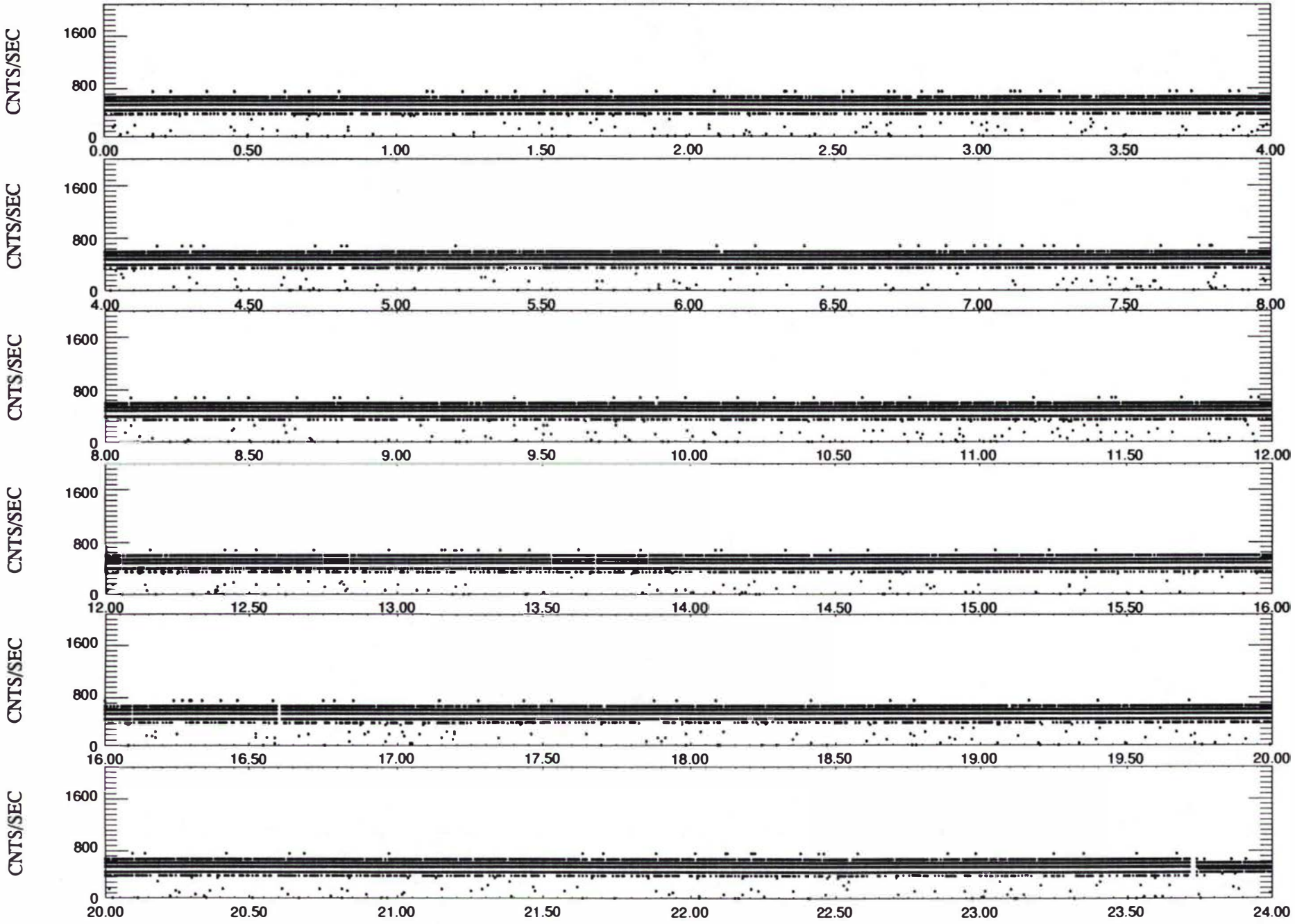

GOES
X
M
C
B
A
10^{-4}
10^{-6}
10^{-8}
10^{-10}
10^{-12}
10^{-14}
Watts m^{-2}
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/12, 0000:01
Plot created: 95/06/15, 1915
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 102, year 1993 to day 102, year 1993 6/12/93



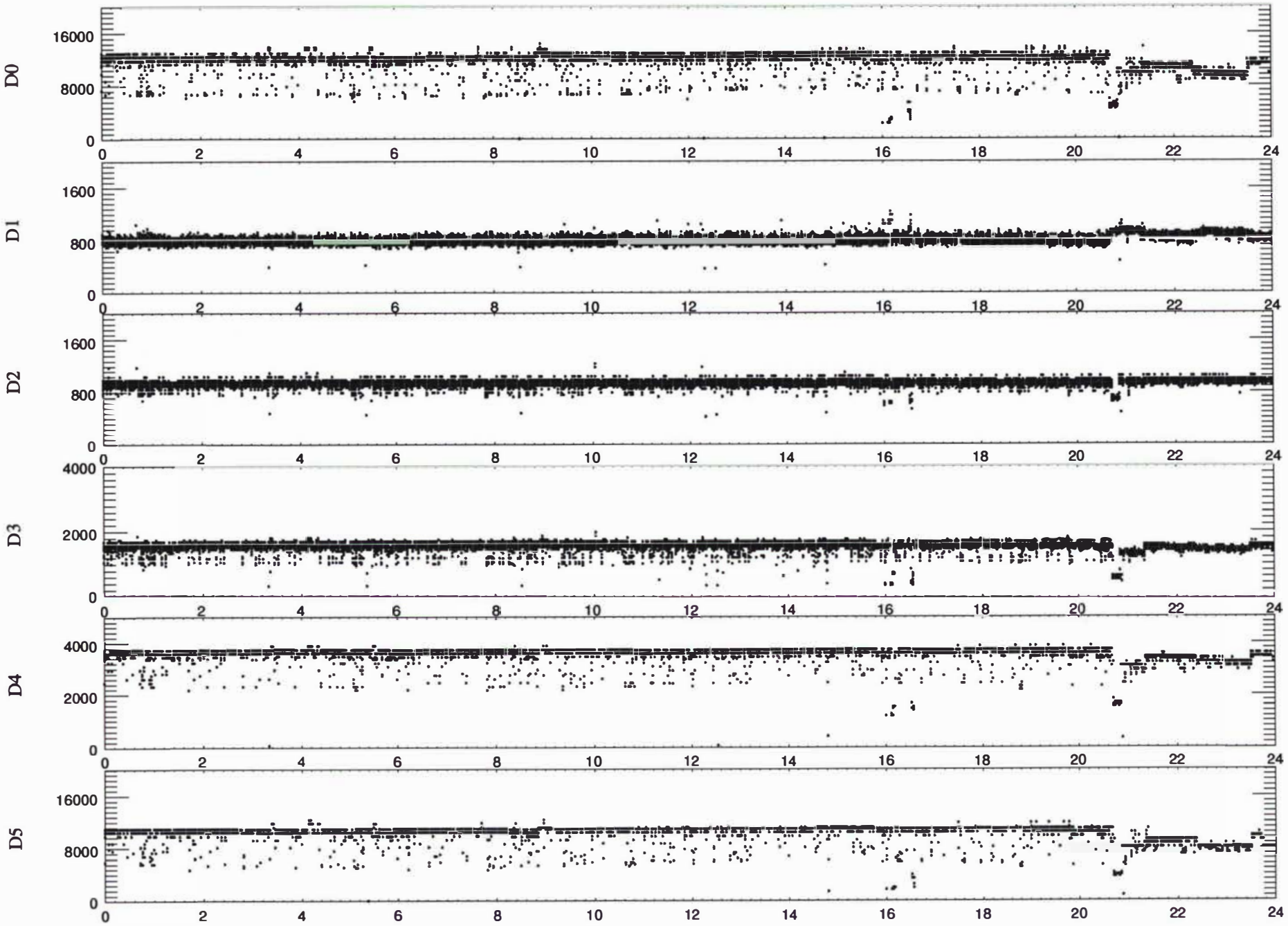
HUS 2A, MODE 1, NOT AVERAGED EDR day 102, year 1993 to day 102, year 1993 6/12/93

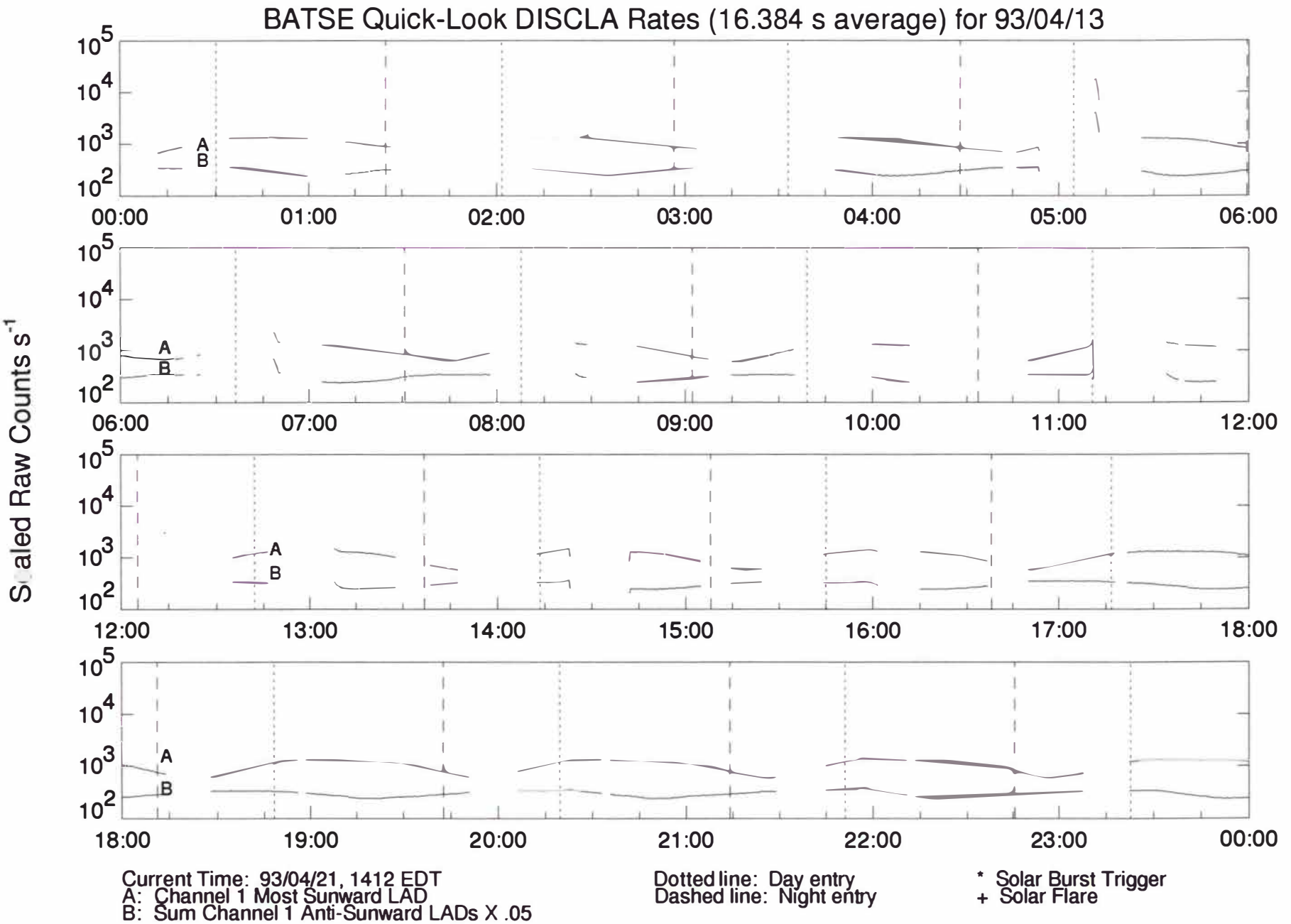
CALIBRATION DATA INCLUDED

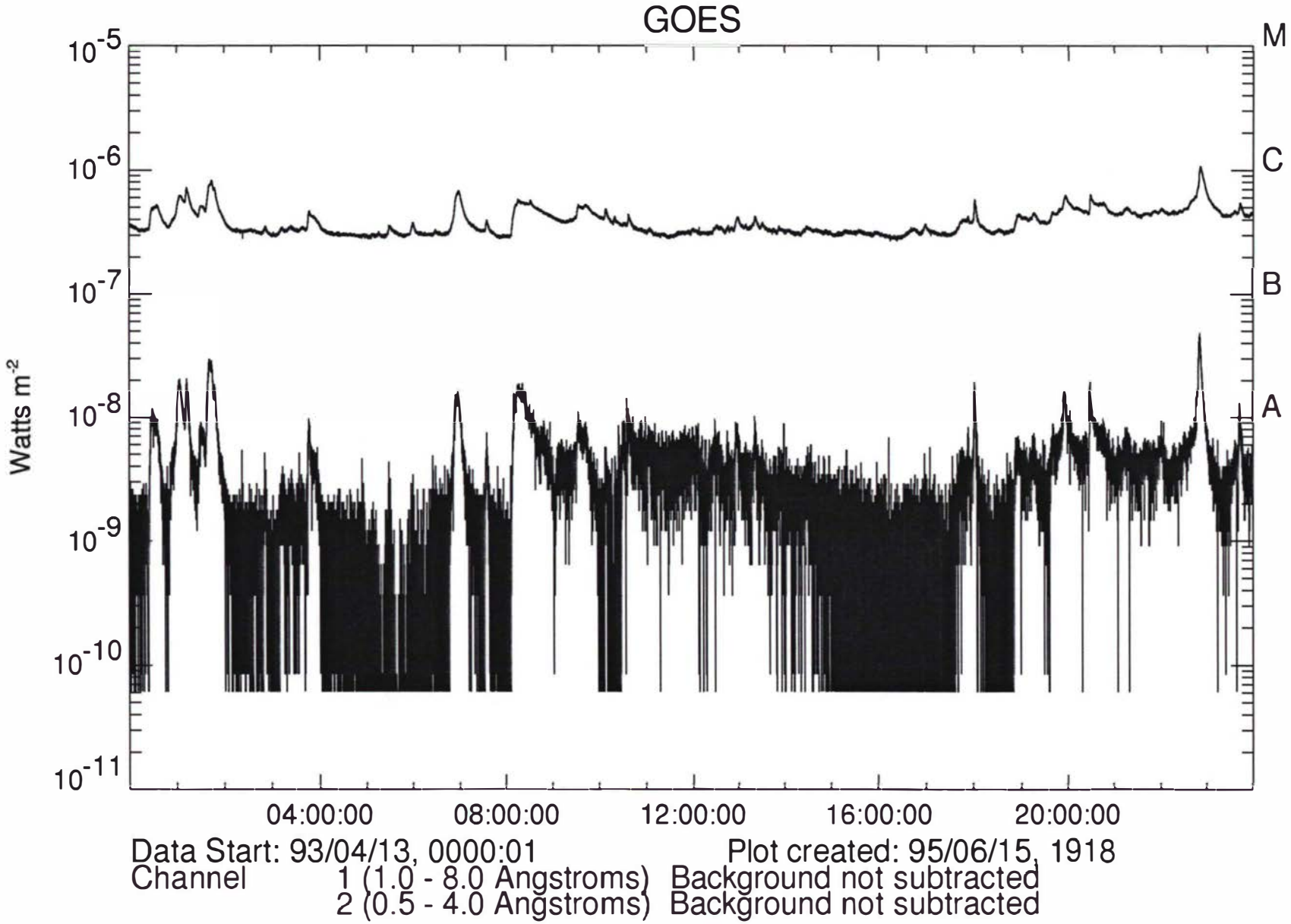


U ERSAL TIME

HUS 2B COUNTS / SEC QEDR day 102, year 1993 to day 102, year 1993 4/14/93

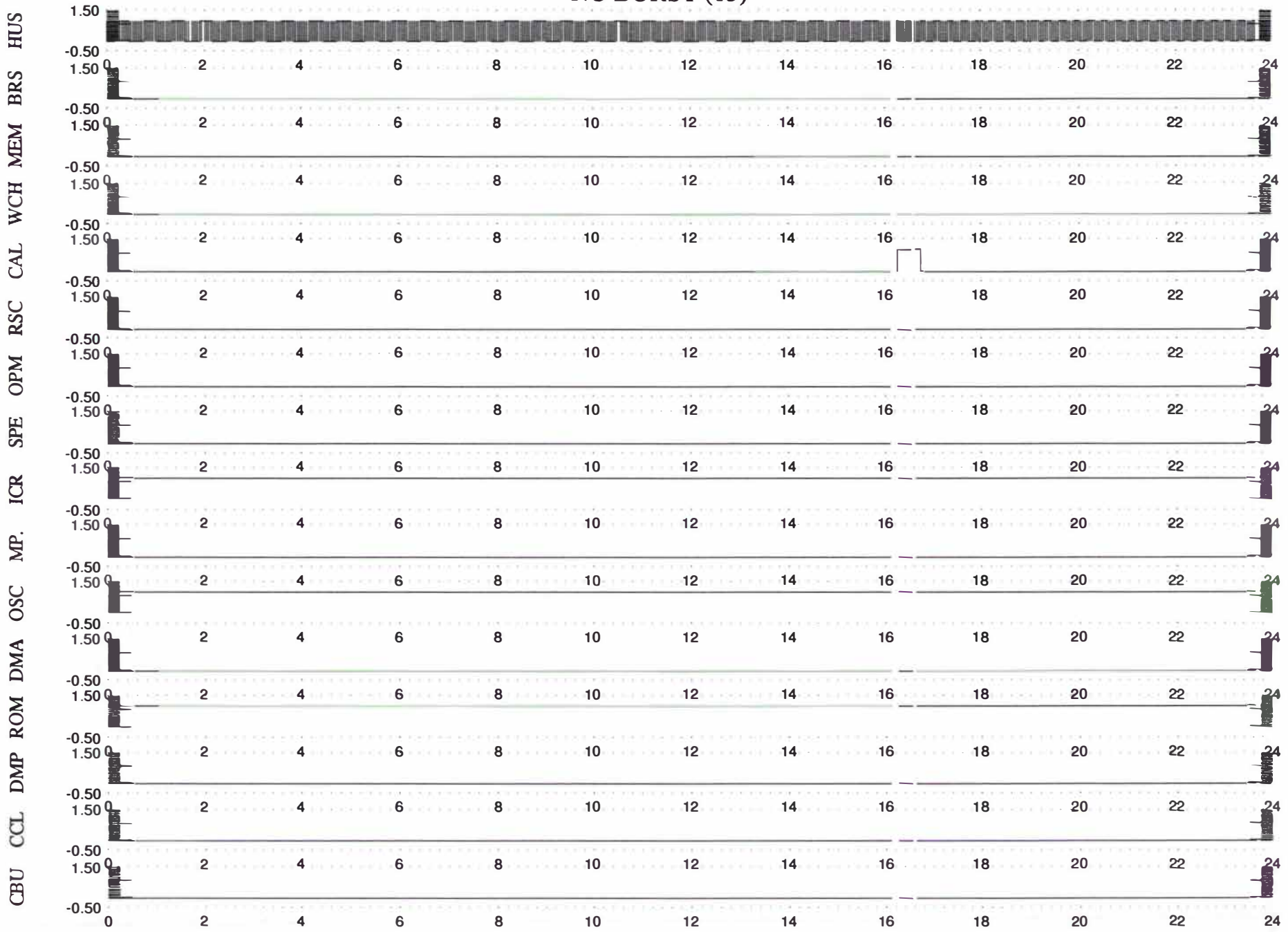



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/13
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1412 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare


GOES
M
C
B
A
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/13, 0000:01
Plot created: 95/06/15, 1918
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

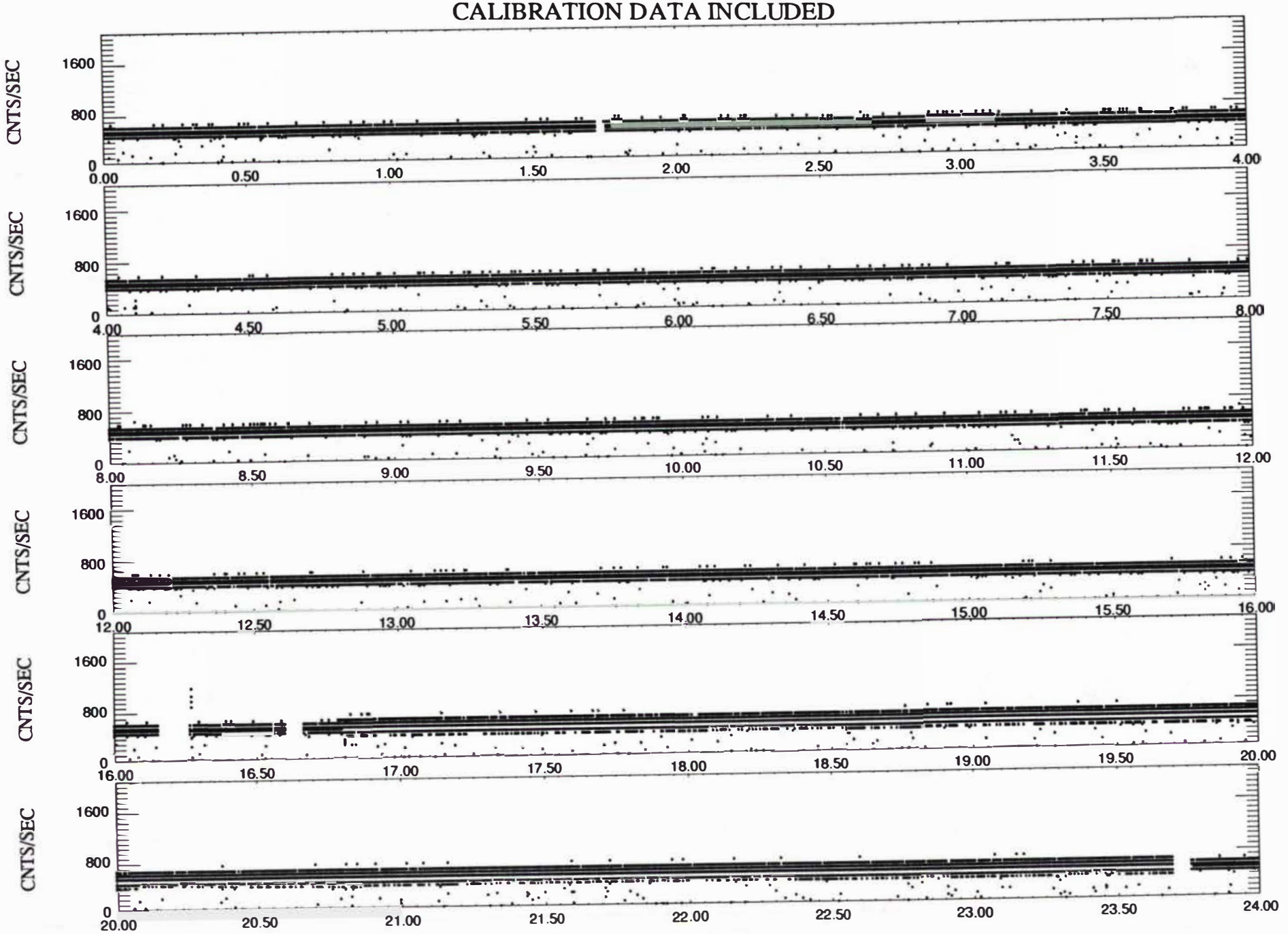
HUS MODES EDR day 103, year 1993 to day 103, year 1993 6/12/93

NO BURST (13)



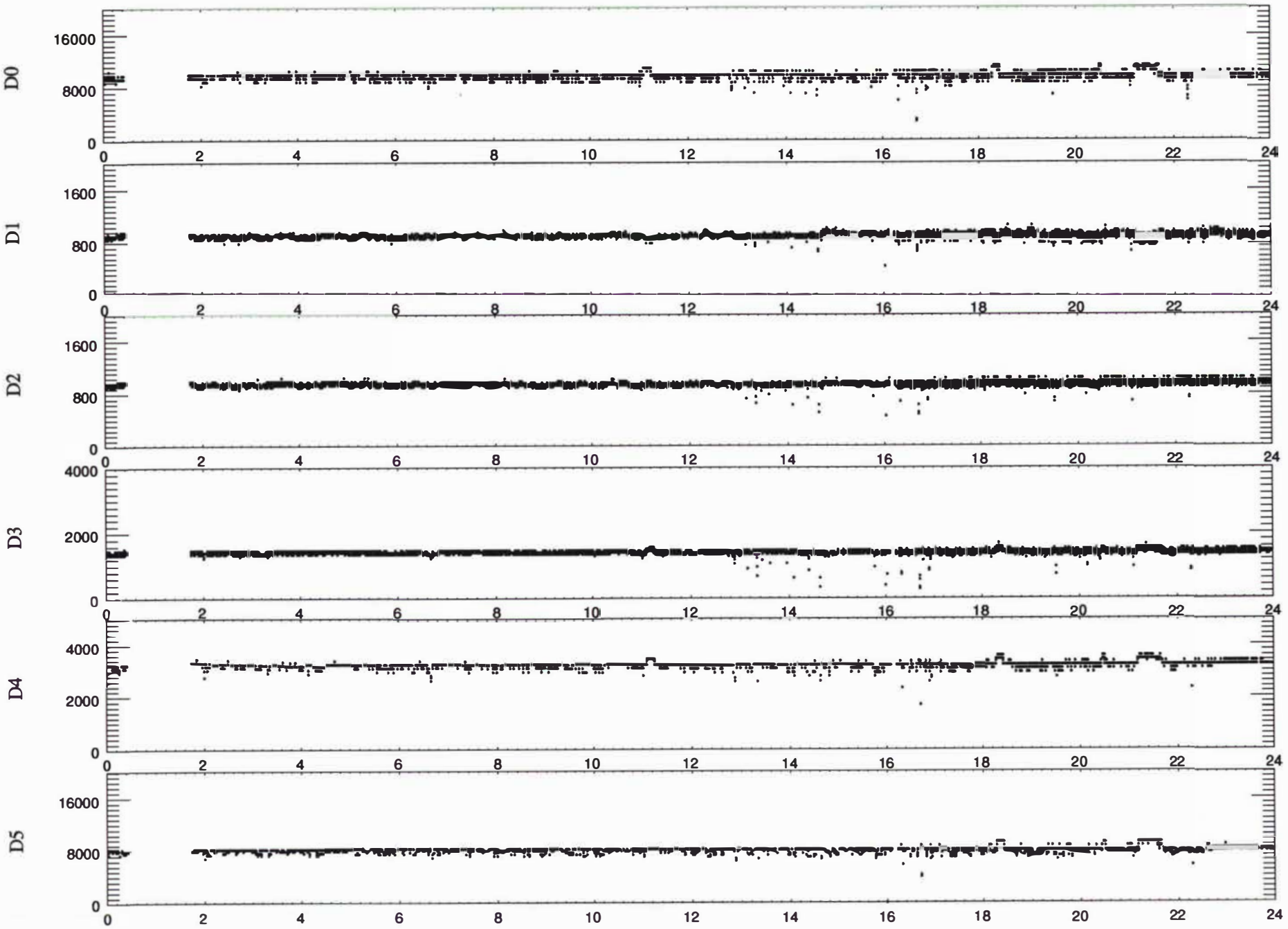
HUS 2A, MODE 1, NOT AVERAGED EDR day 103, year 1993 to day 103, year 1993 6/12/93

CALIBRATION DATA INCLUDED



U 'ERSAL TIME

HUS 2B COUNTS / SEC QEDR day 103, year 1993 to day 103, year 1993 4/15/93



Date: Aug 3 2011

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)?

☐ BATSE ephemeris for T_0?

☐ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included?

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

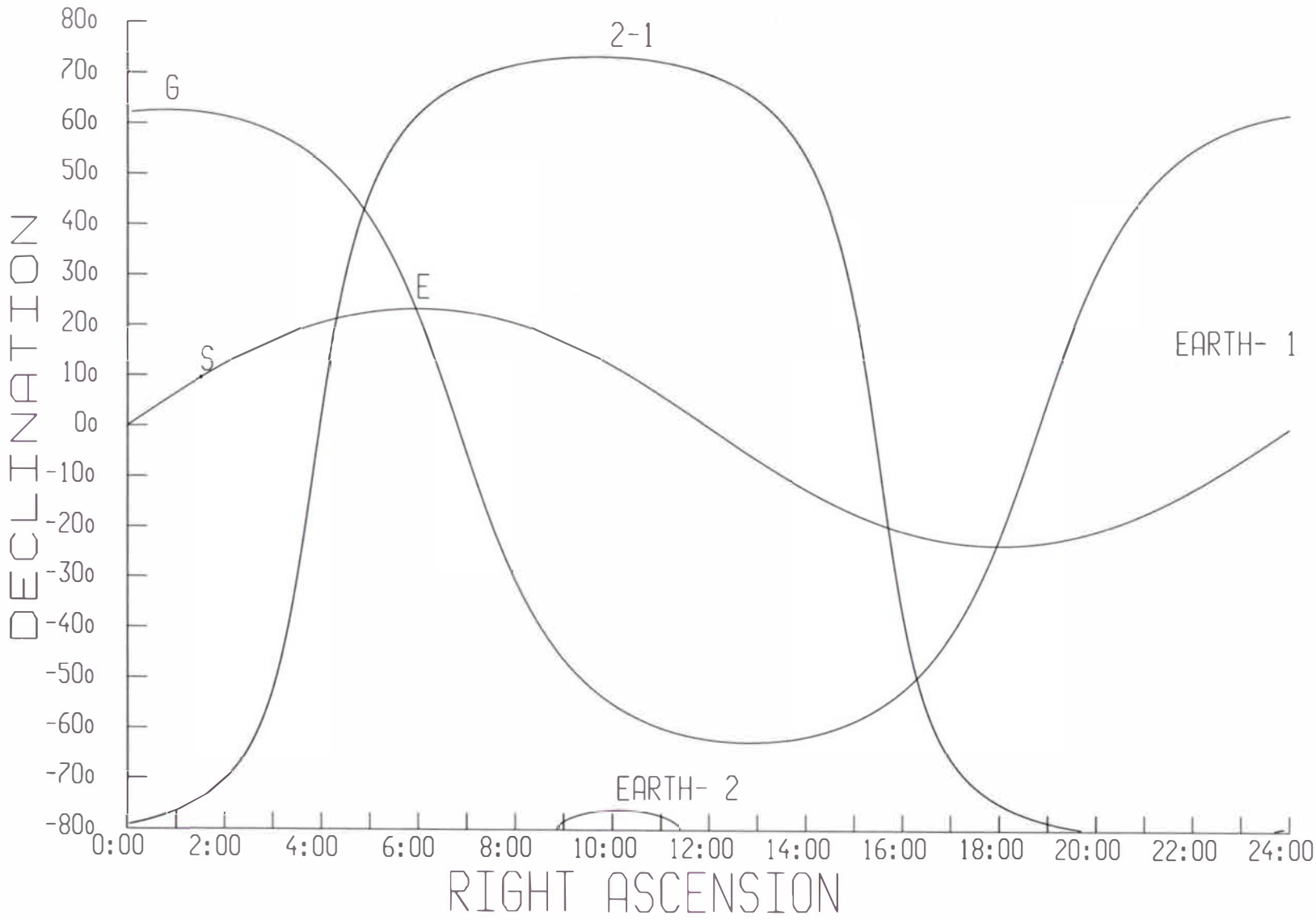
☐ Geocentric time used?

☑ ACCESS and MBL databases updated with identical times?

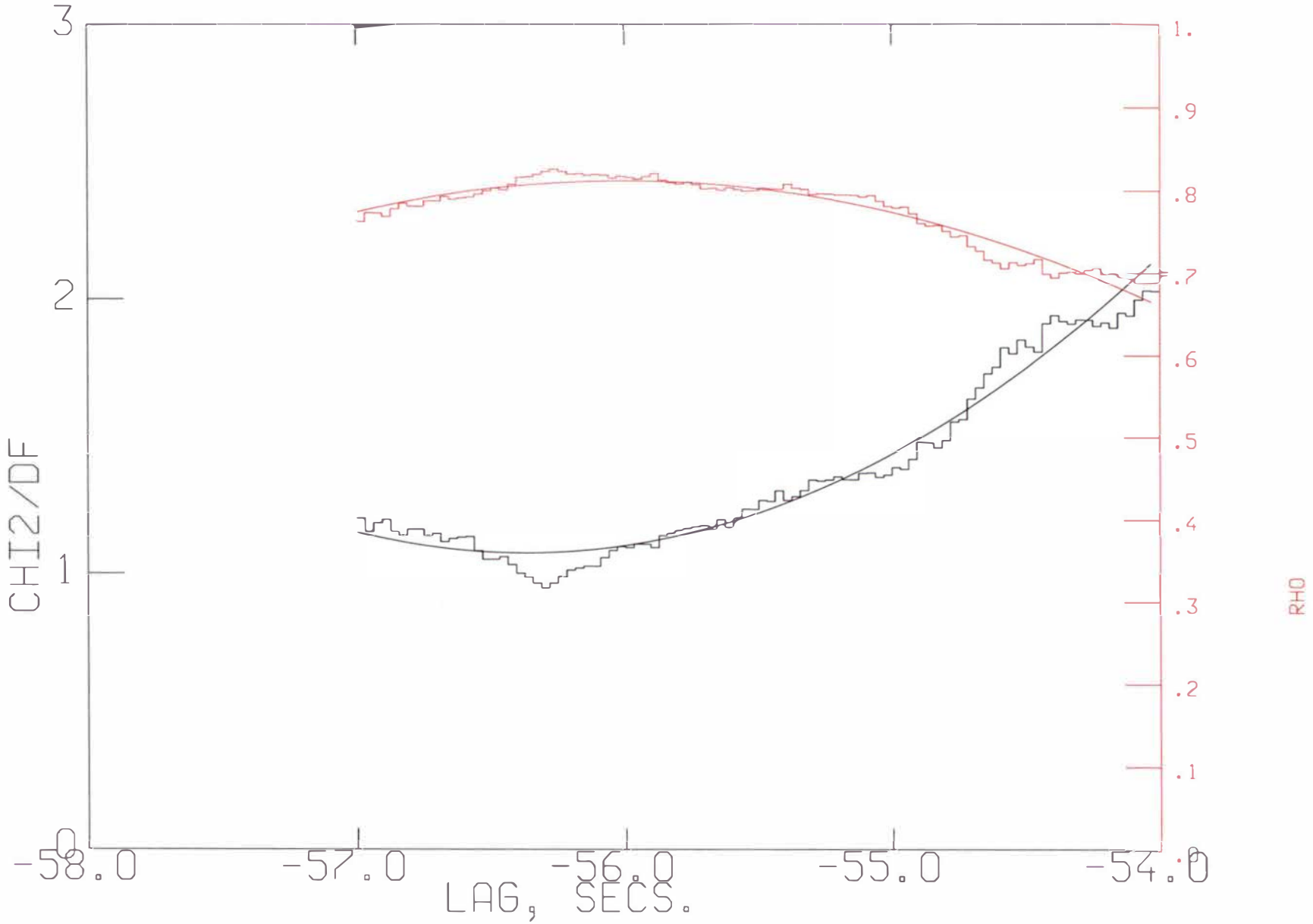
EVENT OF APR 14, 1993 14:52

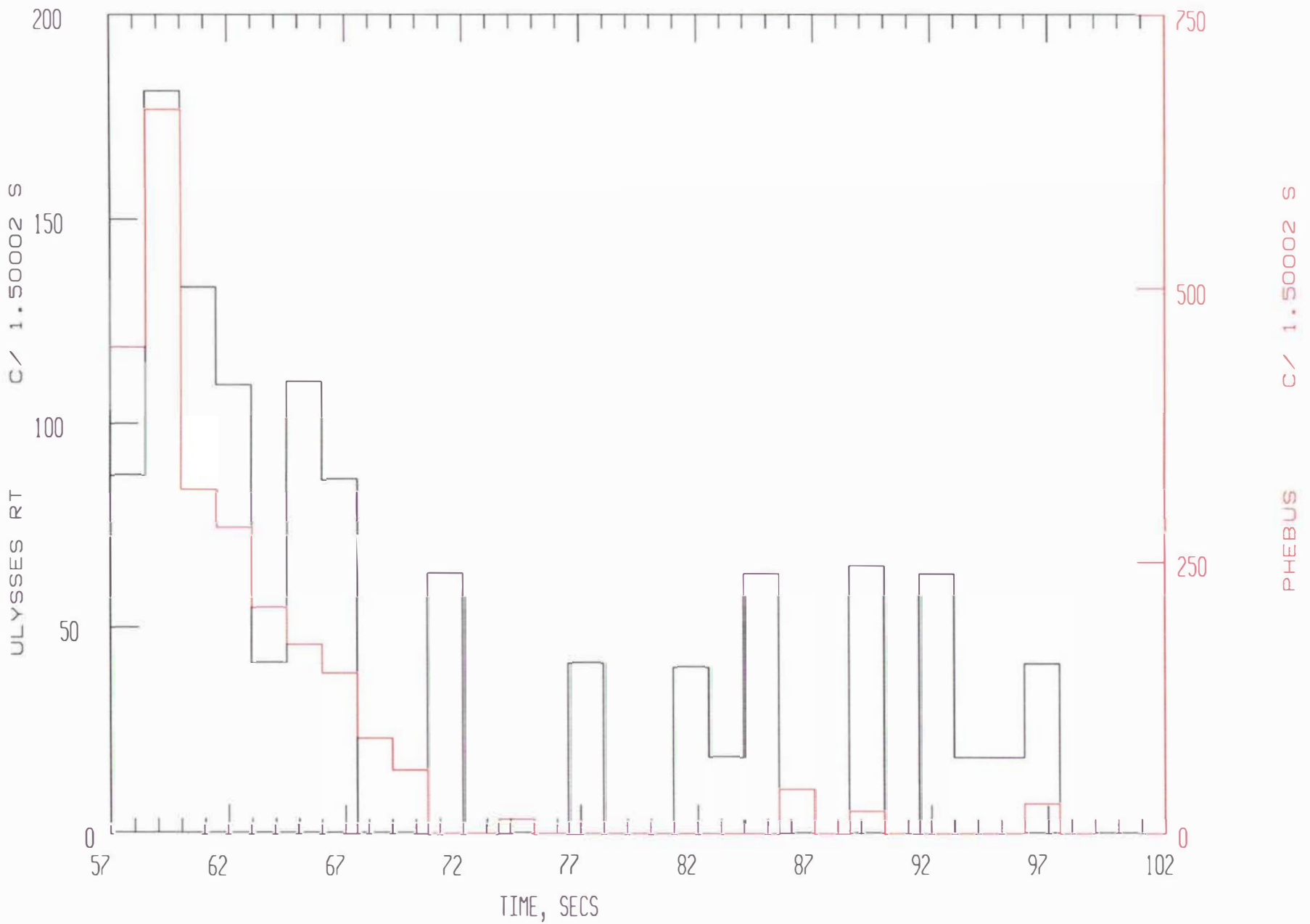
03/08/2011

Z-M = CORRELATION BETWEEN SATELLITES Z AND M
EARTH-Z = EARTH AS SEEN FROM SATELLITE Z
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 PHEBUS



ULYSSES RT- PHEBUS CORRELATION 14/ 4/93 53545.149




ULYSSES RT- PHEBUS CORRELATION 14/ 4/93 53545.149
200
150
100
50
0
ULYSSES RT C/ 1.50002 S
750
500
250
0
PHEBUS C/ 1.50002 S
57
62
67
72
77
82
87
92
97
102
TIME, SECS

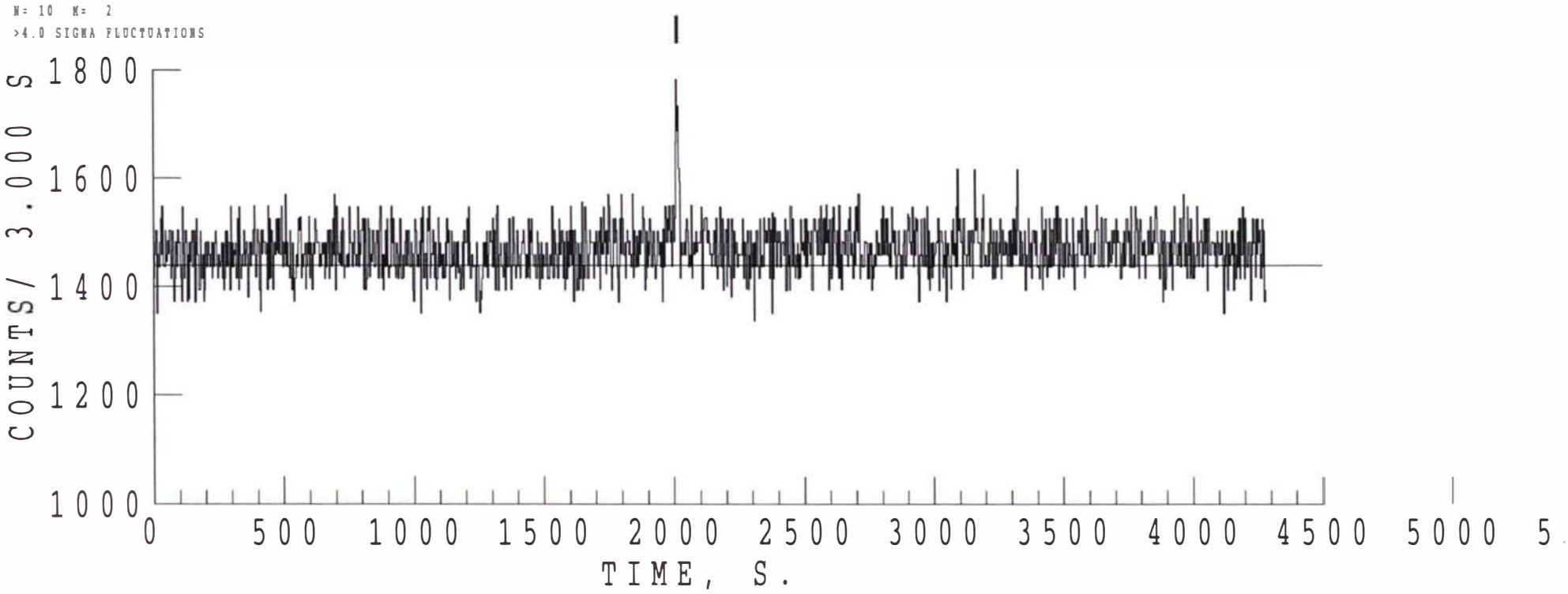
phebus 19930414 53745

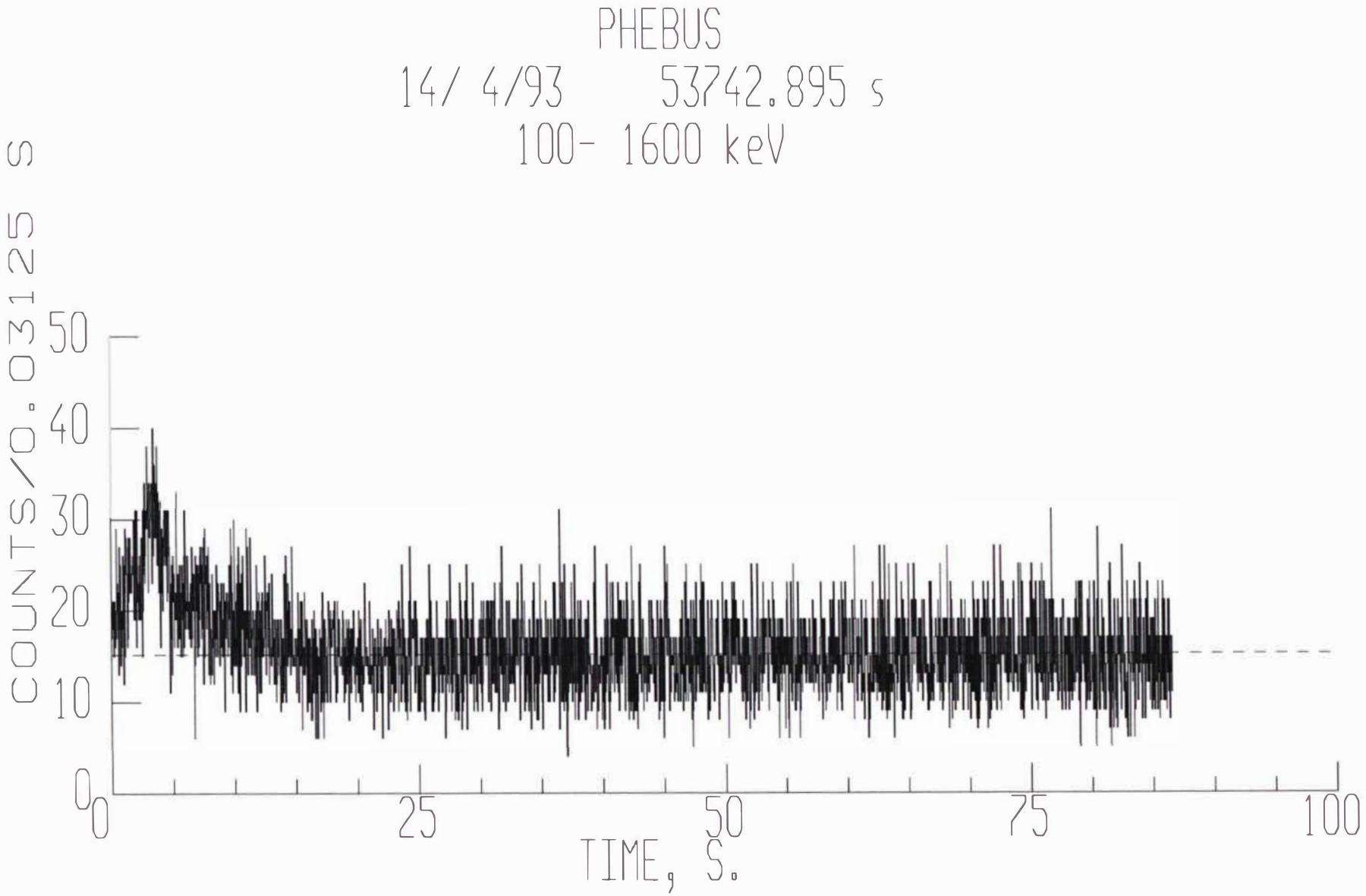
ULYSSES RT 02/08/11

14/04/93 51588.121 s

0.500 S INTERVALS REGROUPED BY 6

0- 0 keV




PHEBUS
14/ 4/93 53742.895 s
100- 1600 keV
COUNTS/0.03125 S
0
10
20
30
40
50
0
25
50
75
100
TIME, S.

```
          ********************
          *BATSEARCH PROGRAM*
          ********************

 BATSE BURST #     2303
 EVENT OF 1993 APR 14 DAY OF YEAR=104
 EVENT CROSSING TIME AT BATSE      :  8835. S. OR 02:27:15.0
 COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 313.000     7.000
 BATSE PEAK COUNTING RATE:  16000     C/S
 EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
 POSITION OF ULYSSES ON 14/ 4/  93 IS:
 RA=  144.817 DEC=  -12.595 DIST=     4.183 AU
 BATSE-ULYSSES DISTANCE =  625716960. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 12.91 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2034.38 SECS.
 CROSSING TIME AT ULYSSES     IS 10869. S. OR   03:01:09 +/-  161.88 SECONDS
```

Apr 16 14:34 1993 standard input Page 27

```
From ZMYEWSKI@ssl.msfc.nasa.gov Fri Apr 16 12:30:51 1993
Date:    Fri, 16 Apr 1993 14:34:45 -0500 (CDT)
From: ZMYEWSKI@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s    RA    Dec
   2303    930414    9091    08835     16000    313    +07
```



```
                  BATSE BURST TRIGGER
 NO.: 02303

 TIME: TJD=9091 SECONDS=08835

 TYPE: BURST                        SOLAR FLARE TRIGGER SIGNAL:N

 SIGNIFICANCE:        SIGMA

 INTENSITY:           COUNTS/CM2

 LOCATION: ZENITH=110     AZIMUTH=103     ERROR=       DEGREES

 COMMENTS:
 GRB LASTING APPROX. 20 SECONDS.  MARGINALLY SEEN IN CHANNEL 4.
```

Helio corr removed

Date: Dec 18 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

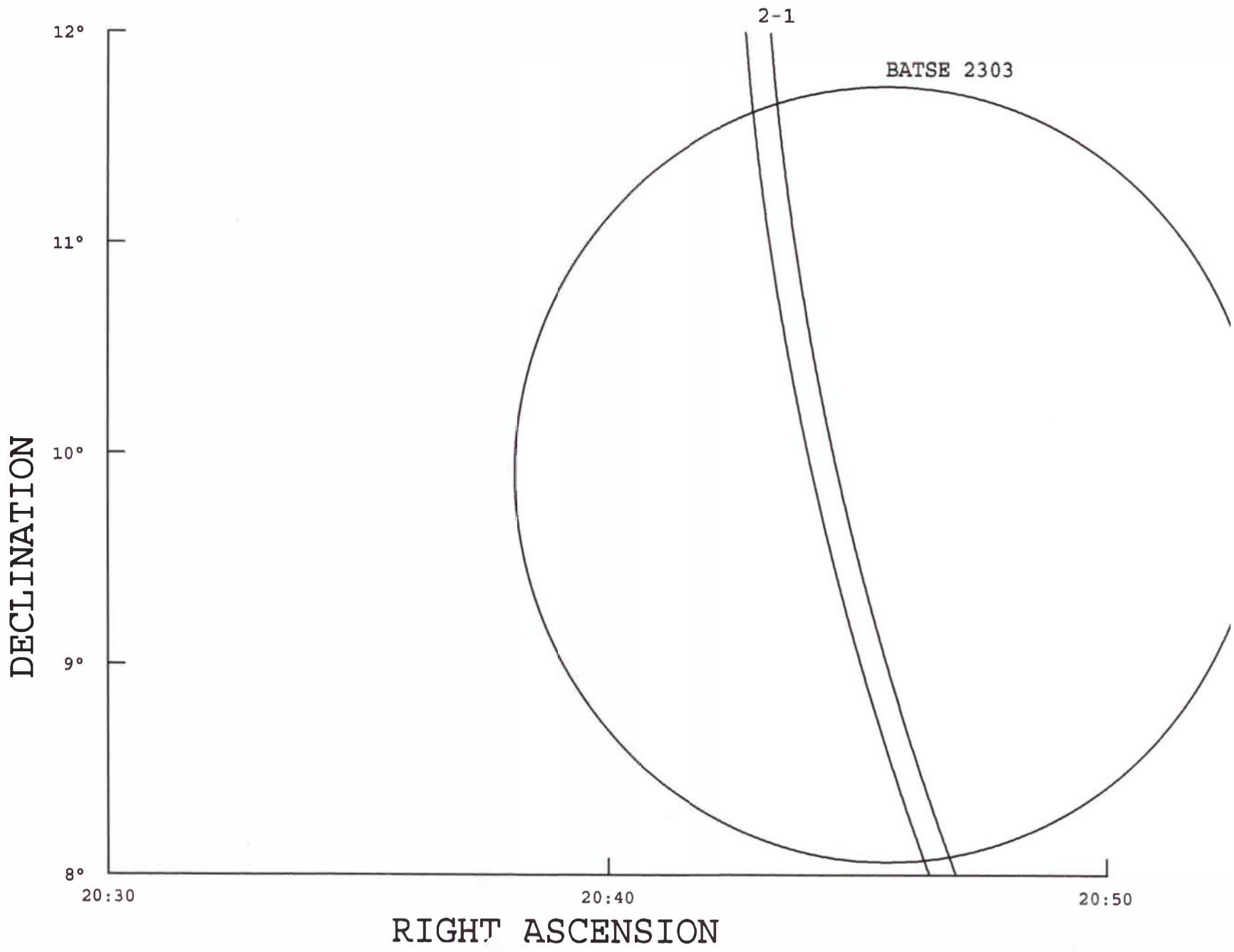
☐ Geocentric time used?

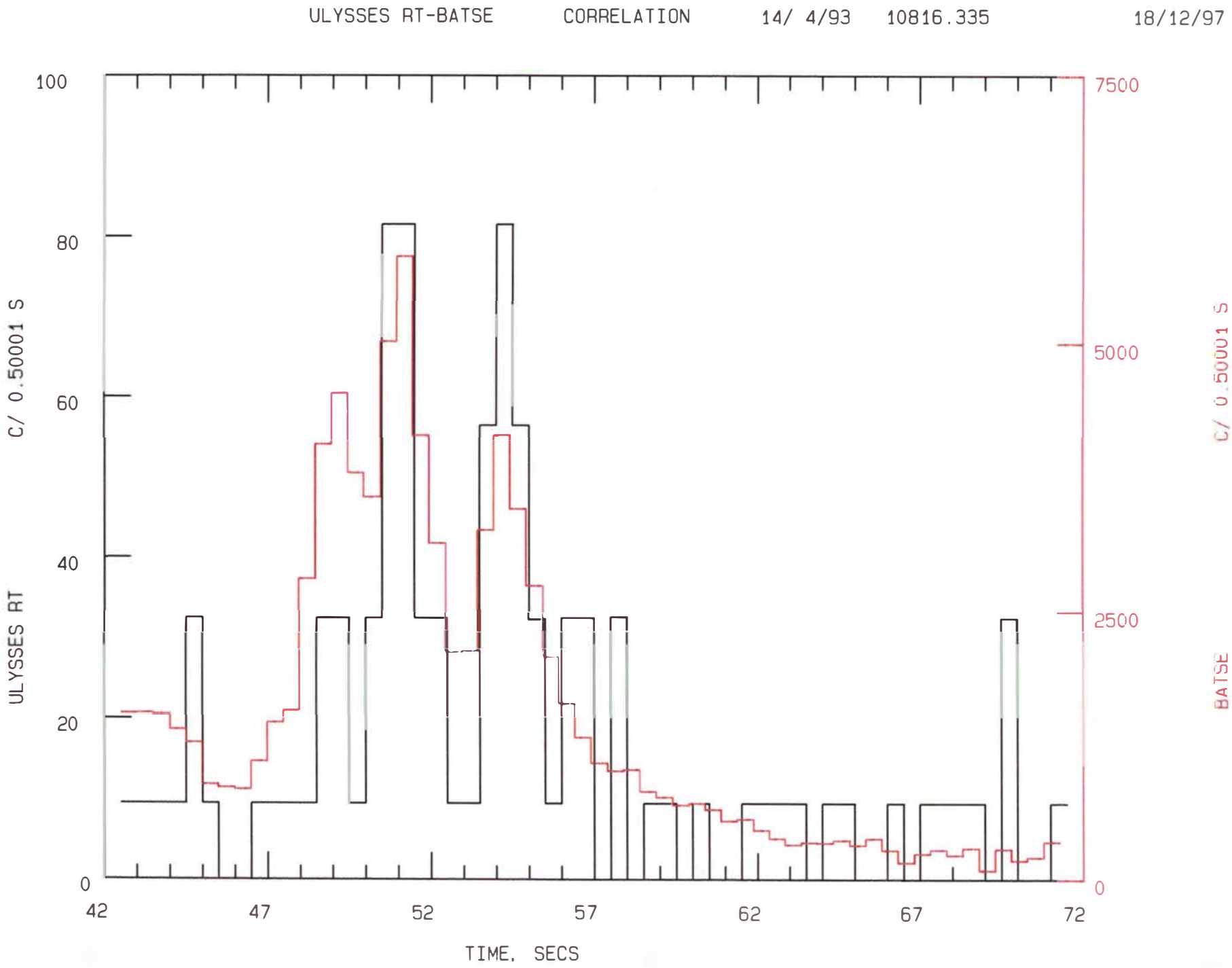
☑ ACCESS database updated?

EVENT OF APR 14, 1993 3:00

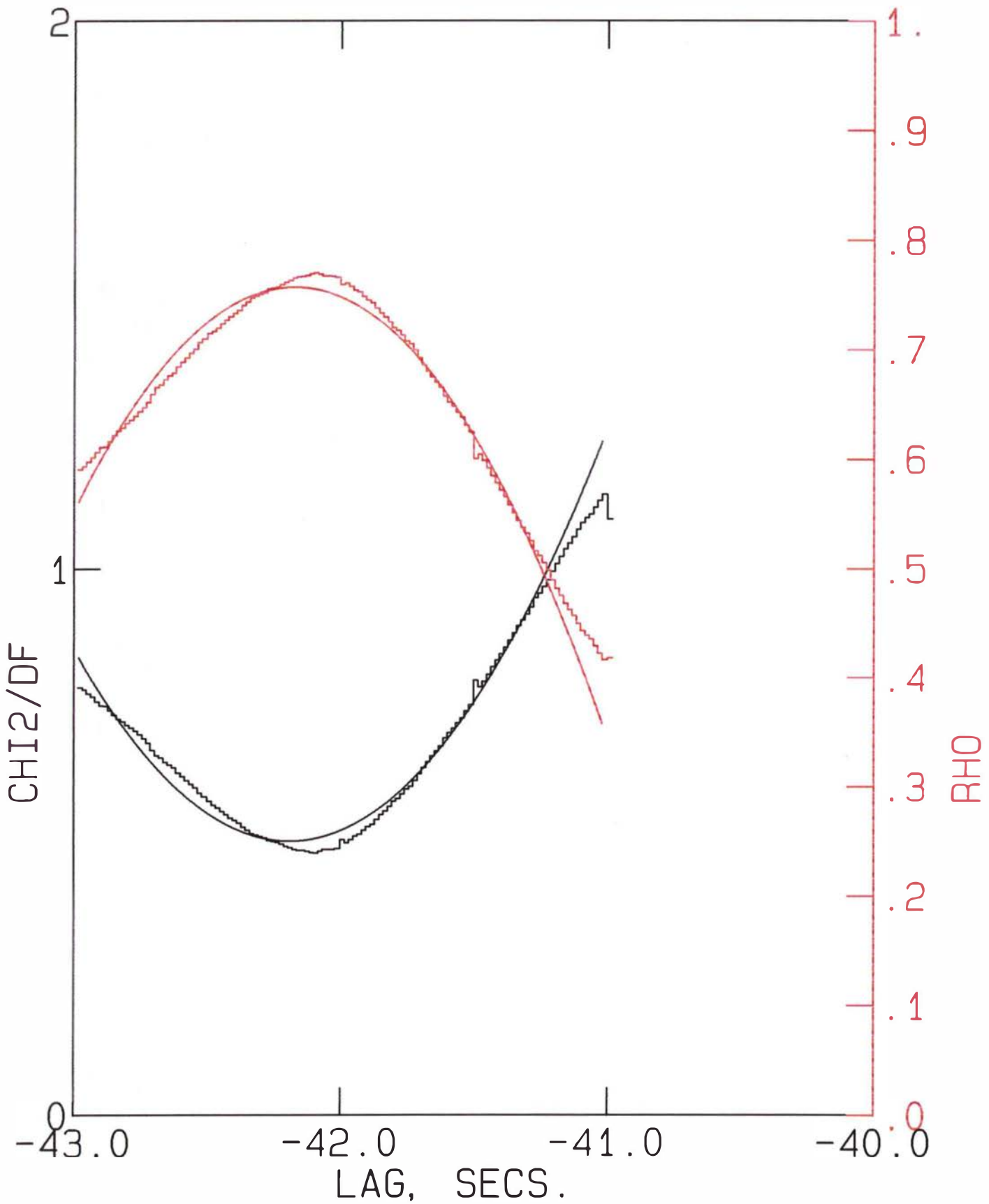
18/12/97

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE




ULYSSES RT-BATSE CORRELATION 14/ 4/93 10816.335 18/12/97
100
80
60
40
20
0
C/ 0.50001 S
ULYSSES RT
7500
5000
2500
0
C/ 0.50001 S
BATSE
42
47
52
57
62
67
72
TIME, SECS

ULYSSES RT-BATSE CORRELATION 14/ 4/93 10816.335

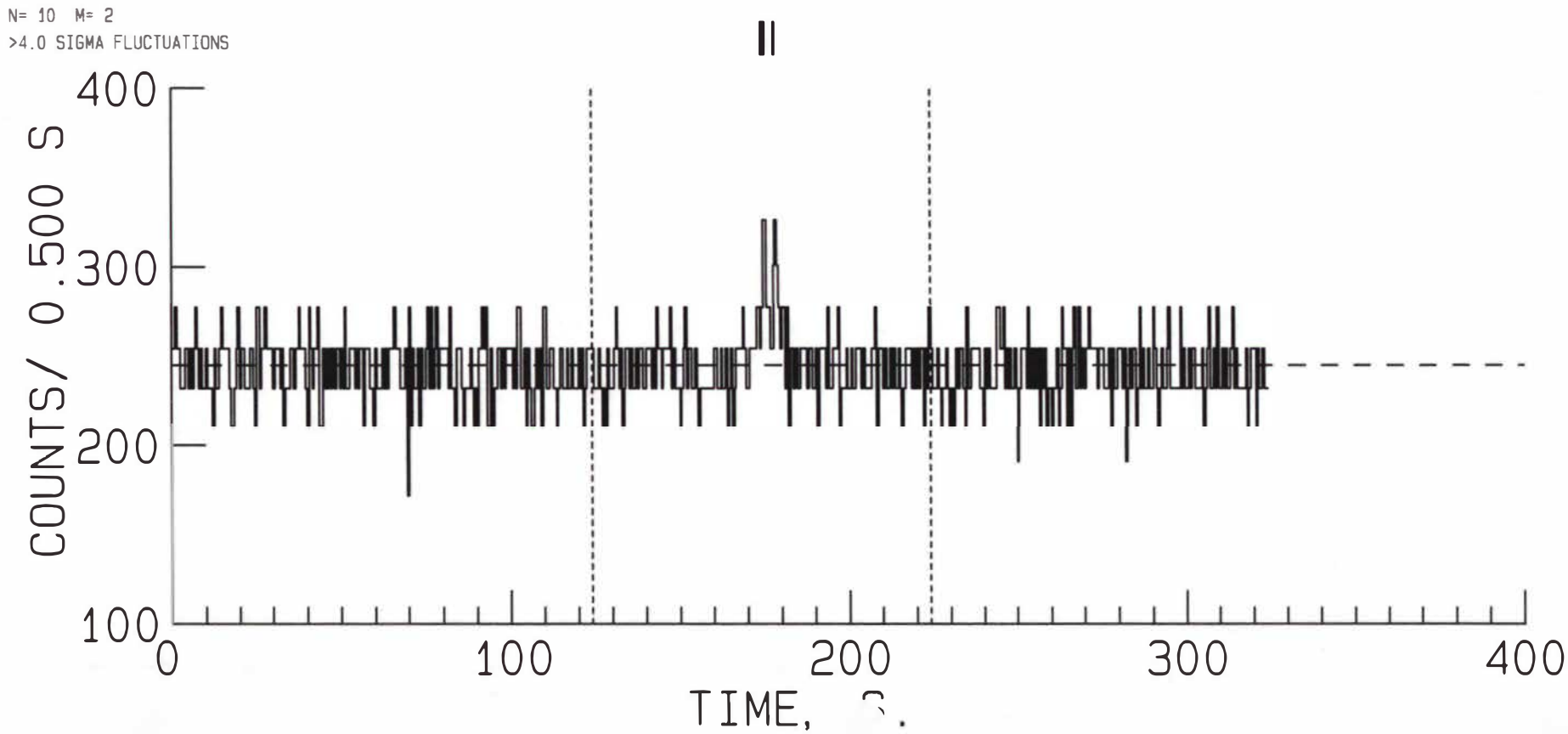


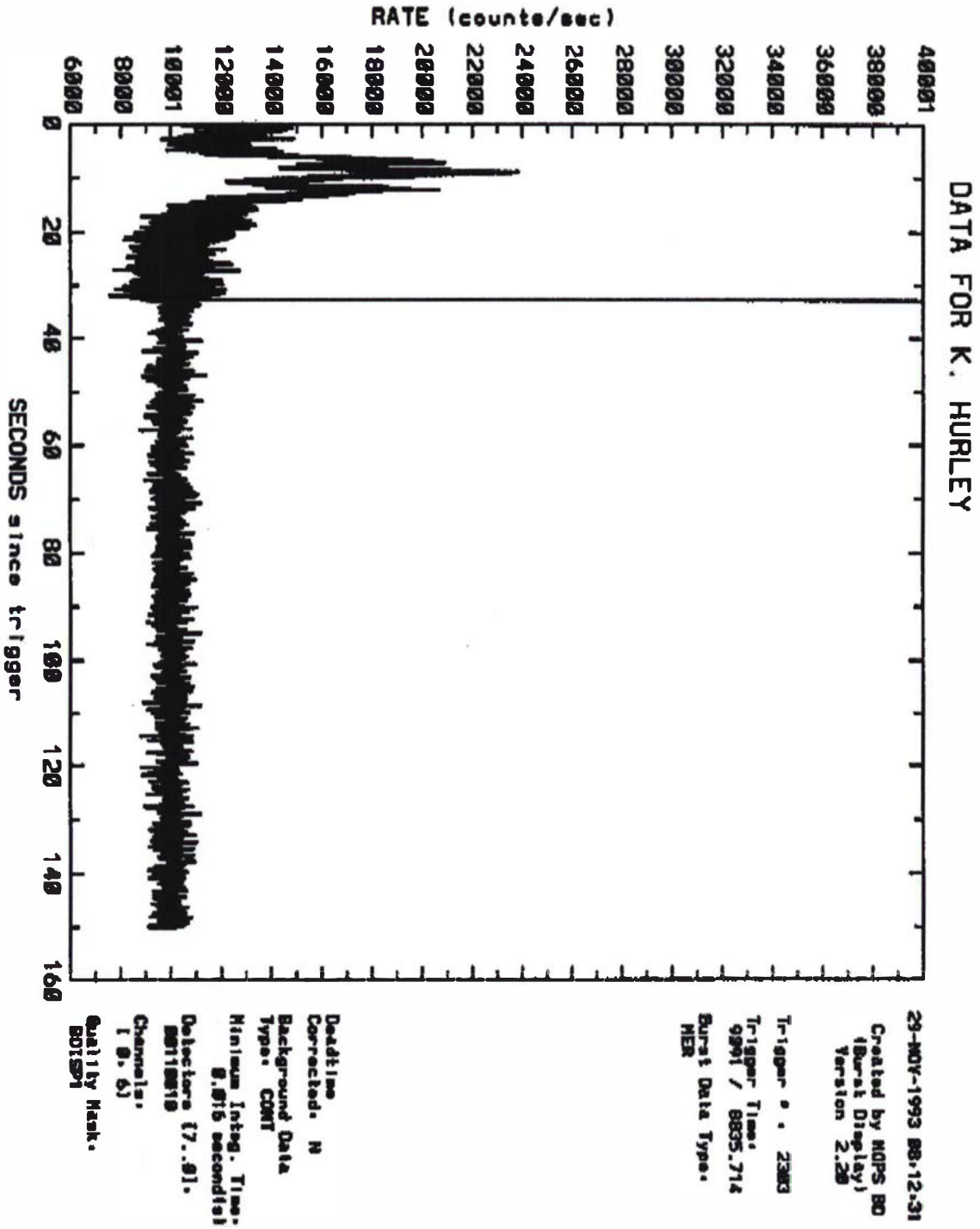
ULYSSES RT

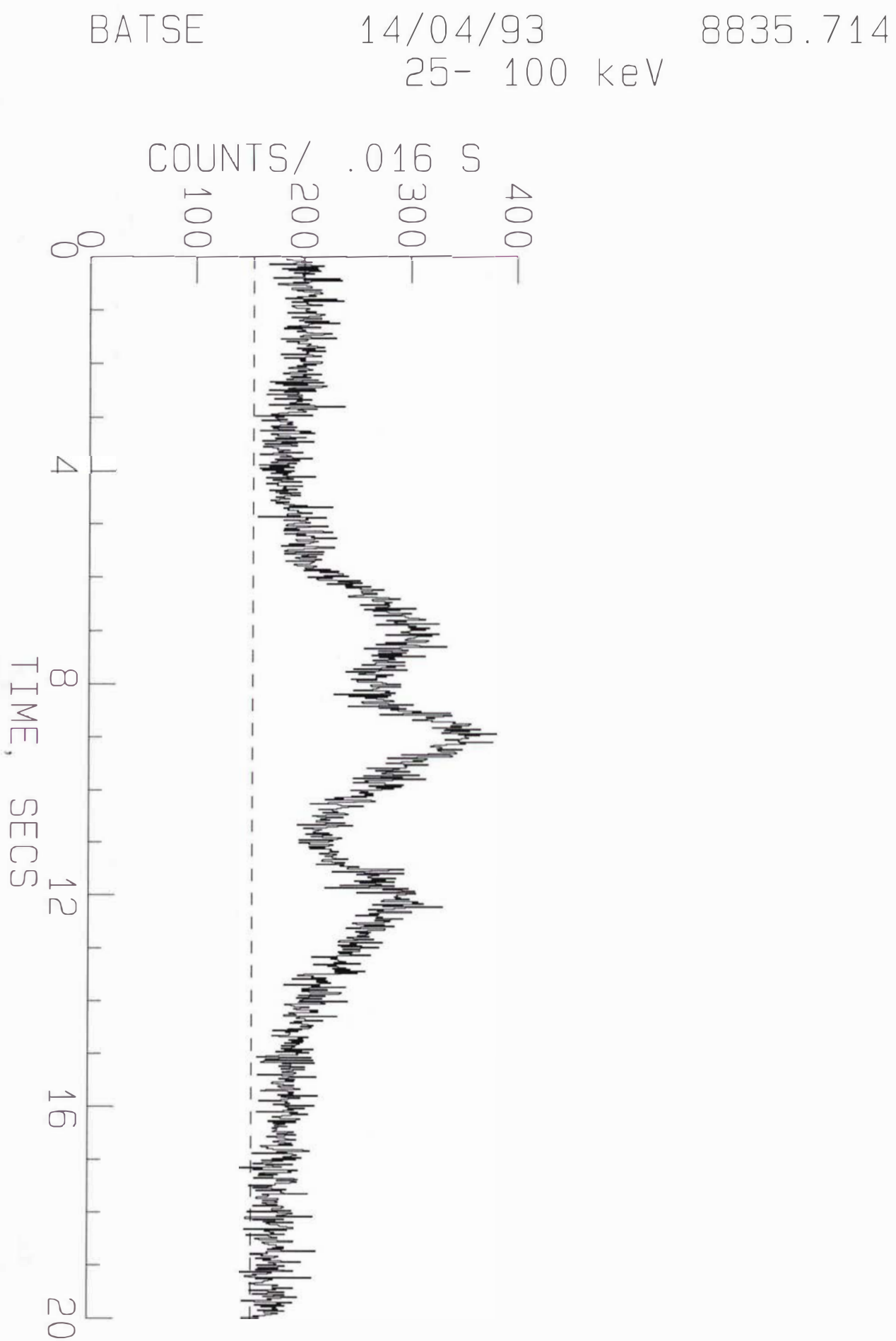
18/12/97

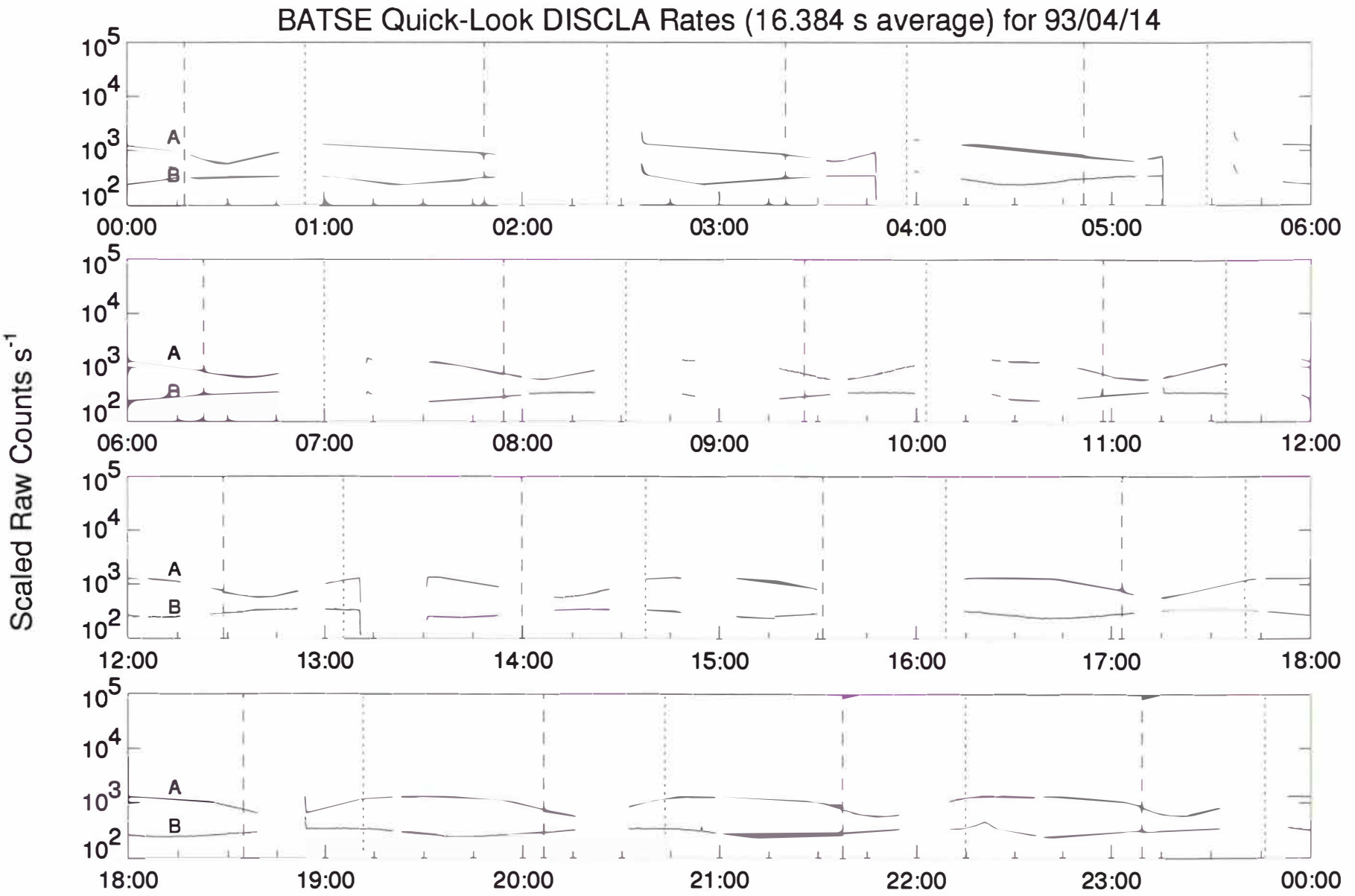
14/ 4/93 10692.478 s

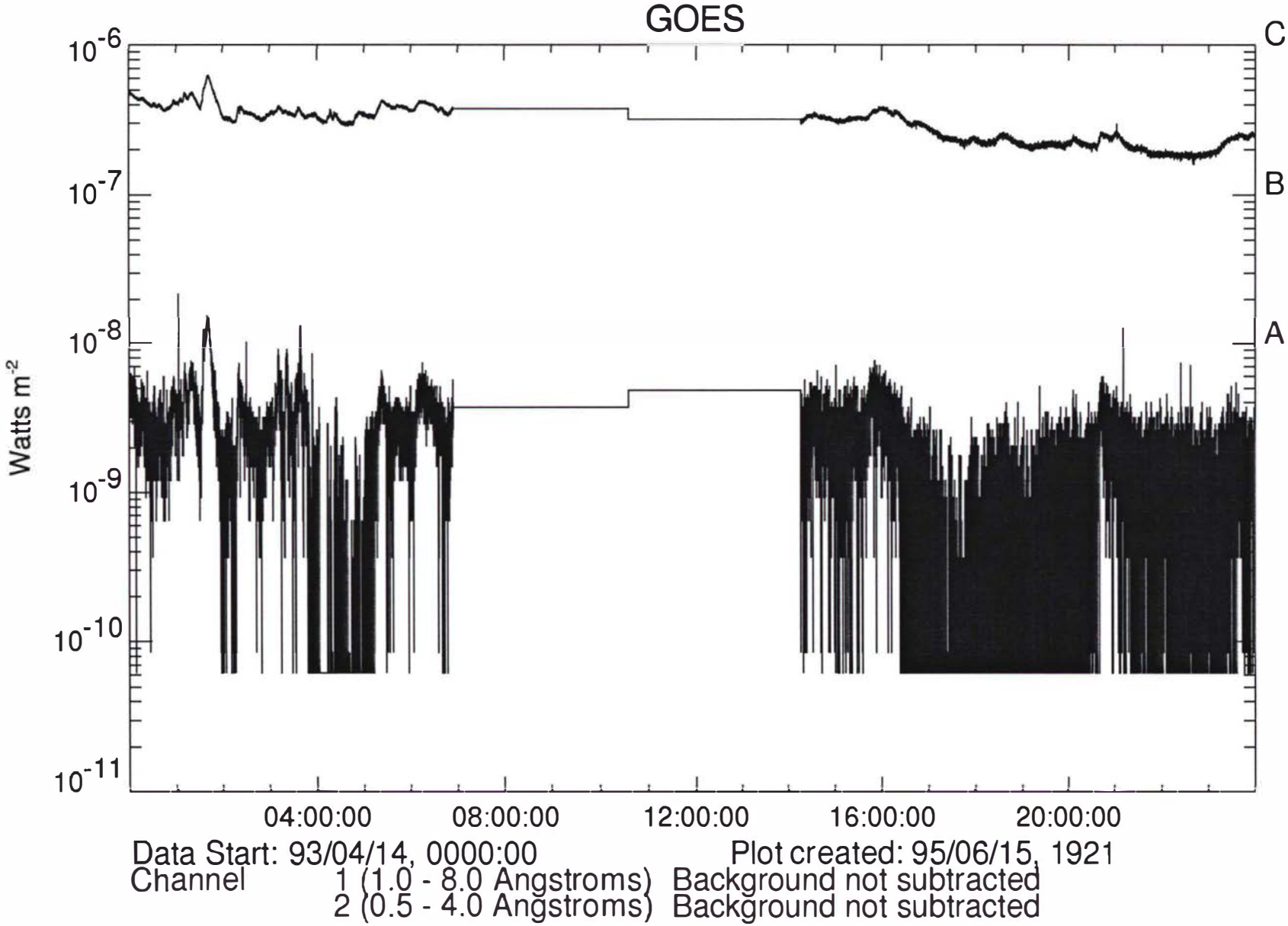
21- 146 keV




DATA FOR K. HURLEY
RATE (counts/sec)
40001
38000
36000
34000
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
10001
8000
6000
0
20
40
60
80
100
120
140
160
SECONDS since trigger
29-NOV-1993 08:12:31
Created by HOPS BD
(Burst Display)
Version 2.20
Trigger # : 2383
Trigger Time:
9901 / 8835.714
Burst Data Type:
MER
Deadtime
Corrected: N
Background Data
Type: CONT
Minimum Integ. Time:
0.016 seconds)
Detectors (7..0):
00110010
Channels:
(0. 6)
Quality Mask:
BD1SP1

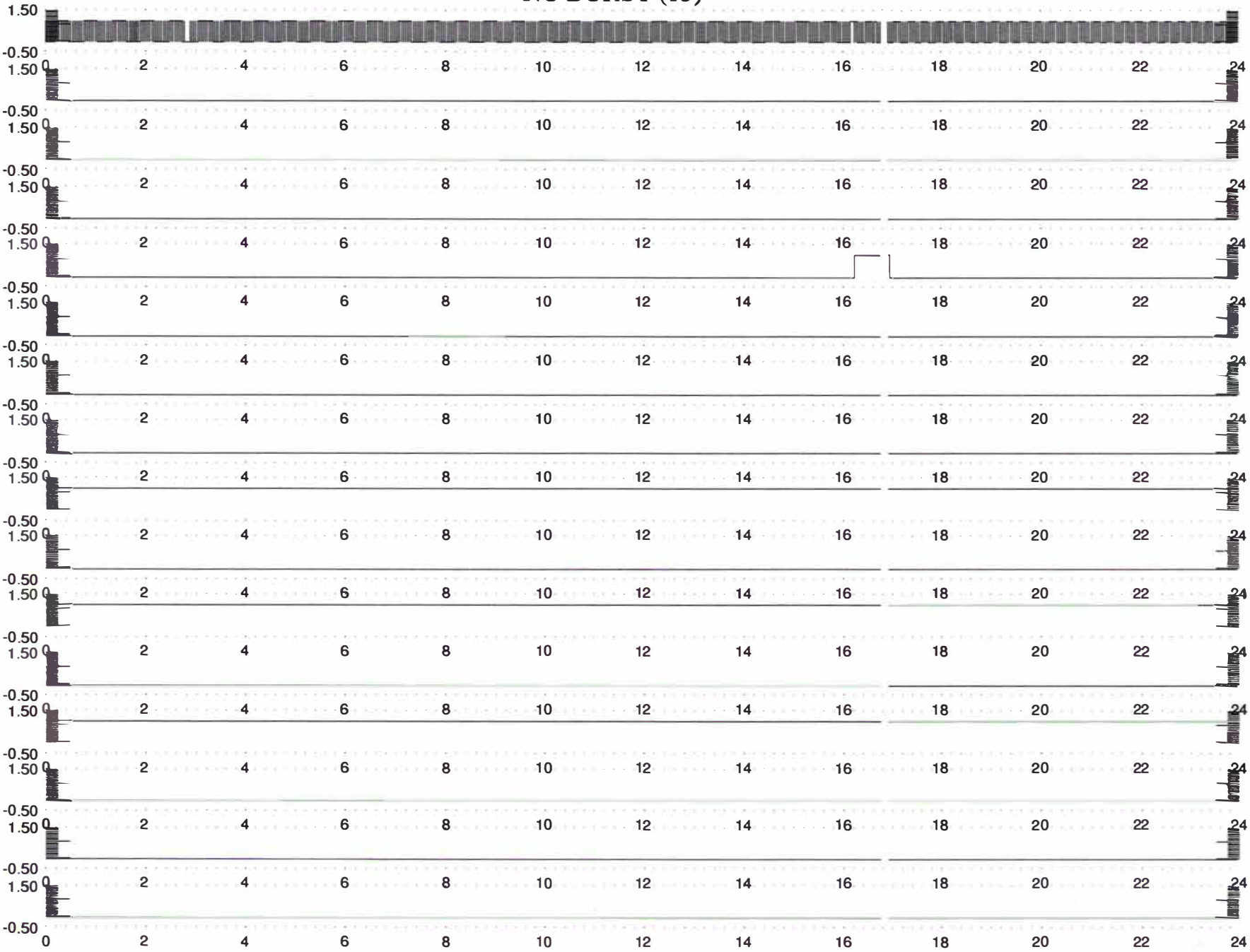

BATSE 14/04/93 8835.714
25- 100 keV
COUNTS/ .016 S
0
100
200
300
400
0
4
8
12
16
20
TIME, SECS


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/14
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1413 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare


GOES
C
B
A
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/14, 0000:00
Plot created: 95/06/15, 1921
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 104, year 1993 to day 104, year 1993 6/12/93

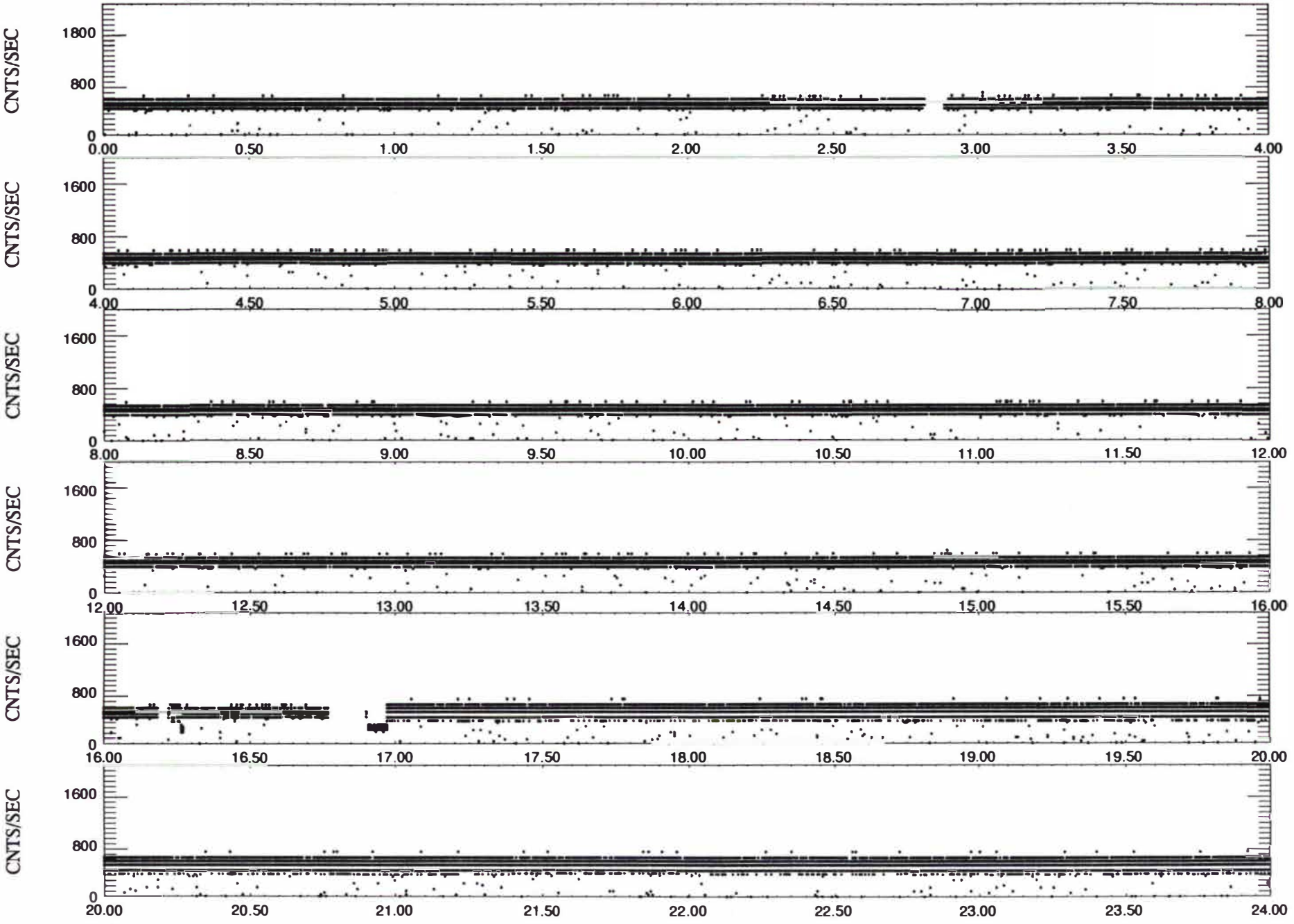
NO BURST (13)



UNIV. AL TIME

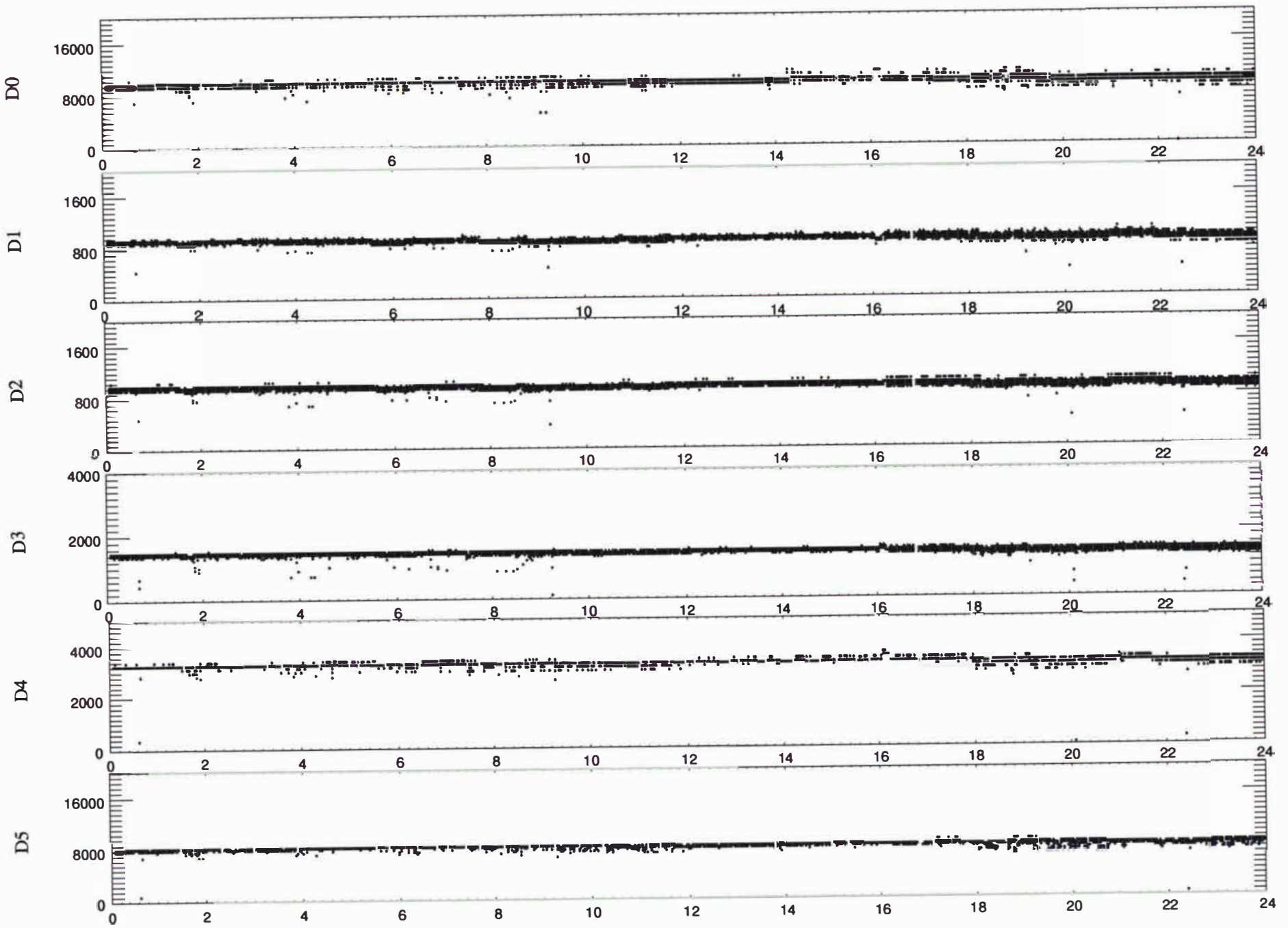
HUS 2A, MODE 1, NOT AVERAGED EDR day 104, year 1993 to day 104, year 1993 6/12/93

CALIBRATION DATA INCLUDED



U 'ERSAL TIME

HUS 2B COUNTS / SEC QEDR day 104, year 1993 to day 104, year 1993 4/16/93



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2304
EVENT OF 1993 APR 15 DAY OF YEAR=105
EVENT CROSSING TIME AT BATSE      : 33588. S. OR 09:19:48.0
COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION:  31.000     8.000
BATSE PEAK COUNTING RATE:    3100     C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
POSITION OF ULYSSES ON 15/ 4/  93 IS:
RA=  144.681 DEC=  -12.539 DIST=     4.192 AU
BATSE-ULYSSES DISTANCE =  627153120. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 65.26 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=  875.41 SECS.
CROSSING TIME AT ULYSSES     IS 34463. S. OR   09:34:23 +/-  393.16 SECONDS
```



```
From MALLOZZI@ssl.msfc.nasa.gov Mon Apr 19 09:14:09 1993
Date:    Mon, 19 Apr 1993 11:18:12 -0500 (CDT)
From: MALLOZZI@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s   RA    Dec
   2304    930415    9092    33588      3100    031   +08
```

ND

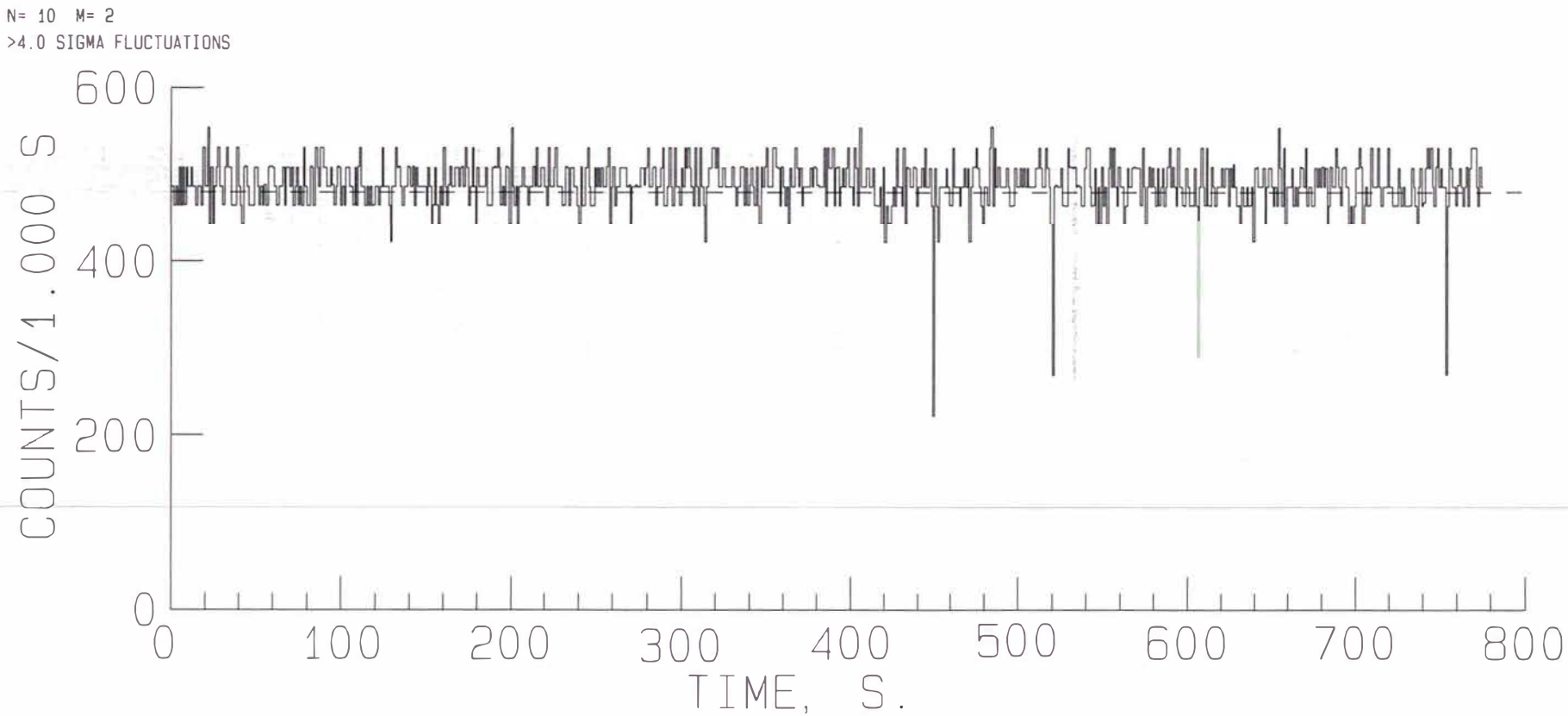
26/ 4/93

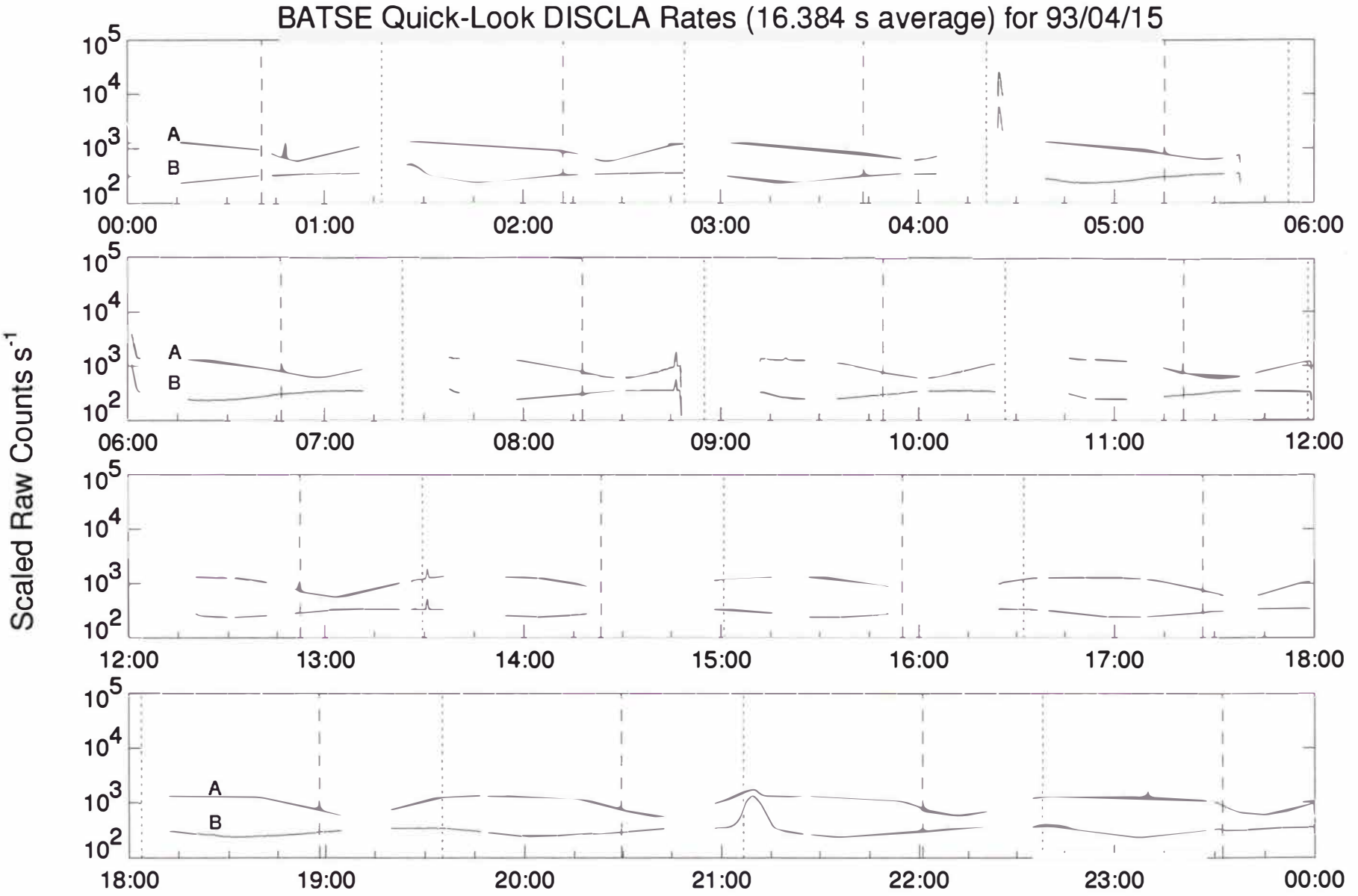
ULYSSES RT

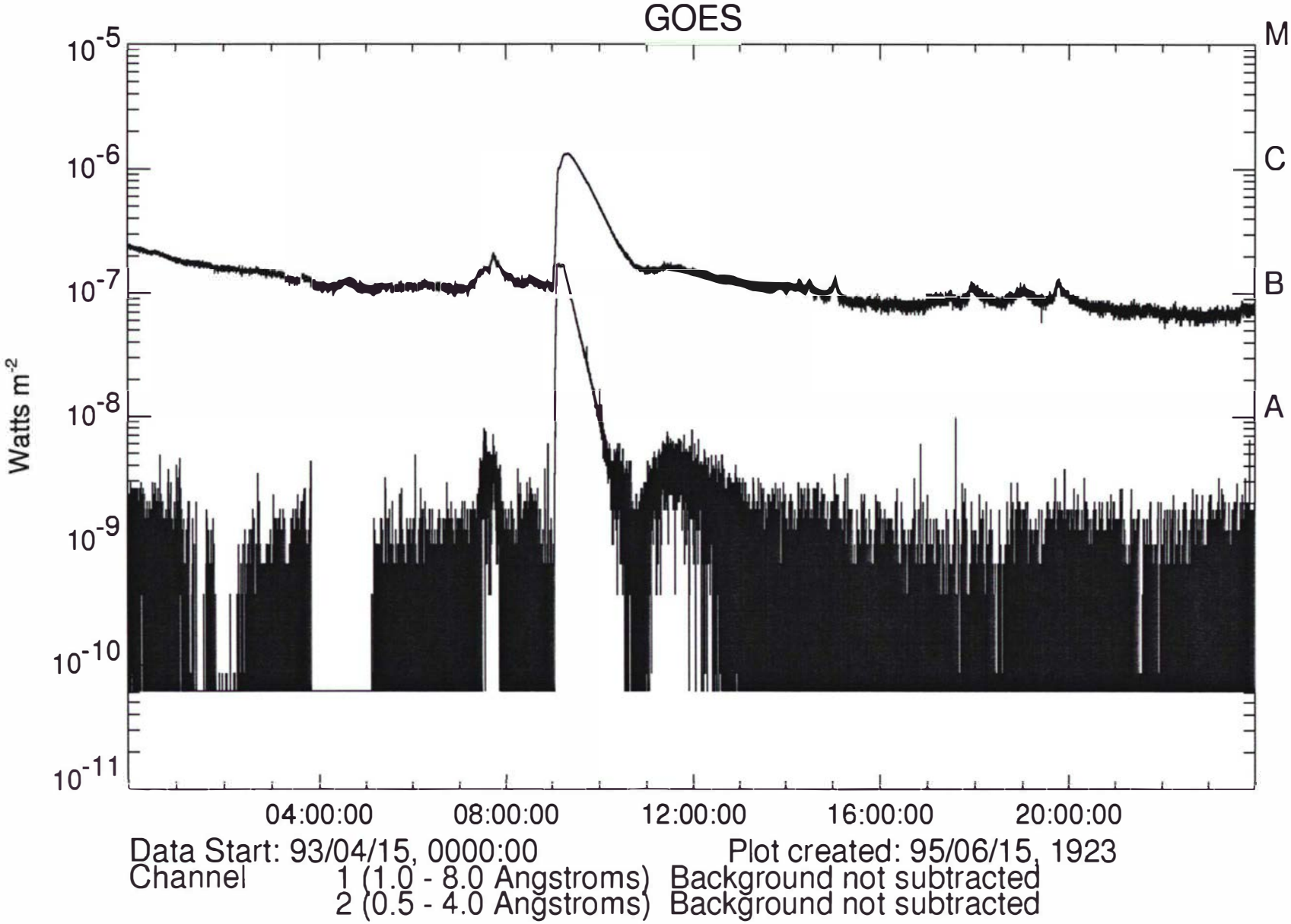
15/ 4/93 34056.191 s

0.500 S INTERVALS REGROUPED BY 2

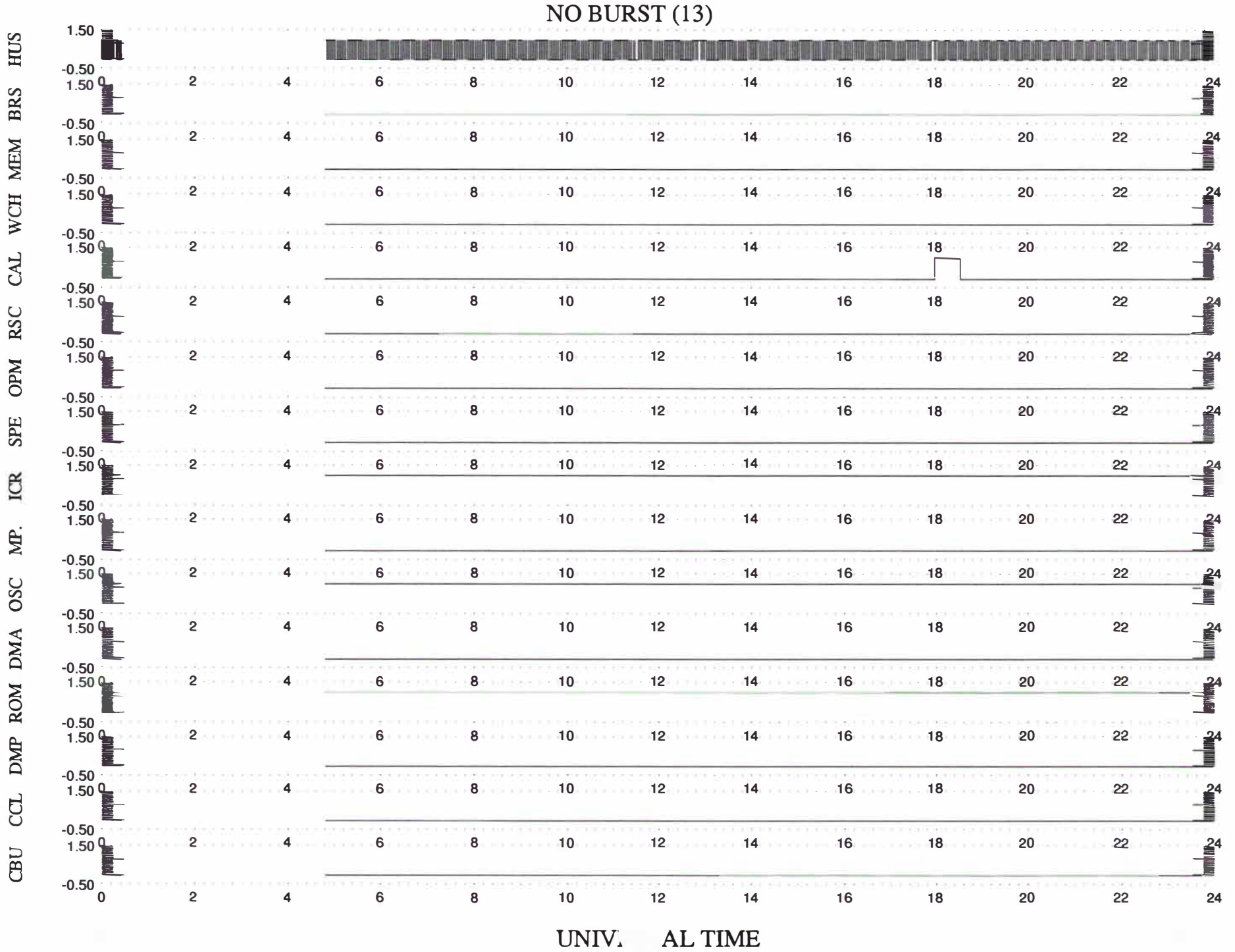
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/15
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1415 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

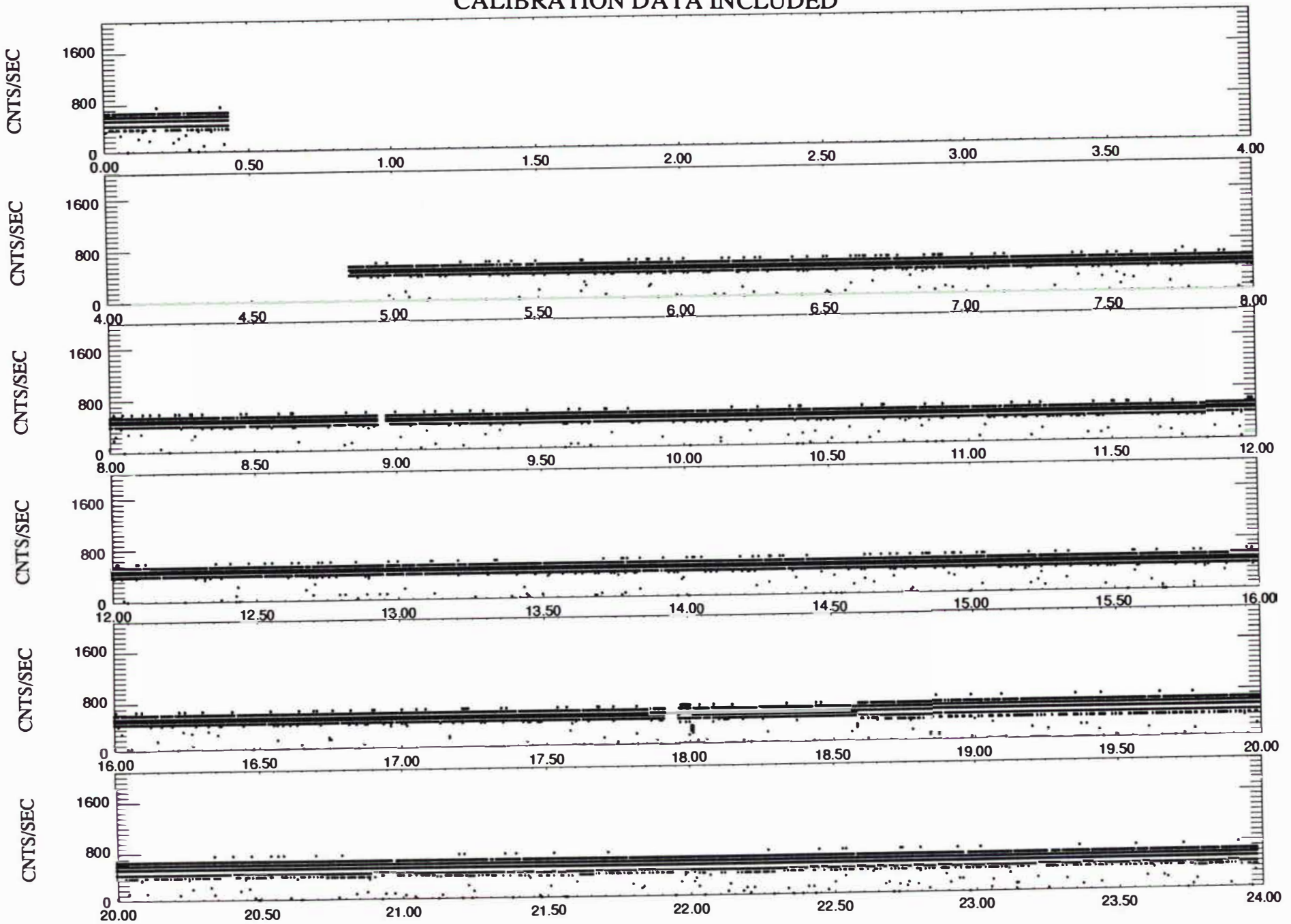

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/15, 0000:00
Plot created: 95/06/15, 1923
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 105, year 1993 to day 105, year 1993 6/12/93



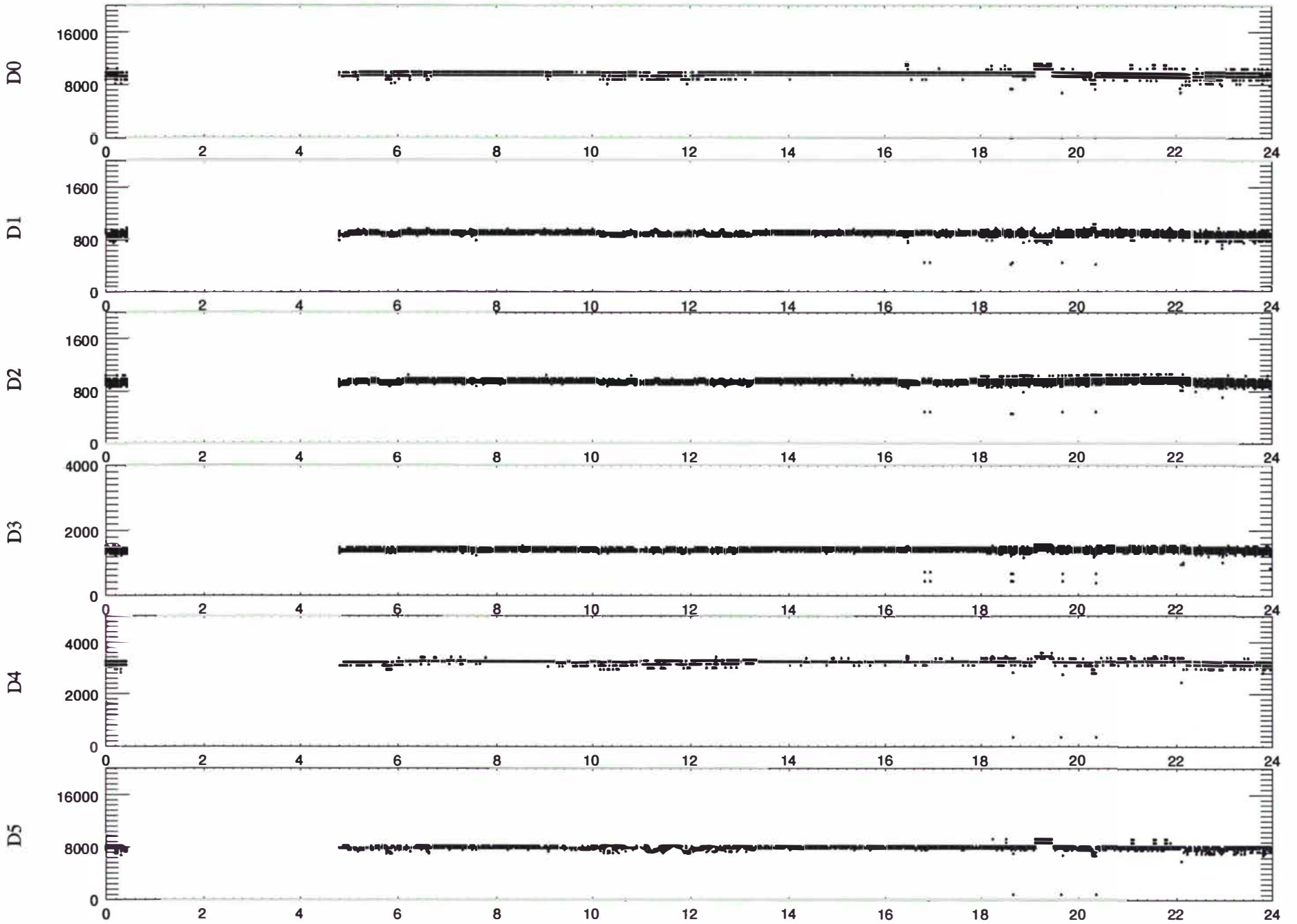
HUS 2A, MODE 1, NOT AVERAGED EDR day 105, year 1993 to day 105, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNI[illegible]SAL TIME

HUS 2B COUNTS / SEC QEDR day 105, year 1993 to day 105, year 1993 4/20/93



Kommers

UNTRIGGERED

ULYSSES RT

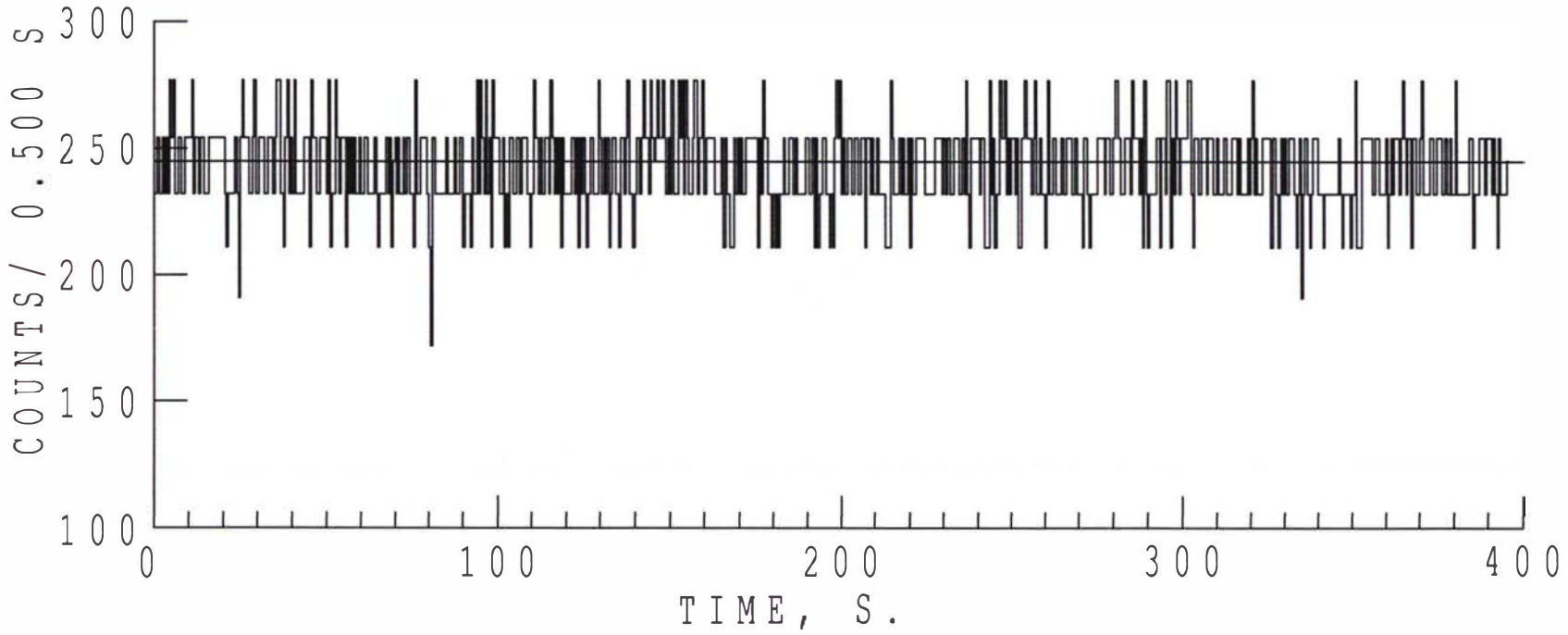
21/ 5/97

16/ 4/93 46548.207 s

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

 BATSE BURST #     2306
 EVENT OF 1993 APR 16 DAY OF YEAR=106
 EVENT CROSSING TIME AT BATSE      : 80833. S. OR 22:27:13.0
 COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 153.000  -28.000
 BATSE PEAK COUNTING RATE:   3800     C/S
 EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
 POSITION OF ULYSSES ON 16/ 4/  93 IS:
 RA=  144.550 DEC=  -12.484 DIST=     4.202 AU
 BATSE-ULYSSES DISTANCE =  628604240. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=162.59 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=-2000.76 SECS.
 CROSSING TIME AT ULYSSES     IS 78832. S. OR   21:53:52 +/-  128.53 SECONDS
```



```
From SHARIFF@ssl.msfc.nasa.gov Mon Apr 19 09:37:36 1993
Date:    Mon, 19 Apr 1993 11:41:44 -0500 (CDT)
From: SHARIFF@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2306   930416    9093   80833     3800   153   -28
```

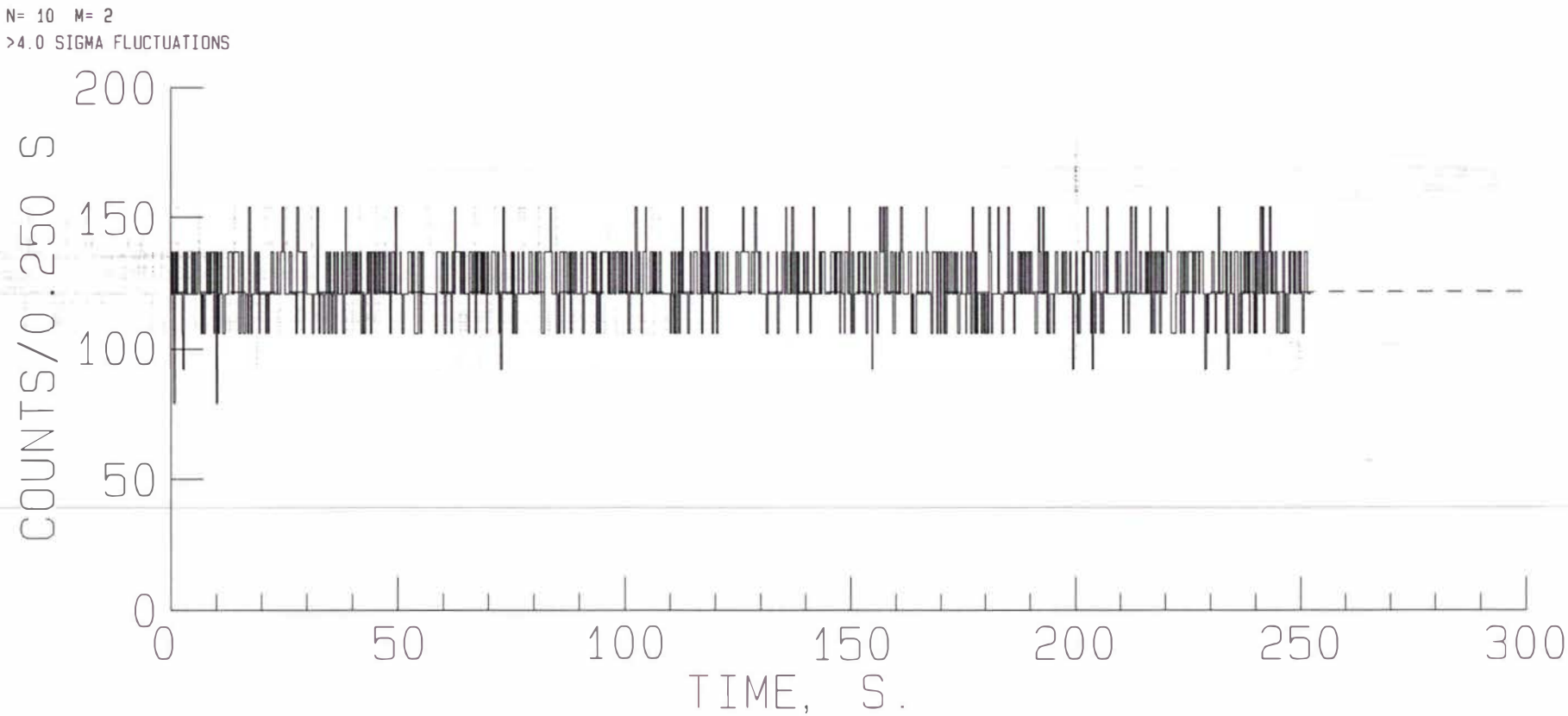
ND

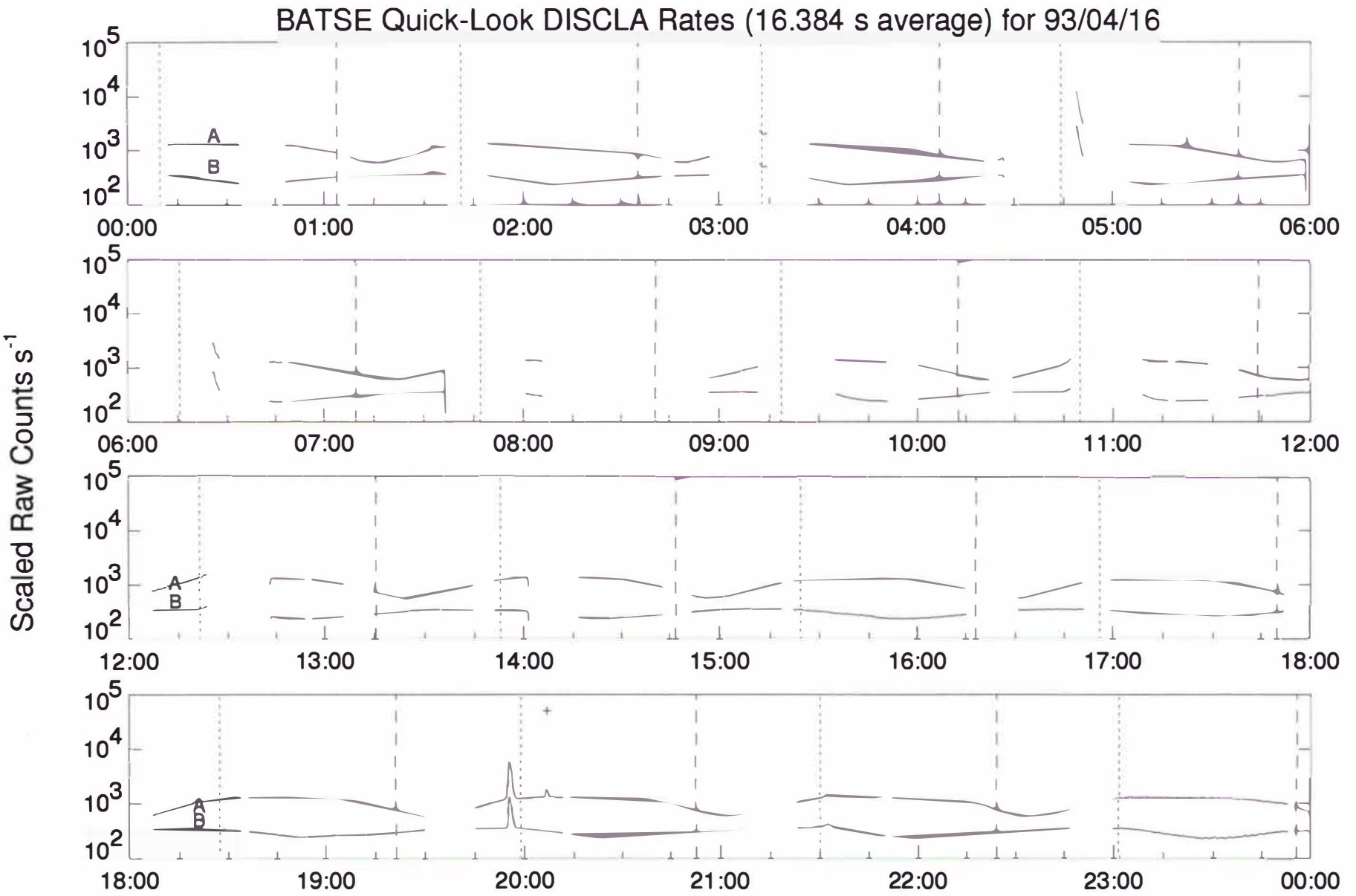
26/ 4/93

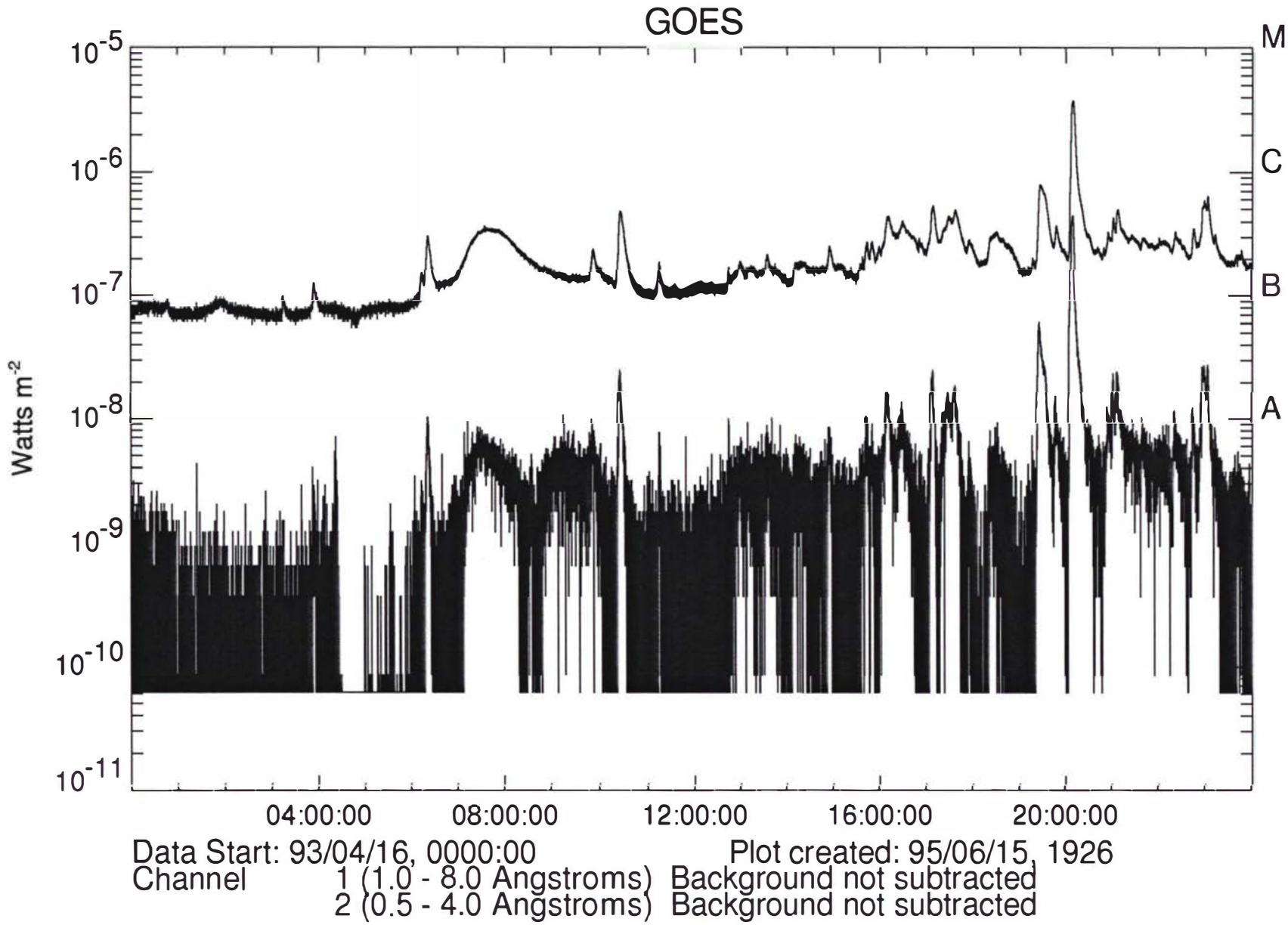
ULYSSES RT

16/ 4/93 78696.211 s

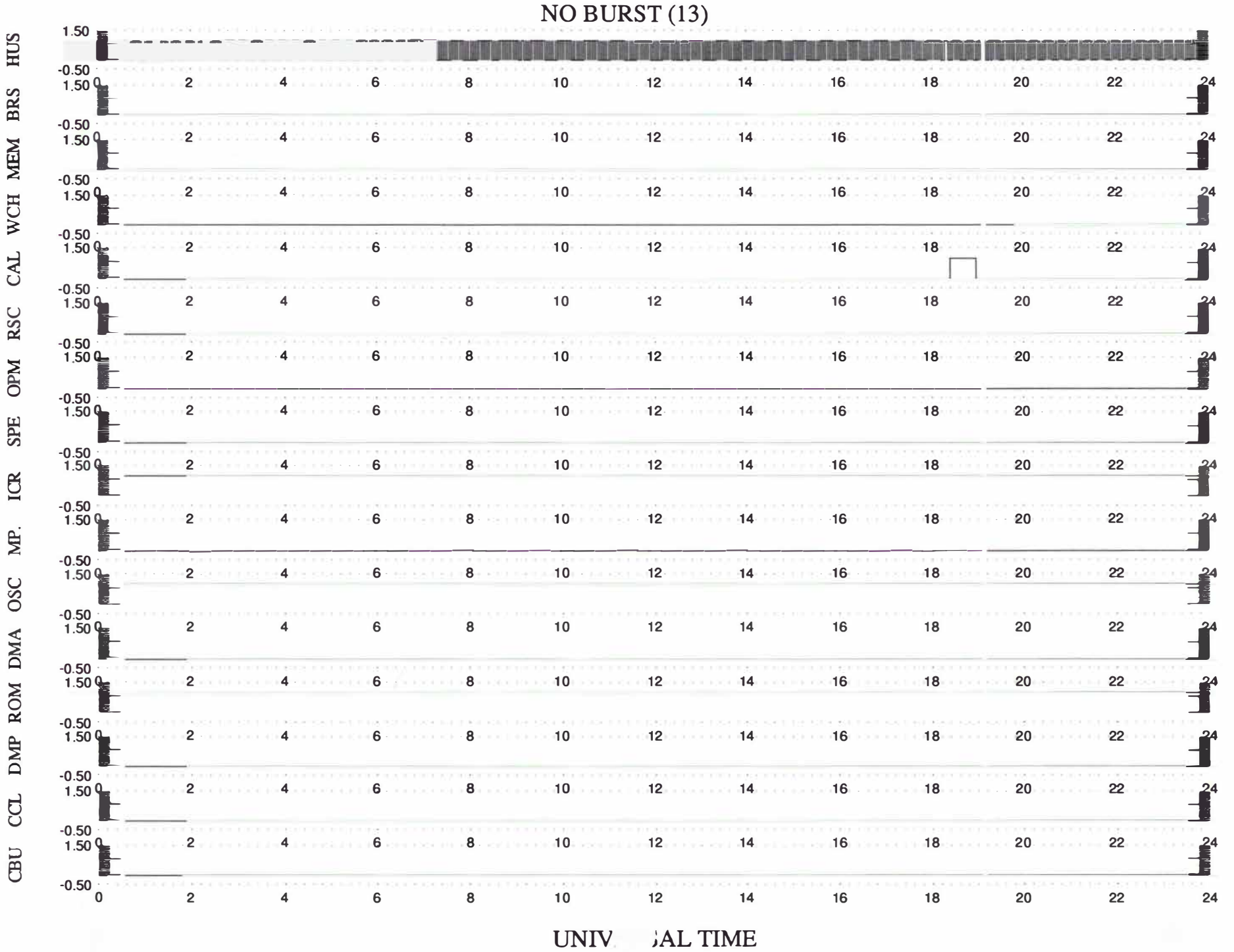
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/16
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1416 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

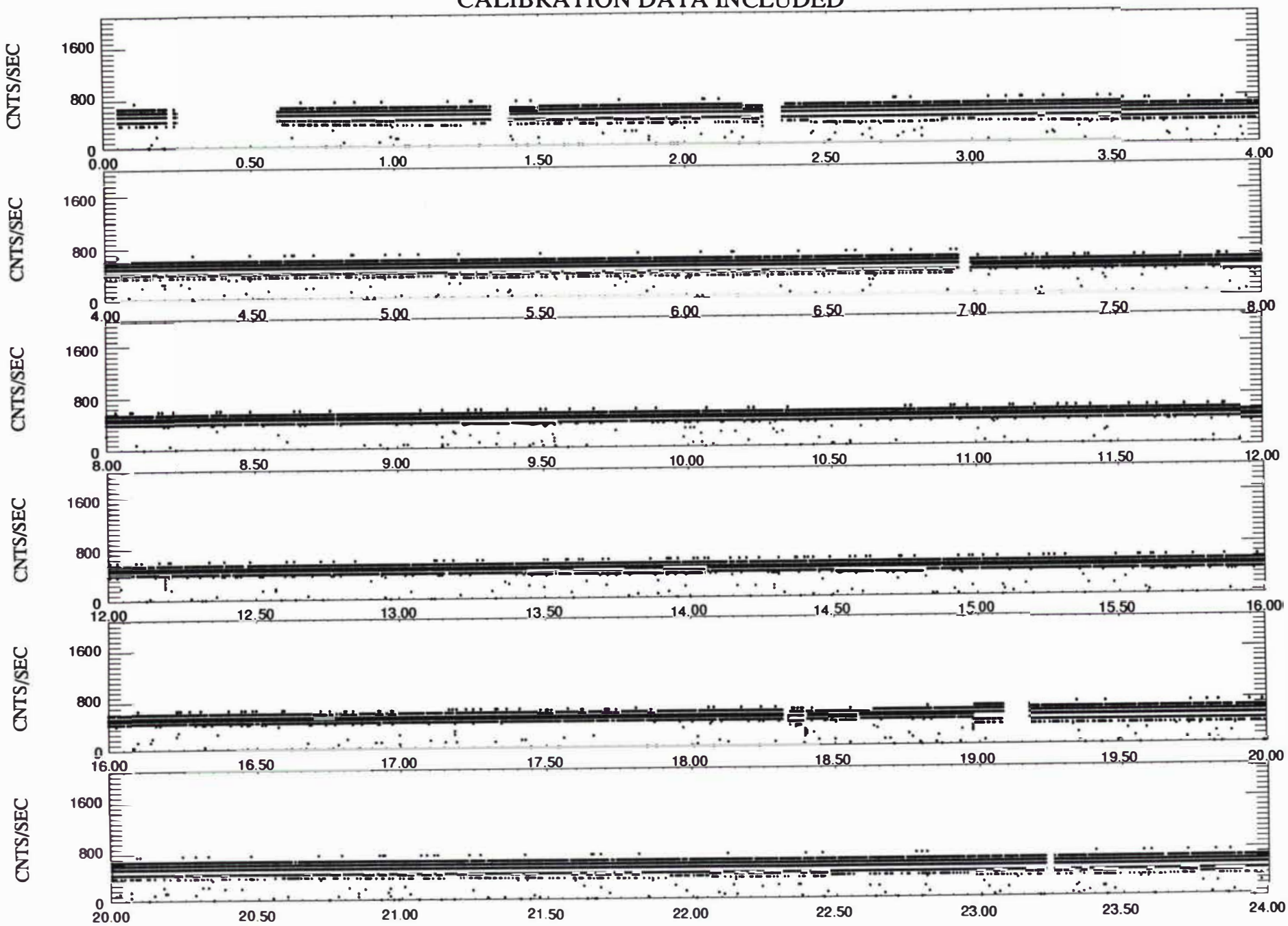

GOES
X
M
C
B
A
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/16, 0000:00
Plot created: 95/06/15, 1926
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 106, year 1993 to day 106, year 1993 6/12/93



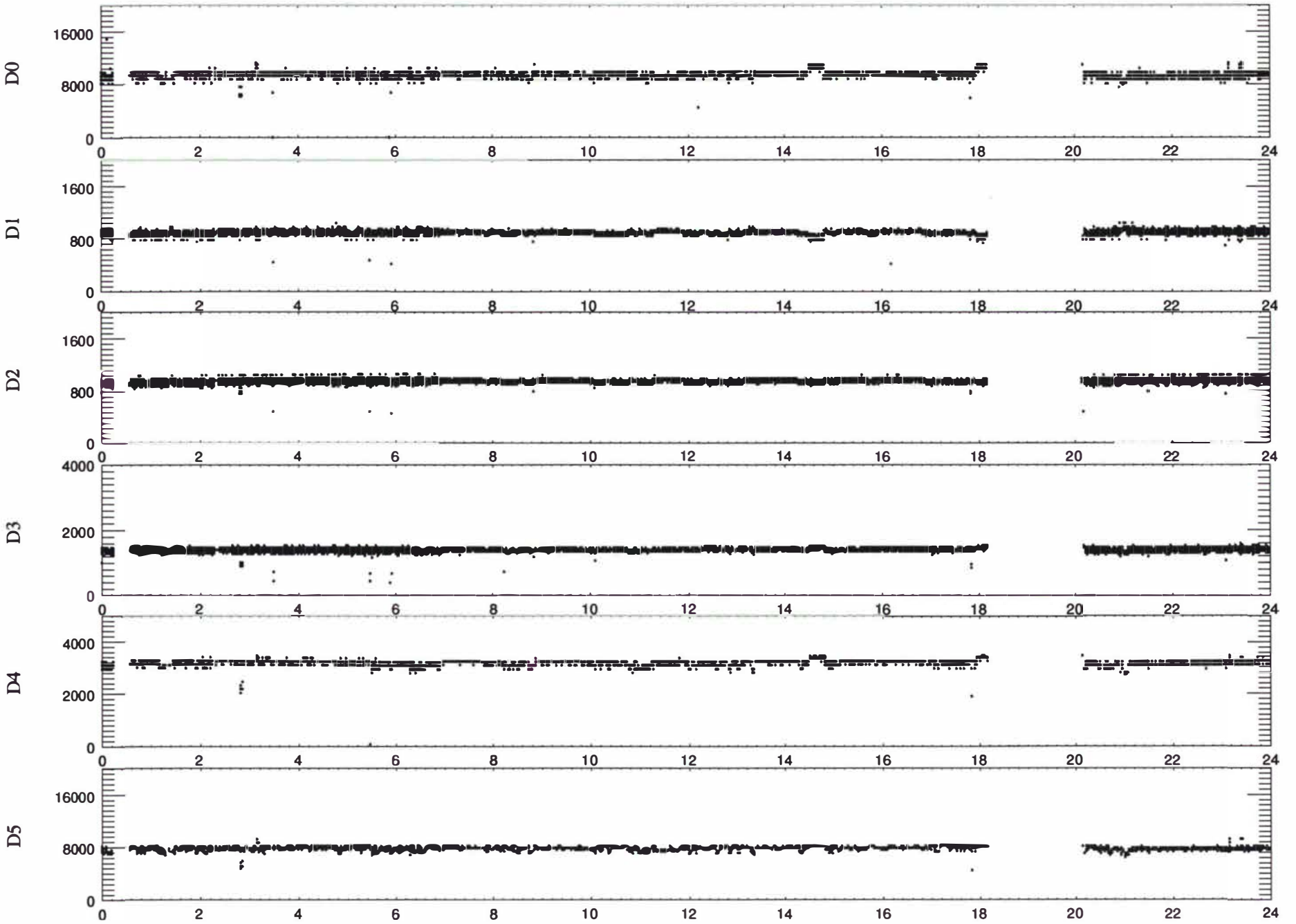
HUS 2A, MODE 1, NOT AVERAGED EDR day 106, year 1993 to day 106, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNI RSAL TIME

HUS 2B COUNTS / SEC QEDR day 106, year 1993 to day 106, year 1993 4/22/93



Kommers

UNTRIGGERED

ULYSSES RT 21/ 5/97

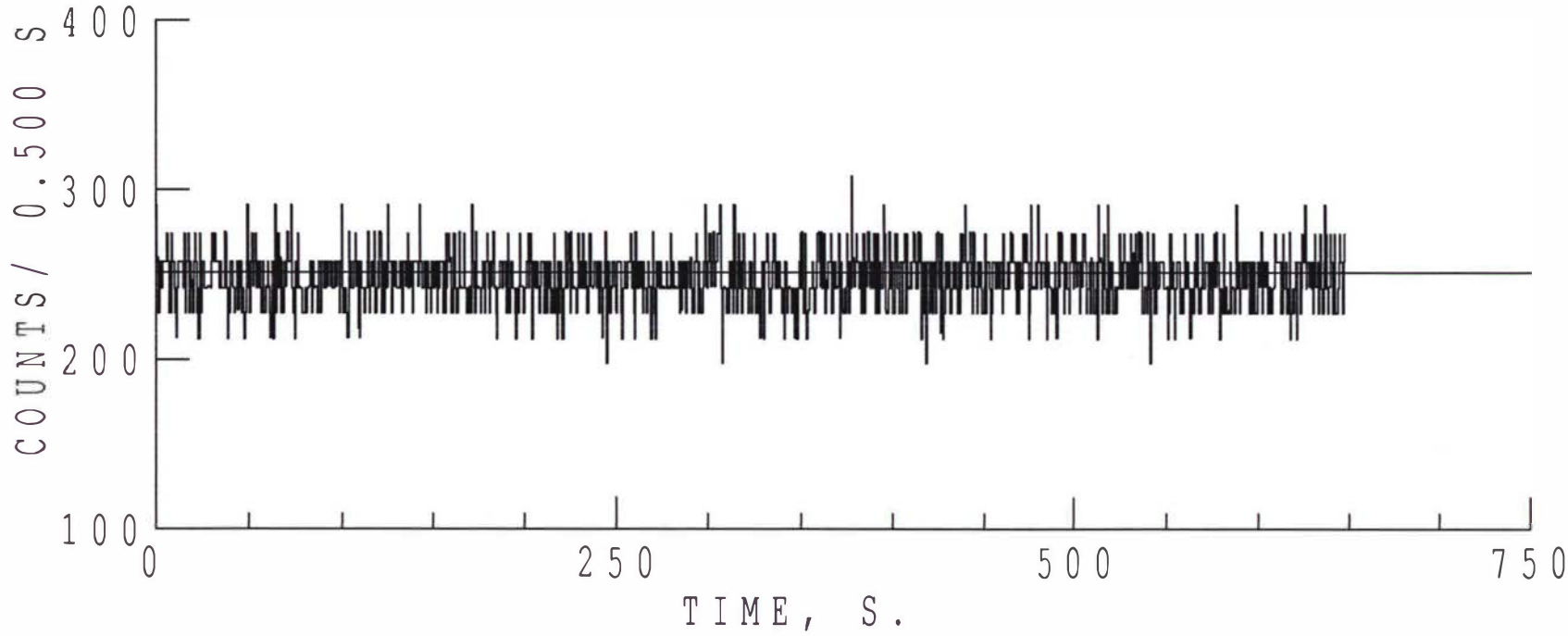
17/ 4/93 66348.102 s

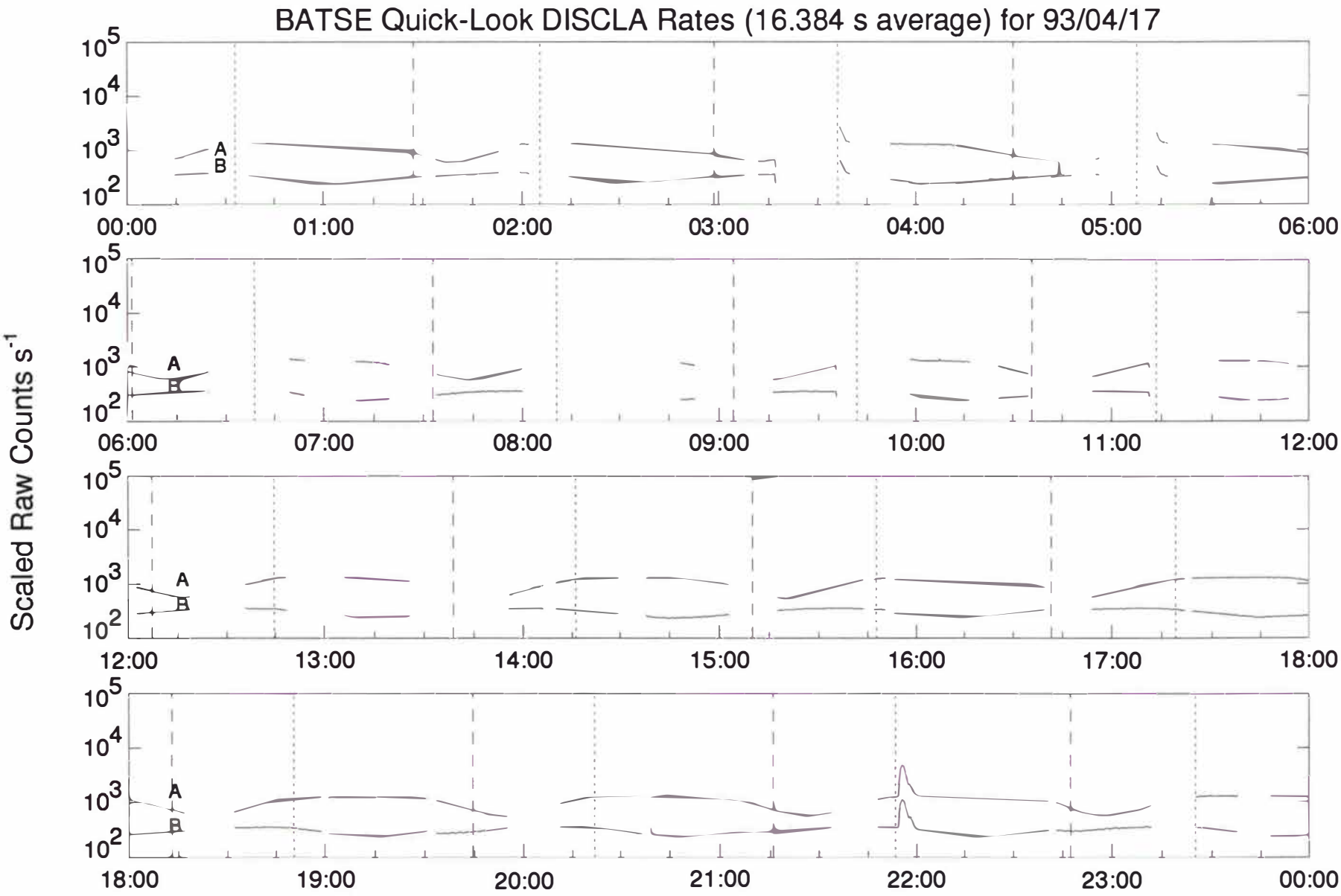
0.250 S INTERVALS REGROUPED BY 2

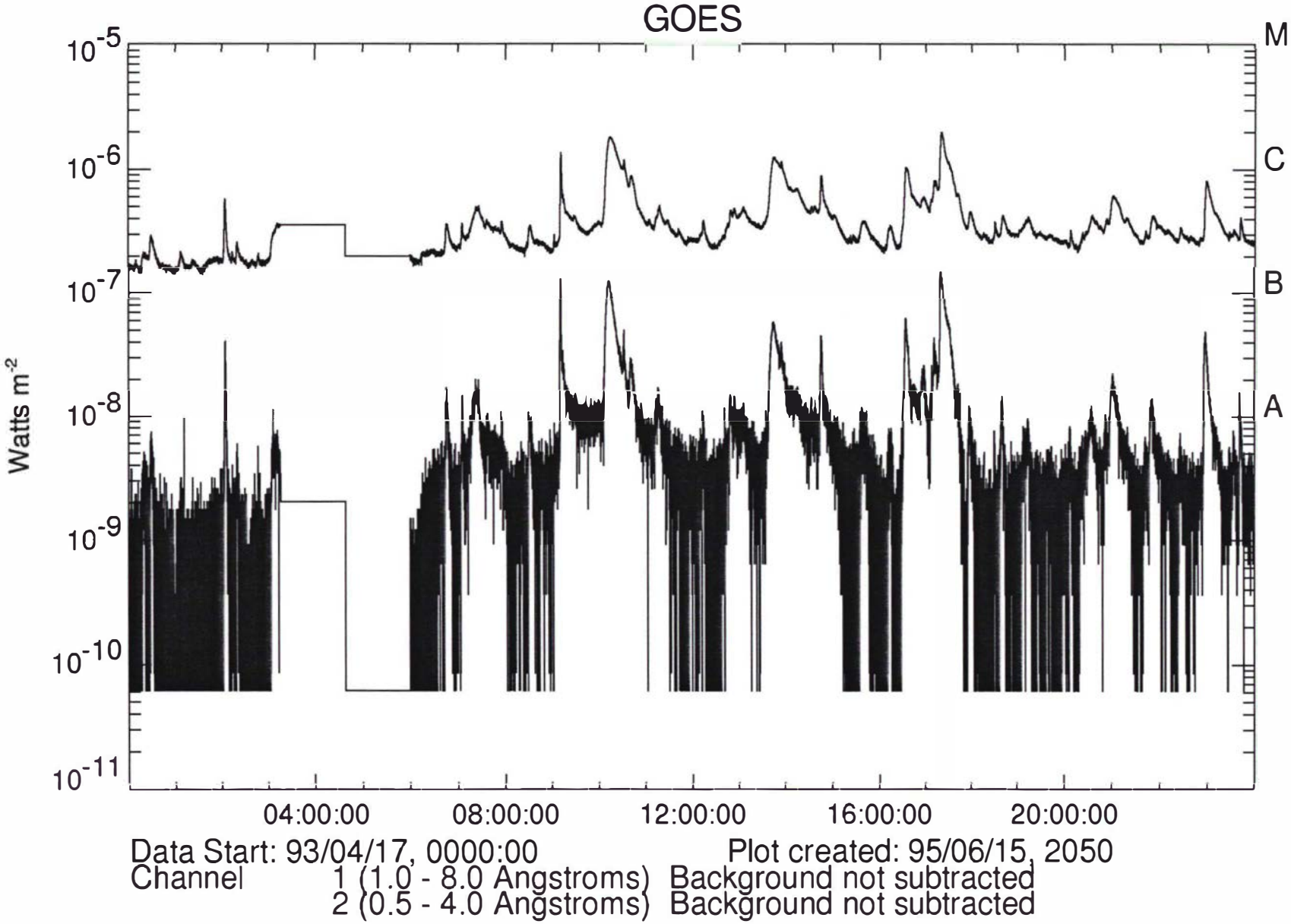
0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

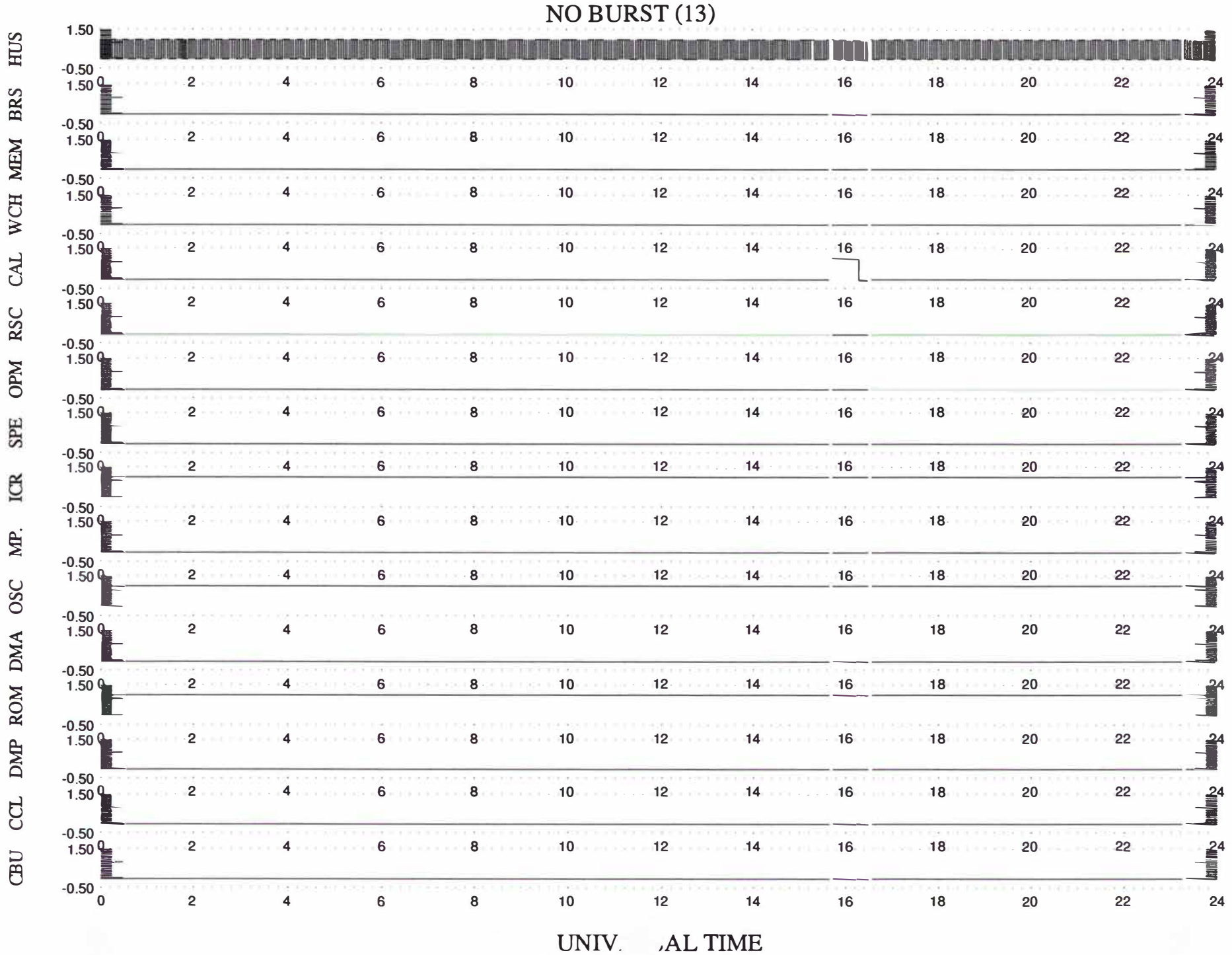
N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/17
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1417 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

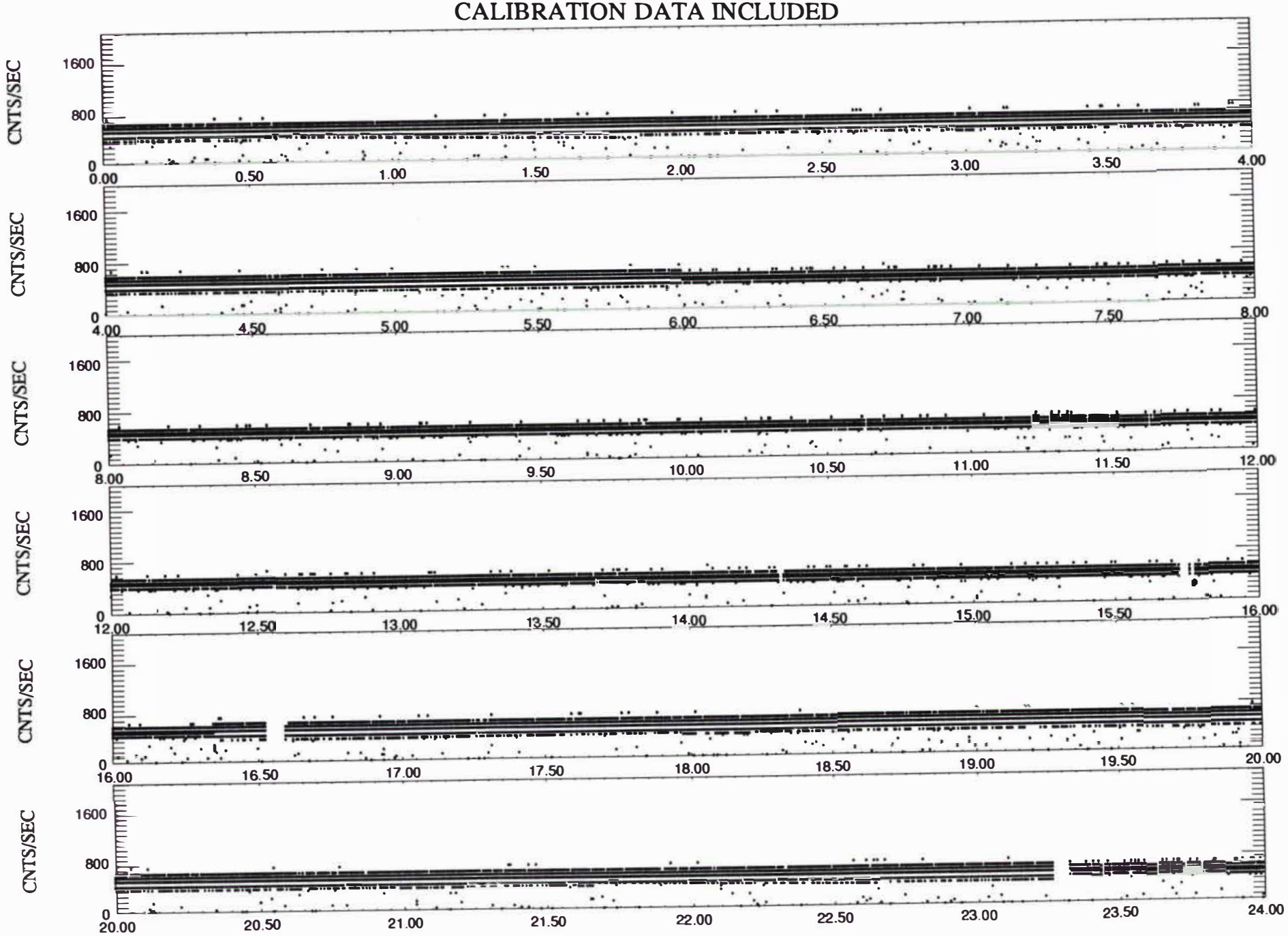

GOES
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
M
C
B
A
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/17, 0000:00
Plot created: 95/06/15, 2050
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 107, year 1993 to day 107, year 1993 6/12/93



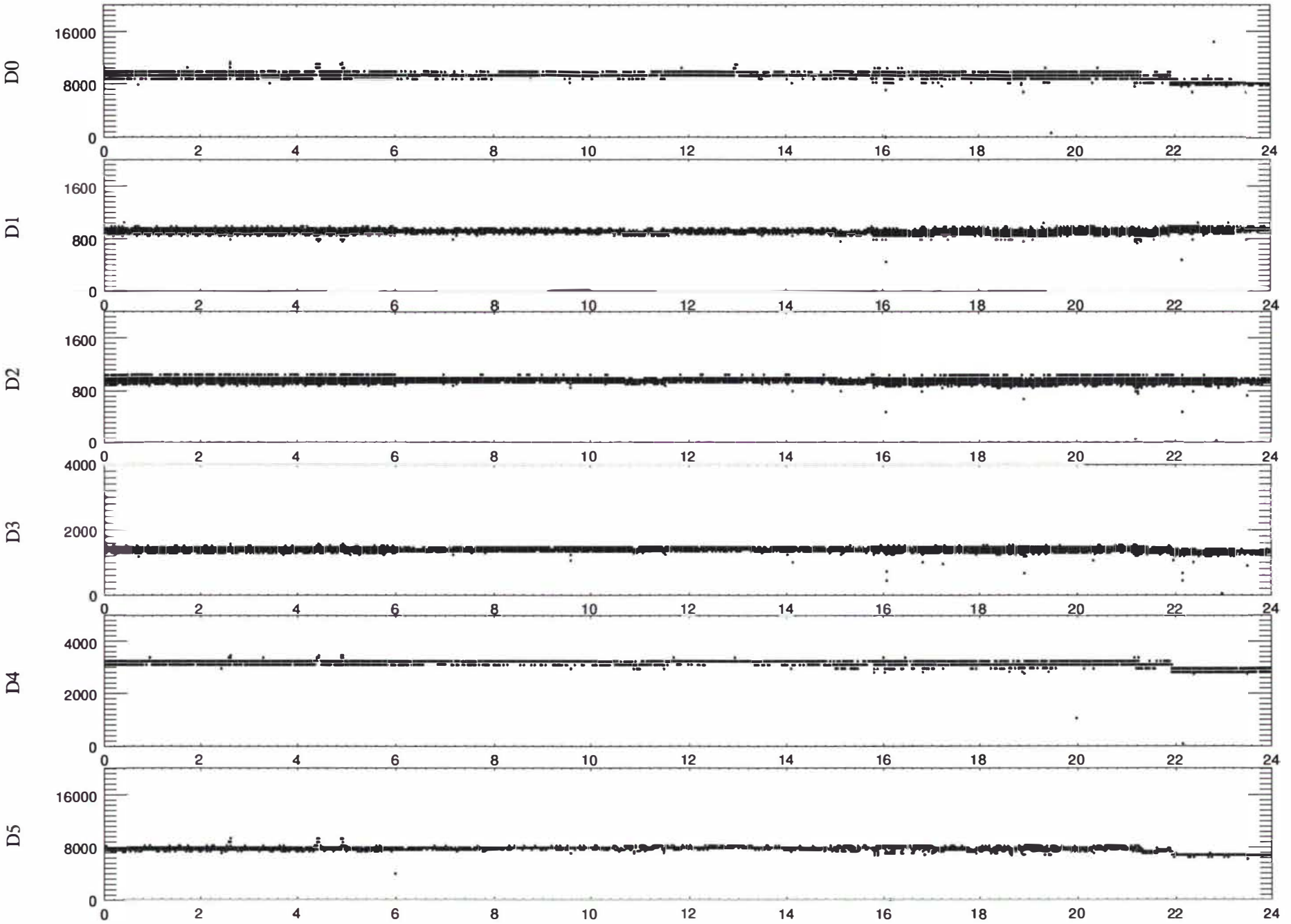
HUS 2A, MODE 1, NOT AVERAGED EDR day 107, year 1993 to day 107, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIVERSAL TIME

HUS 2B COUNTS / SEC QEDR day 107, year 1993 to day 107, year 1993 4/22/93



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

 BATSE BURST #     2307
 EVENT OF 1993 APR 18 DAY OF YEAR=108
 EVENT CROSSING TIME AT BATSE      : 52698. S. OR 14:38:18.0
 COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 313.000   21.000
 BATSE PEAK COUNTING RATE:   8000     C/S
 EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
 INTERPOLATED POSITION OF ULYSSES ON 18/ 4/  93 IS:
 RA=  144.300 DEC=  -12.375 DIST=     4.222 AU
 BATSE-ULYSSES DISTANCE =  631600447. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 13.83 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2045.73 SECS.
 CROSSING TIME AT ULYSSES     IS 54744. S. OR   15:12:23 +/-  168.49 SECONDS
```



```
From BRIGGS@fender.msfc.nasa.gov Mon Apr 19 21:00:23 1993
Date:    Mon, 19 Apr 1993 23:04:46 -0500 (CDT)
From: BRIGGS@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s   RA   Dec
   2307   930418     9095    52698      8000   313   +21
```

RI?

Helio corr removed

Date: Dec 18 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☐ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution? NO - bad stats

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

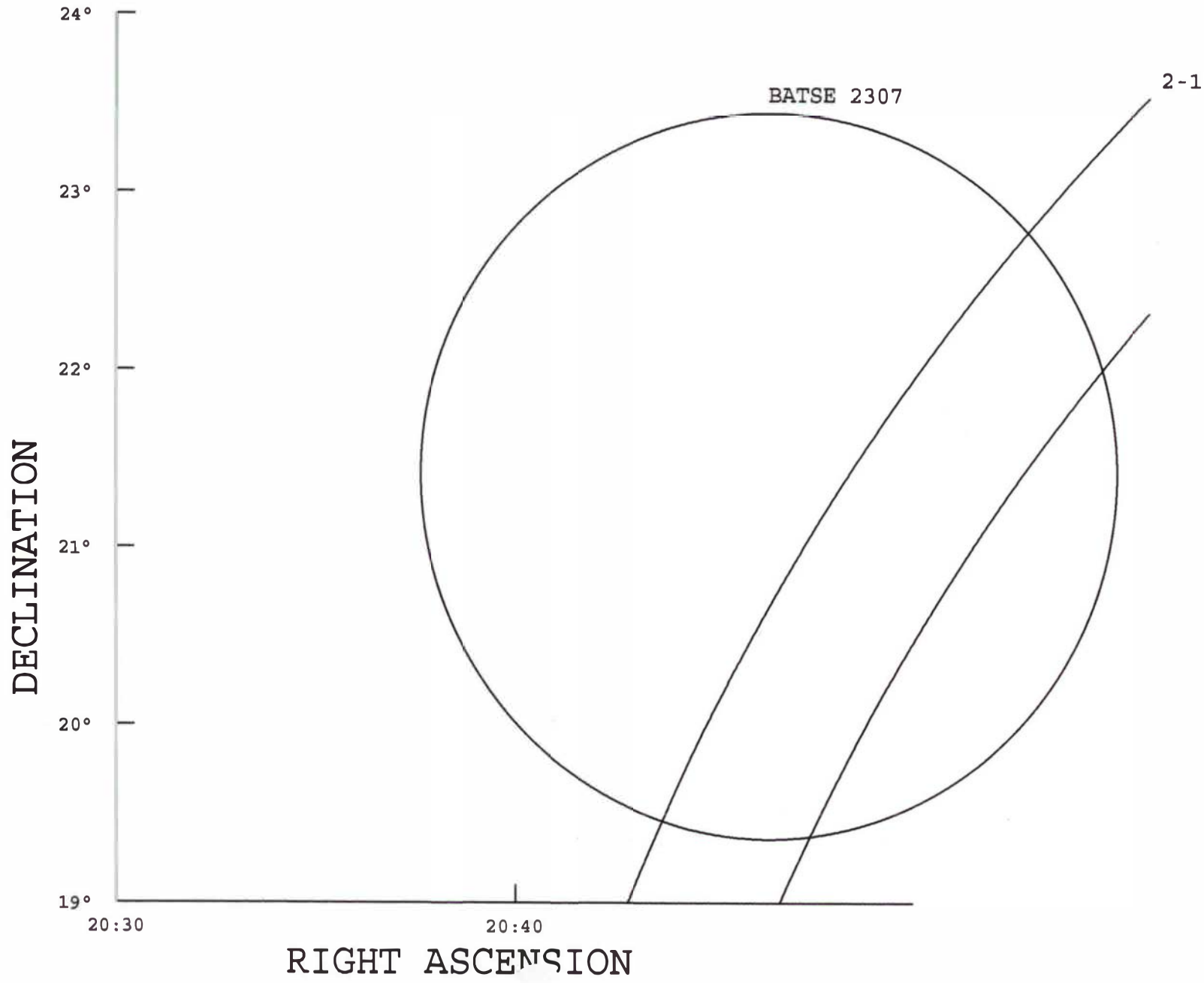
☐ 2000 coordinates used?

☐ Geocentric time used?

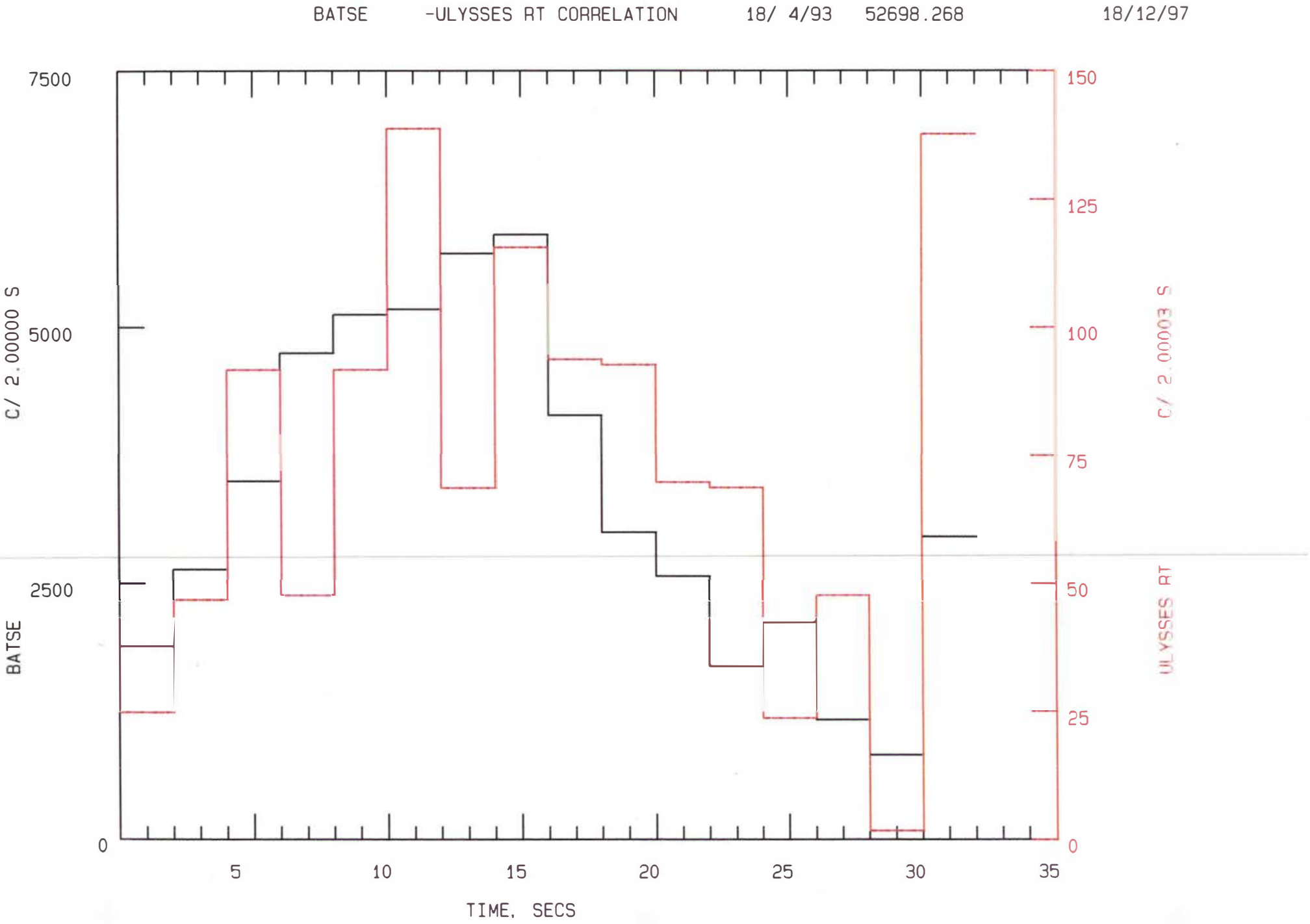
☑ ACCESS database updated?

EVENT OF APR 18, 1993 15:11

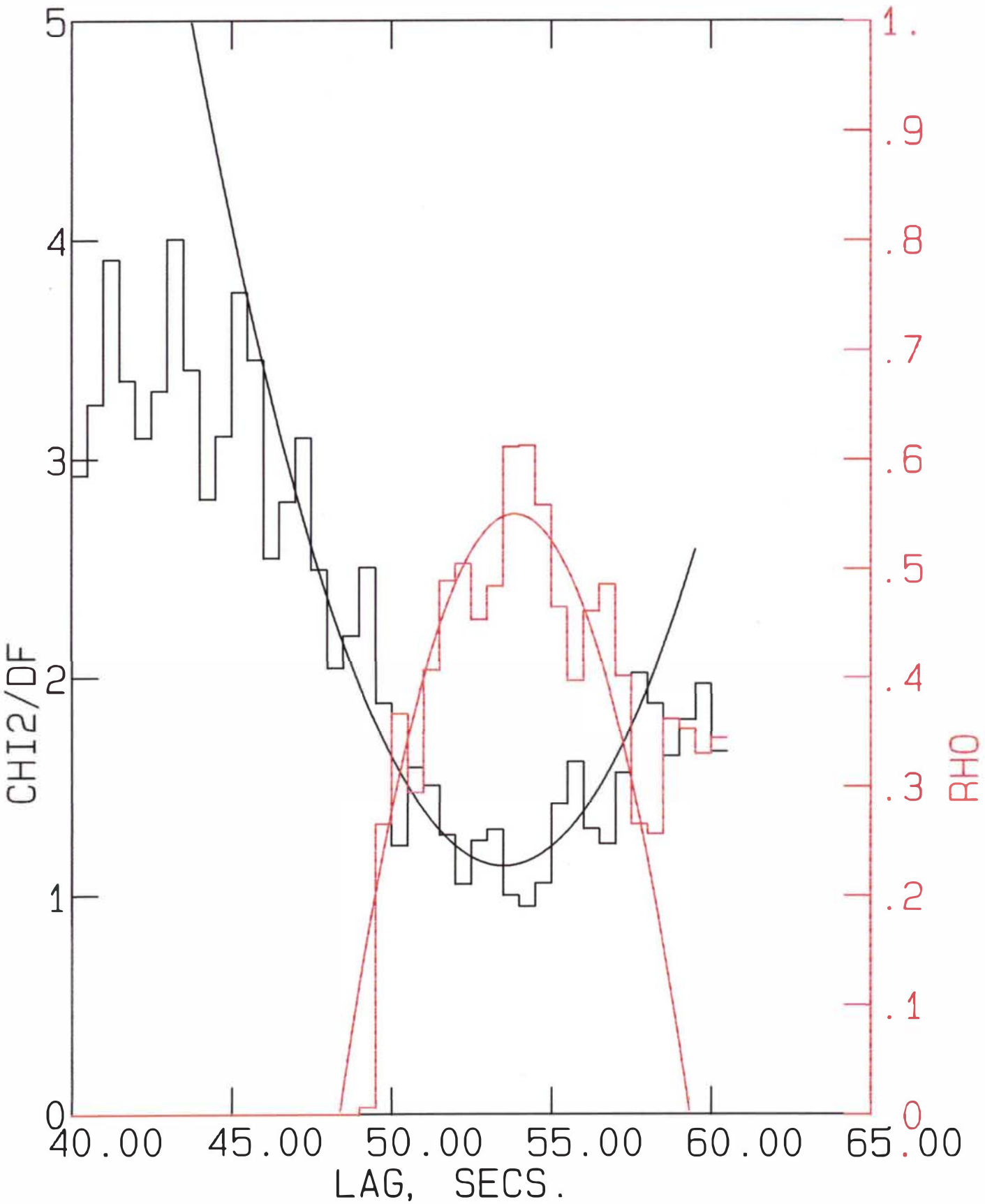
18/12/97



N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE


BATSE -ULYSSES RT CORRELATION 18/ 4/93 52698.268 18/12/97
7500
5000
2500
0
C/ 2.00000 S
BATSE
150
125
100
75
50
25
0
C/ 2.00003 S
ULYSSES RT
5
10
15
20
25
30
35
TIME, SECS

BATSE -ULYSSES RT CORRELATION 18/ 4/93 52698.268



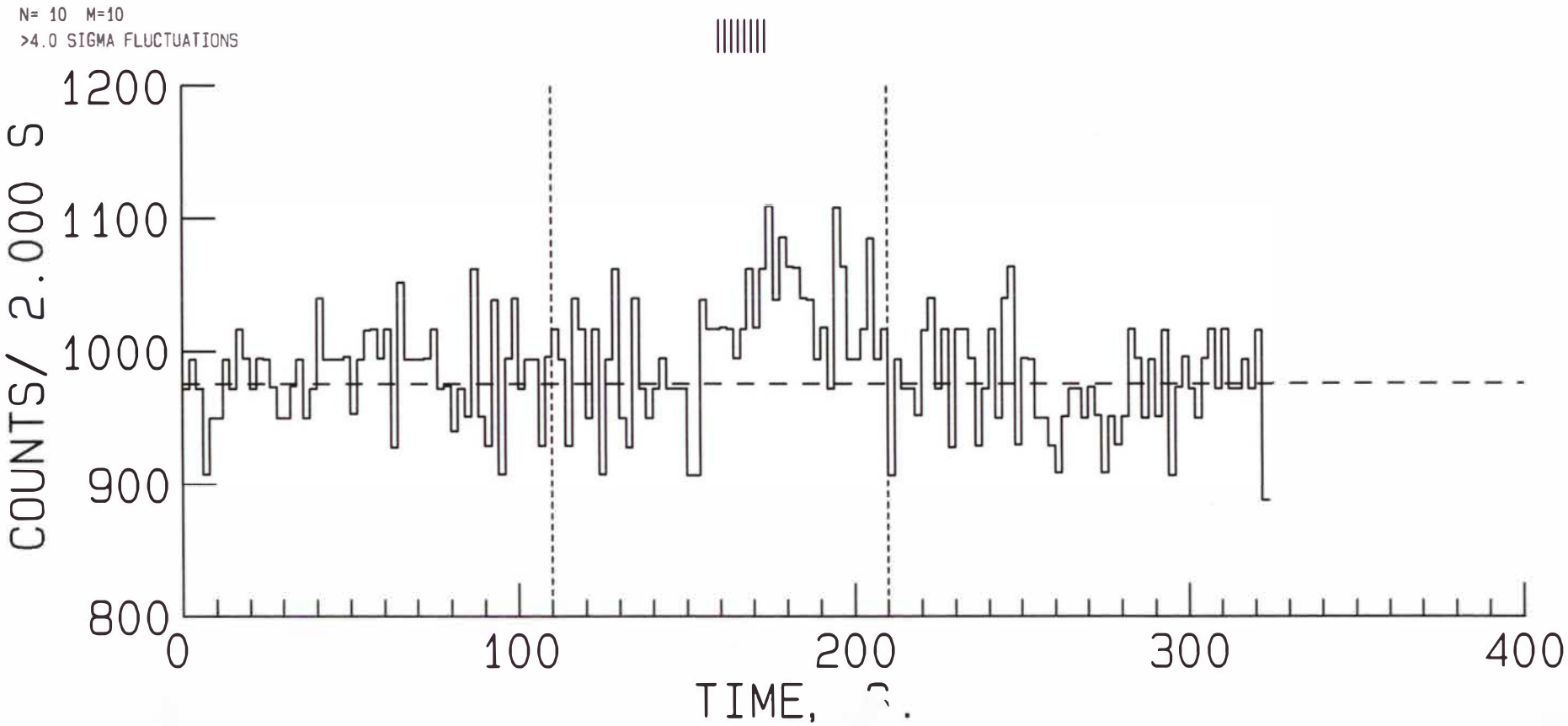
ULYSSES RT

18/12/97

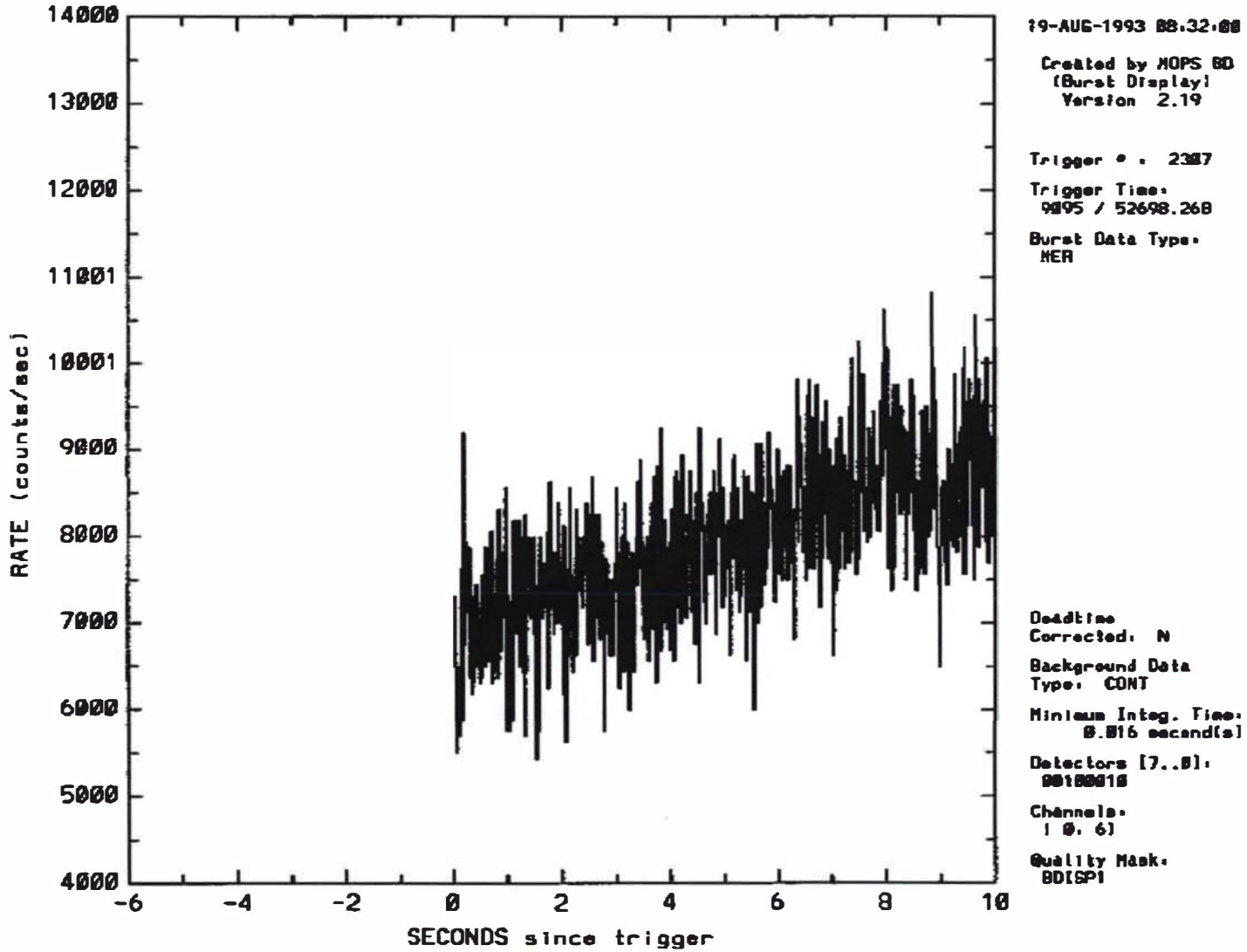
18/ 4/93 54576.015 s

0.500 S INTERVALS REGROUPED BY 4

21- 145 keV



DATA FOR K. HURLEY



19-AUG-1993 08:32:08

Created by MOPS BD
(Burst Display)
Version 2.19

Trigger # : 2387

Trigger Time:
9095 / 52698.268

Burst Data Type:
MER

Deadtime
Corrected: N

Background Data
Type: CONT

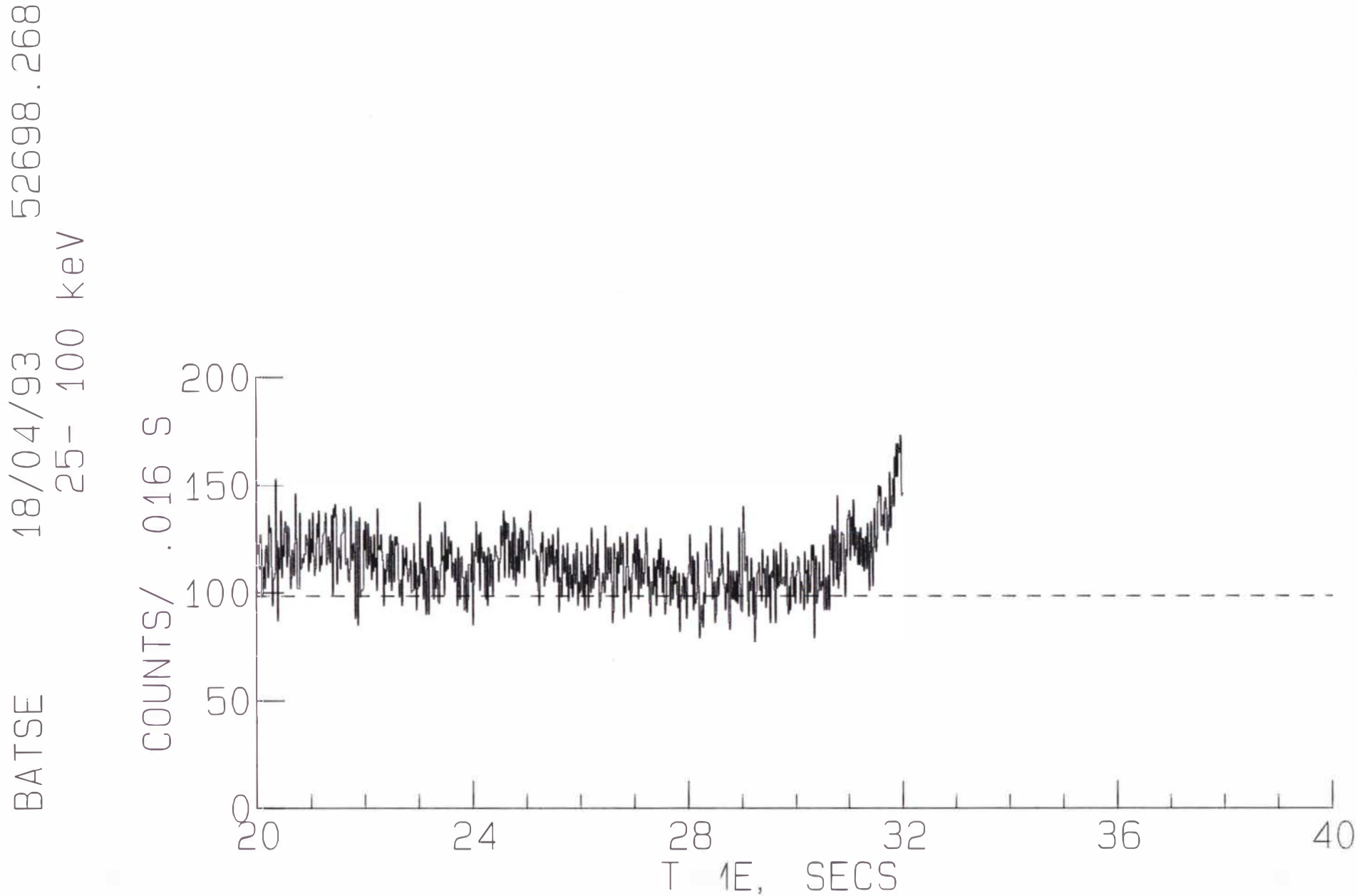
Minimum Integ. Time:
0.016 second(s)

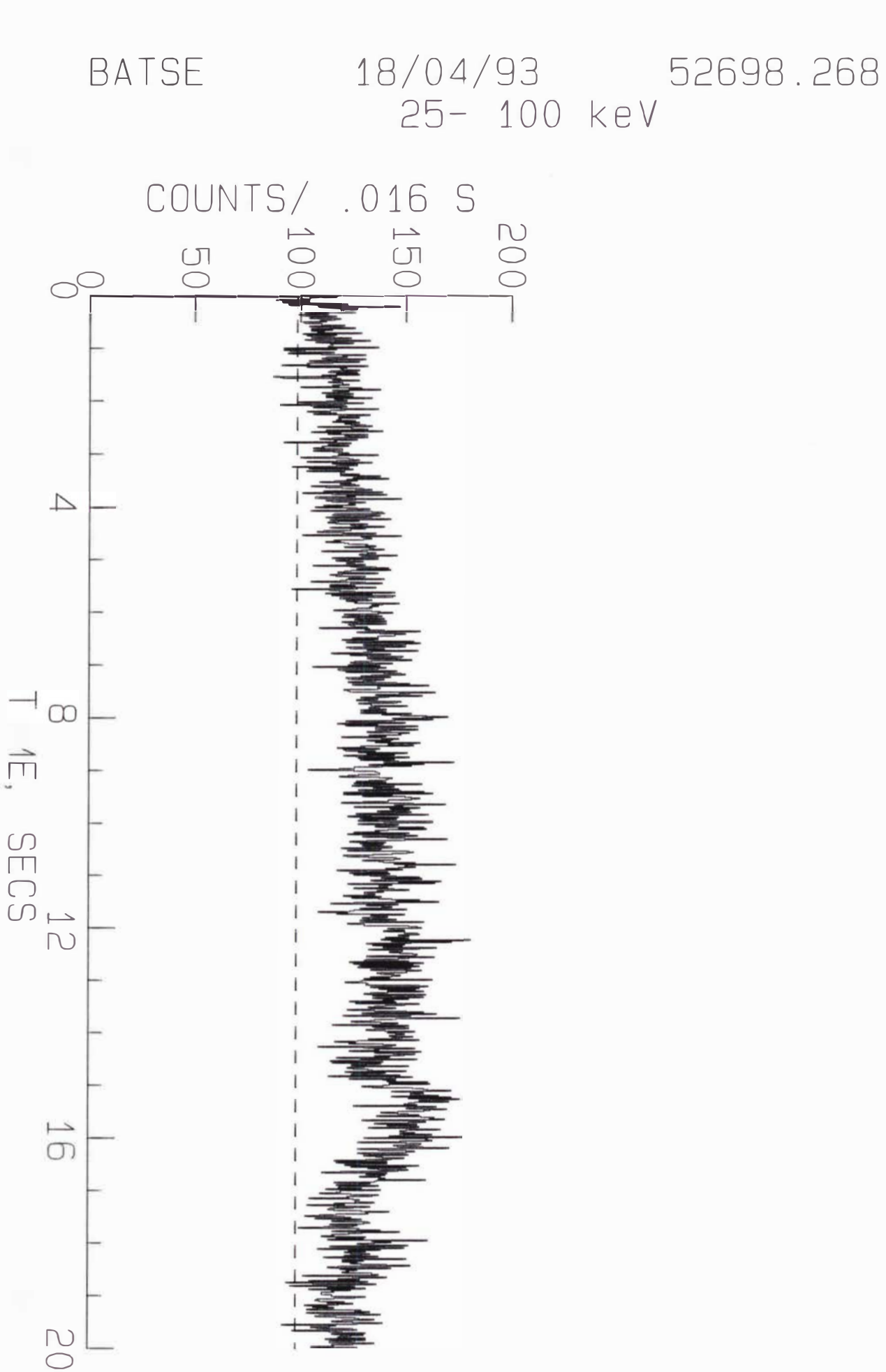
Detectors [7..0]:
00100010

Channels:
[0, 6]

Quality Mask:
BDISP1

11/ 9/93


BATSE 18/04/93 52698.268
25- 100 keV
COUNTS/ .016 S
200
150
100
50
0
20
24
28
32
36
40
T 1E, SECS


BATSE 18/04/93 52698.268
25- 100 keV
COUNTS/ .016 S
0
50
100
150
200
0
4
8
12
16
20
T 1E, SECS

```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2309
EVENT OF 1993 APR 18 DAY OF YEAR=108
EVENT CROSSING TIME AT BATSE      : 81847. S. OR 22:44:07.0
COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 335.000    19.000
BATSE PEAK COUNTING RATE:    5000     C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 18/ 4/  93 IS:
RA=  144.300 DEC=  -12.375 DIST=     4.222 AU
BATSE-ULYSSES DISTANCE =  631600447. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 12.24 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2058.89 SECS.
CROSSING TIME AT ULYSSES     IS 83906. S. OR   23:18:25 +/-  158.82 SECONDS



Apr 23 07:30 1993  standard input Page 31


From BRIGGS@fender.msfc.nasa.gov Mon Apr 19 22:42:02 1993
Date:     Tue, 20 Apr 1993 0:46:25 -0500 (CDT)
From: BRIGGS@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s    RA    Dec
   2309    930418     9095    81847      5000    335    +19
```

NO, but some QEDR data missing

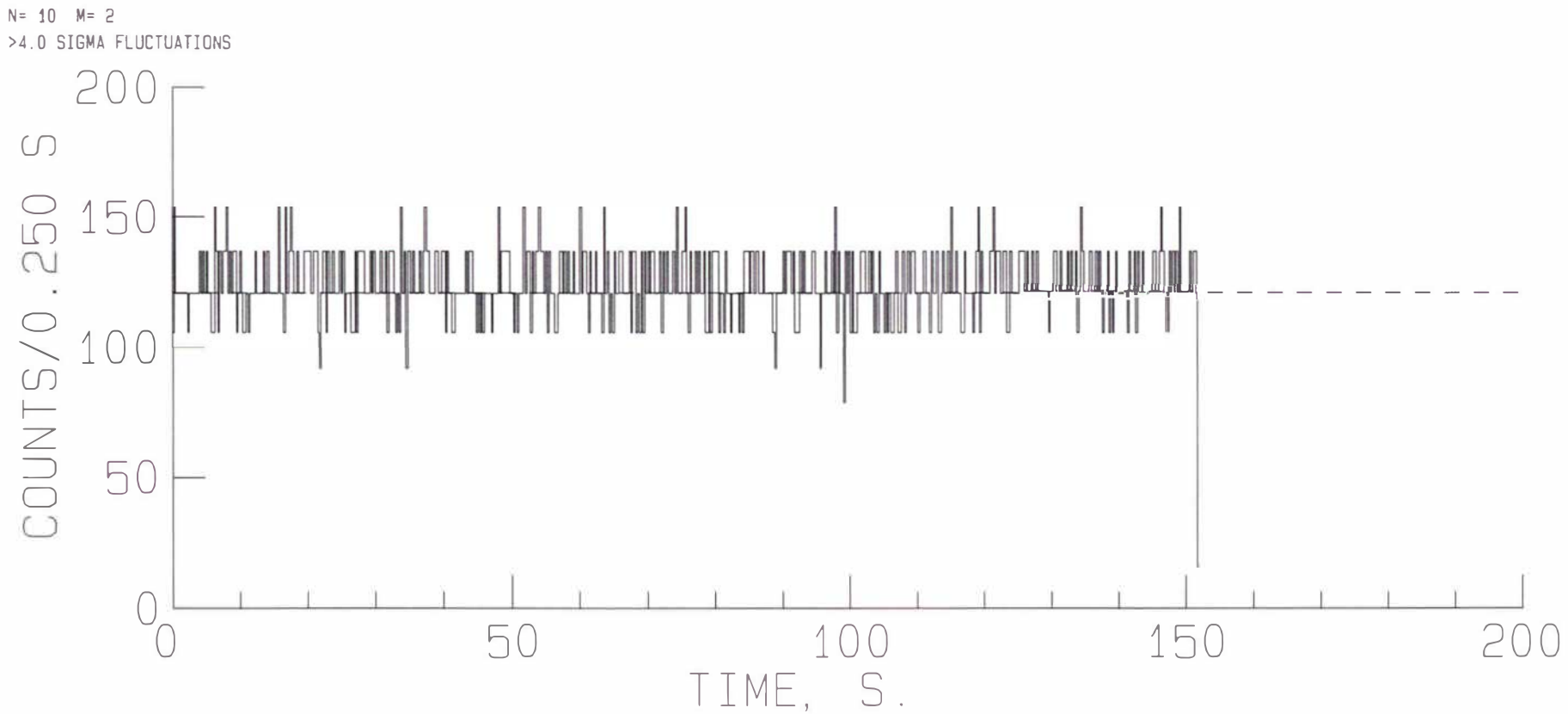
Check again when EDR comes in — NO

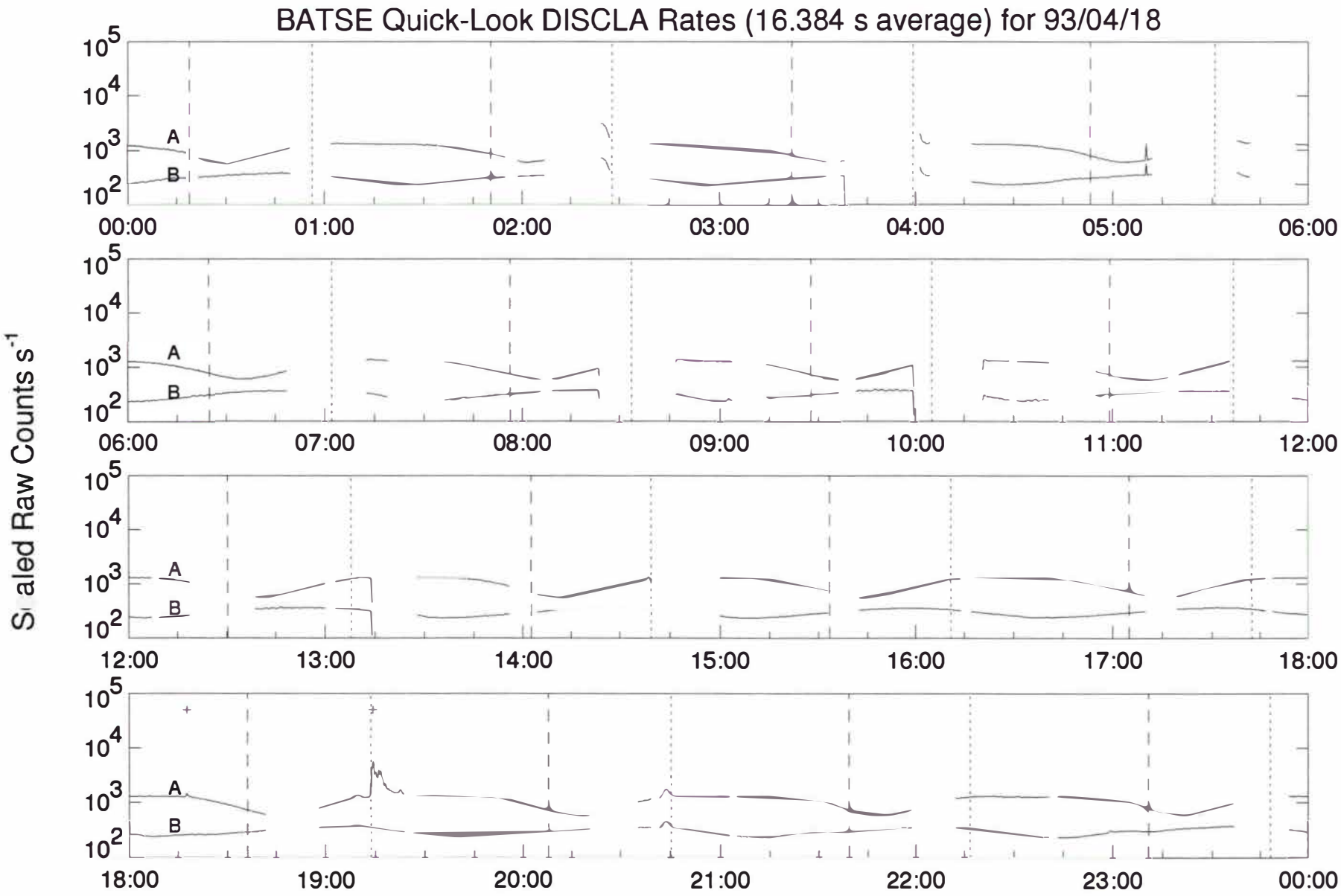
15/ 6/93

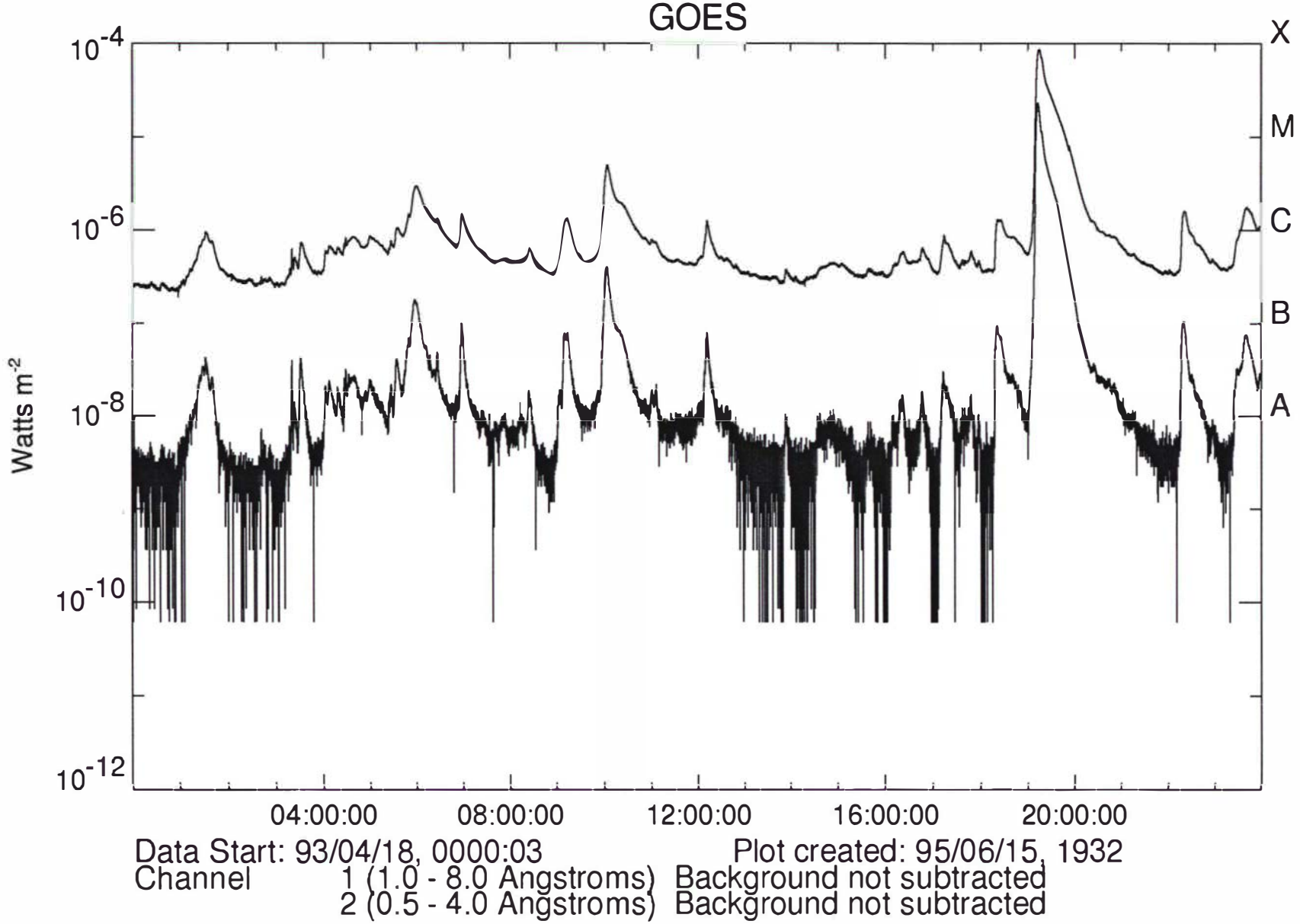
ULYSSES RT

18/ 4/93 83736.219 s

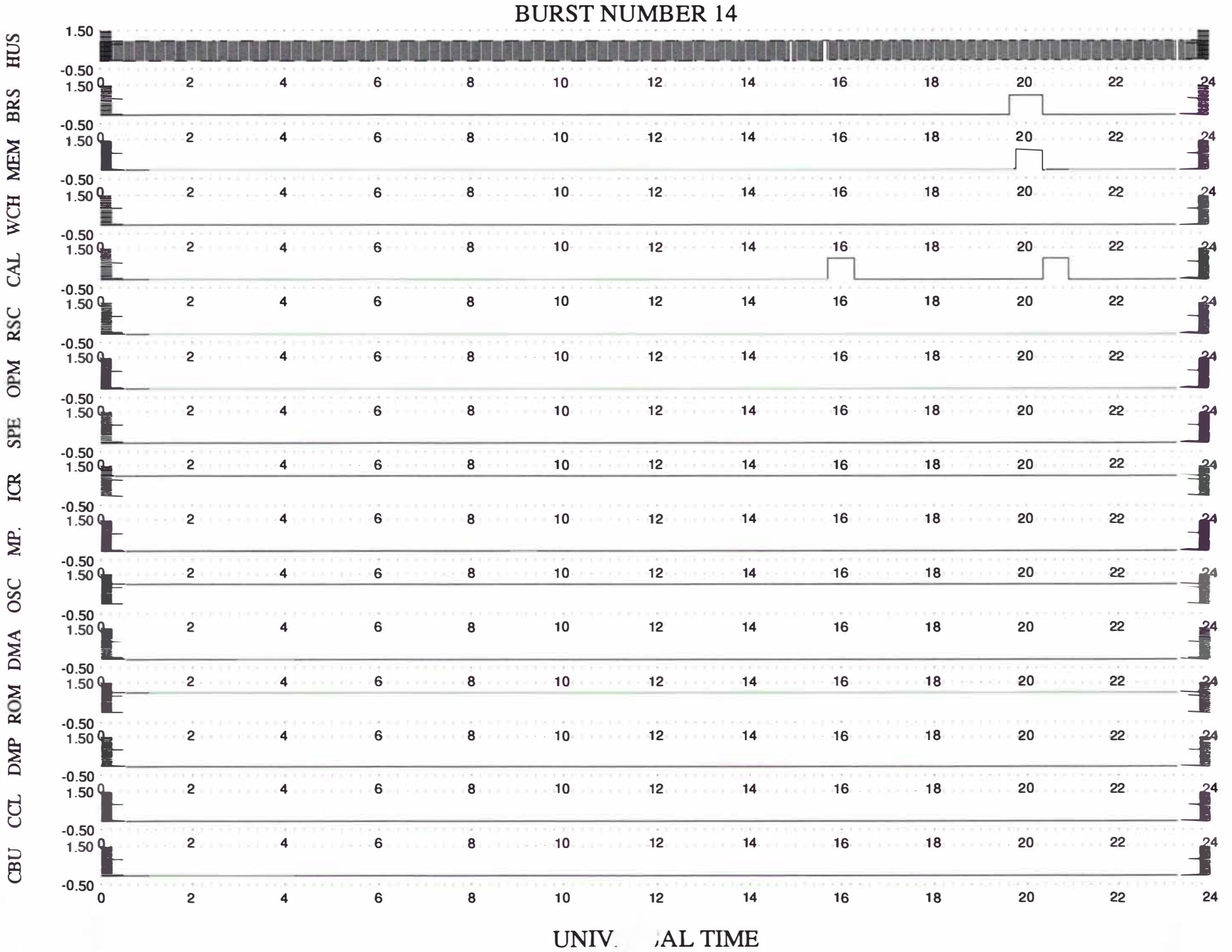
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/18
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/21, 1418 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

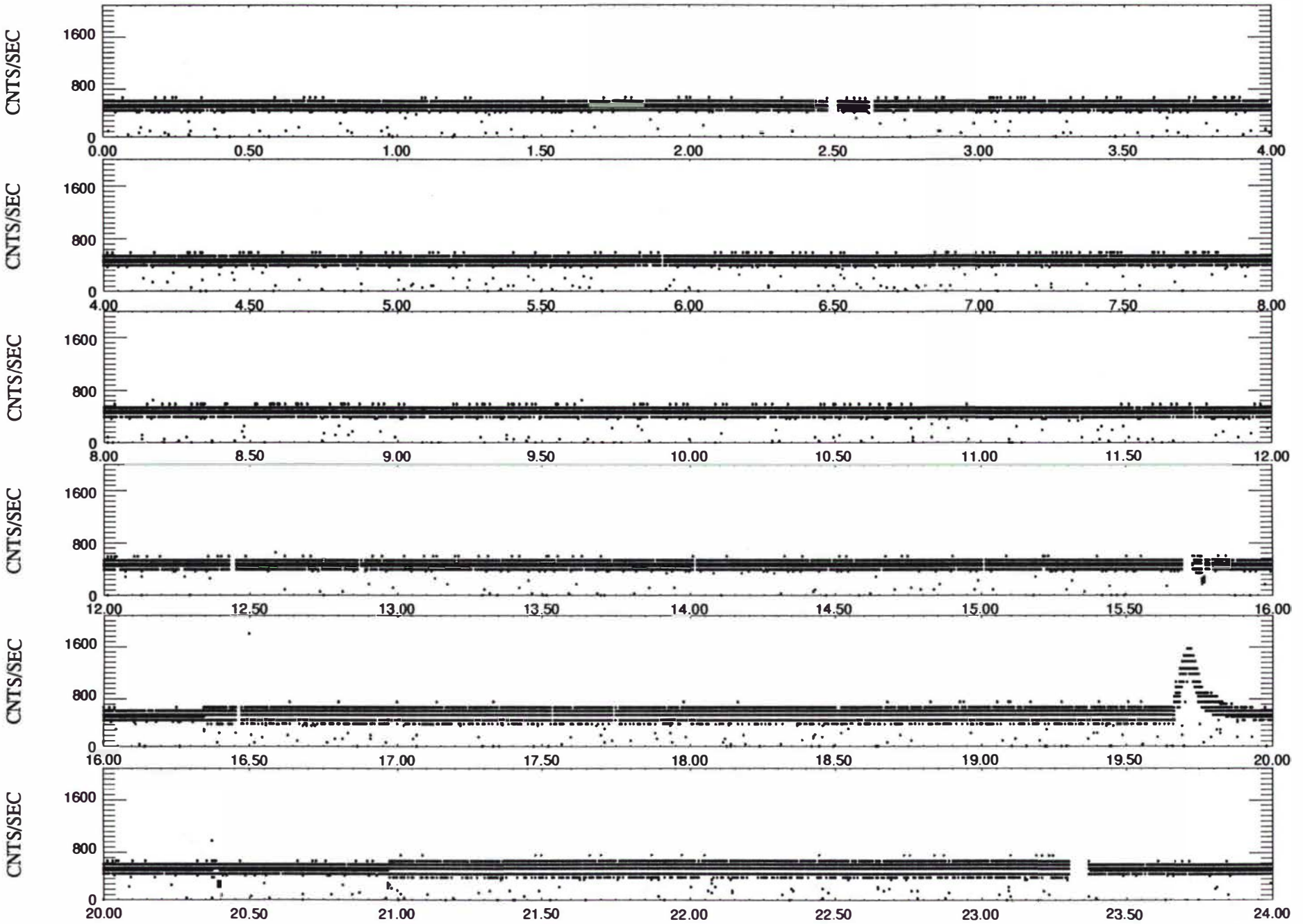

GOES
10^{-4}
10^{-6}
10^{-8}
10^{-10}
10^{-12}
Watts m^{-2}
X
M
C
B
A
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/18, 0000:03
Plot created: 95/06/15, 1932
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 108, year 1993 to day 108, year 1993 6/12/93



HUS 2A, MODE 1, NOT AVERAGED EDR day 108, year 1993 to day 108, year 1993 6/12/93

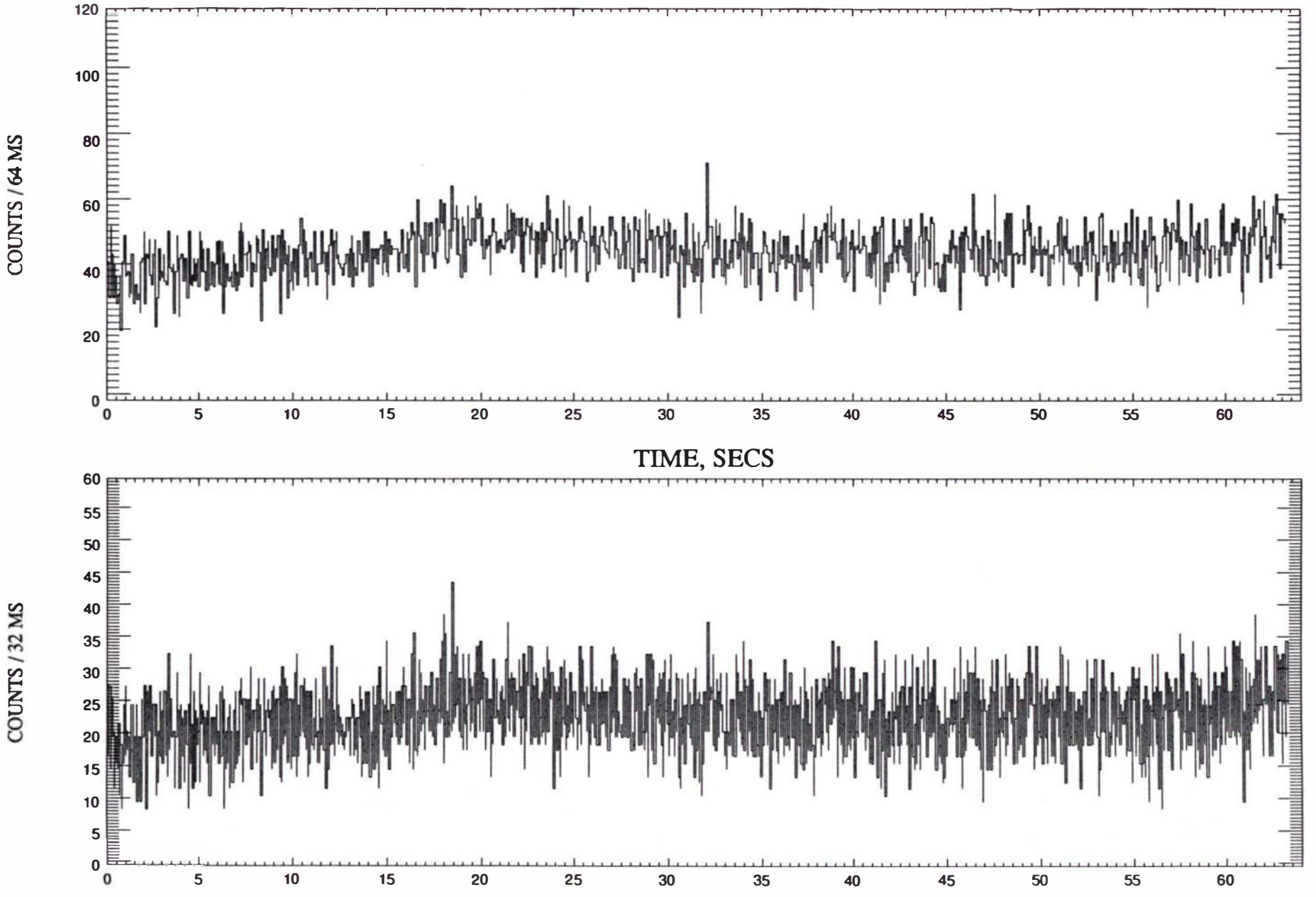
CALIBRATION DATA INCLUDED



UNI[illegible]SAL TIME

HUS 2A TRIGGERED DATA EDR day 108, year 1993 6/12/93

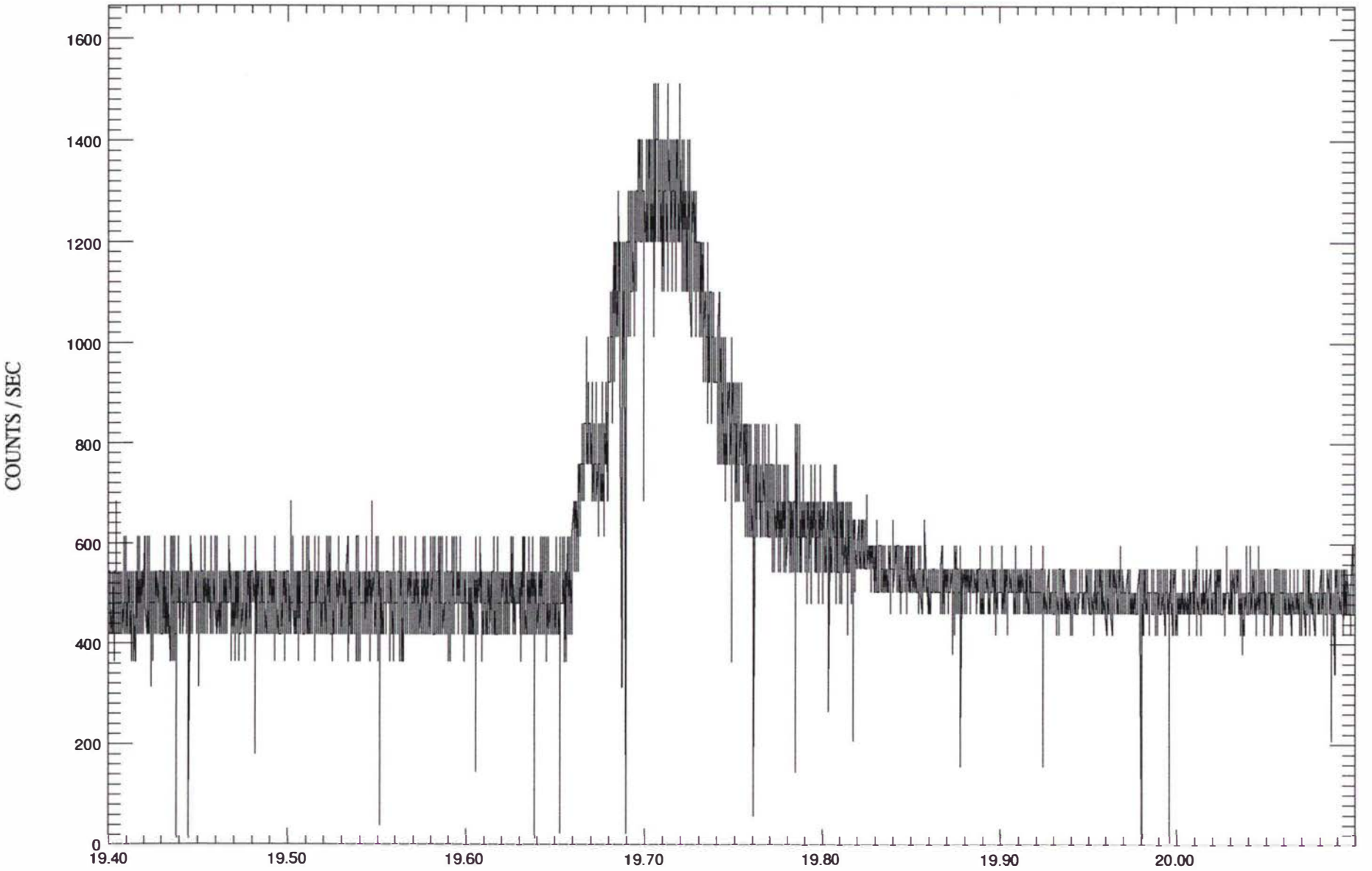
Burst Counter 14 at UT=19.664931483799 h=70793.753 s 19:39:53.753



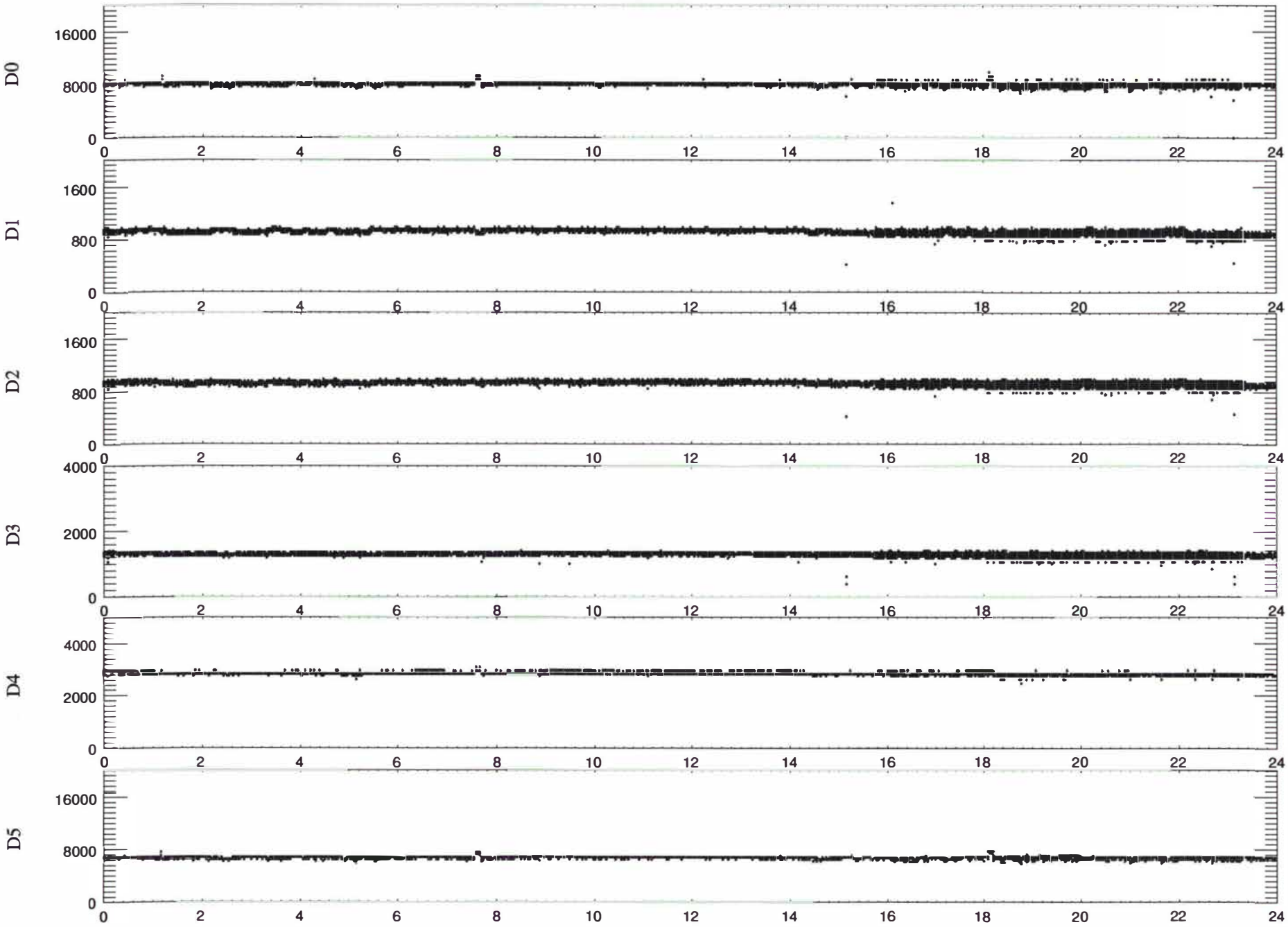
B# 1

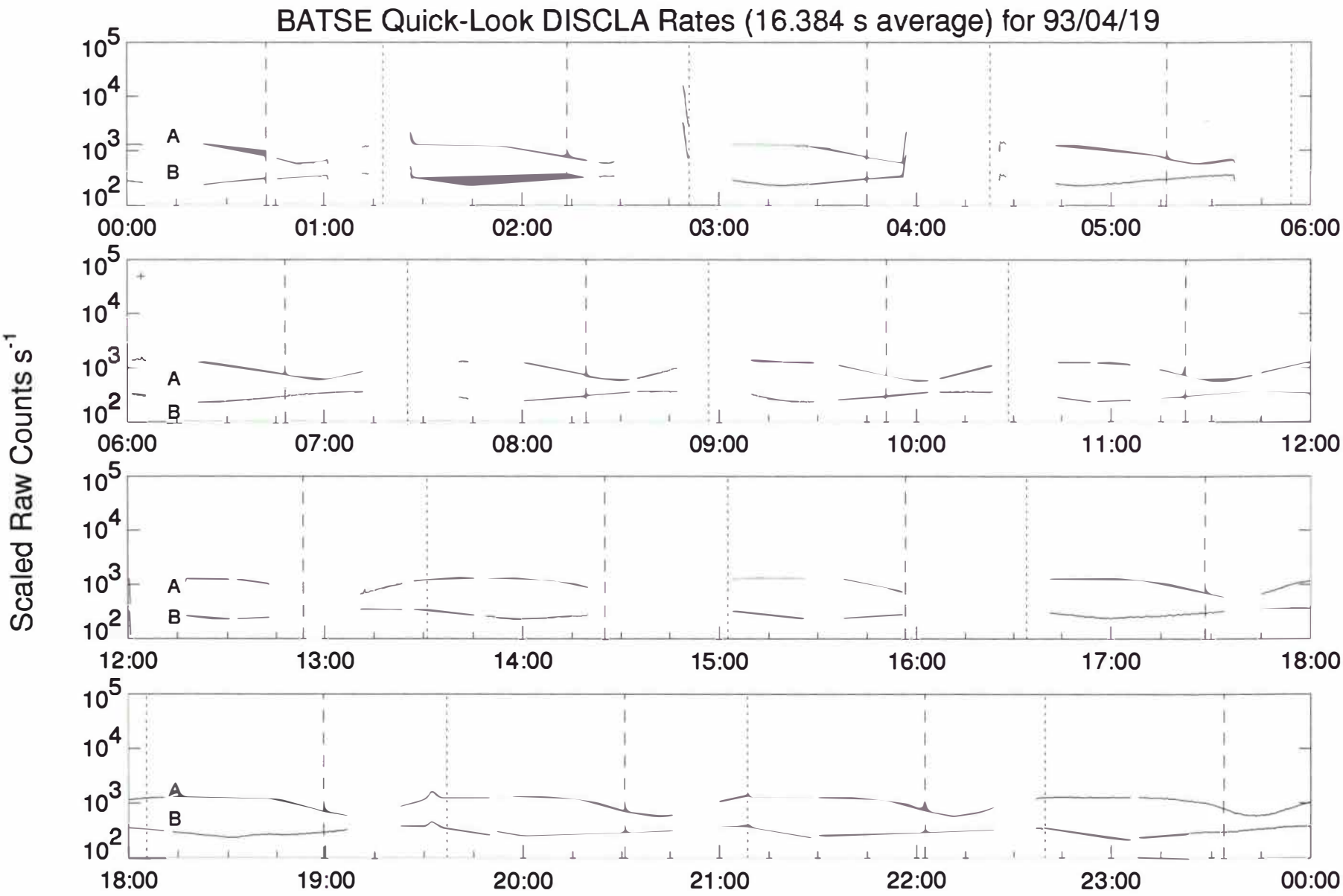
HUS 2A, MODE 1, NOT AVERAGED QEDR day 108, year 1993 to day 108, year 1993 4/26/93

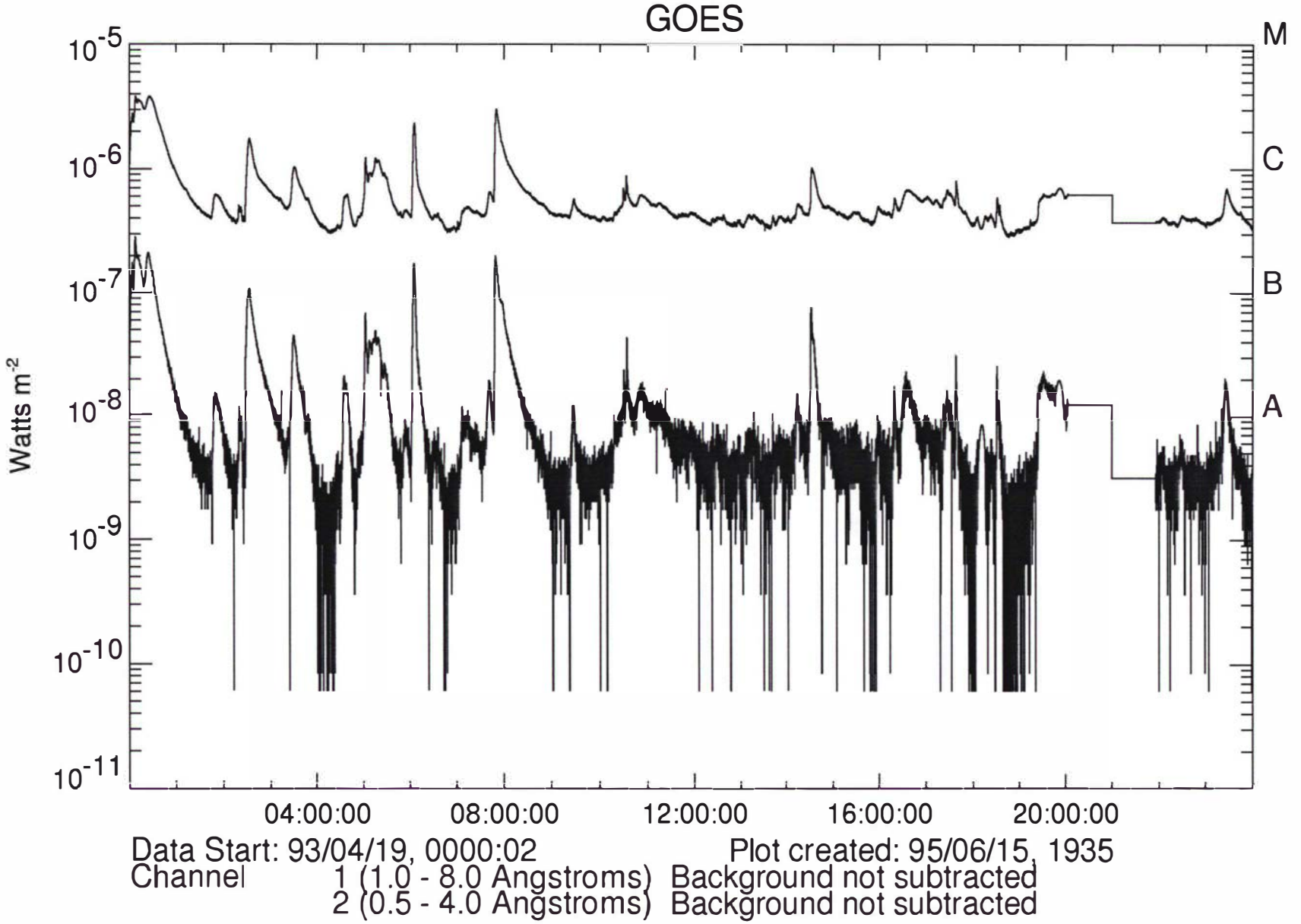
CALIBRATION DATA INCLUDED



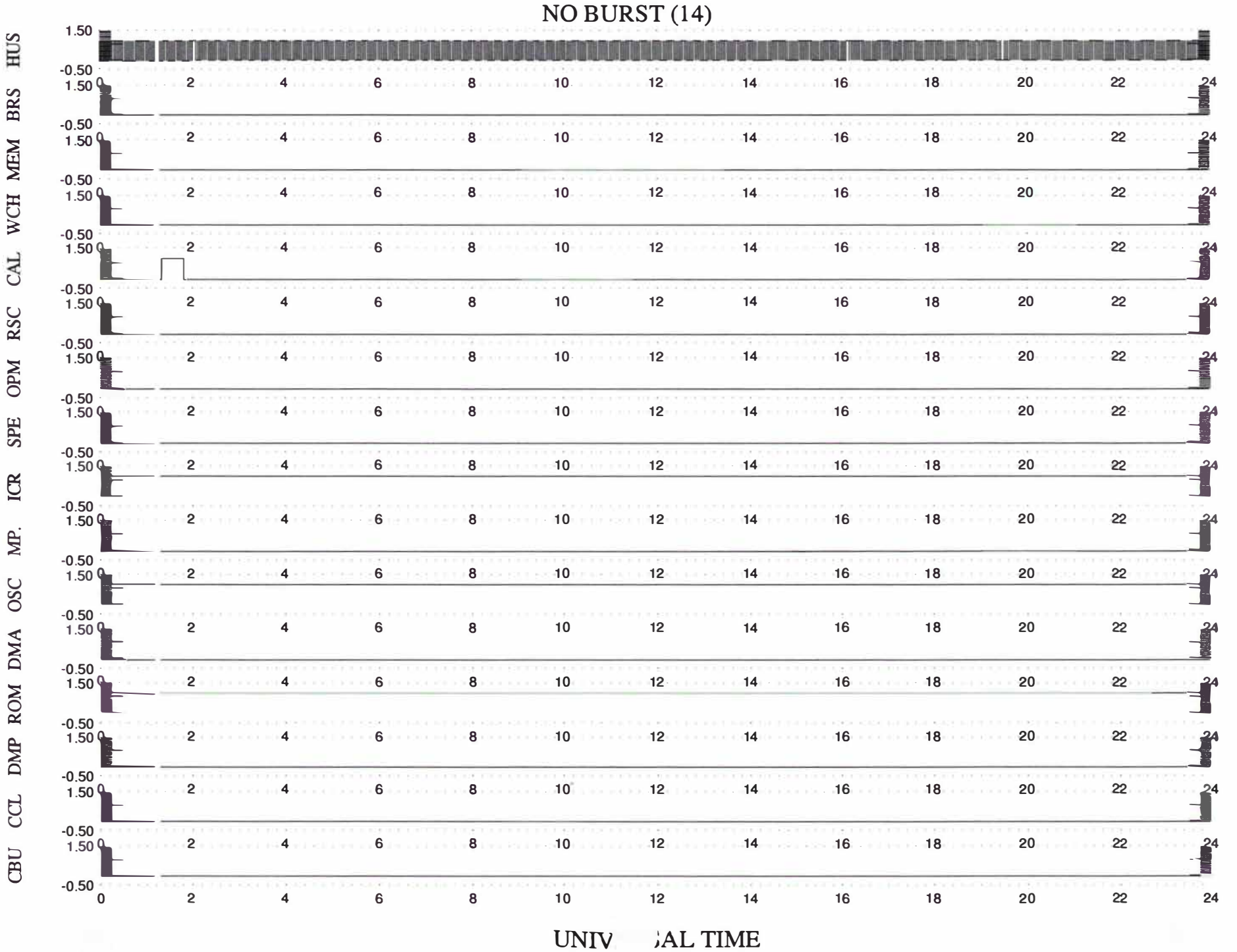
HUS 2B COUNTS / SEC QEDR day 108, year 1993 to day 108, year 1993 4/22/93




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/19
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/21, 1419 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

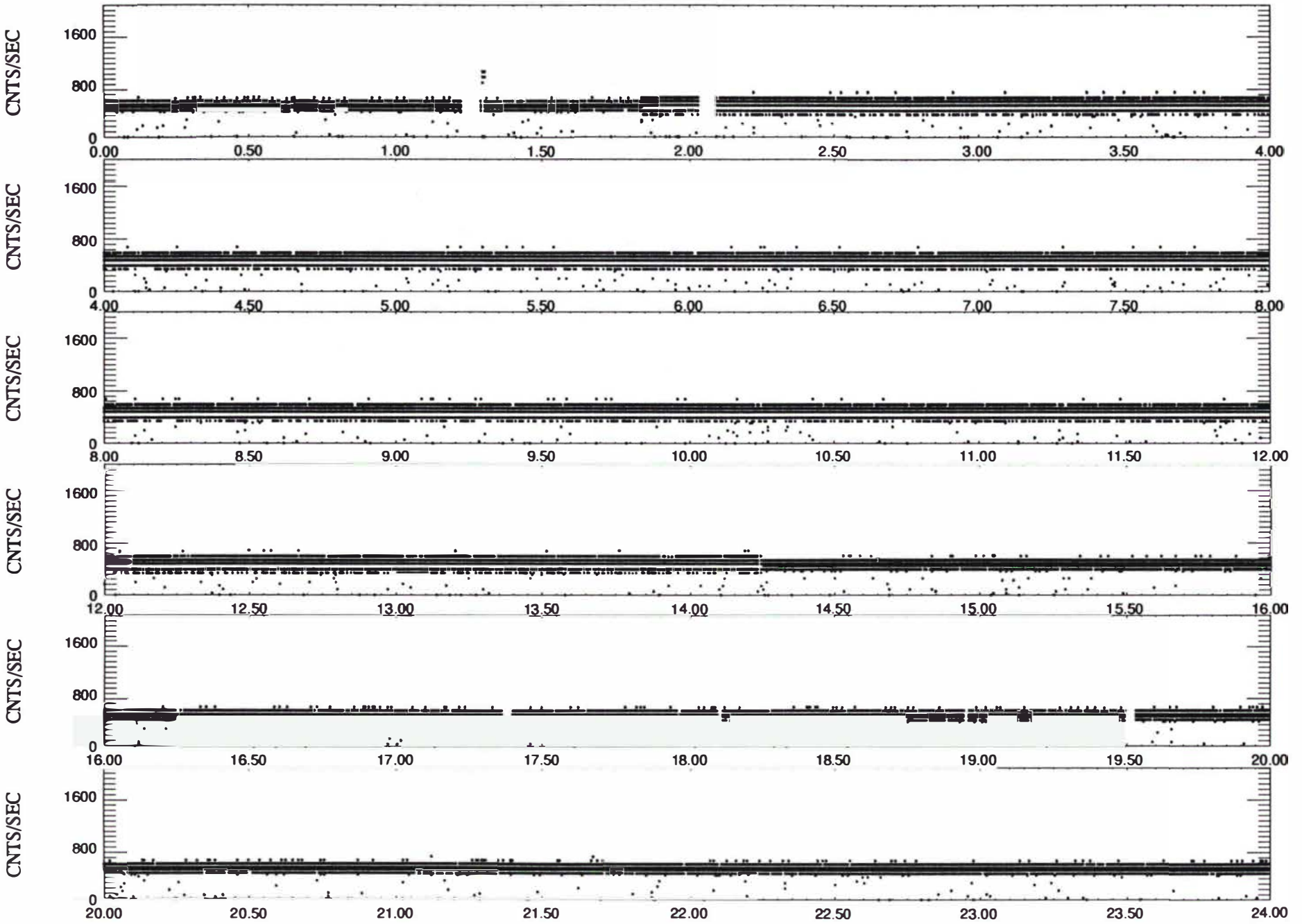

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/19, 0000:02
Plot created: 95/06/15, 1935
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 109, year 1993 to day 109, year 1993 6/12/93



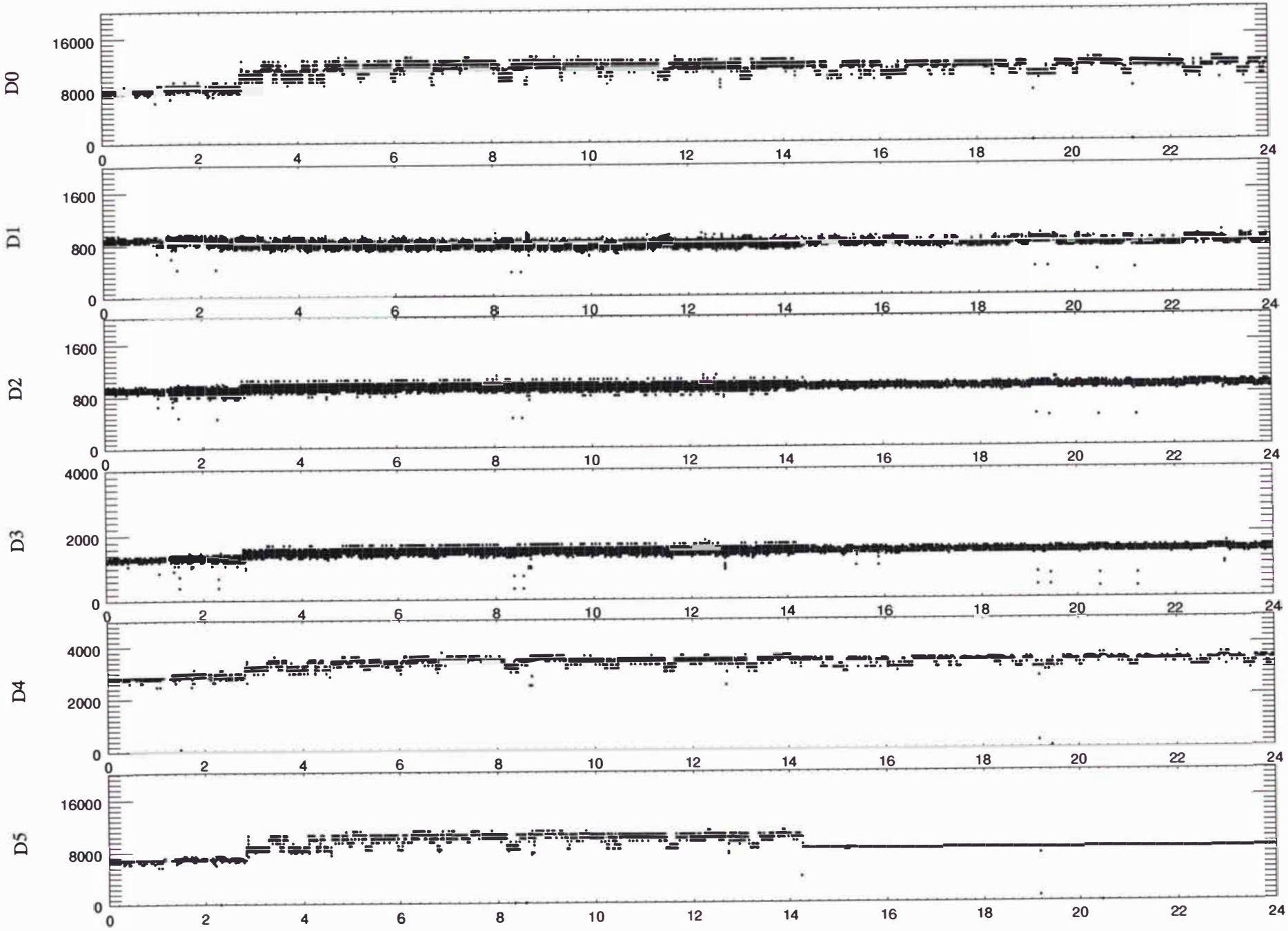
HUS 2A, MODE 1, NOT AVERAGED EDR day 109, year 1993 to day 109, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UN ERSAL TIME

HUS 2B COUNTS / SEC QEDR day 109, year 1993 to day 109, year 1993 4/22/93



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2310
EVENT OF 1993 APR 20 DAY OF YEAR=110
EVENT CROSSING TIME AT BATSE      : 19192. S. OR 05:19:52.0
COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION:  37.000  -23.000
BATSE PEAK COUNTING RATE:    2300    C/S
EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
POSITION OF ULYSSES ON 20/ 4/  93 IS:
RA=  144.067 DEC=  -12.267 DIST=     4.242 AU
BATSE-ULYSSES DISTANCE =  634678000. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 79.57 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=  383.13 SECS.
CROSSING TIME AT ULYSSES    IS 19575. S. OR   05:26:15 +/-  417.30 SECONDS
```



```
From HAGEDON@ssl.msfc.nasa.gov Thu Apr 22 09:50:51 1993
Date:    Thu, 22 Apr 1993 11:50:46 -0500 (CDT)
From: HAGEDON@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec    Max ct/s   RA   Dec
   2310   930420    9097   19192     2300    037   -23
```



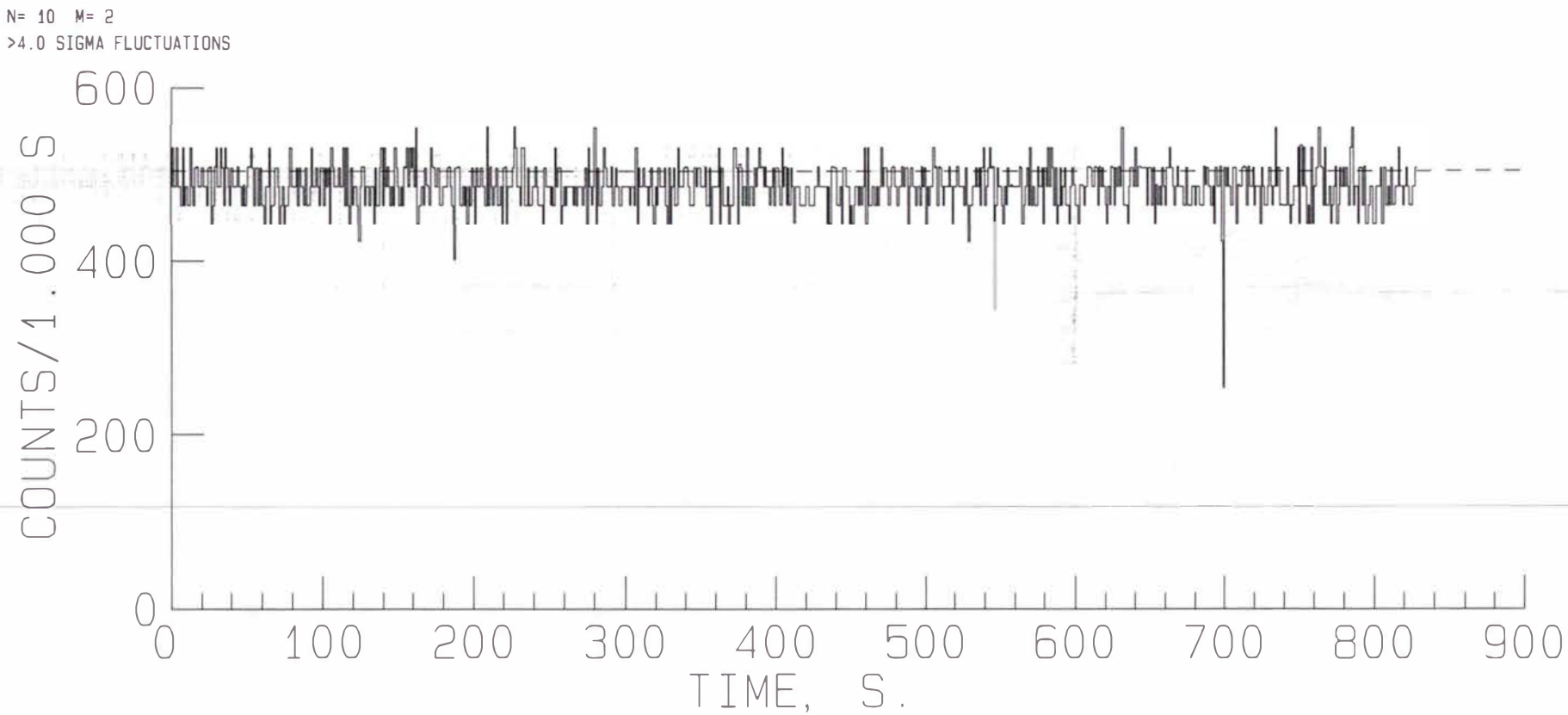
26/ 4/93

ULYSSES RT

20/ 4/93 19152.137 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

 BATSE BURST #     2311
 EVENT OF 1993 APR 20 DAY OF YEAR=110
 EVENT CROSSING TIME AT BATSE      : 65757. S. OR 18:15:57.0
 COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 247.000     4.000
 BATSE PEAK COUNTING RATE:    3100     C/S
 EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
 POSITION OF ULYSSES ON 20/ 4/  93 IS:
 RA=  144.067 DEC=  -12.267 DIST=     4.242 AU
 BATSE-ULYSSES DISTANCE =  634678000. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 76.53 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=  493.25 SECS.
 CROSSING TIME AT ULYSSES     IS 66250. S. OR   18:24:10 +/-  414.93 SECONDS
```



```
From HAGEDON@ssl.msfc.nasa.gov Thu Apr 22 09:52:56 1993
Date:    Thu, 22 Apr 1993 11:52:49 -0500 (CDT)
From: HAGEDON@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s   RA    Dec
   2311    930420    9097    65757      3100    247    +04
```

BATSE BURST# 2311

ULYSSES RT 4/ 5/98

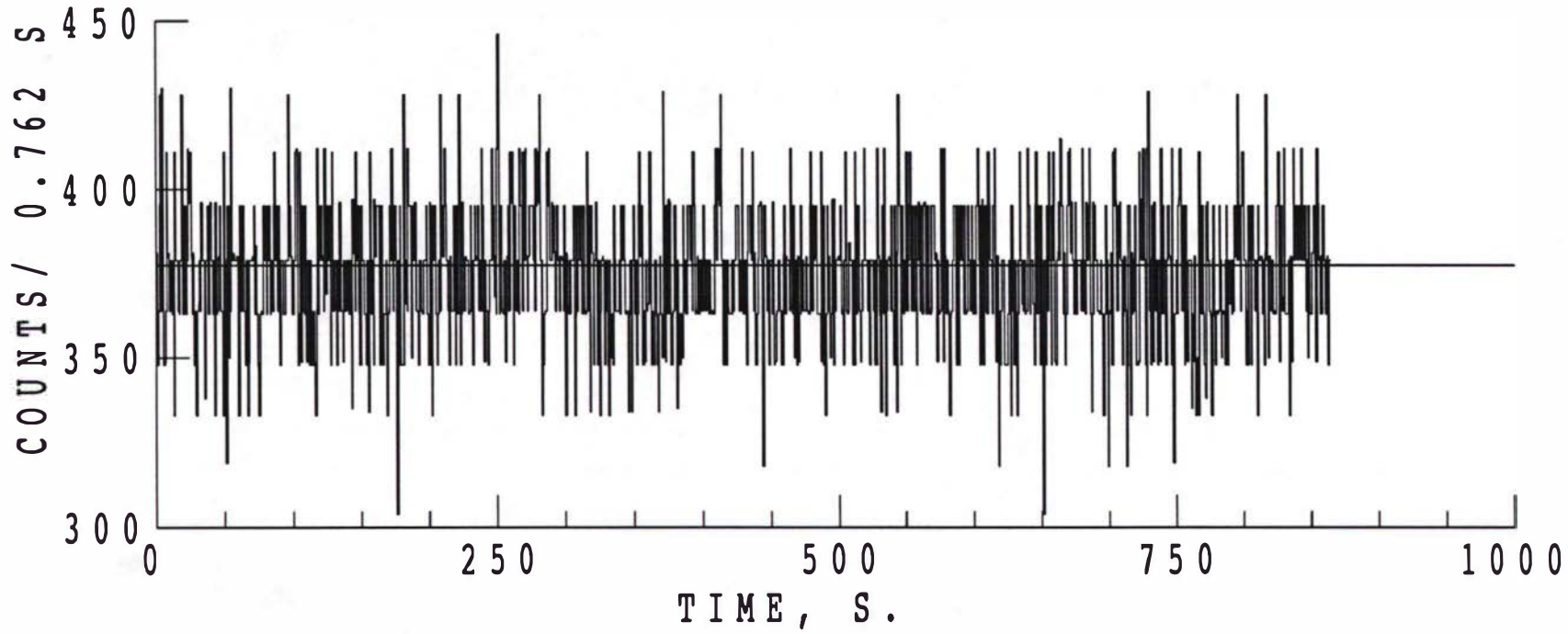
20/ 4/93 65556.109 s

0.254 S INTERVALS REGROUPED BY 3

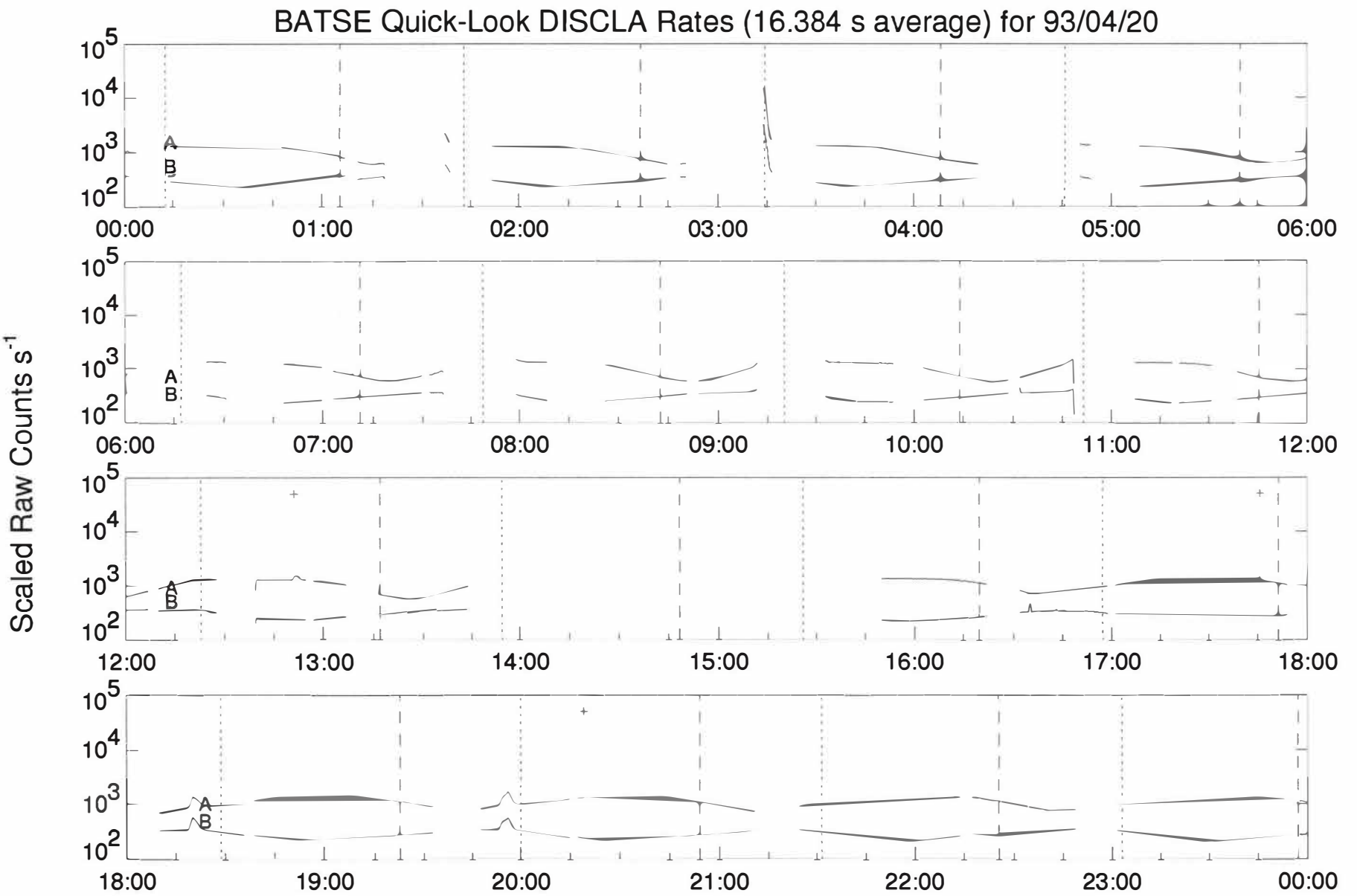
0- 0 keV

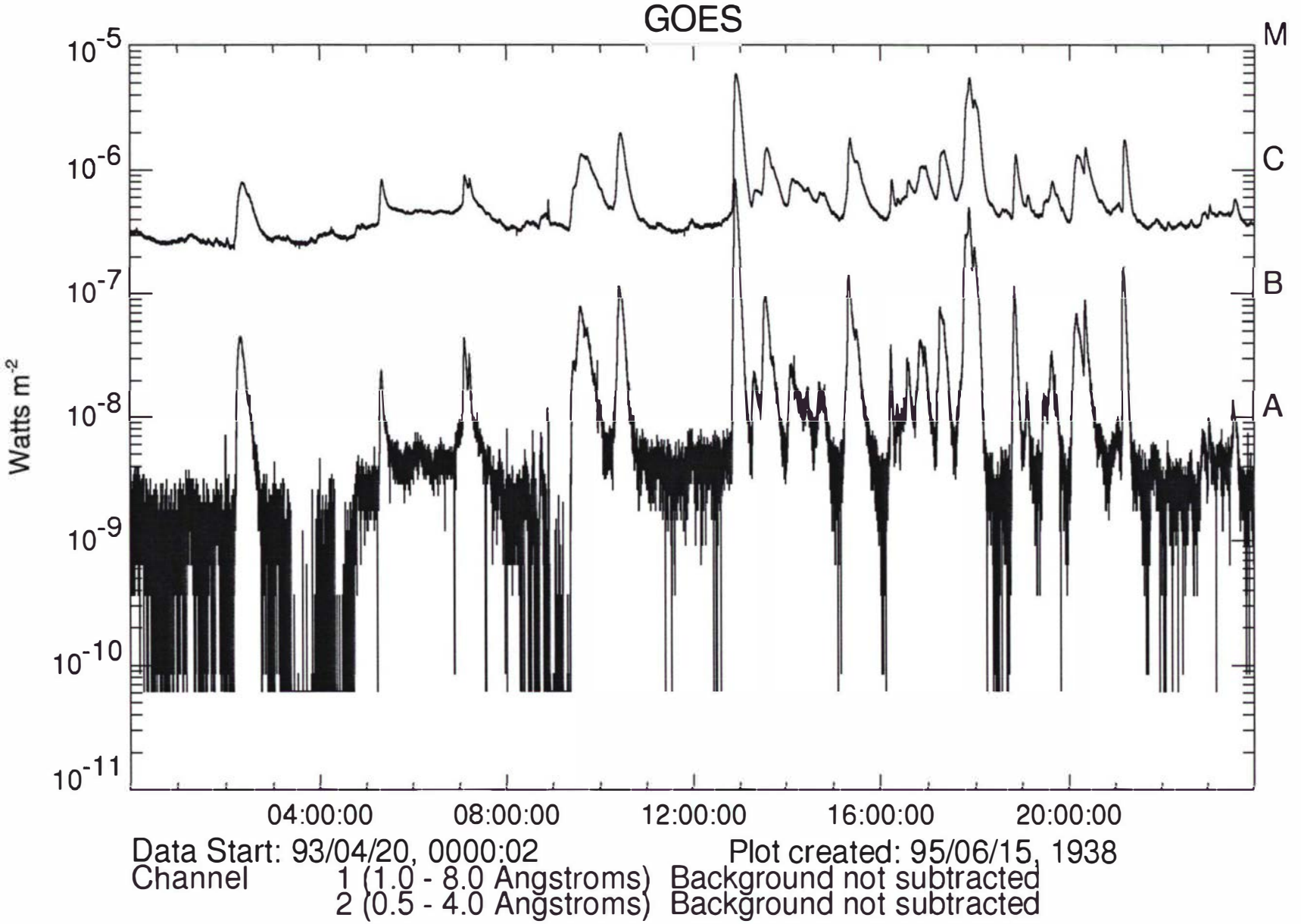
N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

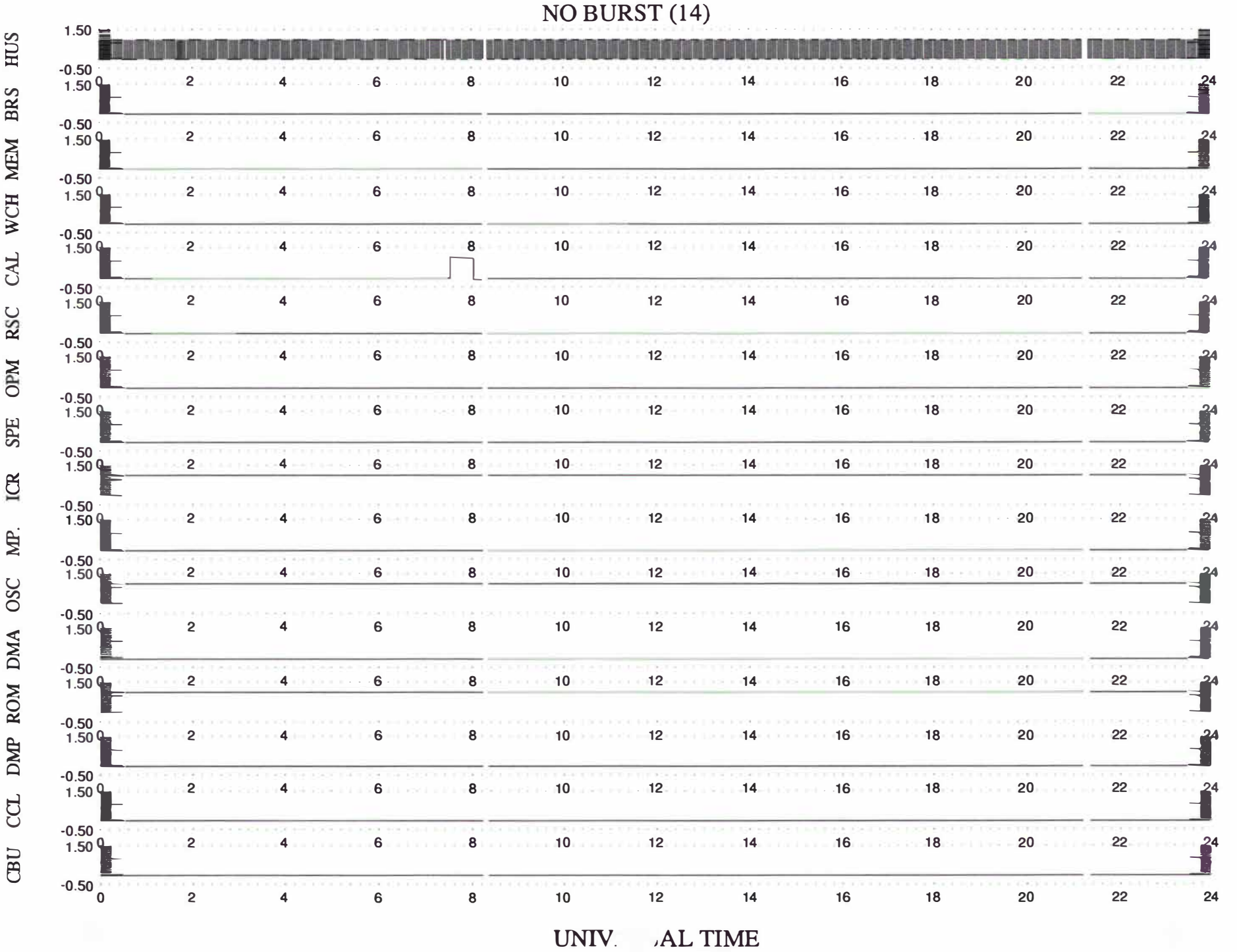


1


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/20
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/29, 1234 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

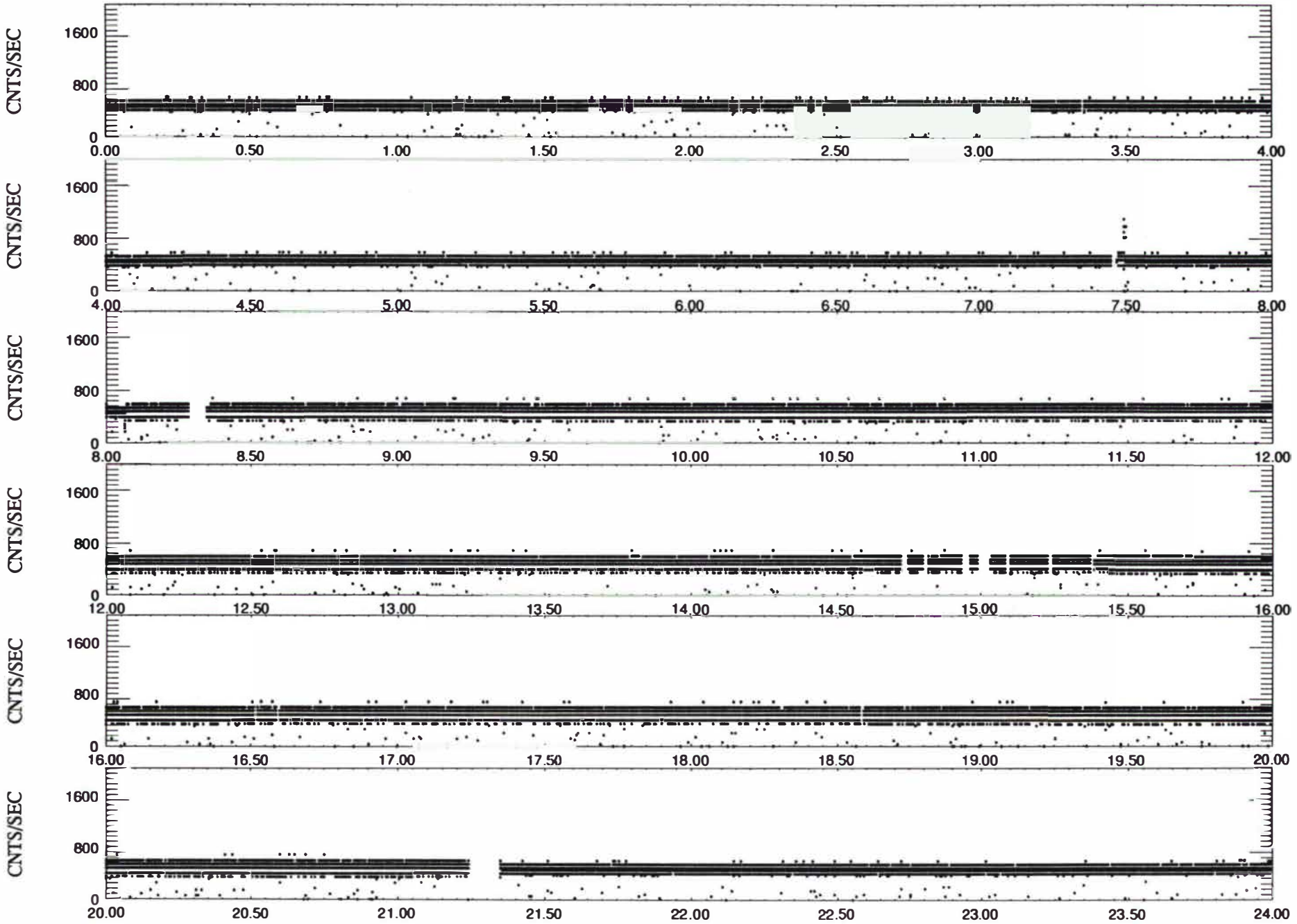

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/20, 0000:02
Plot created: 95/06/15, 1938
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 110, year 1993 to day 110, year 1993 6/12/93



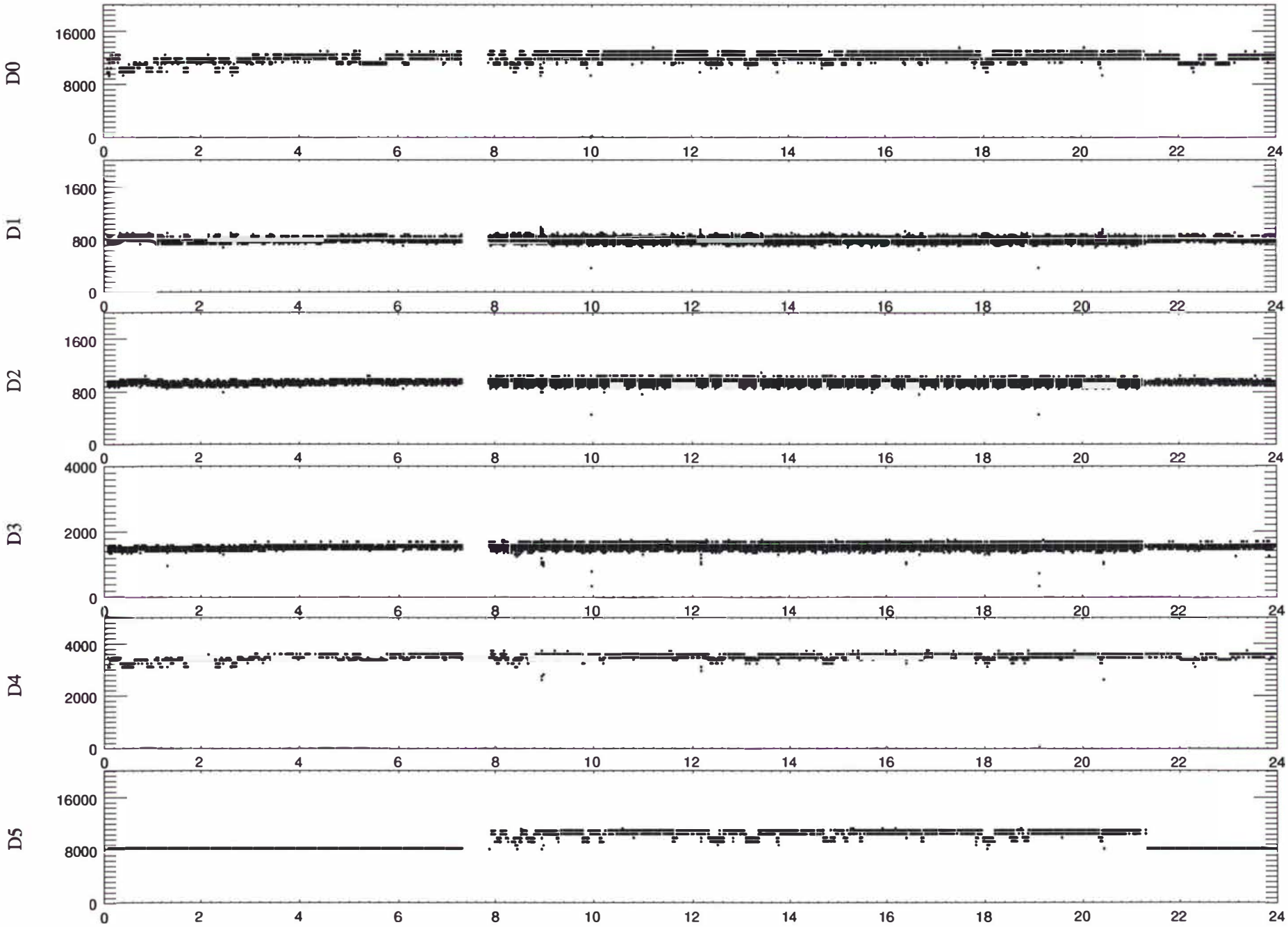
HUS 2A, MODE 1, NOT AVERAGED EDR day 110, year 1993 to day 110, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIVERSAL TIME

HUS 2B COUNTS / SEC QEDR day 110, year 1993 to day 110, year 1993 4/22/93



Kommers

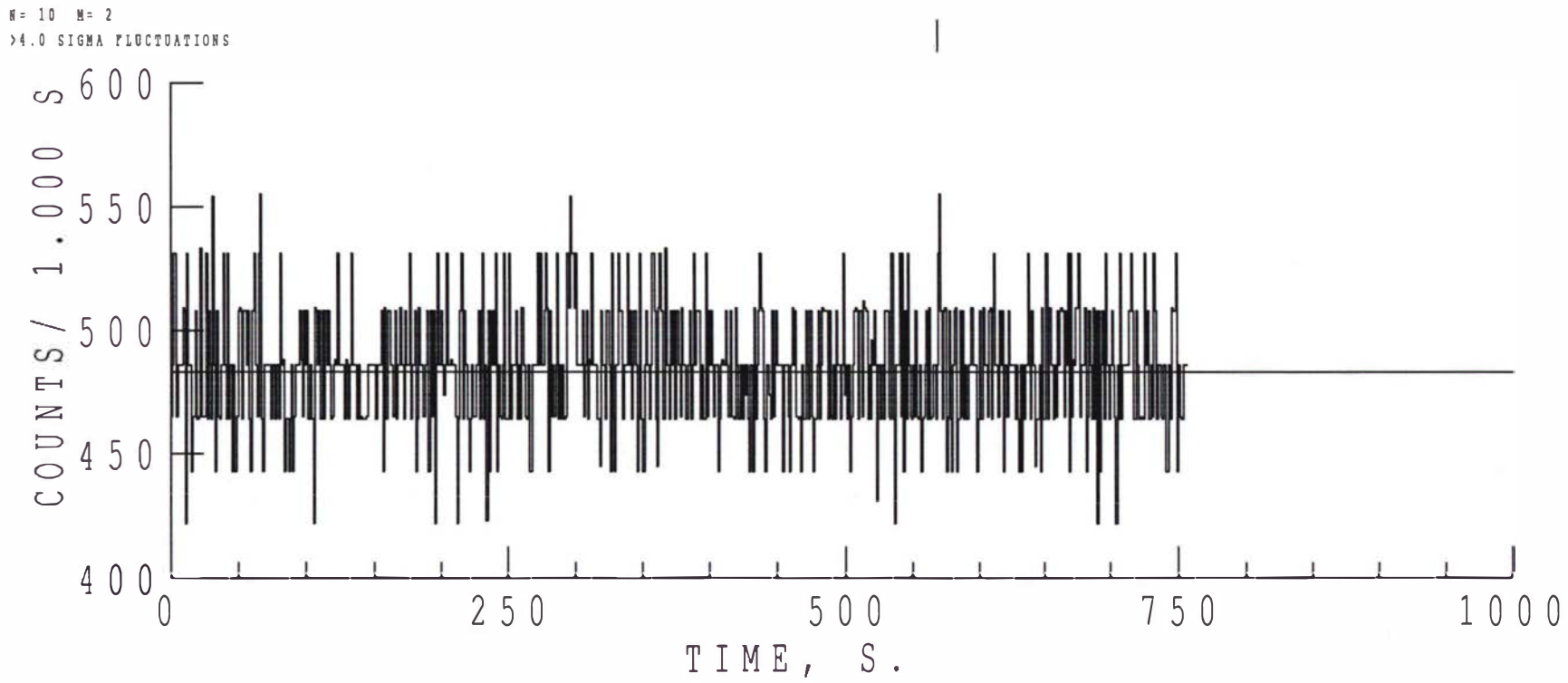
UNTRIGGERED

ULYSSES RT 21/ 5/97

21/ 4/93 10908.347 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV



****
BATSEARCH PROGRAM
****

BATSE BURST # 2312
EVENT OF 1993 APR 21 DAY OF YEAR=111
EVENT CROSSING TIME AT BATSE : 16021. S. OR 04:27:01.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 75.000 -16.000
BATSE PEAK COUNTING RATE: 6500 C/S
EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 21/ 4/ 93 IS:
RA= 143.956 DEC= -12.214 DIST= 4.253 AU
BATSE-ULYSSES DISTANCE = 636248800. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=113.31 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -839.74 SECS.
CROSSING TIME AT ULYSSES IS 15181. S. OR 04:13:01 +/- 375.64 SECONDS

Apr 23 07:30 1993 standard input Page 52

From KOSHUT@fender.msfc.nasa.gov Thu Apr 22 12:45:18 1993
Date: Thu, 22 Apr 1993 14:45:31 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2312	930421	9098	16021	6500	075	-16

~~HD~~ RI ?

BATSE position has moved ~ 50° - re-do!

This is a ~ 10^{-8} erg cm^{-2} burst - prob not detected

BATSE BURST TRIGGER

NO.: 02312

TIME: TJD=9098 SECONDS=16021

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=67 AZIMUTH=70 ERROR= DEGREES

COMMENTS:
SHORT BURST WITH DURATION LESS THAN ~ 0.5 SECONDS. HARD SPECTRUM;
EMISSION ABOVE 300 KEV IS OBSERVED.

```
          ********************
          *CATSEARCH PROGRAM*
          ********************

 ATSE BURST # 2312
 EVENT OF 1993 APR 21 DAY OF YEAR=111
 EVENT CROSSING TIME AT BATSE      : 16022. S. OR 04:27:01.7
 COORDINATES ARE   0.000   0.000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION:  14.720  -33.560
 BATSE PEAK COUNTING RATE:  0000   C/S

 EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
 POSITION OF ULYSSES ON 21/ 4/  93 IS:
 RA=  143.956 DEC=  -12.214 DIST=    4.253 AU
 BATSE-ULYSSES DISTANCE =  636253288. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL    DIRECTION= 66.53 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=  845.10 SECS.
 CROSSING TIME AT ULYSSES    IS 16867. S. OR 04:41:06.7 +/-  400.83 SECONDS
```

ULYSSES RT

25/ 5/96

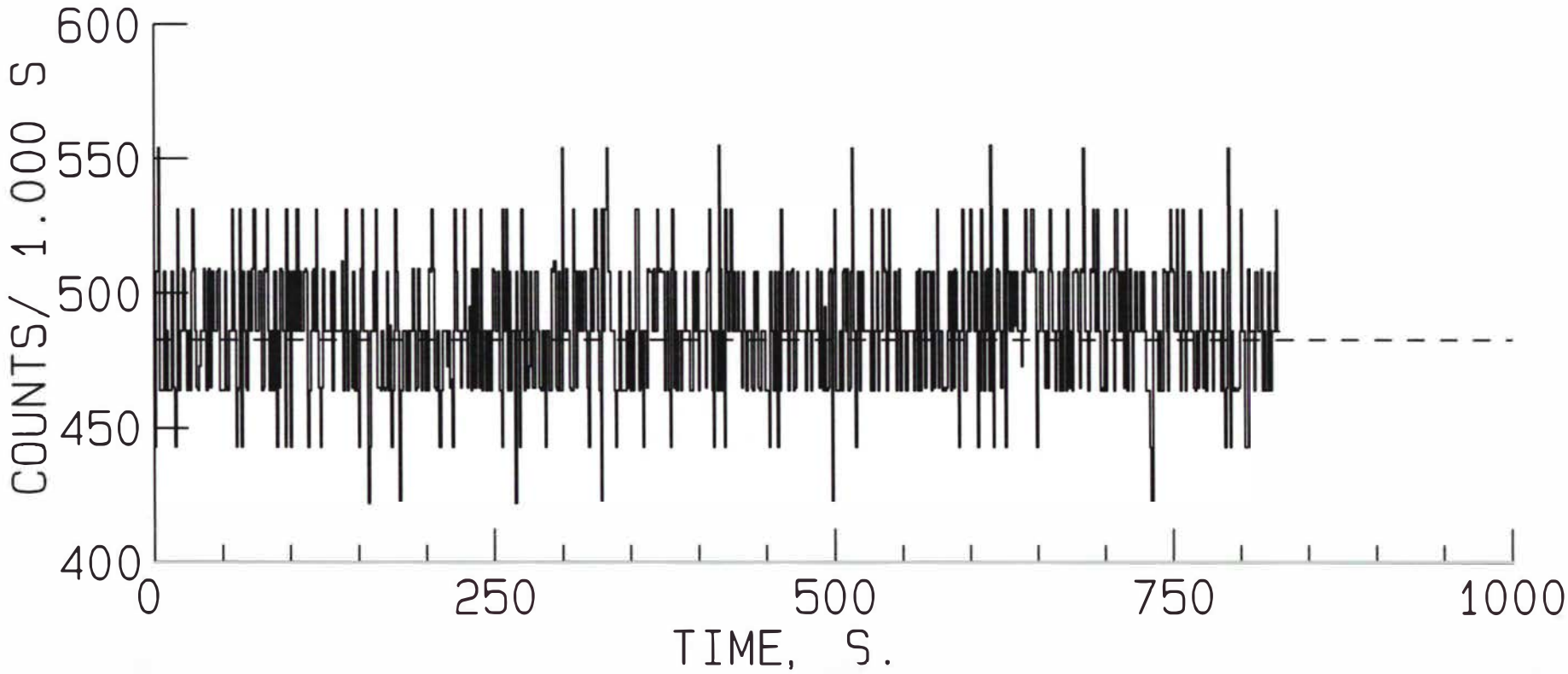
21/ 4/93 16452.435 s

0.500 S INTERVALS REGROUPED BY 2

21- 145 keV

BATSE position moved 50°
New crossing window does not
contain event

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



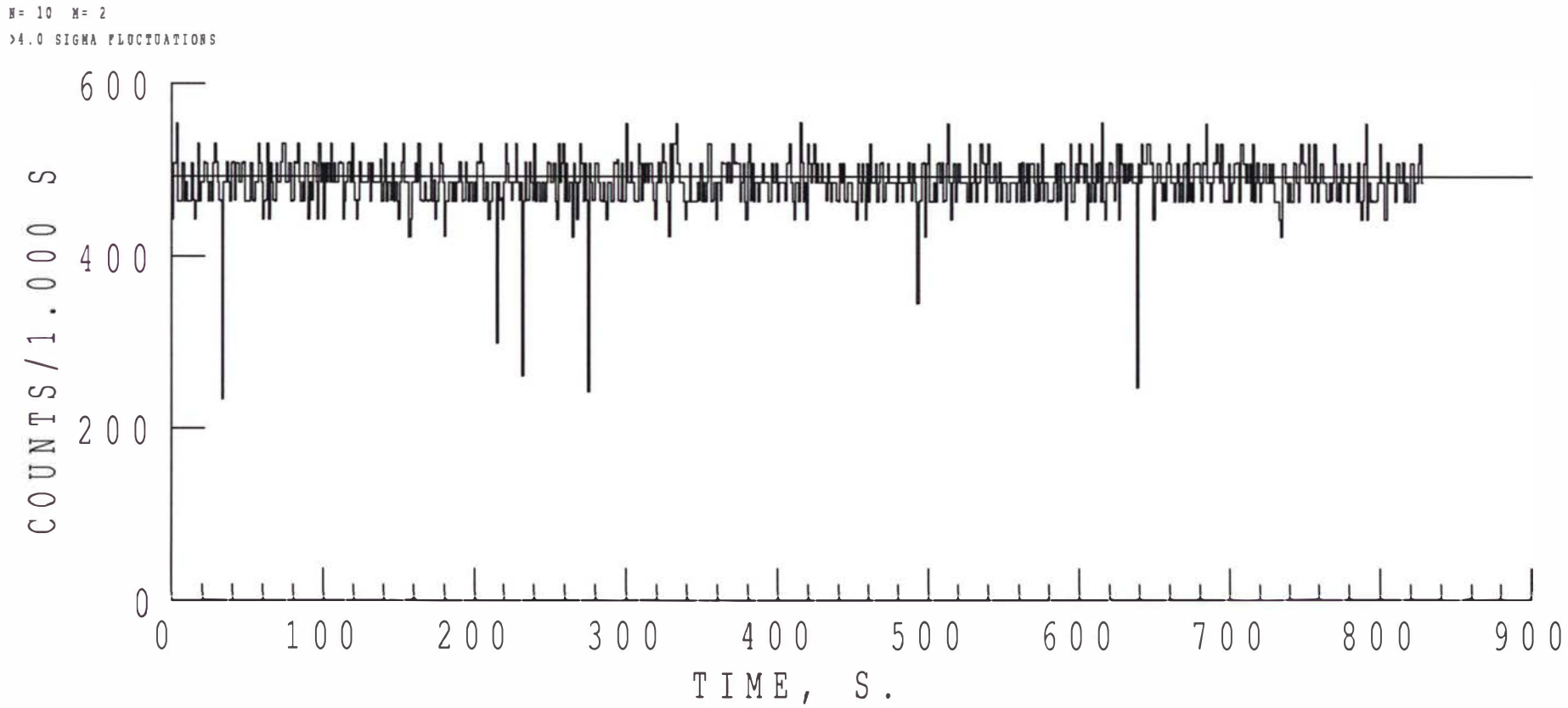
9/11/95

ULYSSES RT

21/ 4/93 16452.436 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV



BATSE BURST# 2312

ULYSSES RT 4/ 5/98

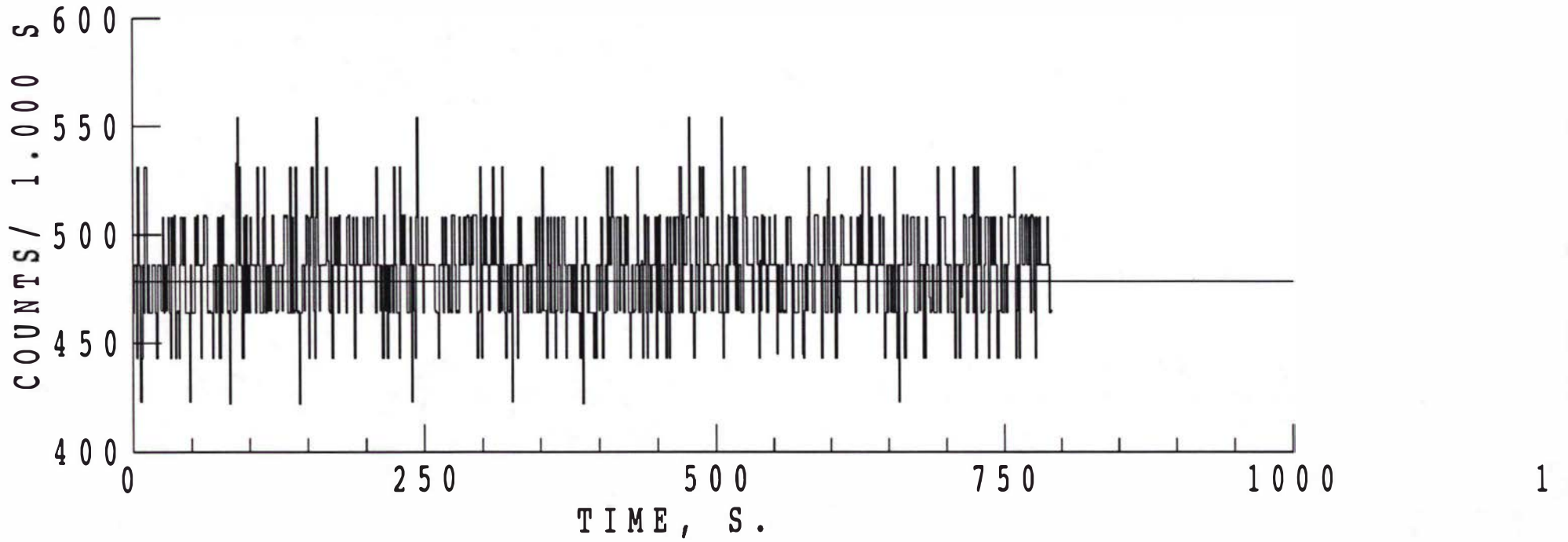
21/ 4/93 14976.411 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV

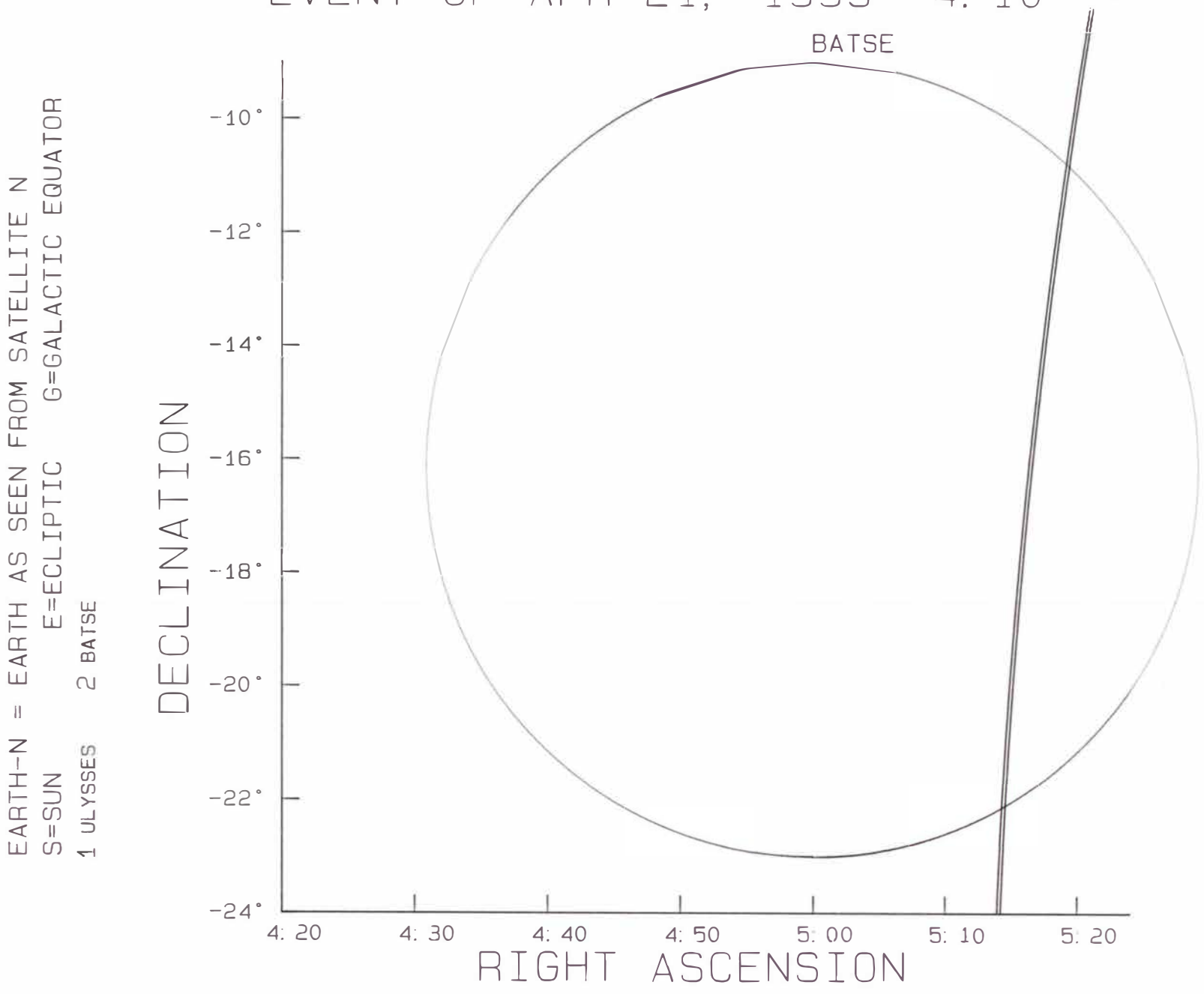
N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

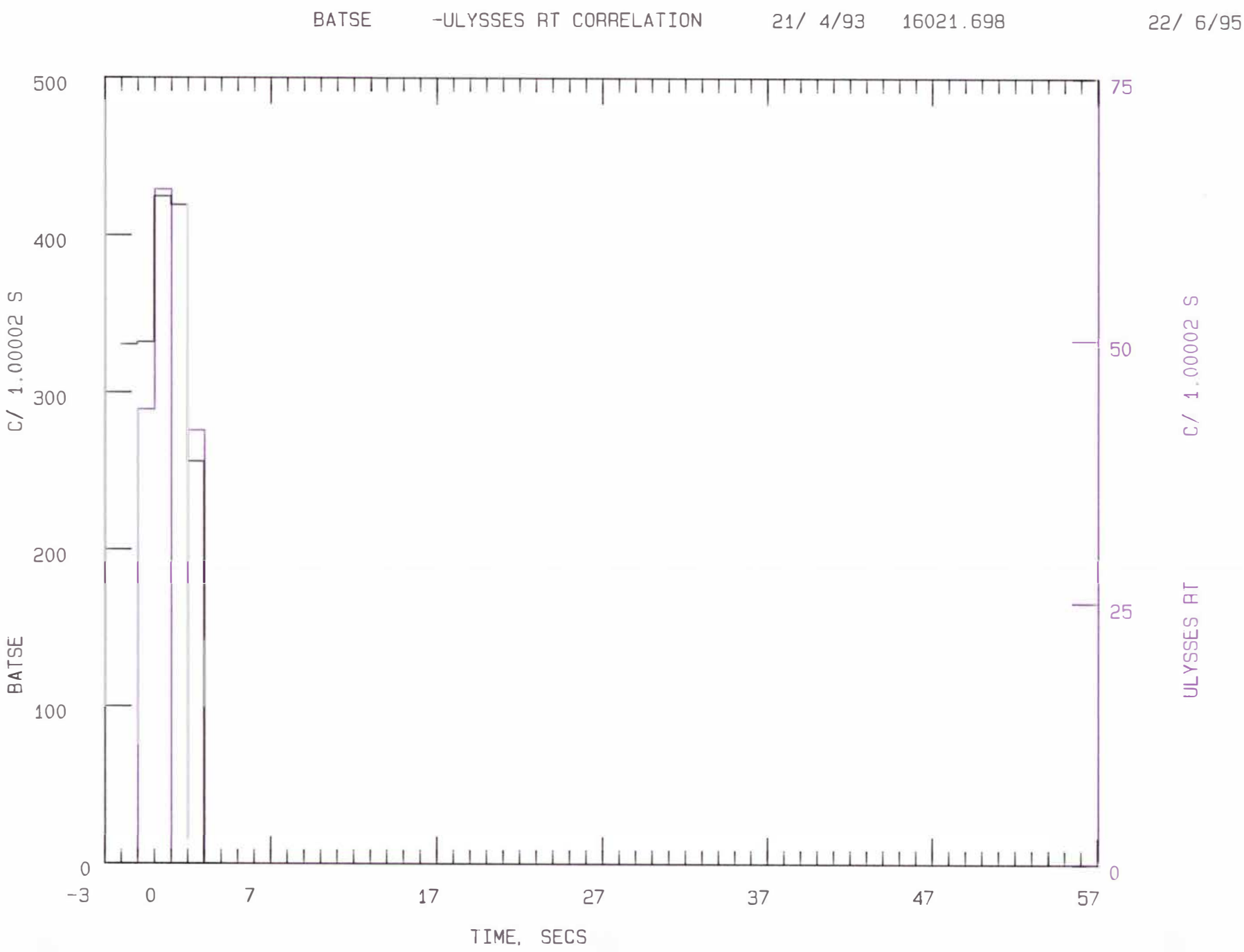


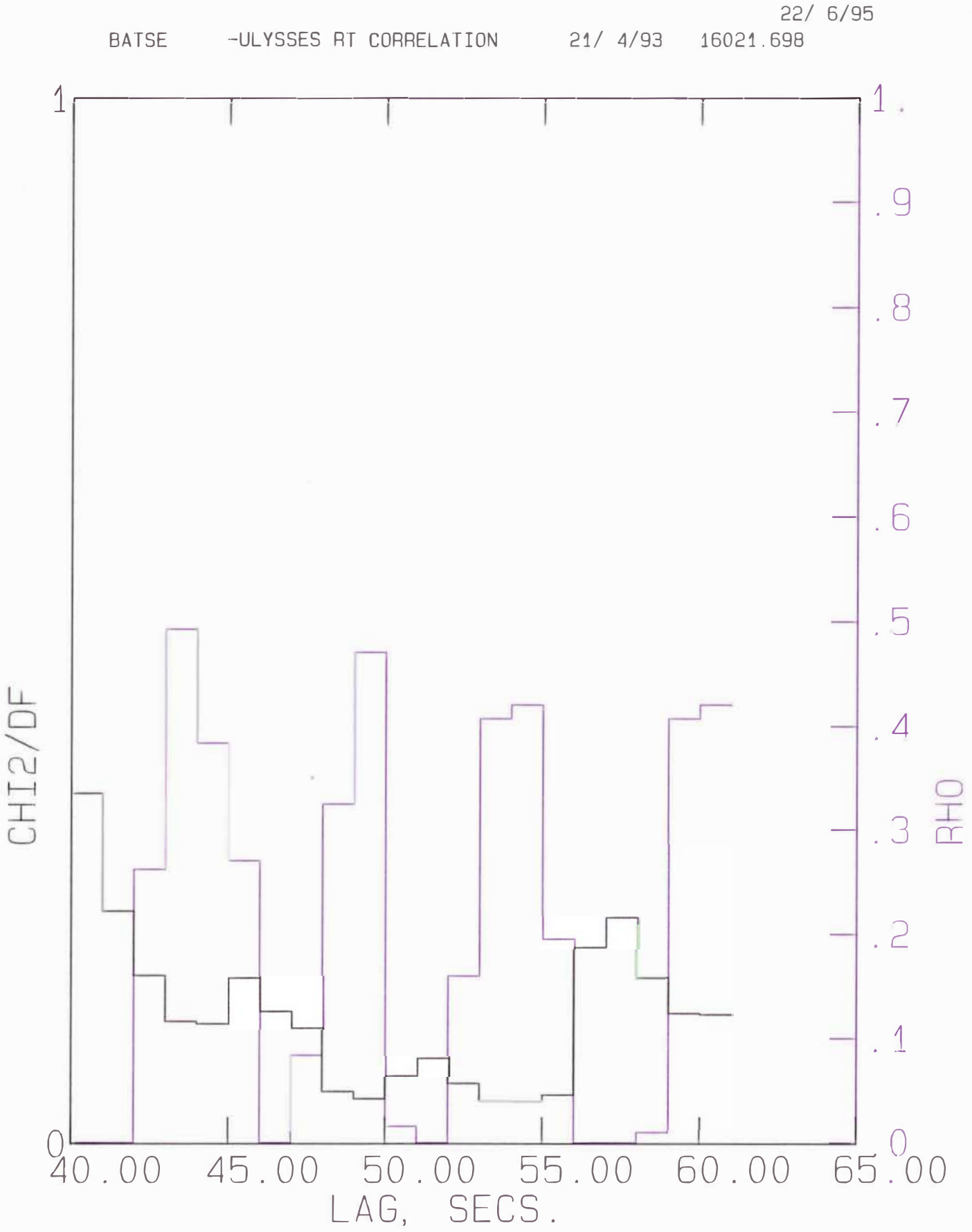
EVENT OF APR 21, 1993 4: 10 2-1

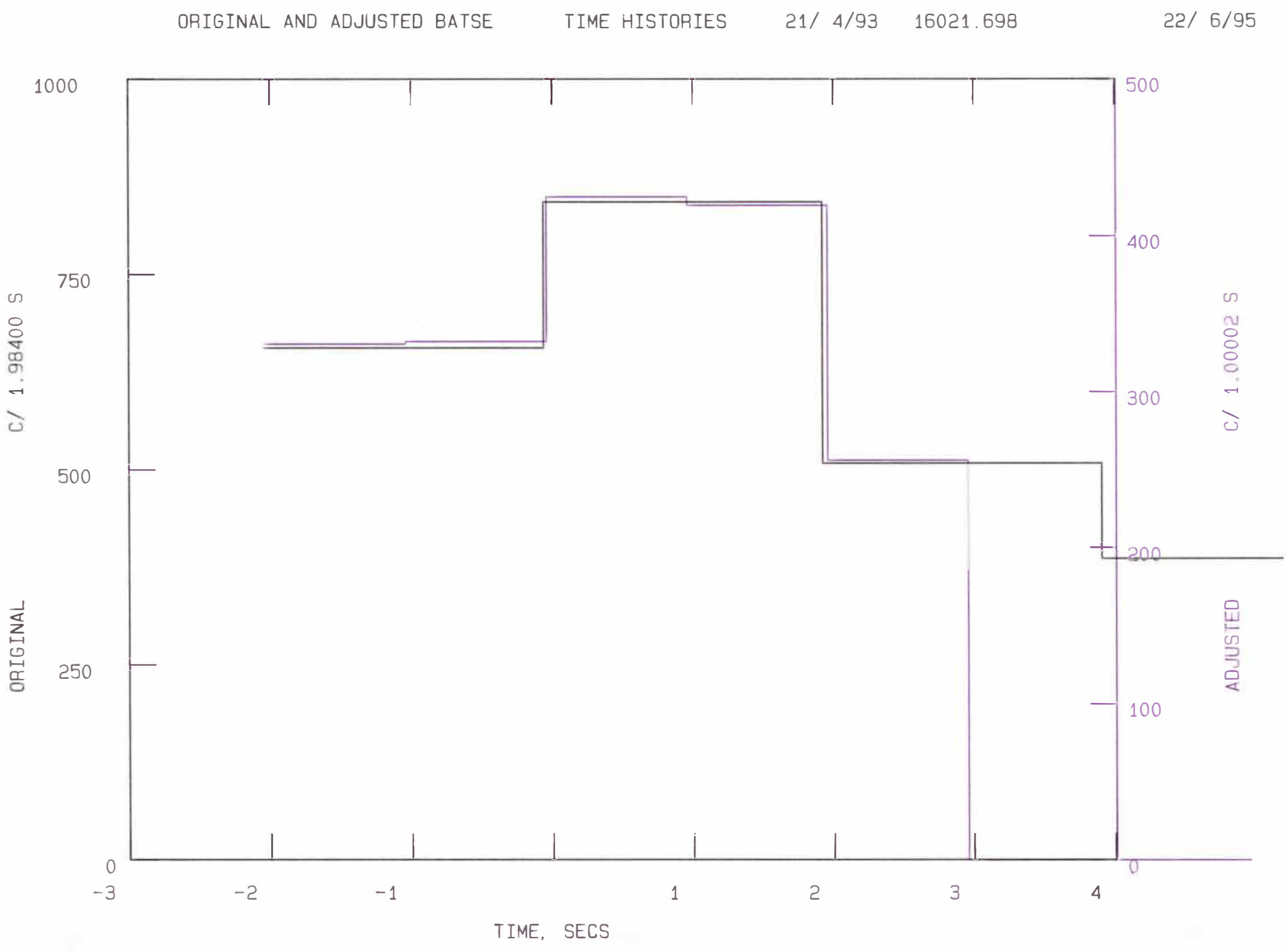
22/ 6/95



EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE


BATSE -ULYSSES RT CORRELATION 21/ 4/93 16021.698 22/ 6/95
500
400
300
200
100
0
C/ 1.00002 S
BATSE
75
50
25
0
C/ 1.00002 S
ULYSSES RT
-3
0
7
17
27
37
47
57
TIME, SECS


22/ 6/95
BATSE -ULYSSES RT CORRELATION 21/ 4/93 16021.698
CHI2/DF
RHO
1
0
1.
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
40.00
45.00
50.00
55.00
60.00
65.00
LAG, SECS.

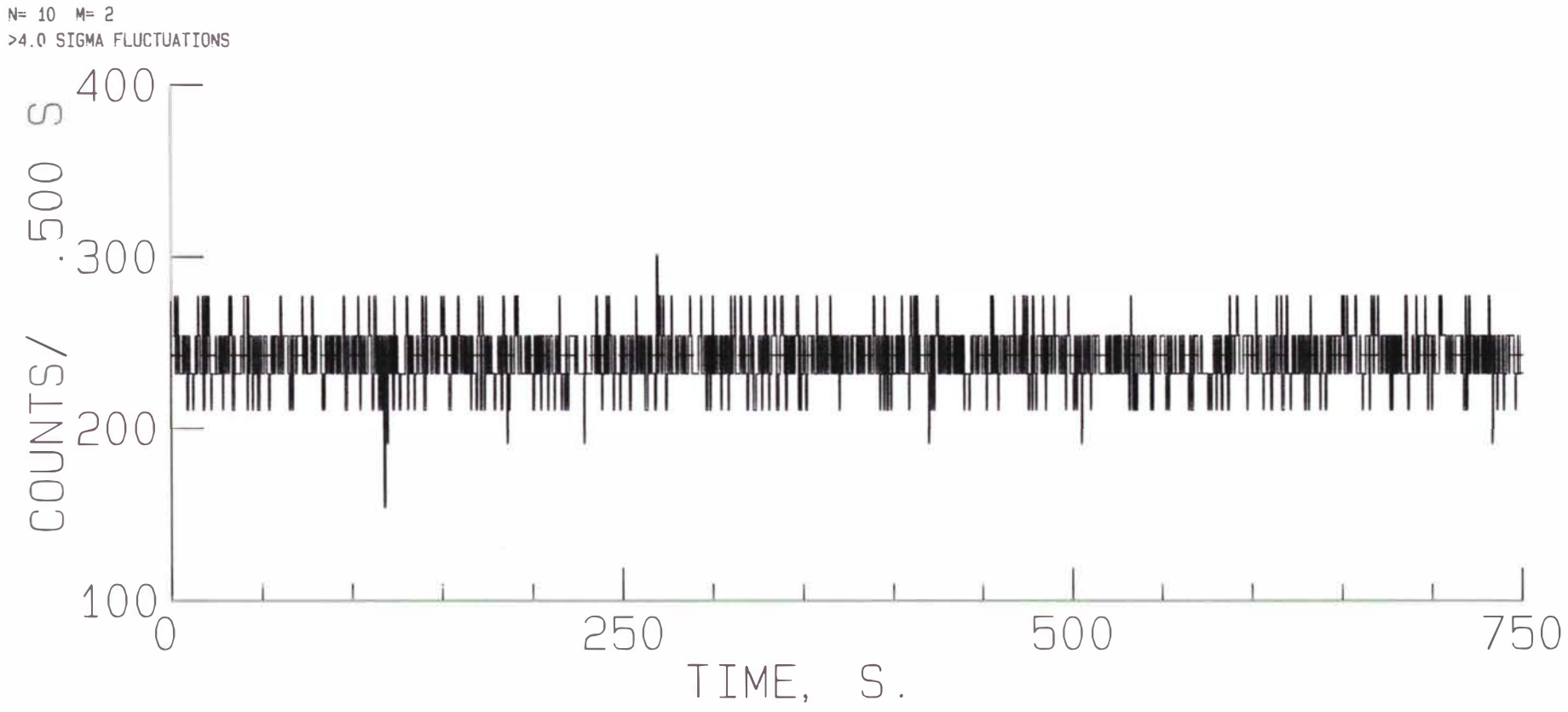

ORIGINAL AND ADJUSTED BATSE TIME HISTORIES 21/ 4/93 16021.698 22/ 6/95
1000
750
500
250
0
ORIGINAL
C/ 1.98400 S
500
400
300
200
100
0
ADJUSTED
C/ 1.00002 S
-3
-2
-1
1
2
3
4
TIME, SECS

ULYSSES RT

22/ 6/95

21/ 4/93 14796.411 s

21- 145 keV



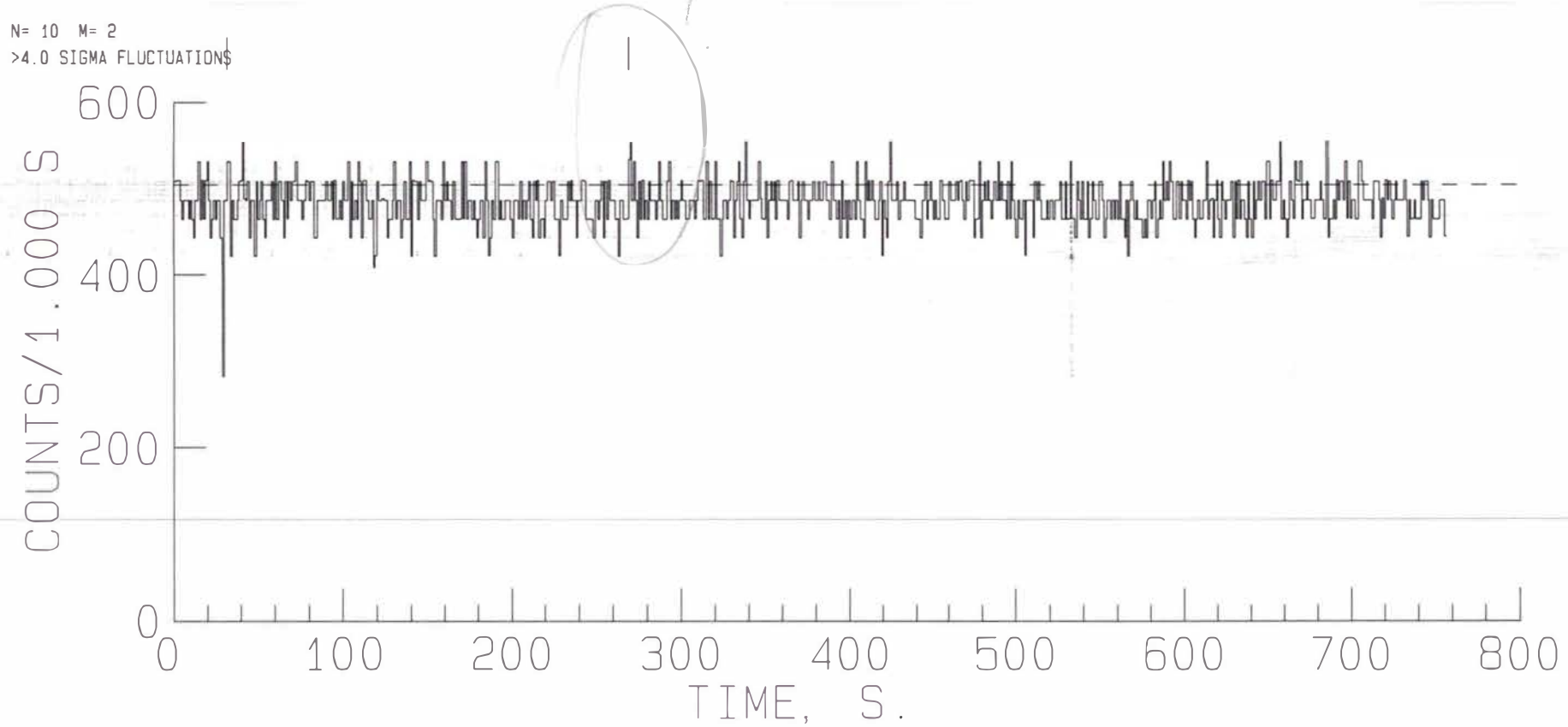
26/ 4/93

ULYSSES RT

21/ 4/93 14796.411 s

0.500 S INTERVALS REGROUPED BY 2

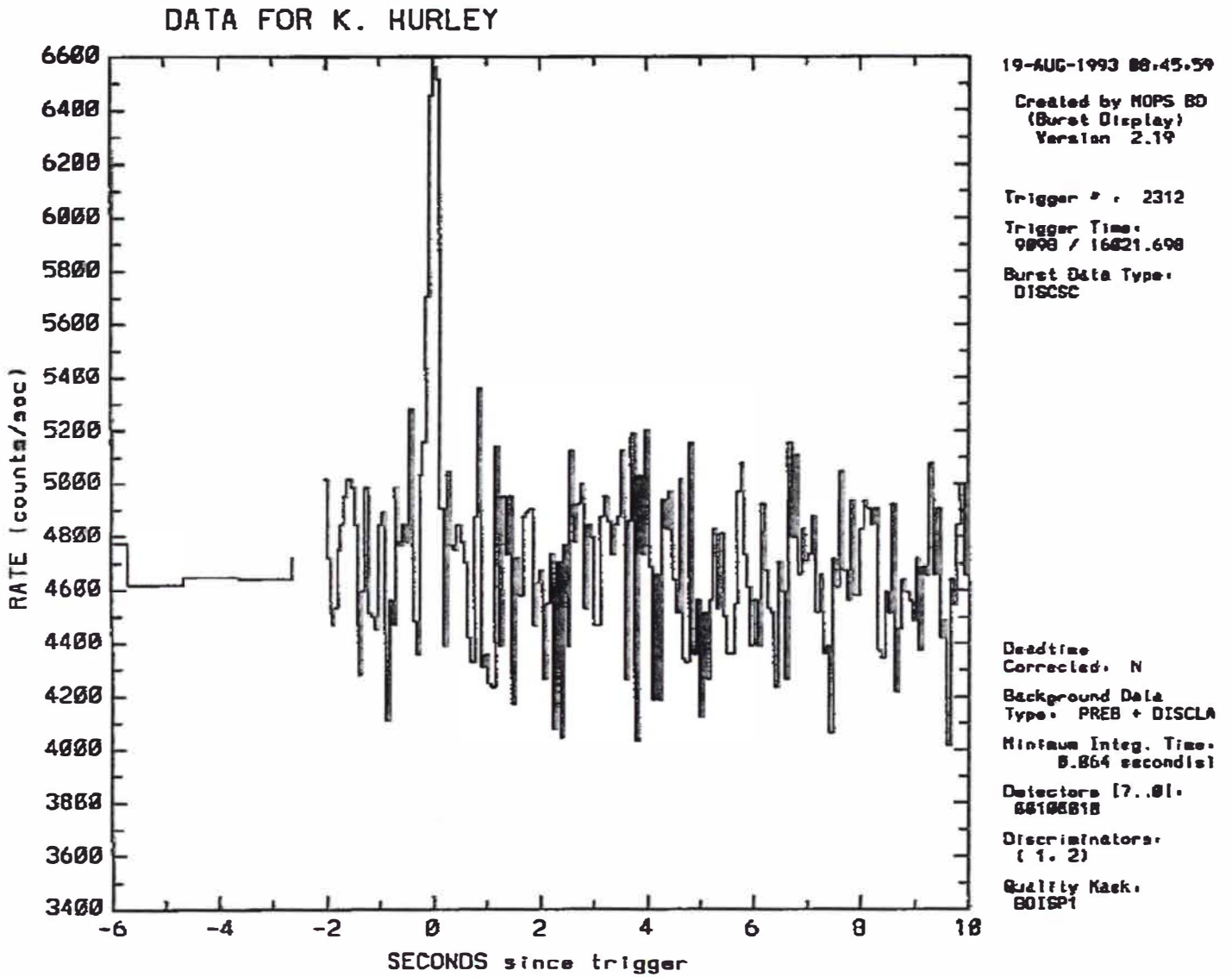
0- 0 keV



BATSE 21/04/93 16021.698

25- 100 keV

4/ 9/93


DATA FOR K. HURLEY
RATE (counts/sec)
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
4600
4400
4200
4000
3800
3600
3400
-6
-4
-2
0
2
4
6
8
10
SECONDS since trigger
19-AUG-1993 08:45:59
Created by MOPS BD
(Burst Display)
Version 2.19
Trigger # : 2312
Trigger Time:
9898 / 16821.698
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 seconds
Detectors [7..0]:
66100010
Discriminators:
(1, 2)
Quality Mask:
BDISP1

```
          ********************
          *BATSEARCH PROGRAM*
          ********************

 BATSE BURST #     2313
 EVENT OF 1993 APR 21 DAY OF YEAR=111
 EVENT CROSSING TIME AT BATSE      : 78403. S. OR 21:46:43.0
 COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 244.000  -10.000
 BATSE PEAK COUNTING RATE:   1500    C/S
 EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
 POSITION OF ULYSSES ON 21/ 4/  93 IS:
 RA=  143.956 DEC=  -12.214 DIST=    4.253 AU
 BATSE-ULYSSES DISTANCE =  636248800. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 82.47 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=  278.30 SECS.
 CROSSING TIME AT ULYSSES    IS 78681. S. OR   21:51:21 +/-  419.51 SECONDS
```

Apr 23 07:43 1993 standard input Page 4

```
From KOSHUT@fender.msfc.nasa.gov Fri Apr 23 07:37:25 1993
Date:    Fri, 23 Apr 1993 9:37:44 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec    Max ct/s   RA   Dec
   2313   930421    9098   78403      1500   244   -10
```

ND

```
                BATSE BURST TRIGGER
NO.: 02313

TIME: TJD=9098 SECONDS=78403

TYPE: BURST                     SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:       SIGMA

INTENSITY:          COUNTS/CM2

LOCATION: ZENITH=79.    AZIMUTH=222.   ERROR=      DEGREES

COMMENTS:
BURST OF ~ 20 SECONDS DURATION.  TIME HISTORY CONSISTS OF TWO PULSES, WITH
THE PEAK (~1500 C/S) OBSERVED AT ~ TRIGGER + 7 SECONDS.  NO EMISSION OBSERVED
ABOVE 300 KEV.
```

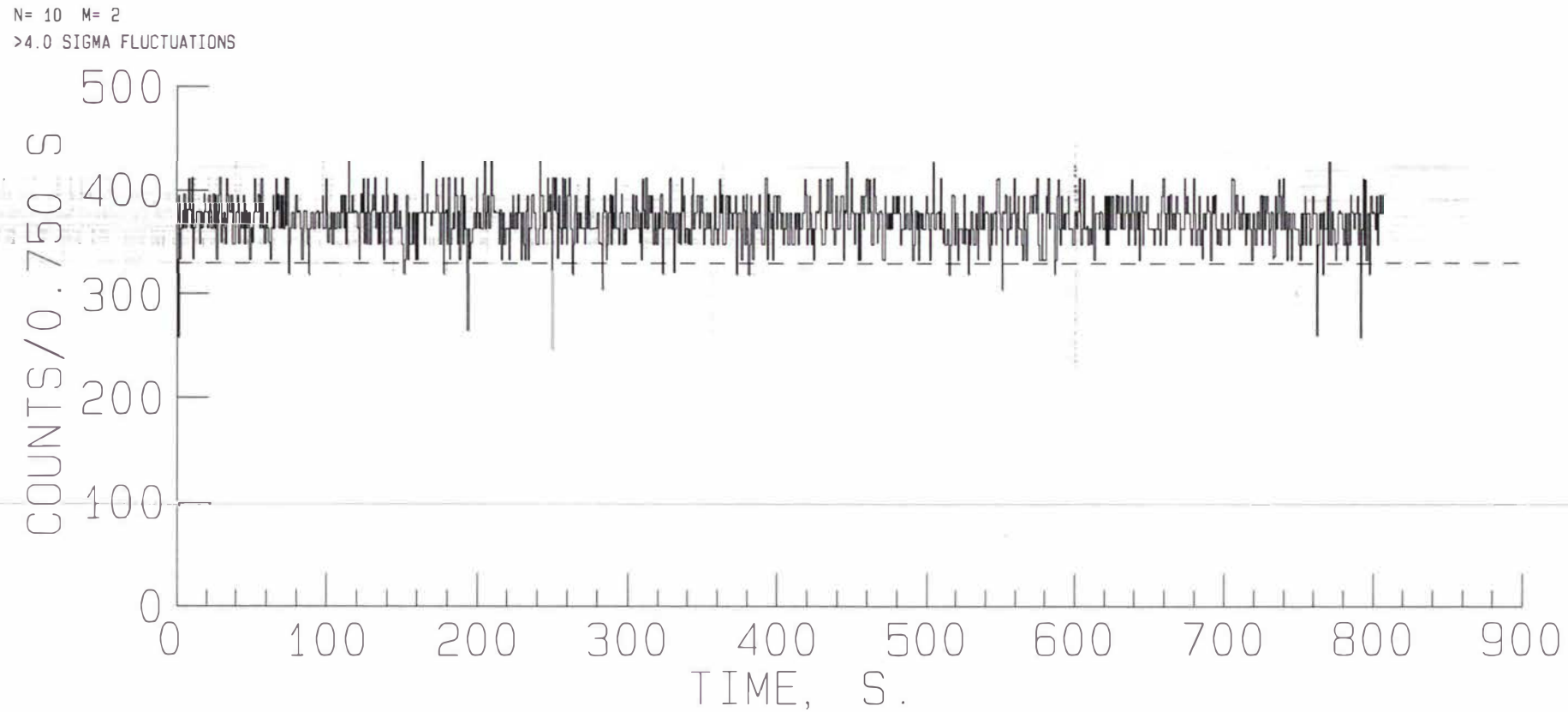
26/ 4/93

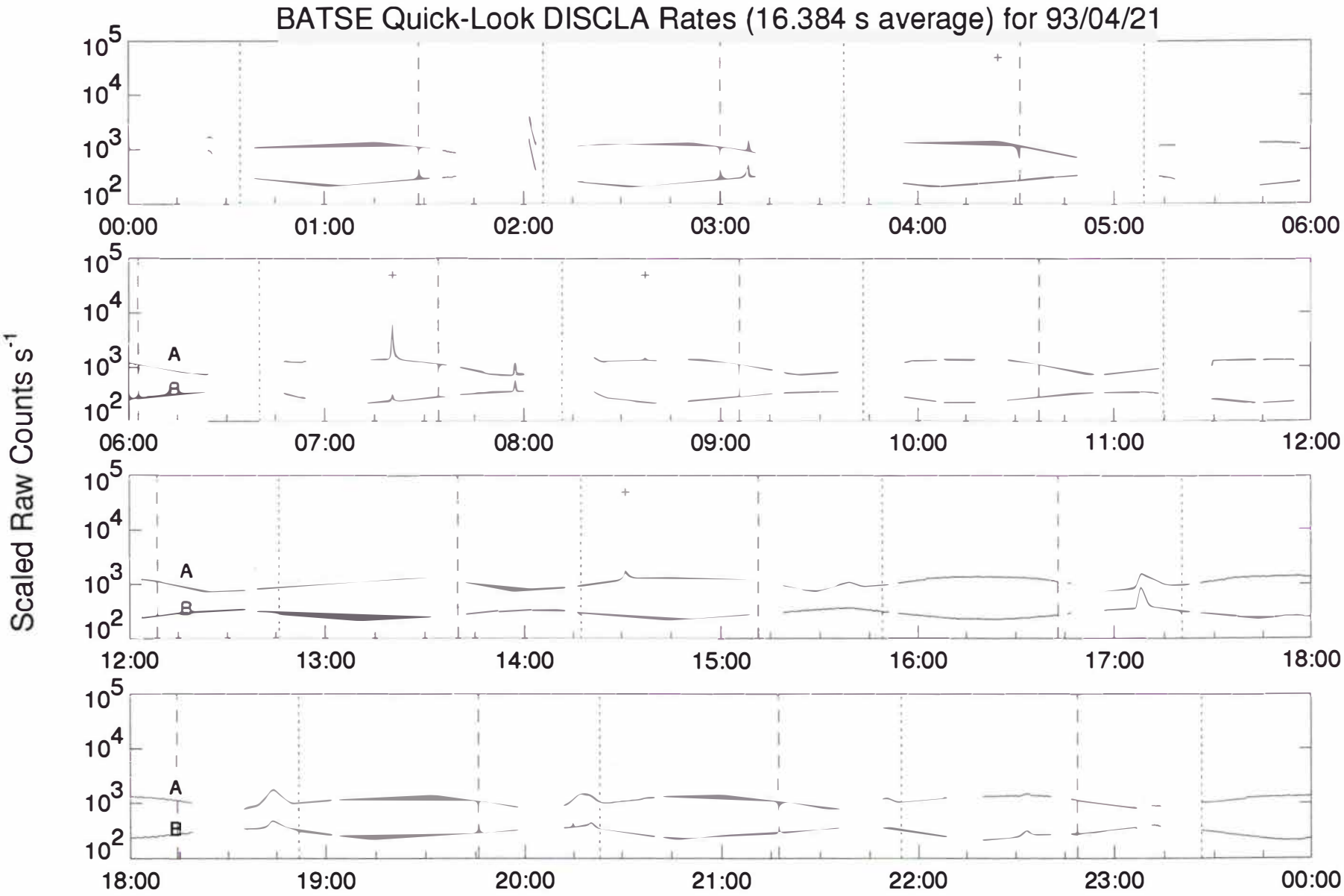
ULYSSES RT

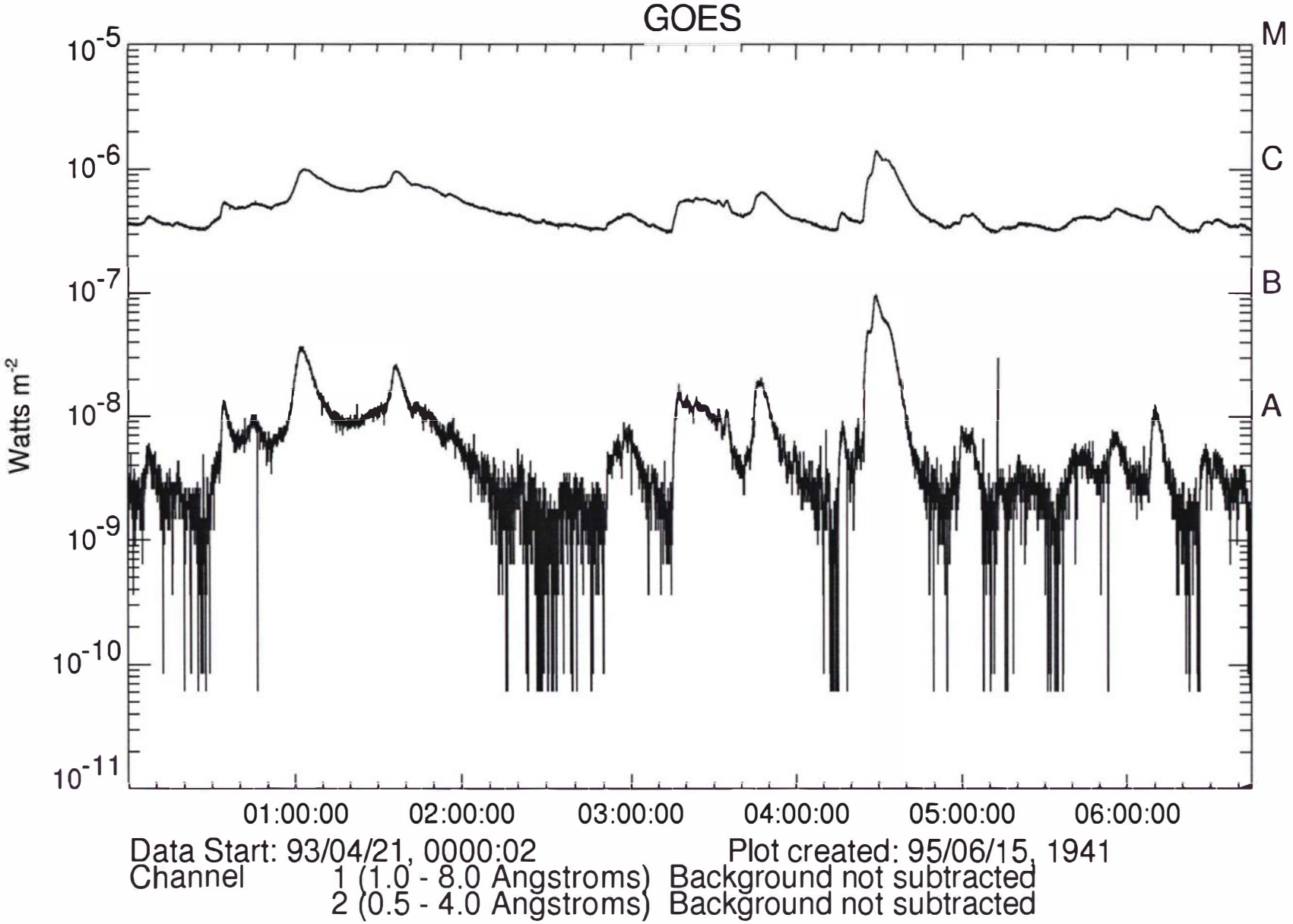
21/ 4/93 78264.148 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV

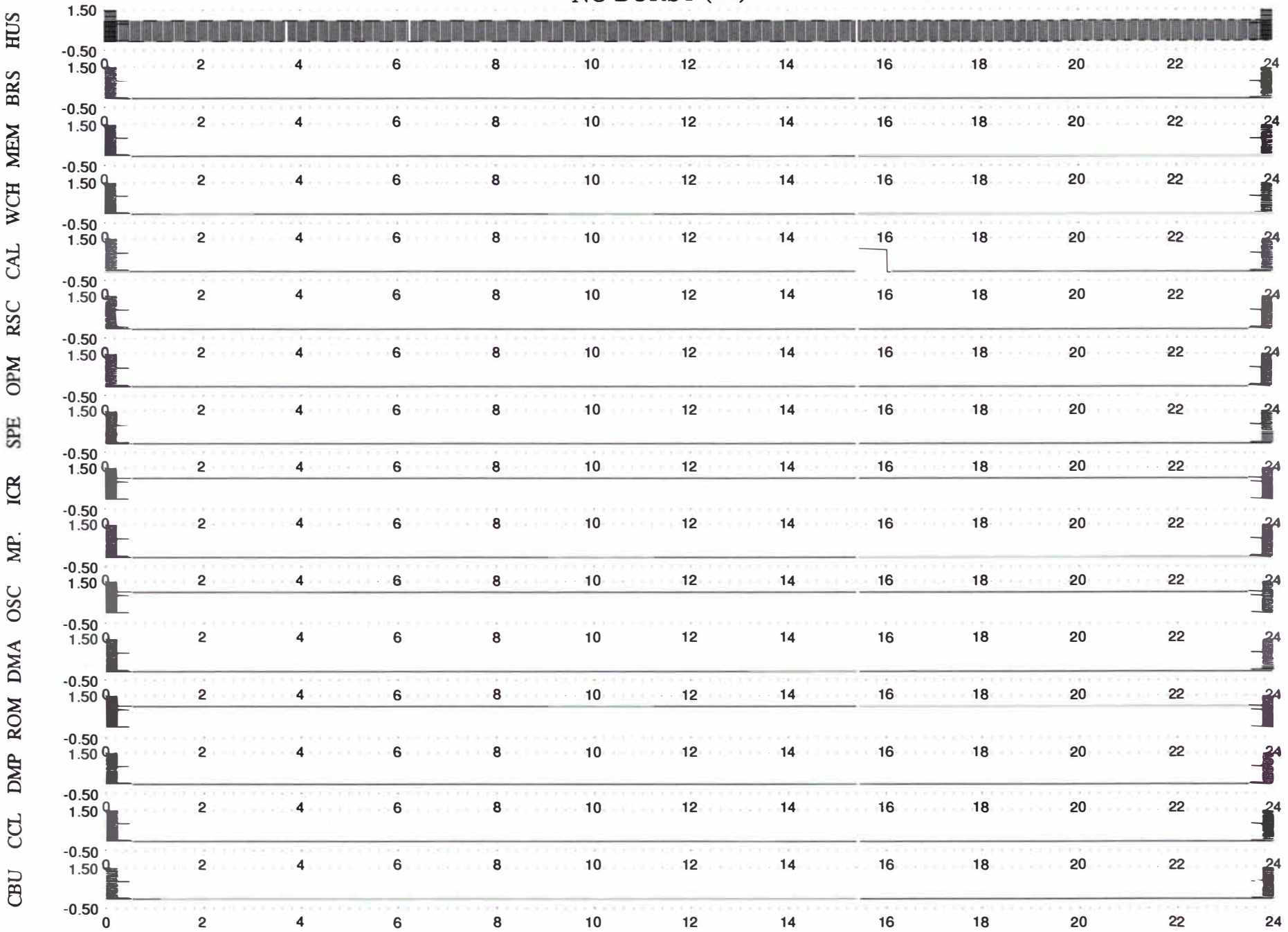



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/21
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/29, 1235 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare


GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
01:00:00
02:00:00
03:00:00
04:00:00
05:00:00
06:00:00
Data Start: 93/04/21, 0000:02
Plot created: 95/06/15, 1941
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 111, year 1993 to day 111, year 1993 6/12/93

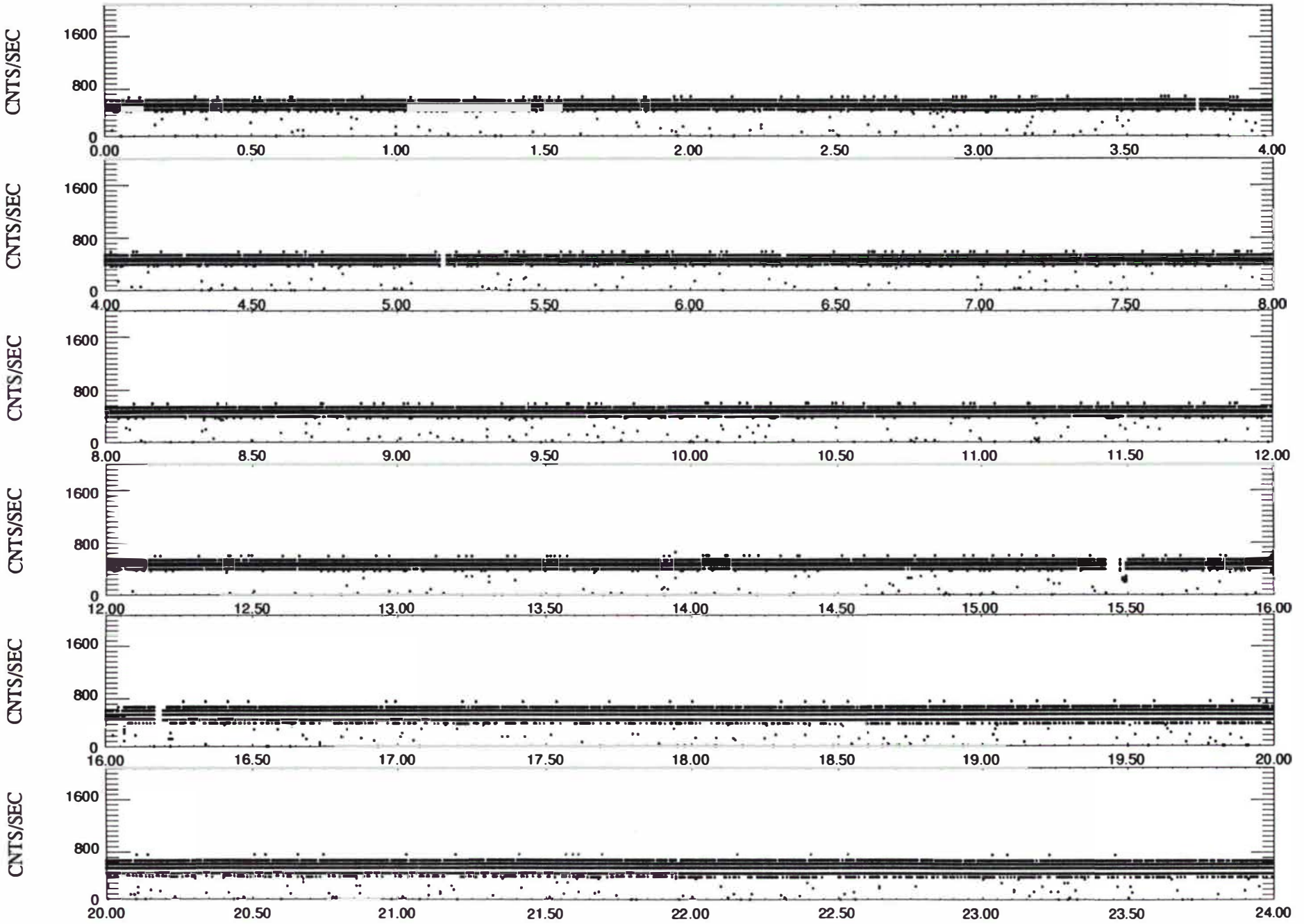
NO BURST (14)



UNIV AL TIME

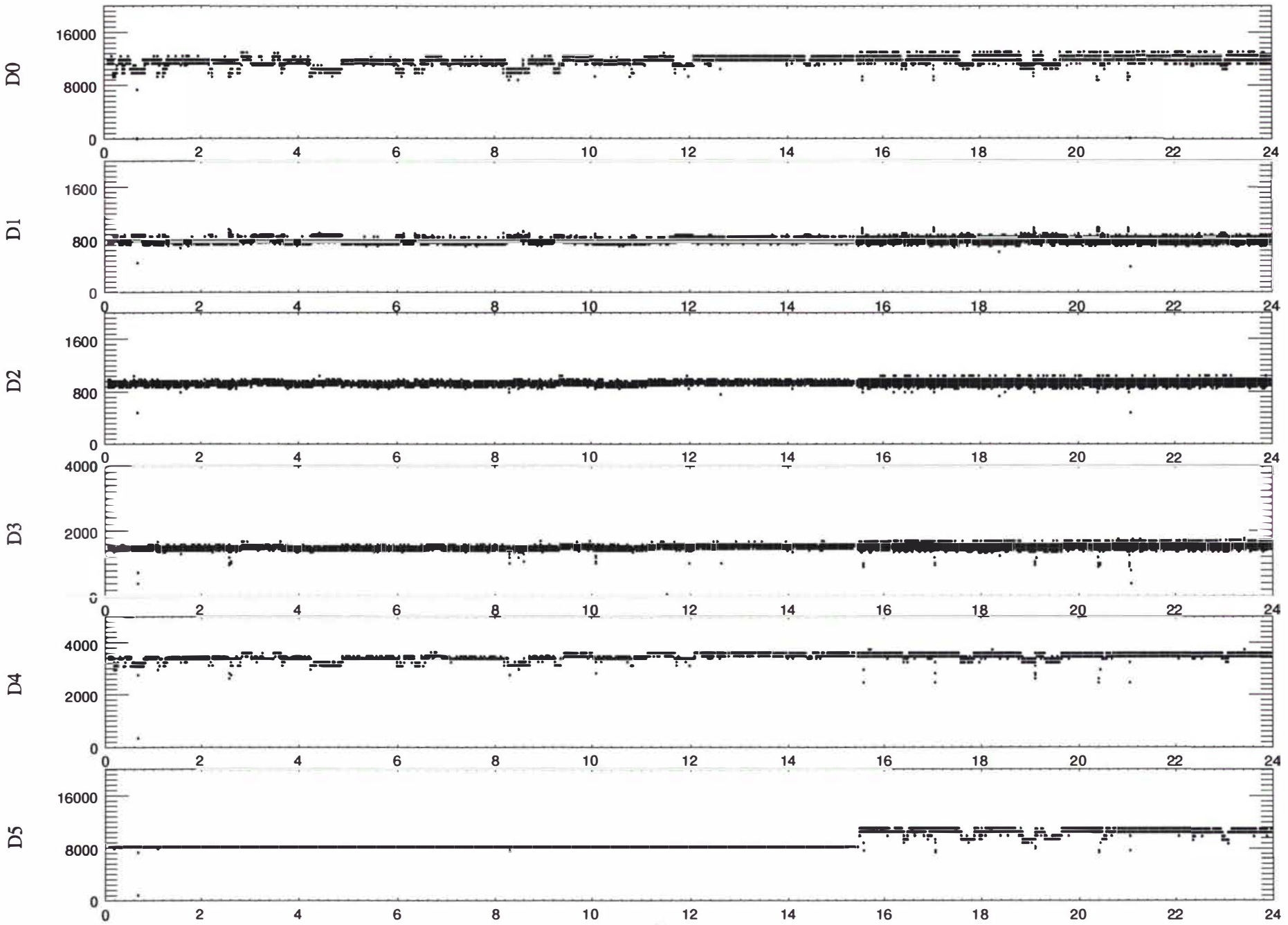
HUS 2A, MODE 1, NOT AVERAGED EDR day 111, year 1993 to day 111, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UN ERSAL TIME

HUS 2B COUNTS / SEC QEDR day 111, year 1993 to day 111, year 1993 4/26/93



Kommers

UNTRIGGERED

ULYSSES RT 21/ 5/97

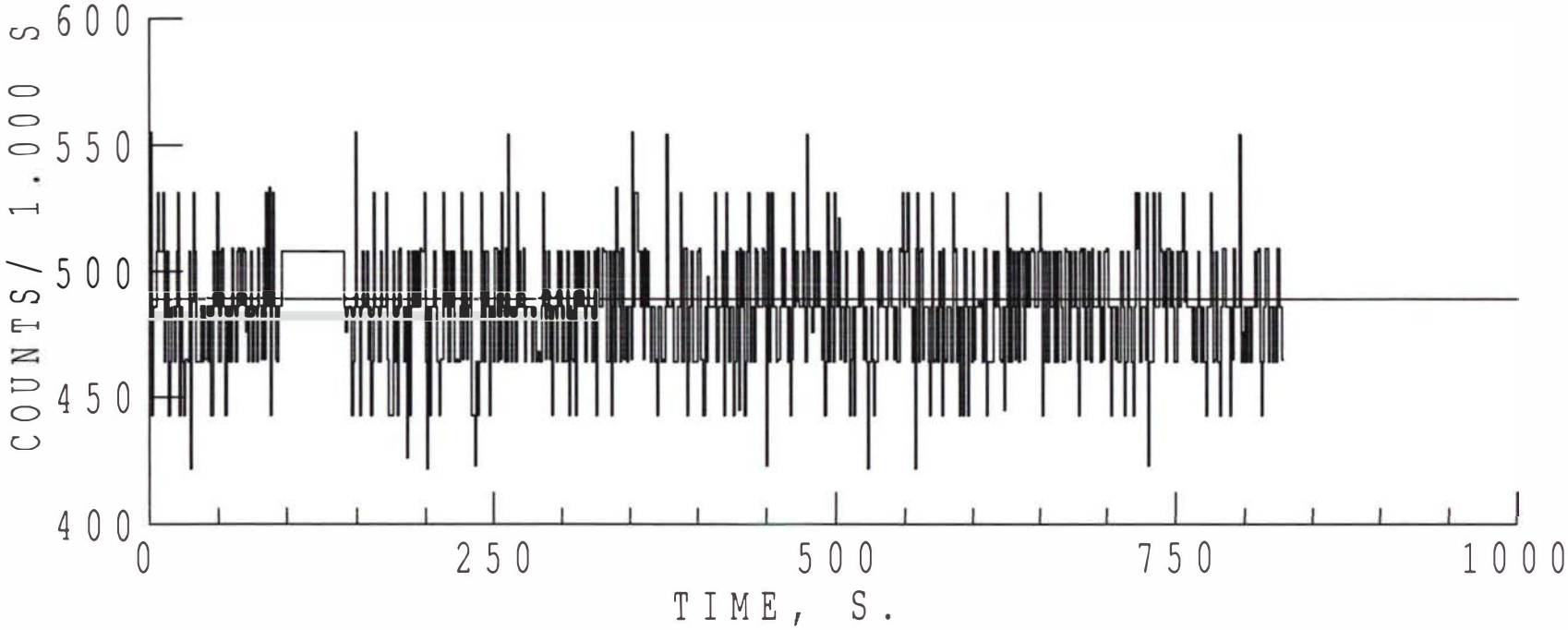
22/ 4/93 50472.305 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



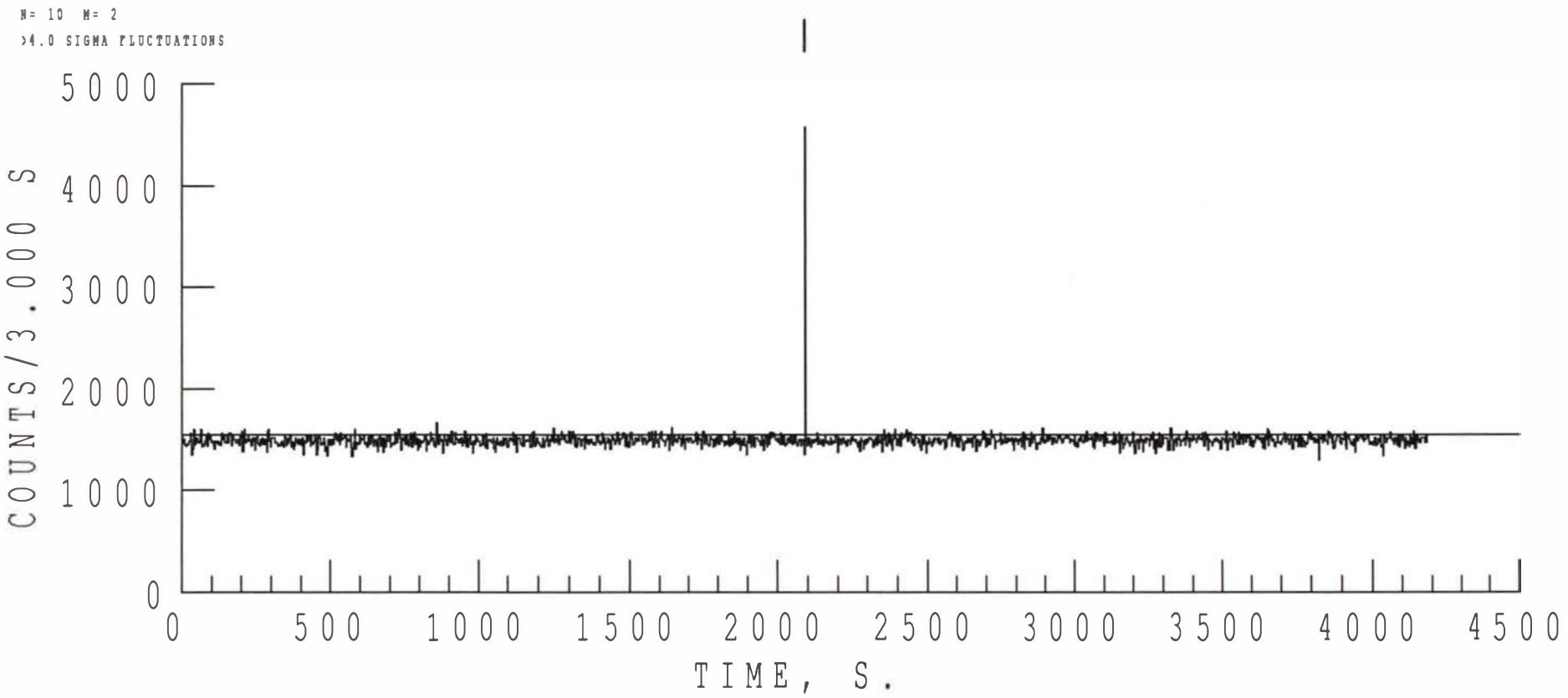
22/ 2/95

ULYSSES RT

22/ 4/93 72180.141 s

0.250 S INTERVALS REGROUPED BY 12

0- 0 keV



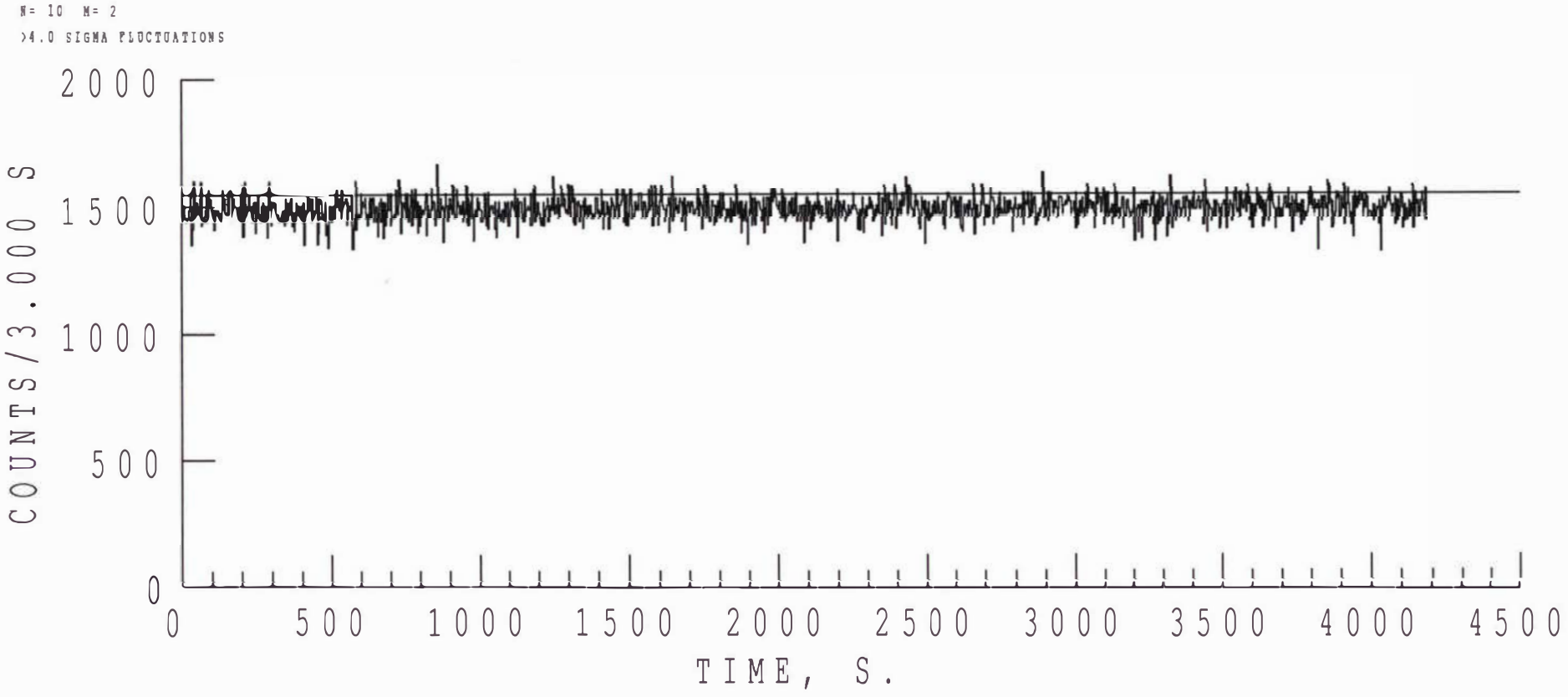
23/ 2/95

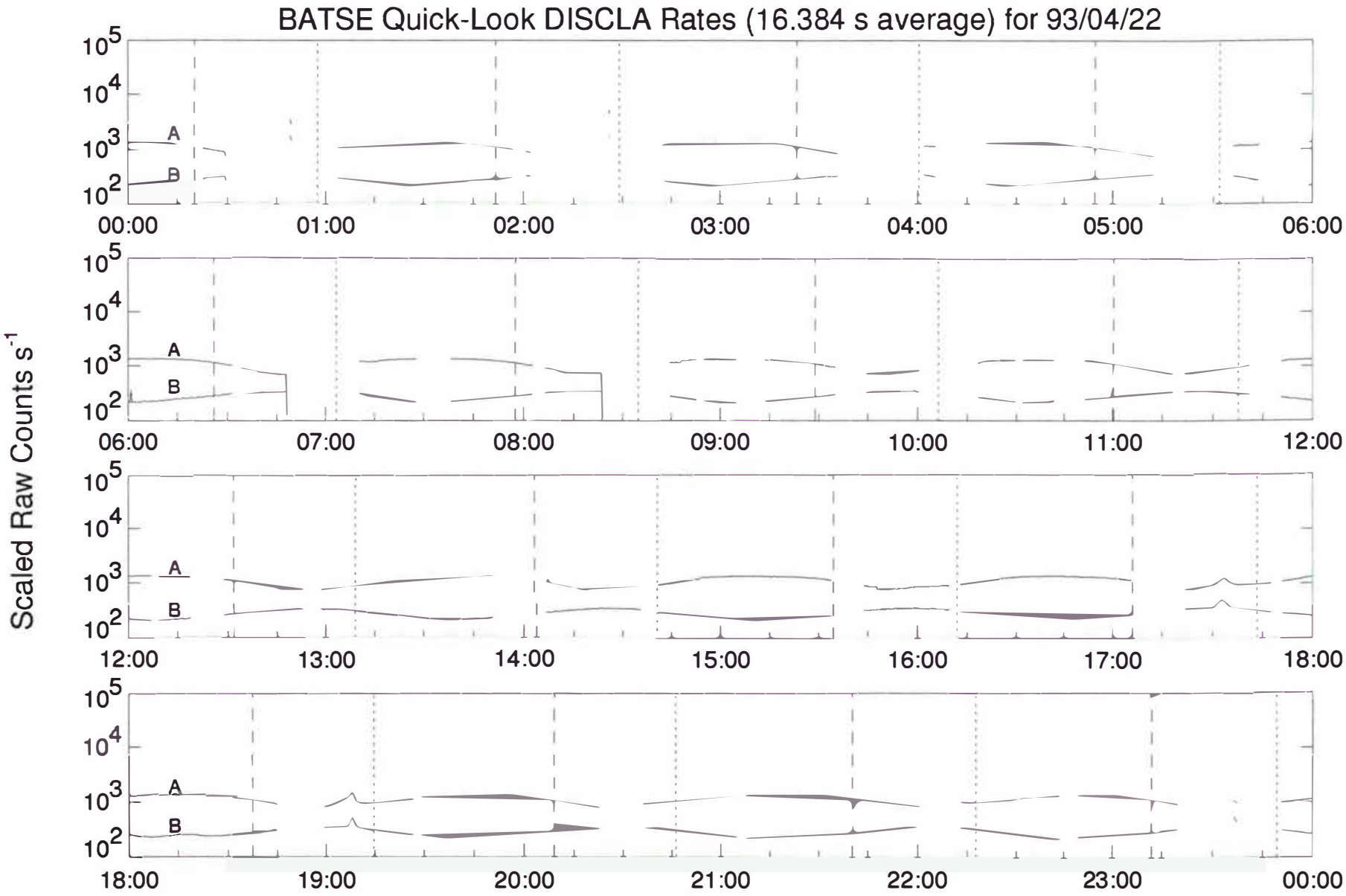
ULYSSES RT

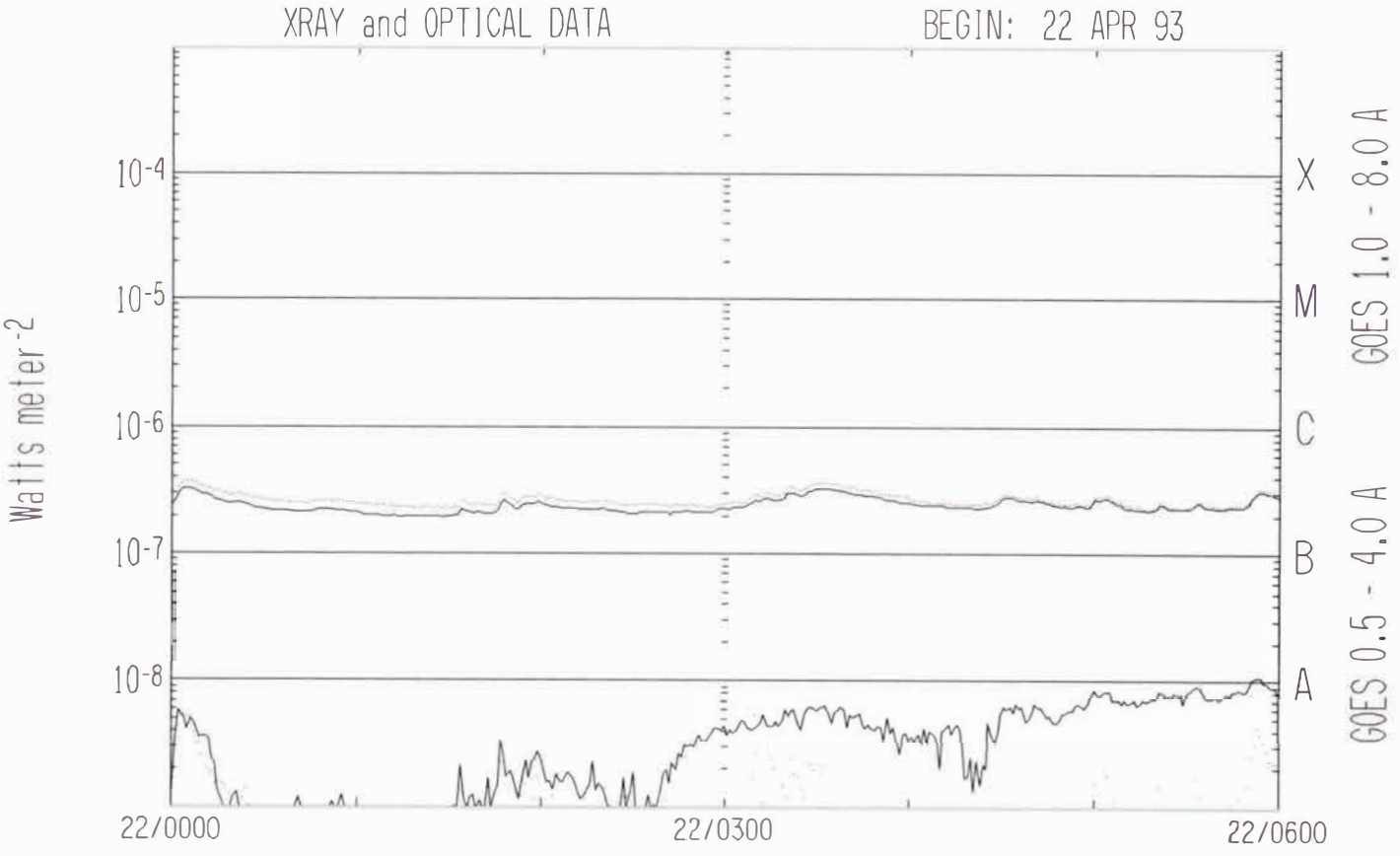
22/ 4/93 72180.141 s

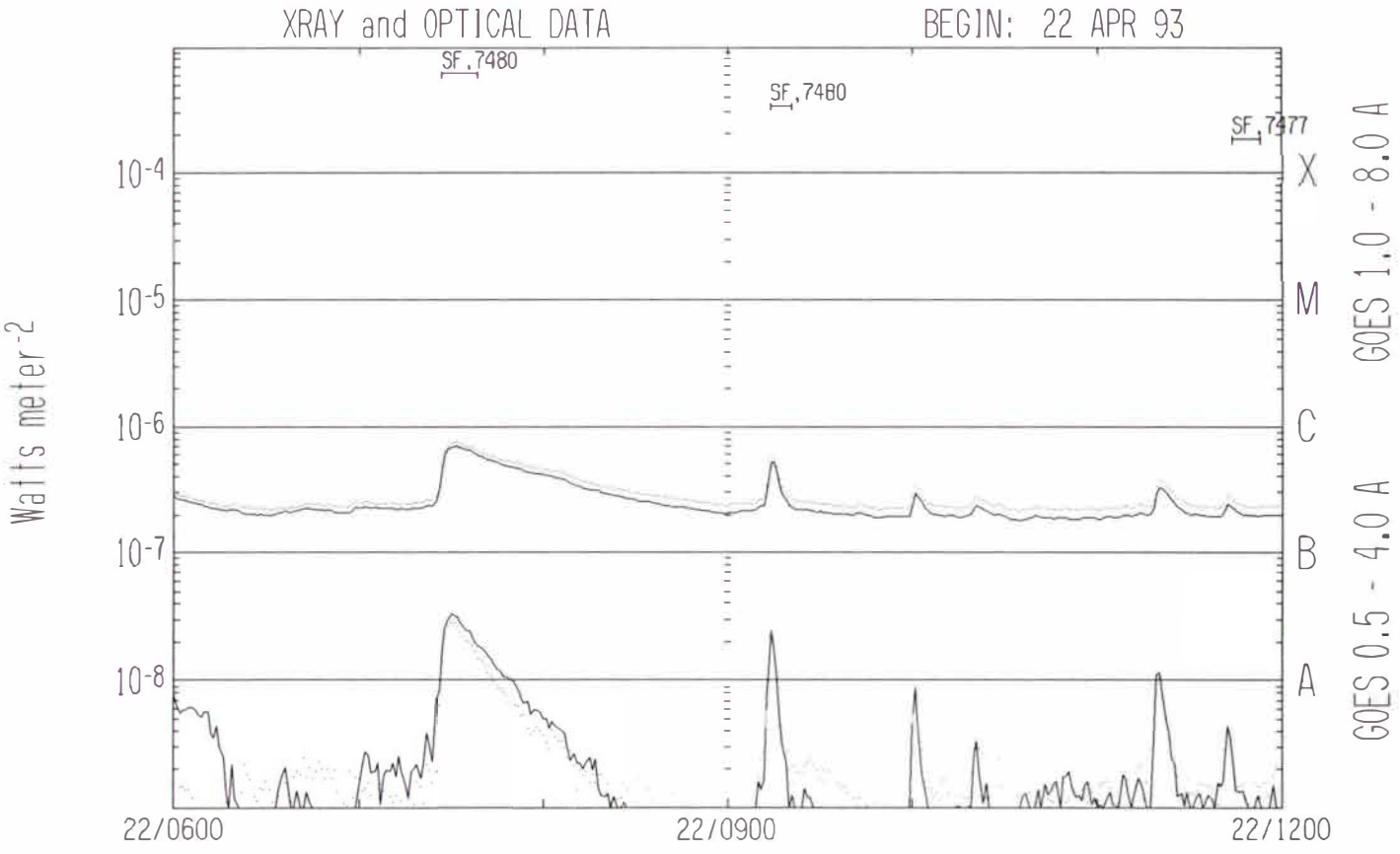
0.250 S INTERVALS REGROUPED BY 12

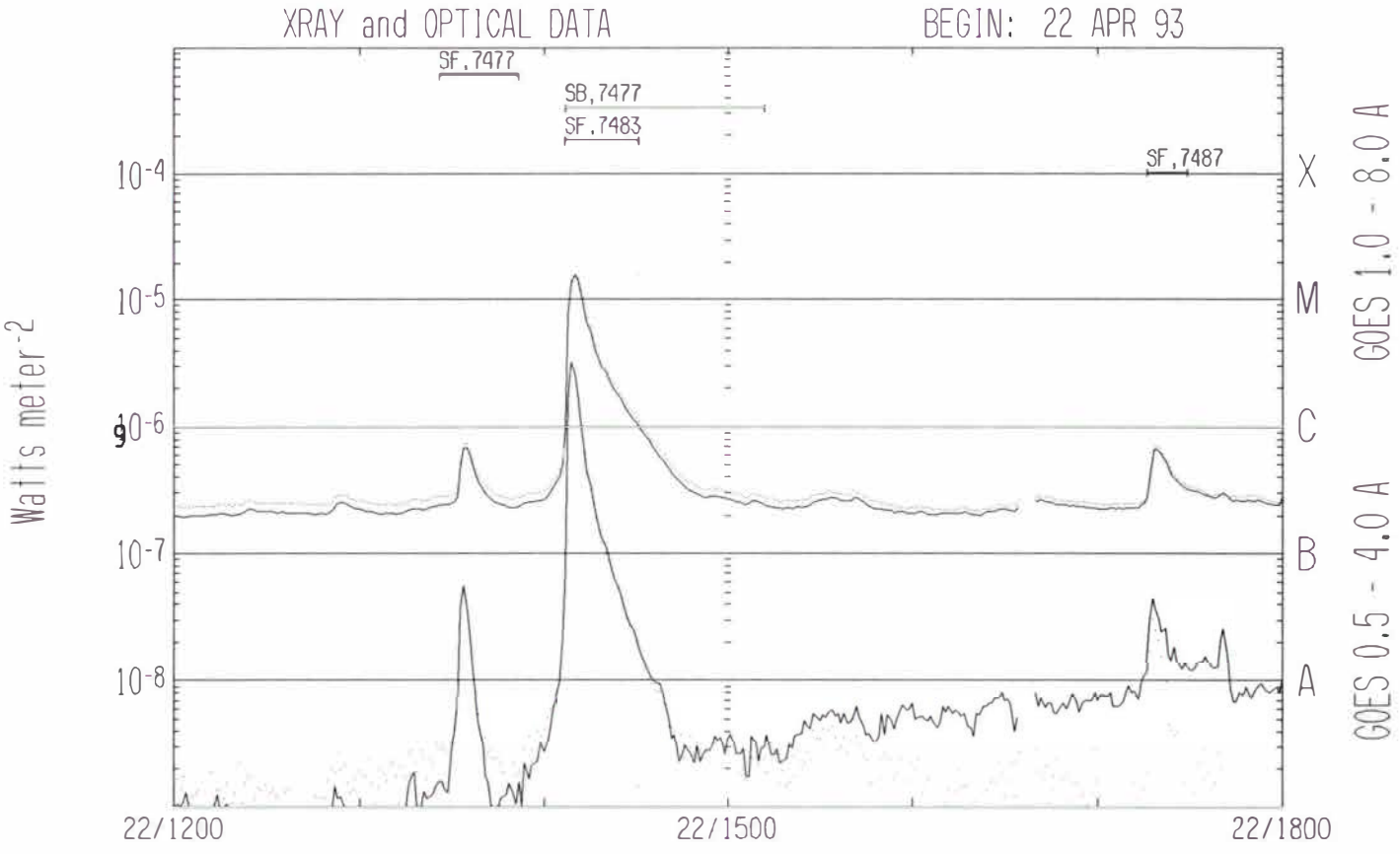
0- 0 keV

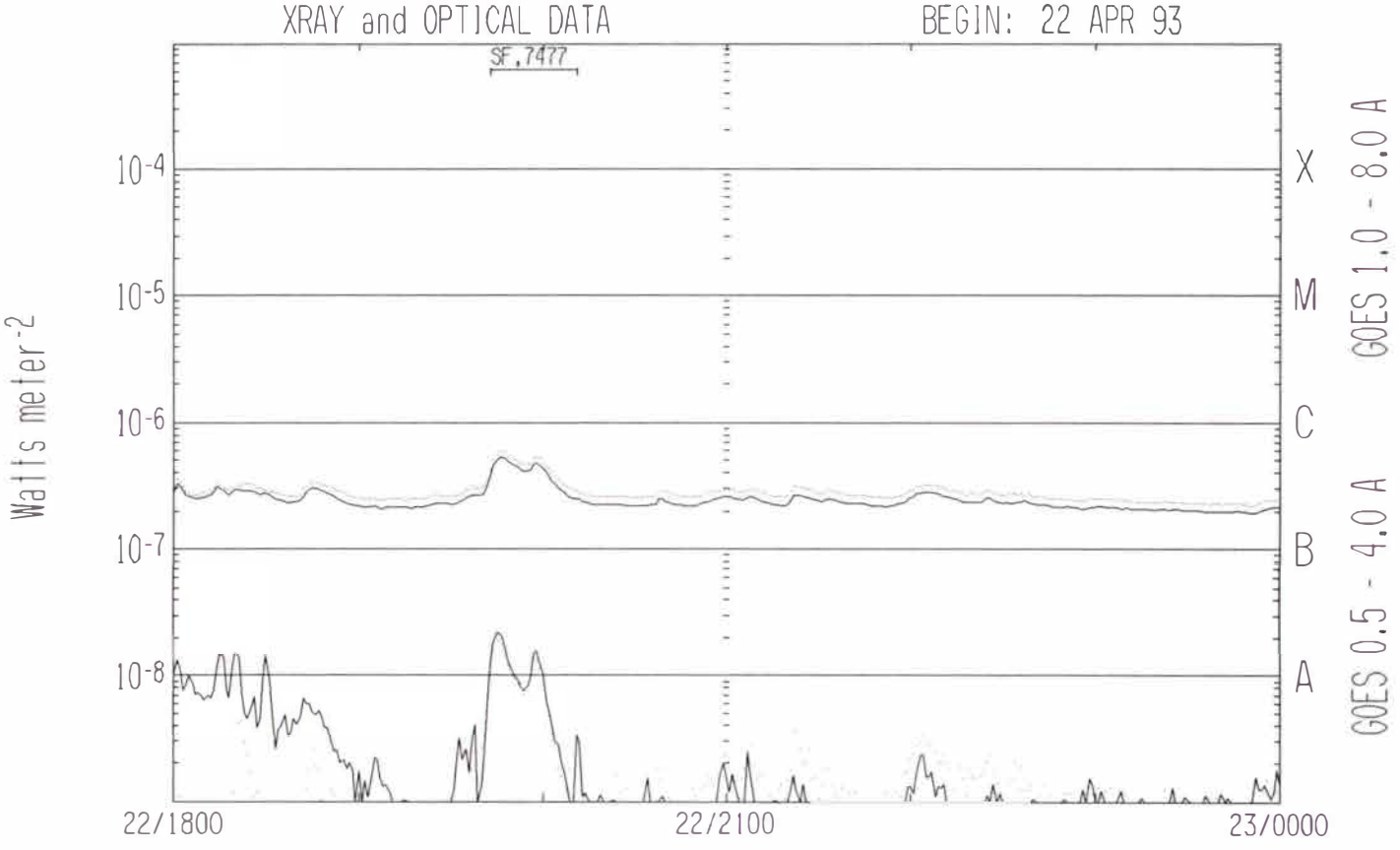



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/22
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/29, 1237 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

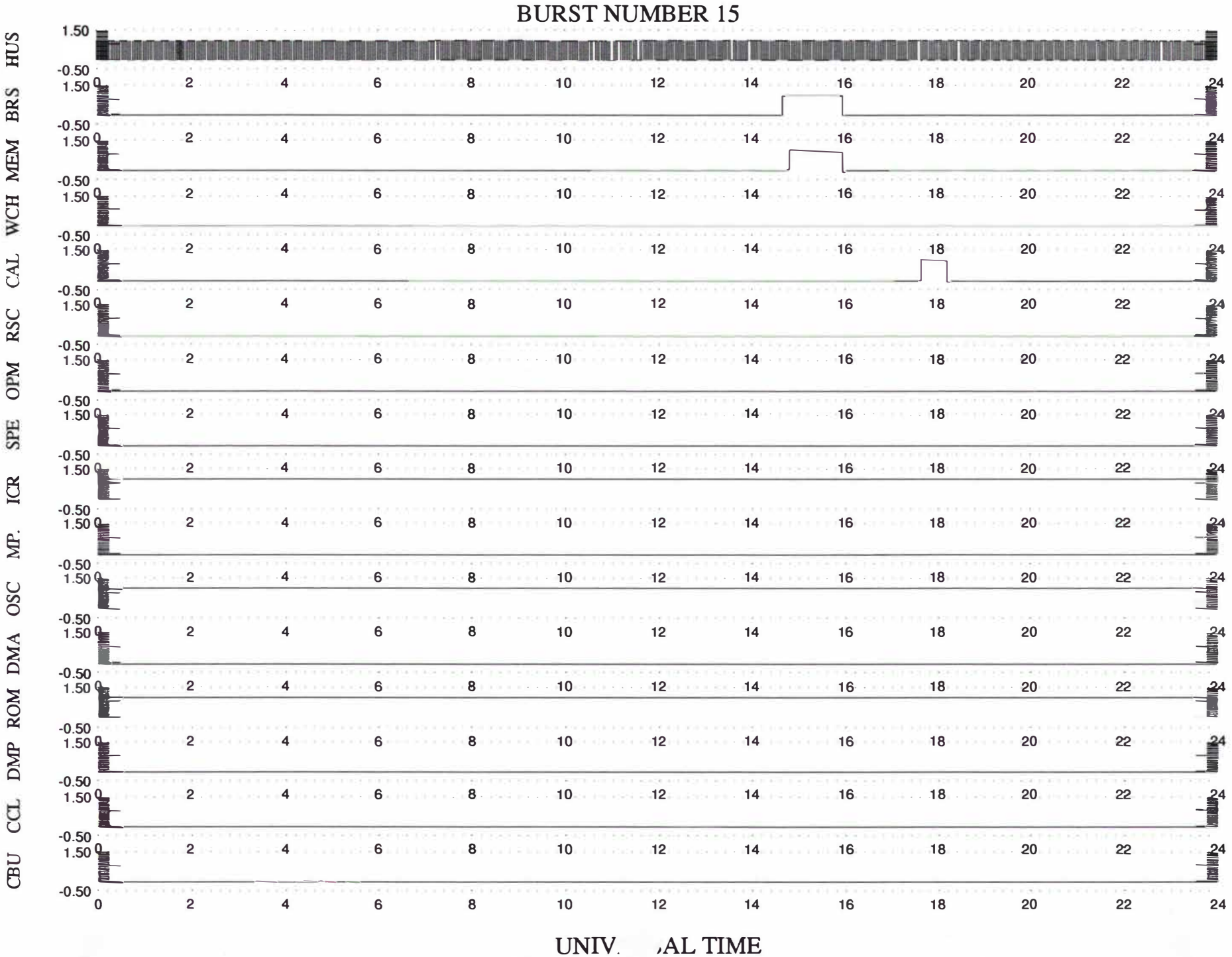

XRAY and OPTICAL DATA
BEGIN: 22 APR 93
Watts meter-2
10-4
10-5
10-6
10-7
10-8
X
M
C
B
A
GOES 1.0 - 8.0 A
GOES 0.5 - 4.0 A
22/0000
22/0300
22/0600


XRAY and OPTICAL DATA
BEGIN: 22 APR 93
SF, 7480
SF, 7480
SF, 7477
Watts meter-2
10-4
10-5
10-6
10-7
10-8
X
M
C
B
A
GOES 1.0 - 8.0 A
GOES 0.5 - 4.0 A
22/0600
22/0900
22/1200


XRAY and OPTICAL DATA
BEGIN: 22 APR 93
SF,7477
SB,7477
SF,7483
SF,7487
Watts meter-2
10-4
10-5
10-6
10-7
10-8
X
M
C
B
A
GOES 1.0 - 8.0 A
GOES 0.5 - 4.0 A
22/1200
22/1500
22/1800

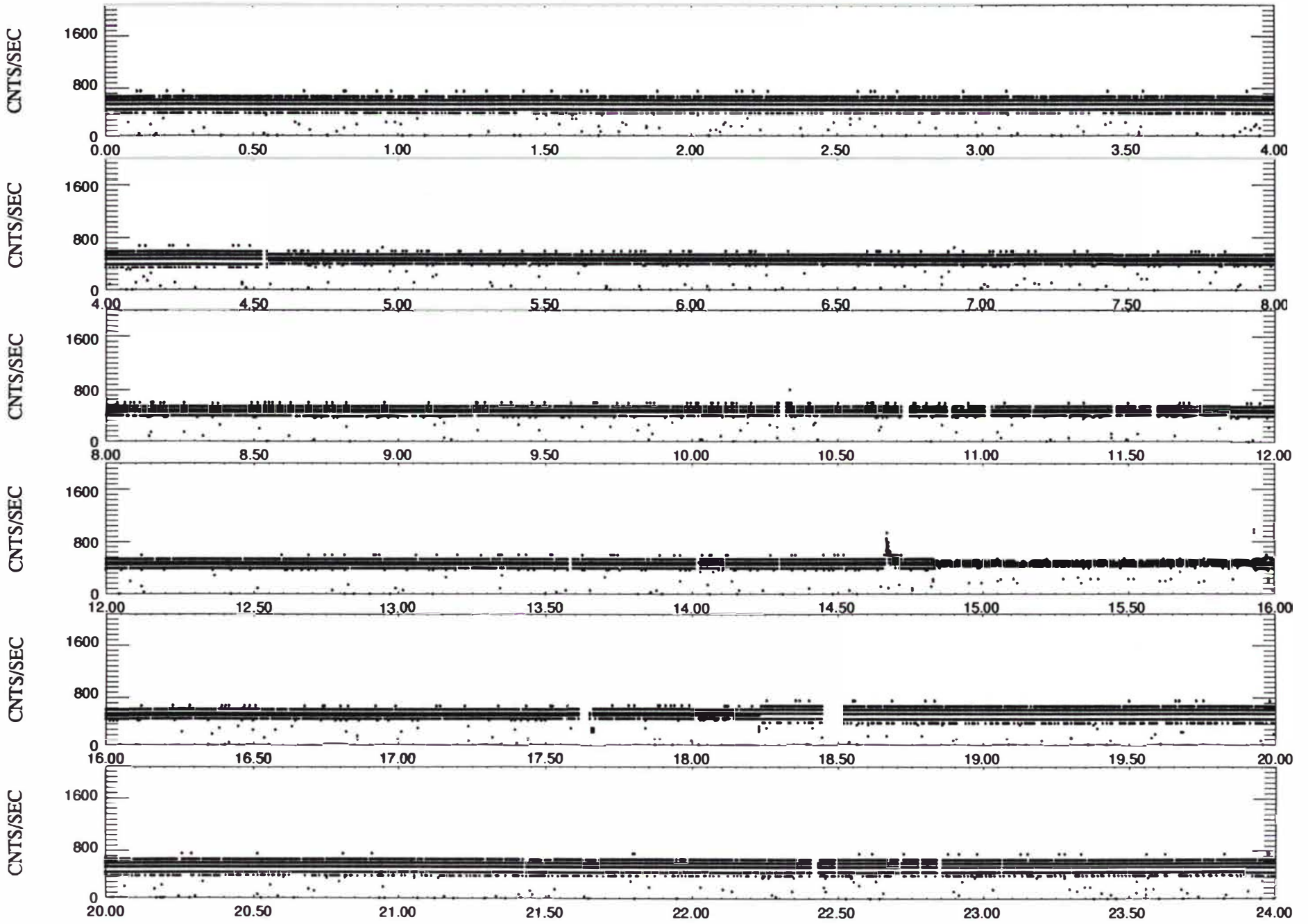

XRAY and OPTICAL DATA
BEGIN: 22 APR 93
SF,7477
Watts meter-2
10-4
10-5
10-6
10-7
10-8
X
M
C
B
A
GOES 1,0 - 8.0 A
GOES 0.5 - 4.0 A
22/1800
22/2100
23/0000

HUS MODES EDR day 112, year 1993 to day 112, year 1993 6/12/93



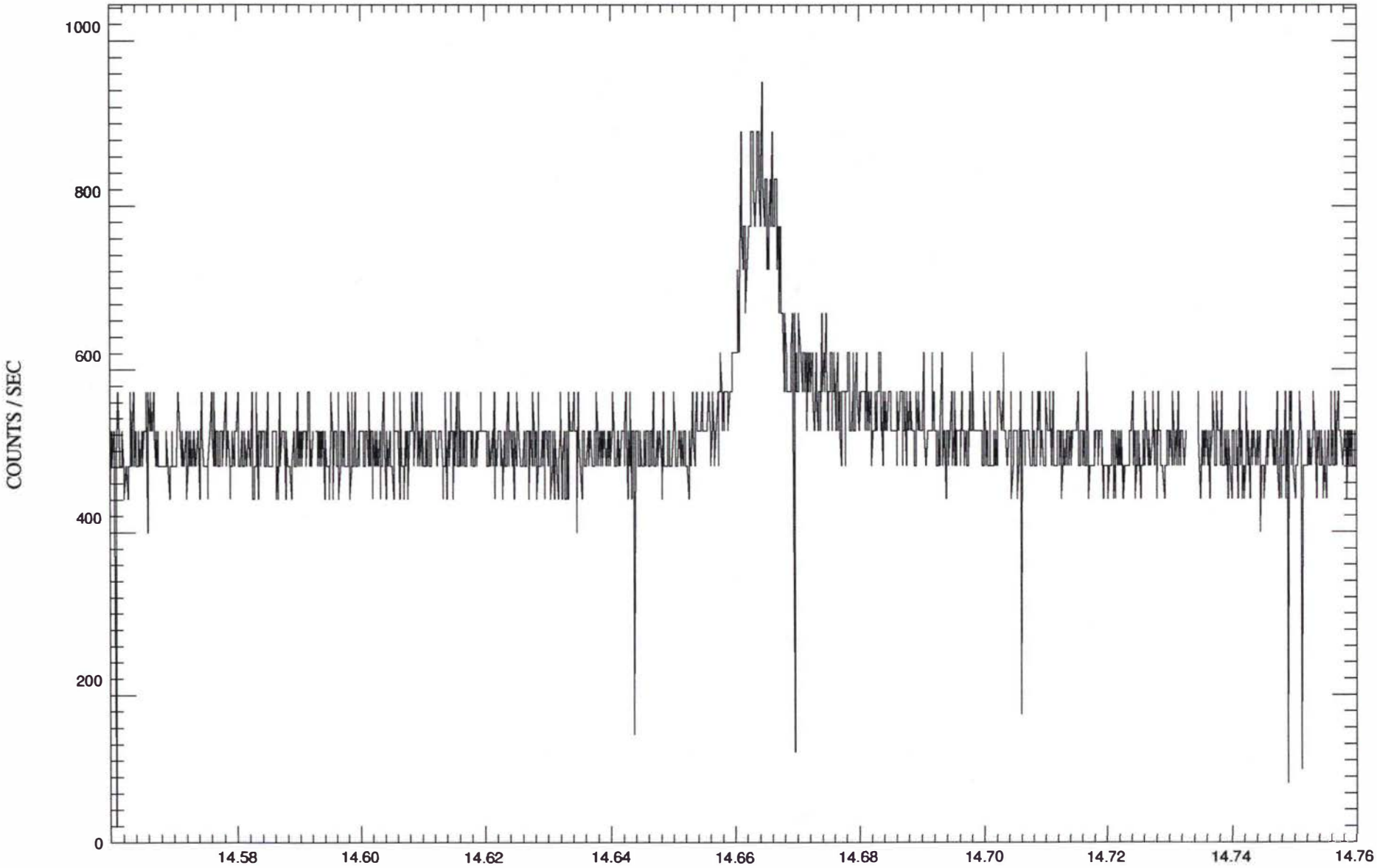
HUS 2A, MODE 1, NOT AVERAGED EDR day 112, year 1993 to day 112, year 1993 6/12/93

CALIBRATION DATA INCLUDED



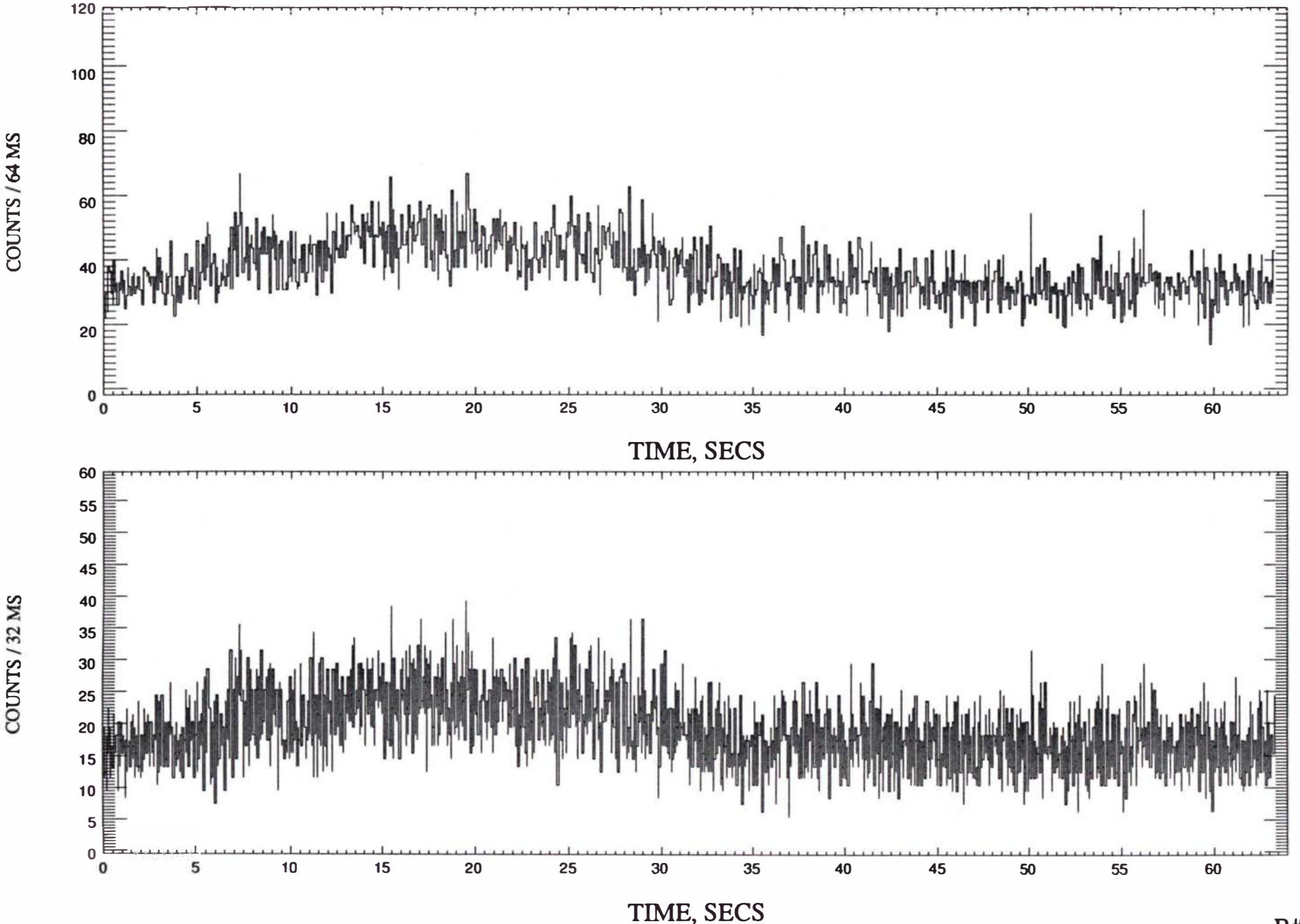
HUS 2A, MODE 1, NOT AVERAGED EDR day 112, year 1993 to day 112, year 1993 6/12/93

CALIBRATION DATA INCLUDED



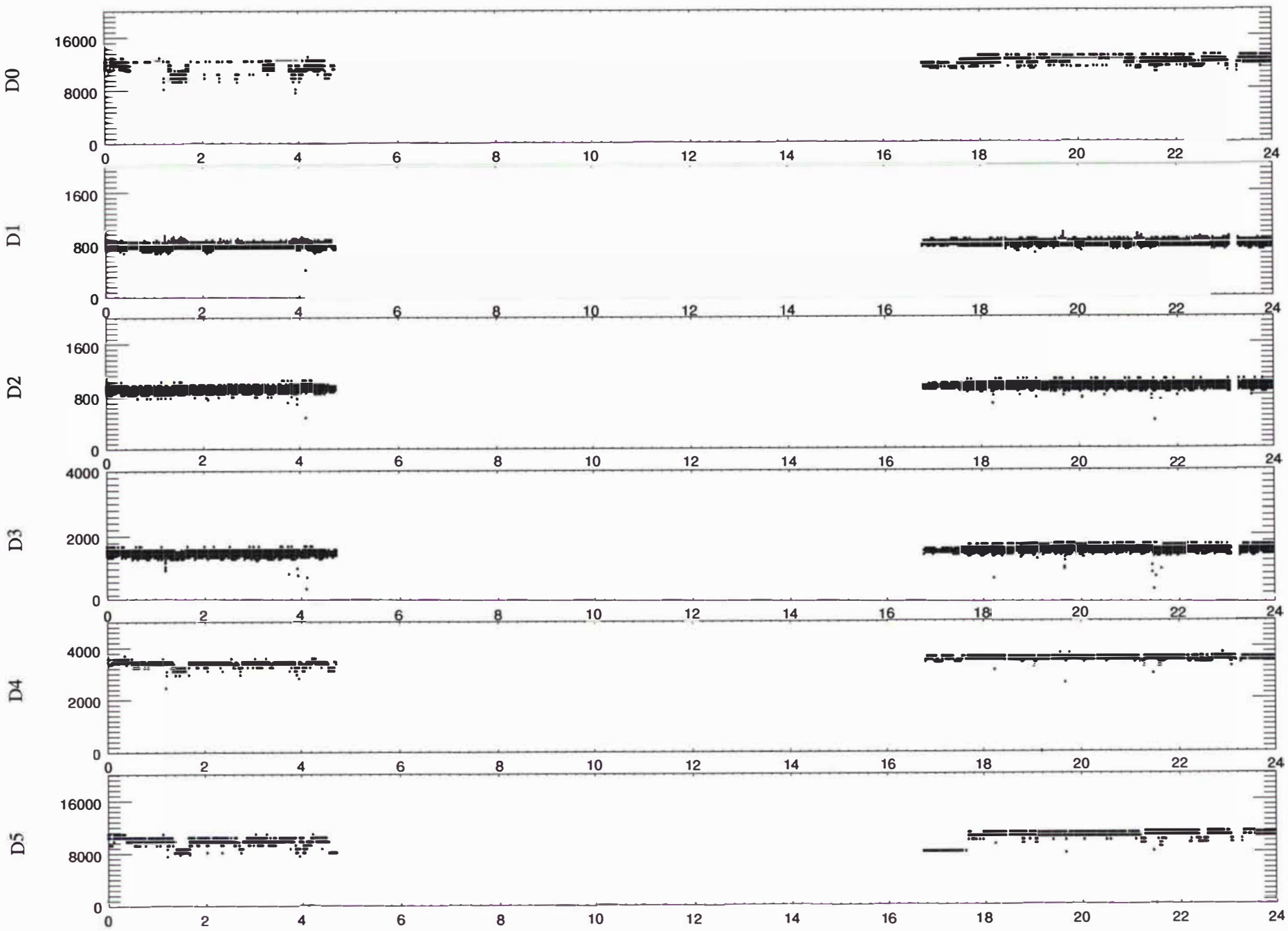
HUS 2A TRIGGERED DATA EDR day 112, year 1993 6/12/93

Burst Counter 15 at UT=14.661300926208 h=52780.683 s 14:39:40.683



B# 1

HUS 2B COUNTS / SEC QEDR day 112, year 1993 to day 112, year 1993 4/26/93



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2314
EVENT OF 1993 APR 23 DAY OF YEAR=113
EVENT CROSSING TIME AT BATSE      : 47779. S. OR 13:16:19.0
COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 152.000  -33.000
BATSE PEAK COUNTING RATE:     700    C/S
EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
POSITION OF ULYSSES ON 23/ 4/  93 IS:
RA=  143.747 DEC=  -12.111 DIST=    4.274 AU
BATSE-ULYSSES DISTANCE =  639450240. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=157.79 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1974.67 SECS.
CROSSING TIME AT ULYSSES    IS 45804. S. OR   12:43:24 +/-  160.02 SECONDS
```



```
From SHARIFF@ssl.msfc.nasa.gov Mon Apr 26 12:59:11 1993
Date:    Mon, 26 Apr 1993 14:59:24 -0500 (CDT)
From: SHARIFF@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD      sec    Max ct/s   RA   Dec
   2314   930423    9100   47779       700   152   -33
```

NO

```
                BATSE BURST TRIGGER
NO.: 02314

TIME: TJD=9100 SECONDS=47779

TYPE: BURST                     SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:       SIGMA

INTENSITY:          COUNTS/CM2

LOCATION: ZENITH=080.7  AZIMUTH=134.0  ERROR=      DEGREES

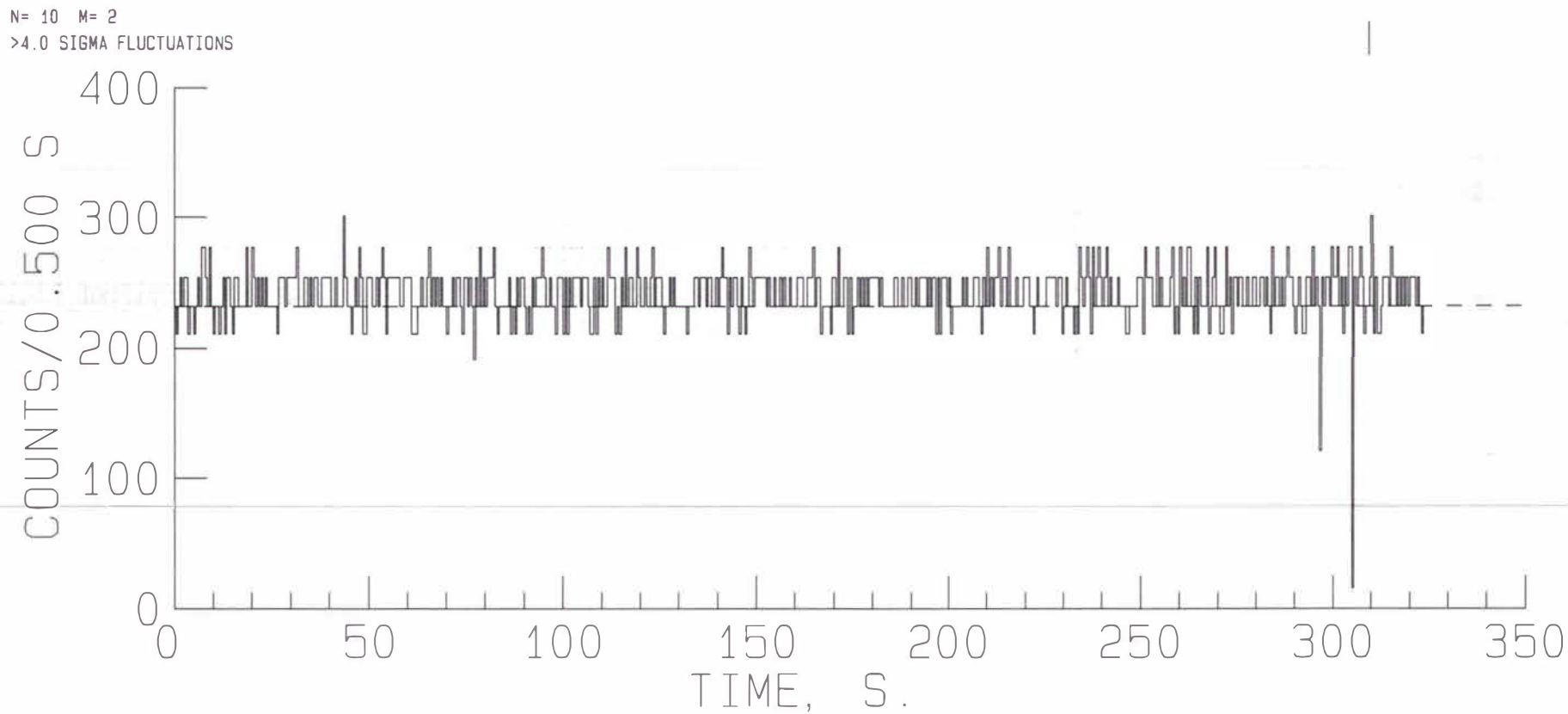
COMMENTS:
BURST, SINGLE SPIKE LASTING ~0.5S. NOT VISIBLE ABOVE 300KEV.
```

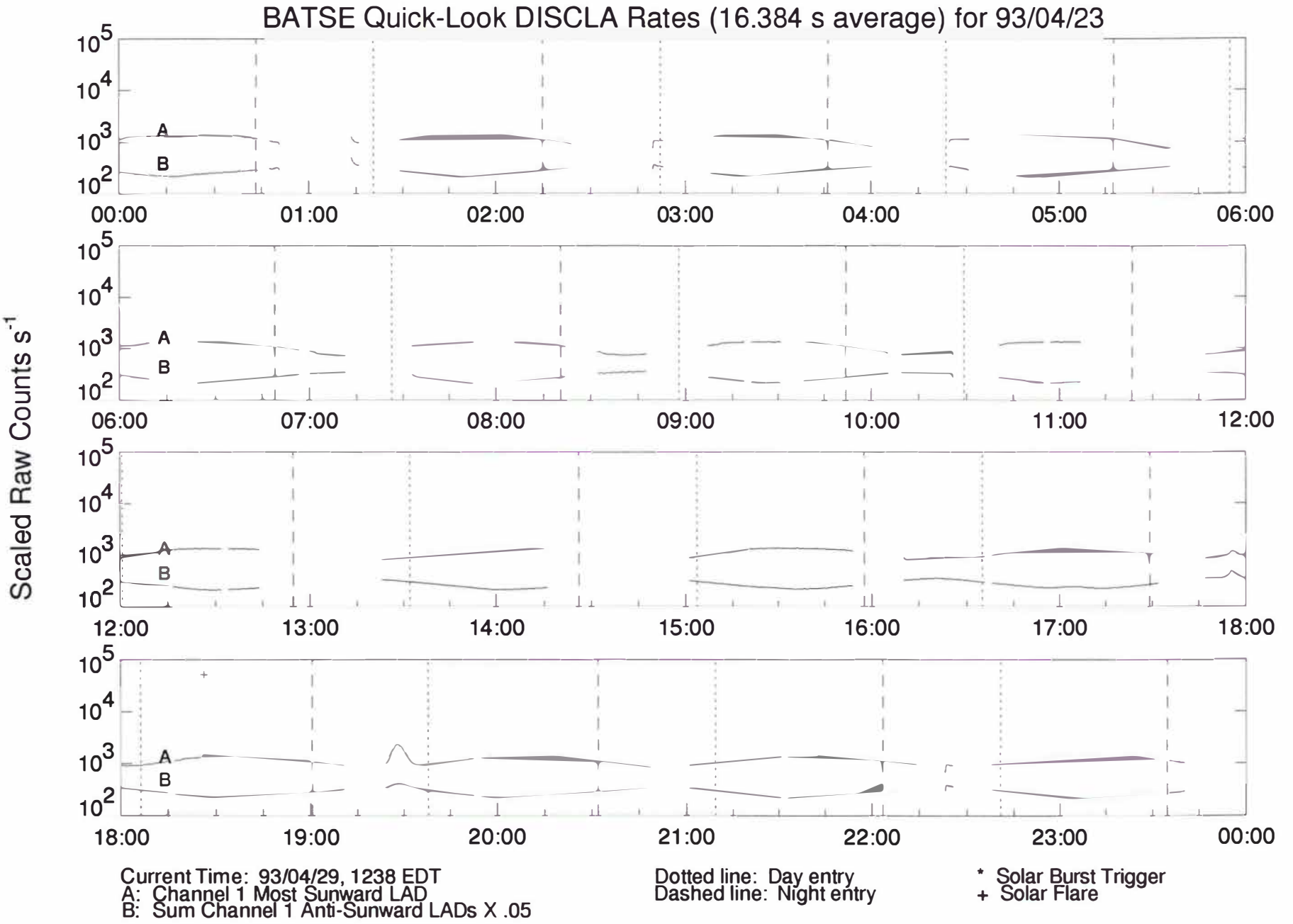
28/ 4/93

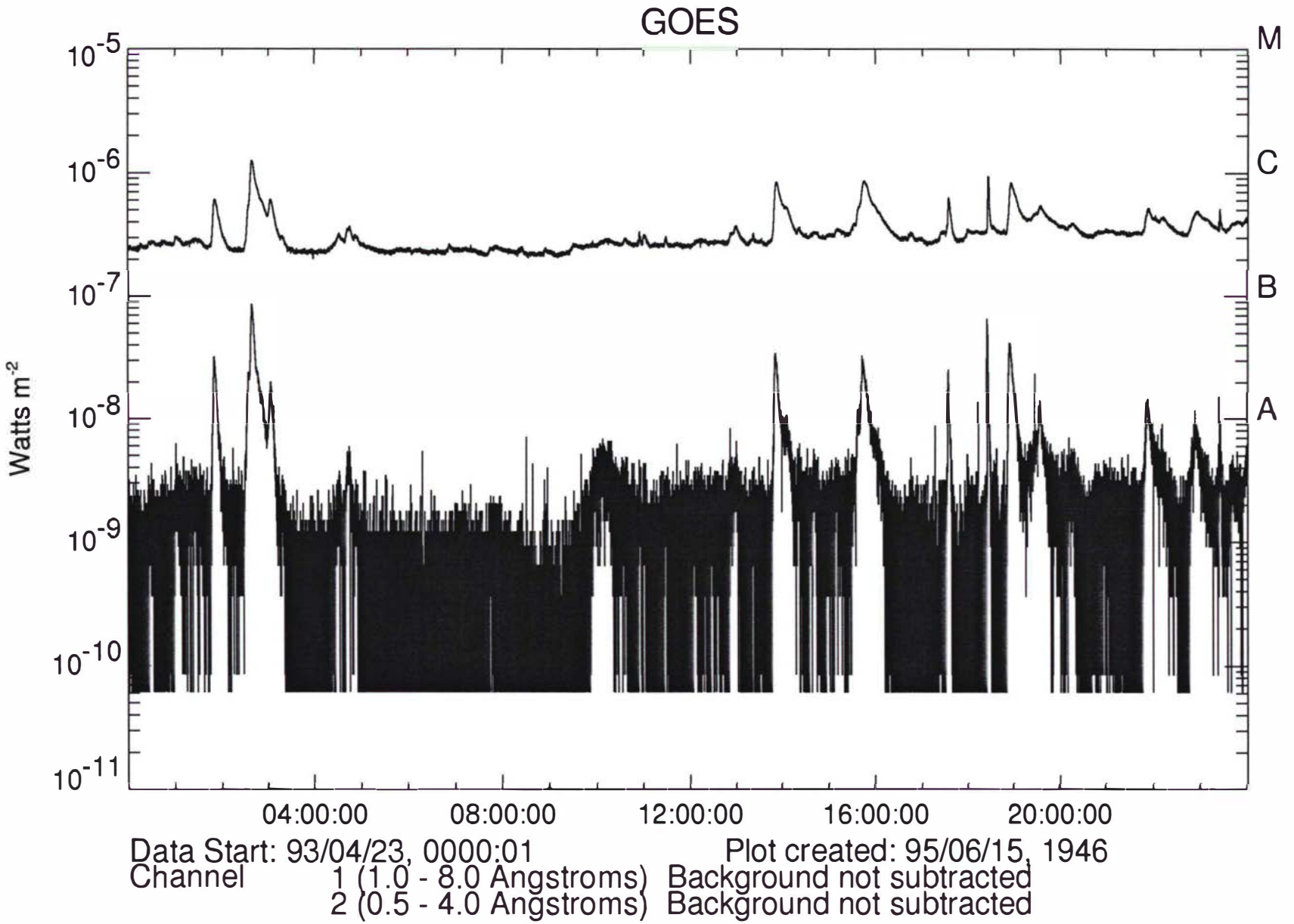
ULYSSES RT

23/ 4/93 45648.066 s

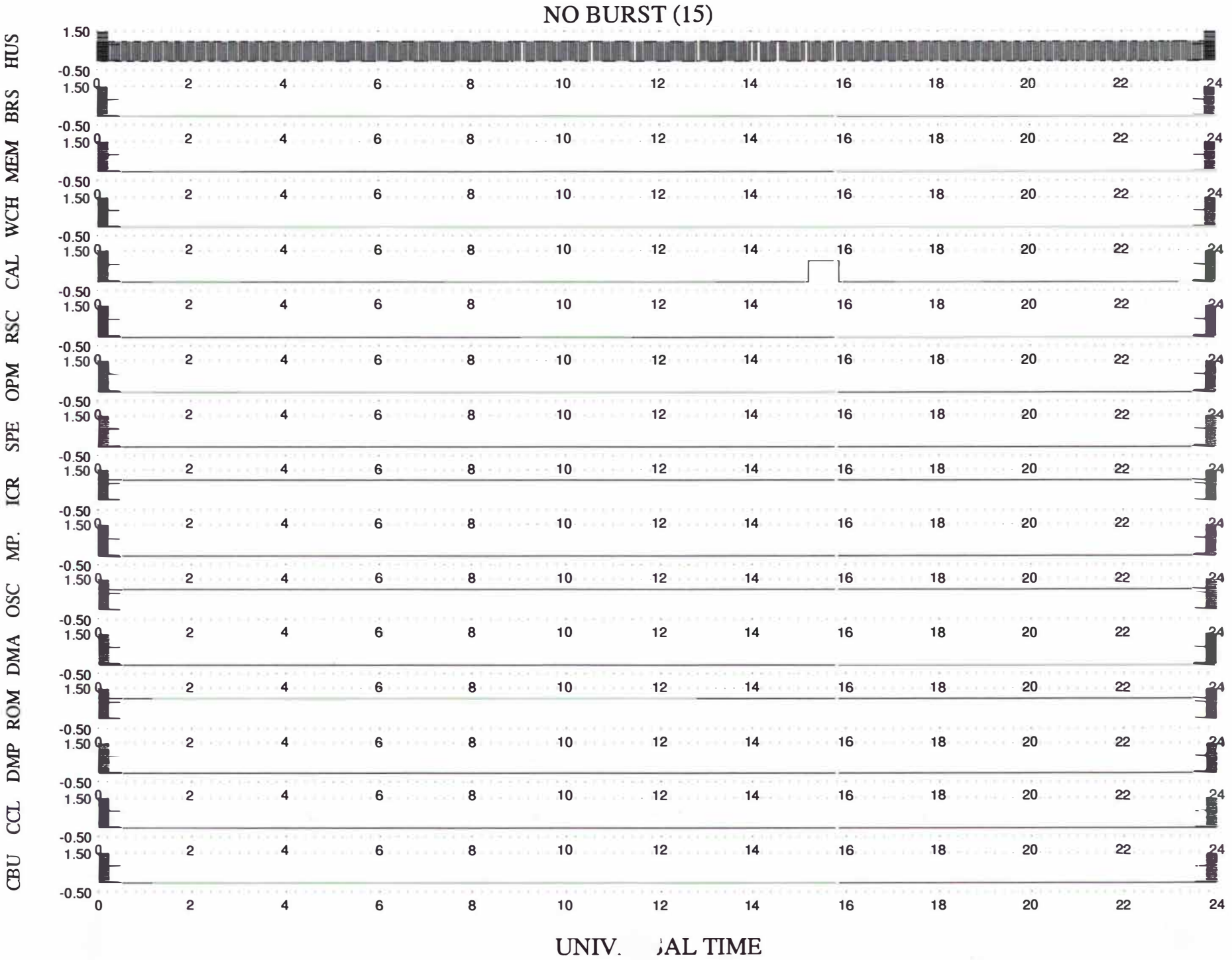
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/23
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Current Time: 93/04/29, 1238 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

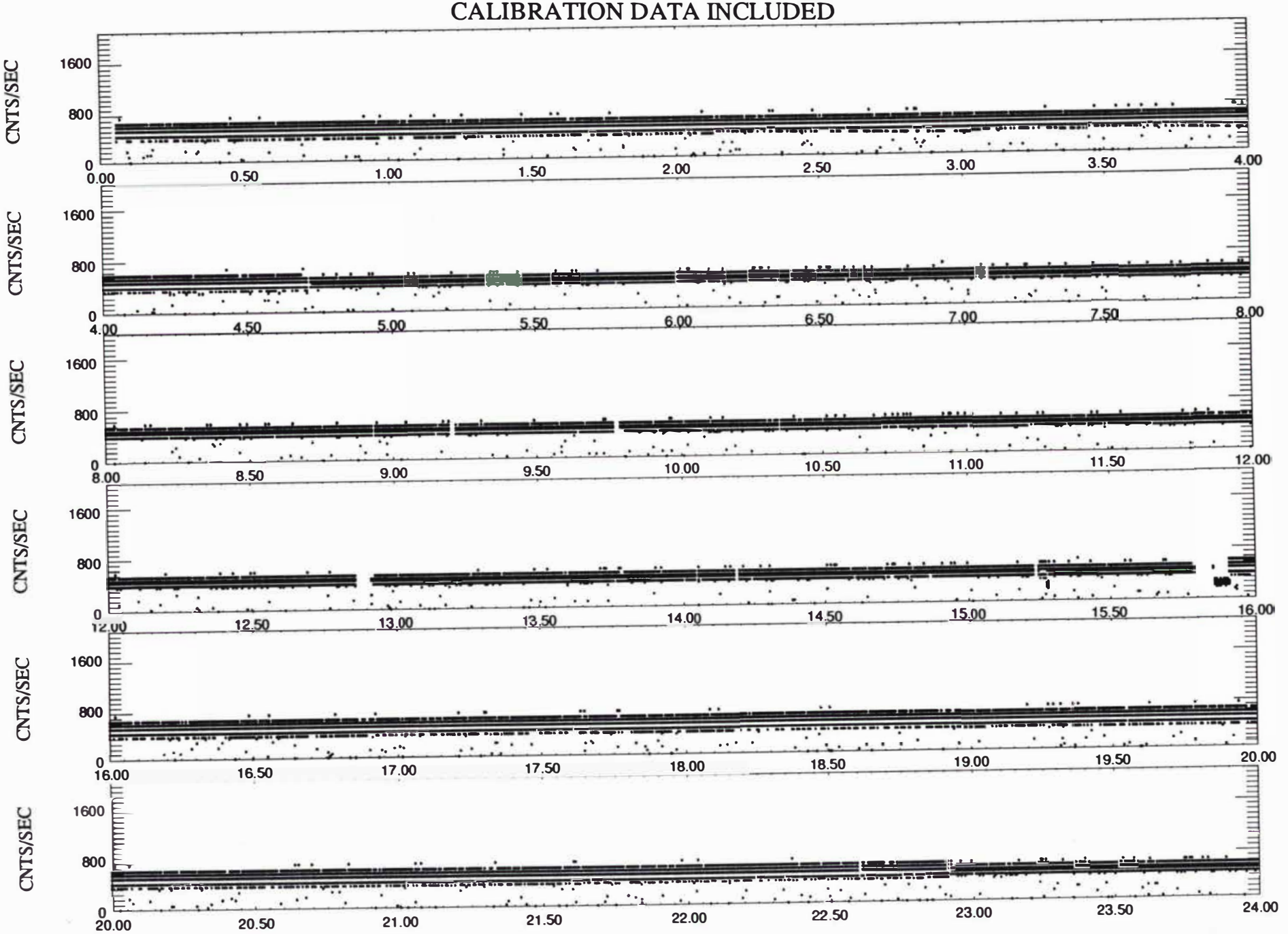

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/23, 0000:01
Plot created: 95/06/15, 1946
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 113, year 1993 to day 113, year 1993 6/12/93

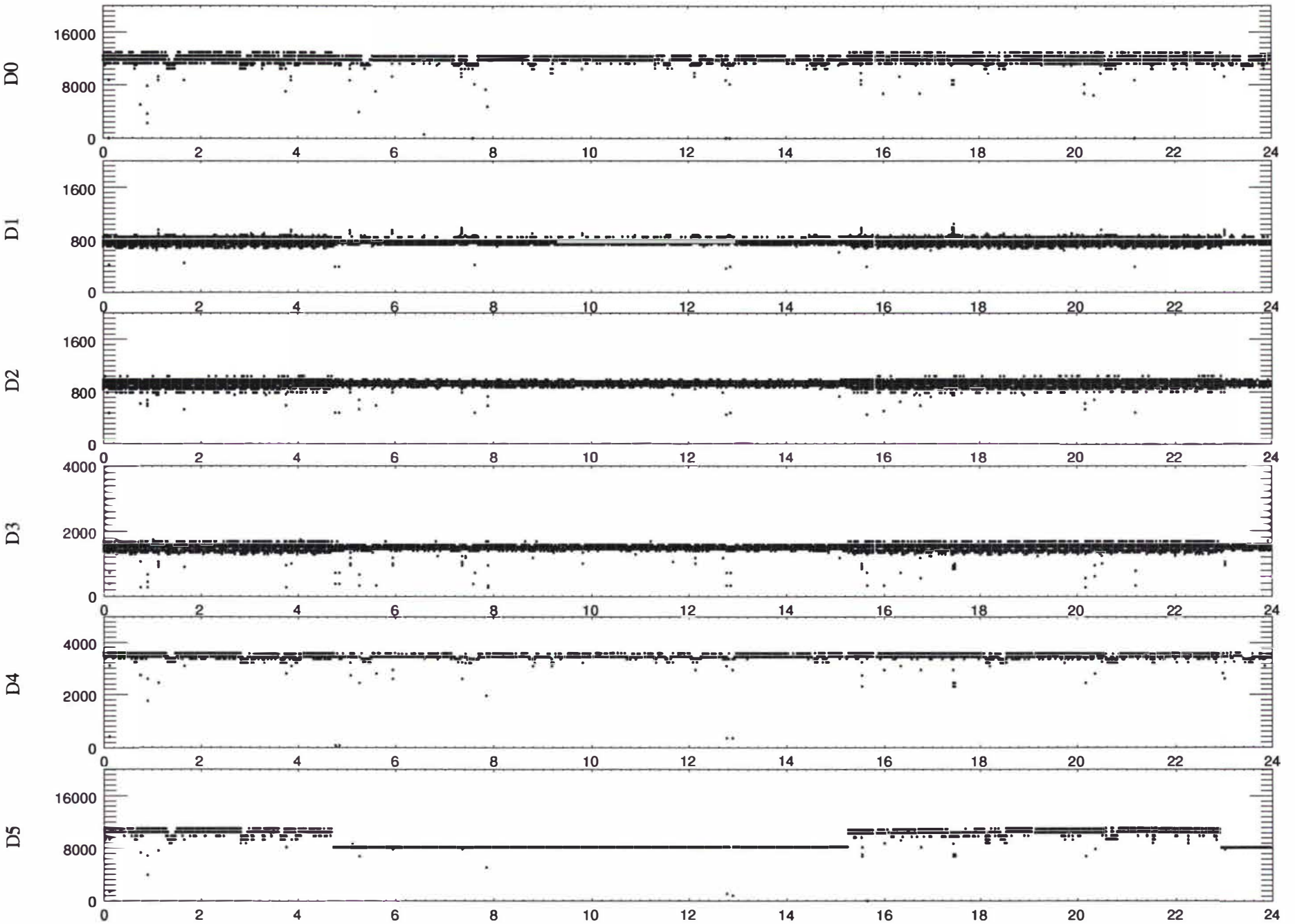


HUS 2A, MODE 1, NOT AVERAGED EDR day 113, year 1993 to day 113, year 1993 6/12/93

CALIBRATION DATA INCLUDED



HUS 2B COUNTS / SEC QEDR day 113, year 1993 to day 113, year 1993 4/26/93



Date: June 16 2003

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ BATSE ephemeris for T_0? N/A

☐ Error circle position and radius from public catalog used? N/A

☐ If MER data were used, is a 30 ms systematic error included?

3. NEAR Data

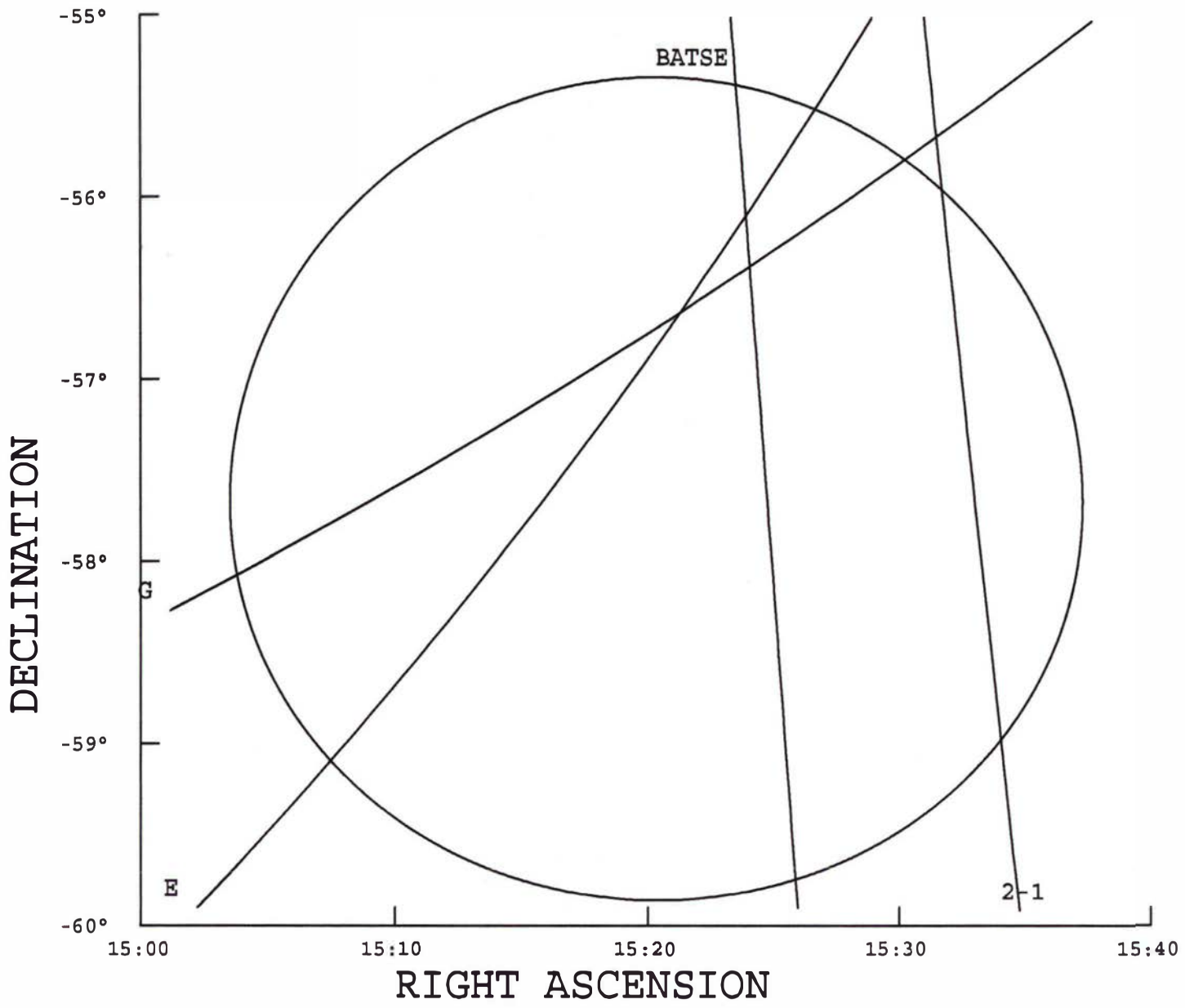
☐ Final, correct time used? (Files postmarked vwx@bocc1, from from Teresa Sheets, postmarked May 2 1999 or later have the correct time; files on website have incorrect times)

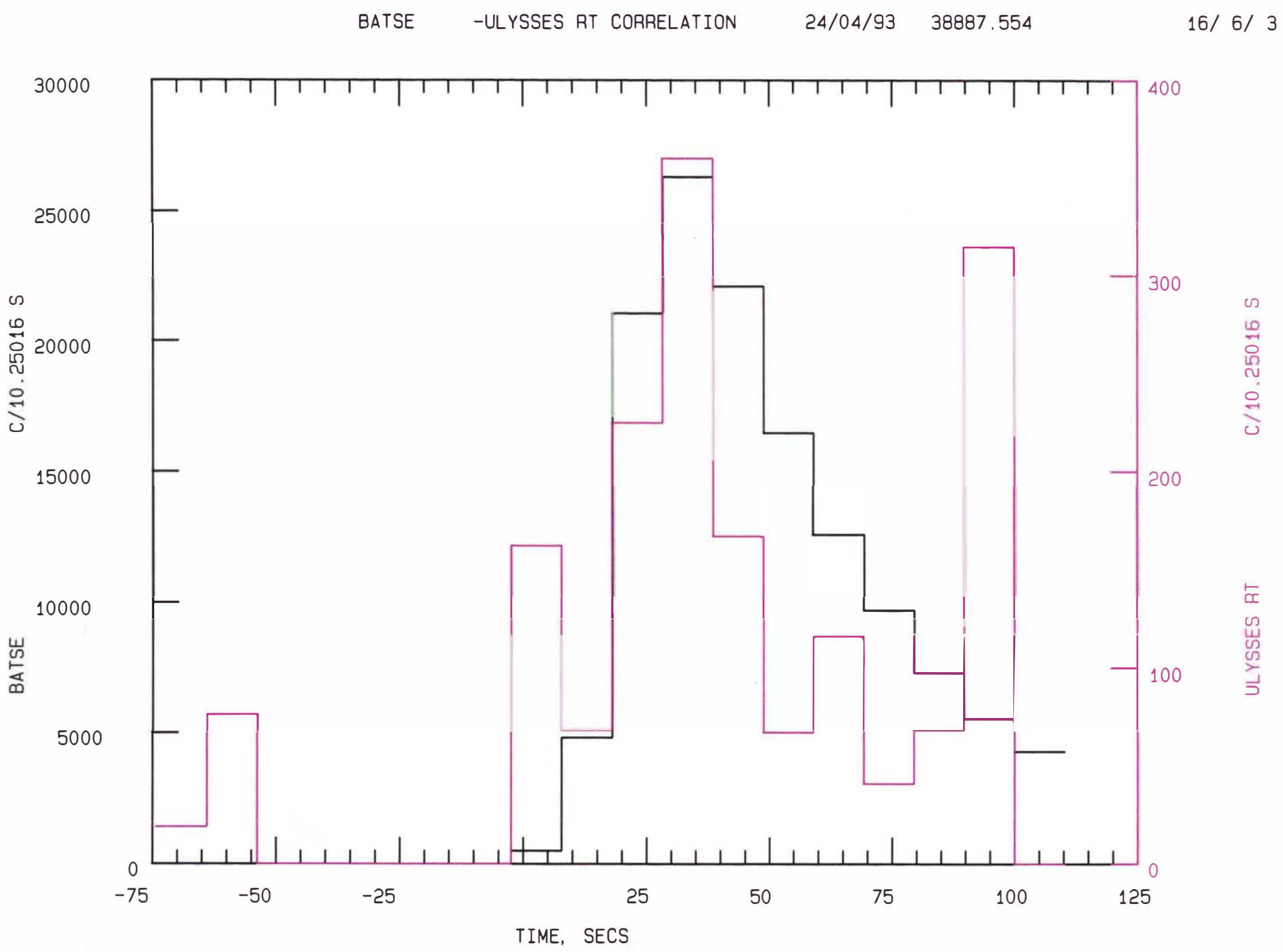
☐ BATSE >100 keV data used for NEAR correlation?

☑ ACCESS database updated?

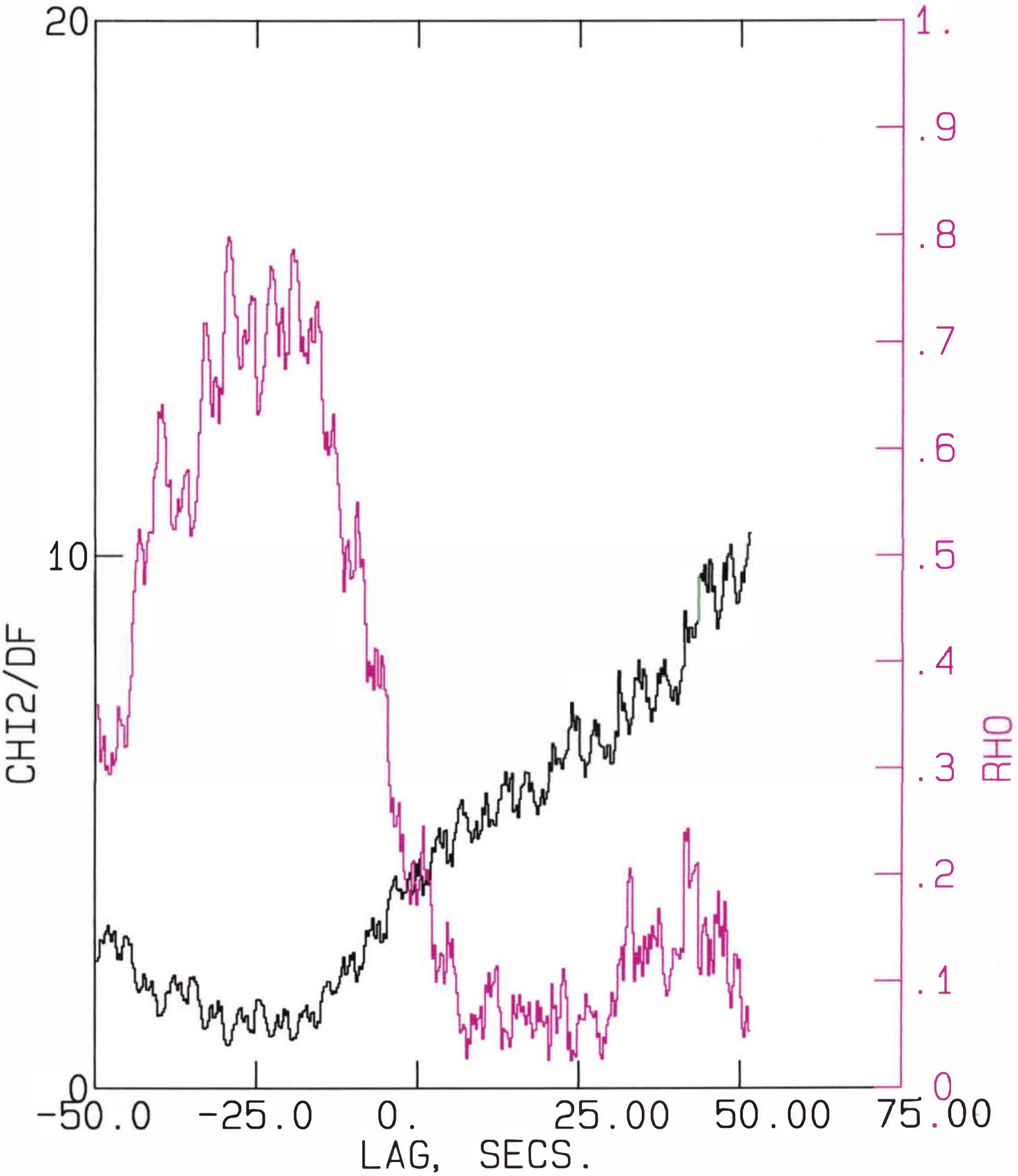
EVENT OF APR 24, 1993 10:48

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 BATSE 2 ULYSSES




BATSE -ULYSSES RT CORRELATION 24/04/93 38887.554 16/ 6/ 3
30000
25000
20000
15000
10000
5000
0
C/10.25016 S
BATSE
400
300
200
100
0
C/10.25016 S
ULYSSES RT
-75
-50
-25
25
50
75
100
125
TIME, SECS

BATSE -ULYSSES RT CORRELATION 24/04/93 38887.554



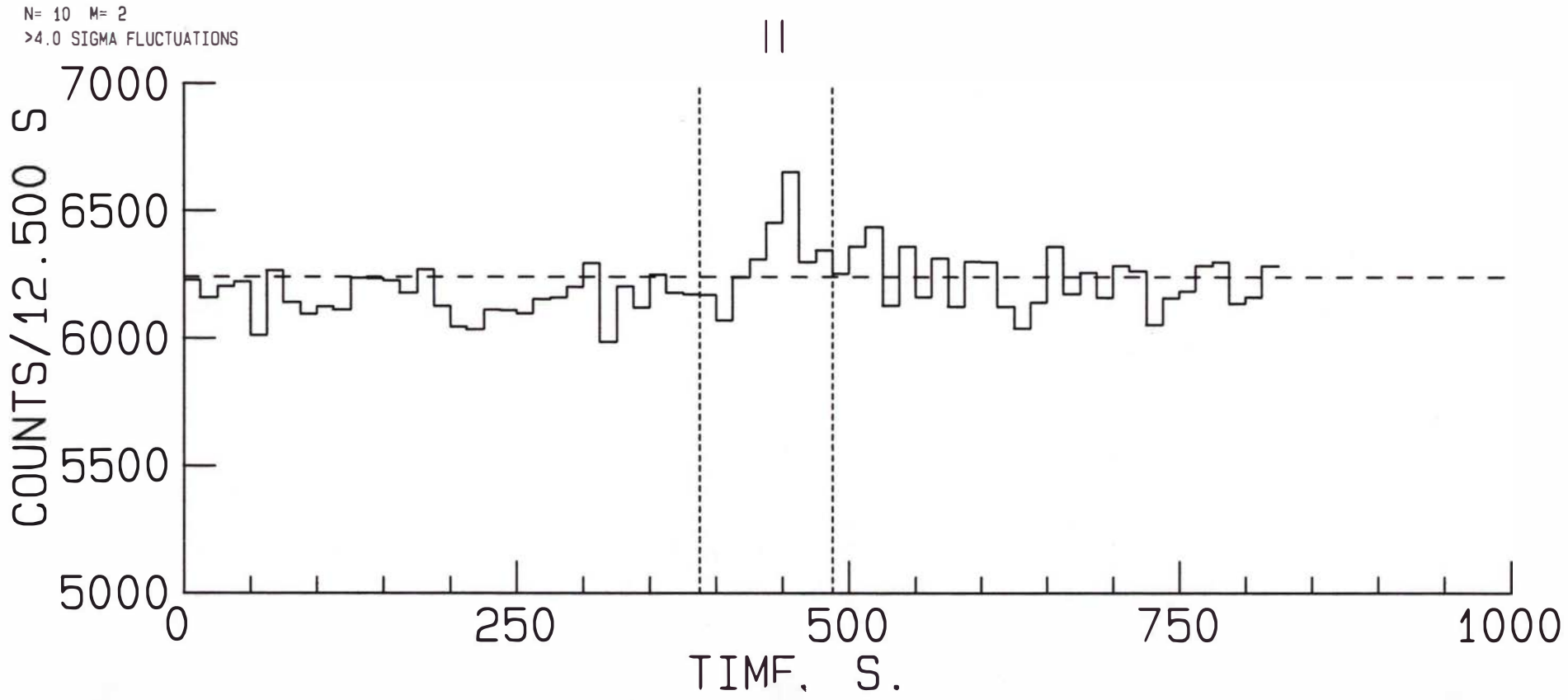
ULYSSES RT

16/ 6/ 3

24/ 4/93 38052.039 s

0.250 S INTERVALS REGROUPED BY 50

21- 145 keV



Kommers

UNTRIGGERED

ULYSSES RT 21/ 5/97

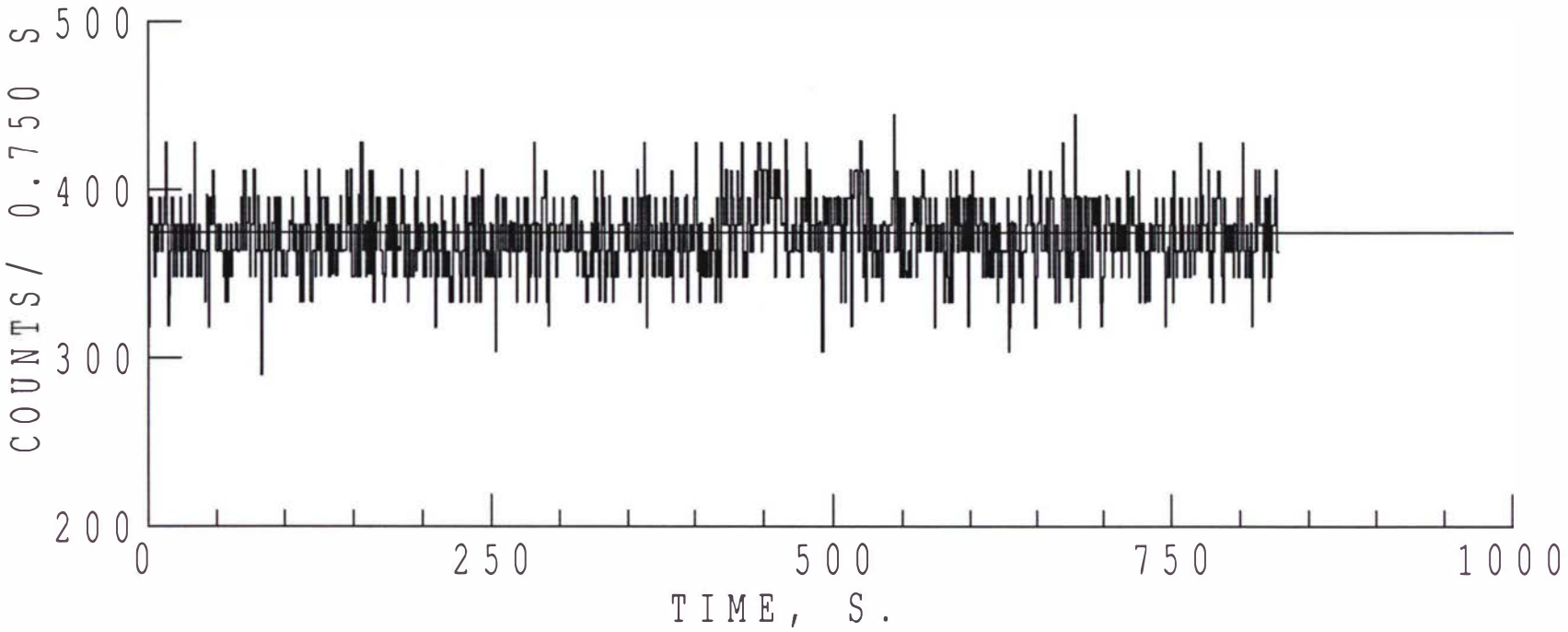
24/ 4/93 38052.039 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



Kommers

UNTRIGGERED

ULYSSES RT 21/ 5/97

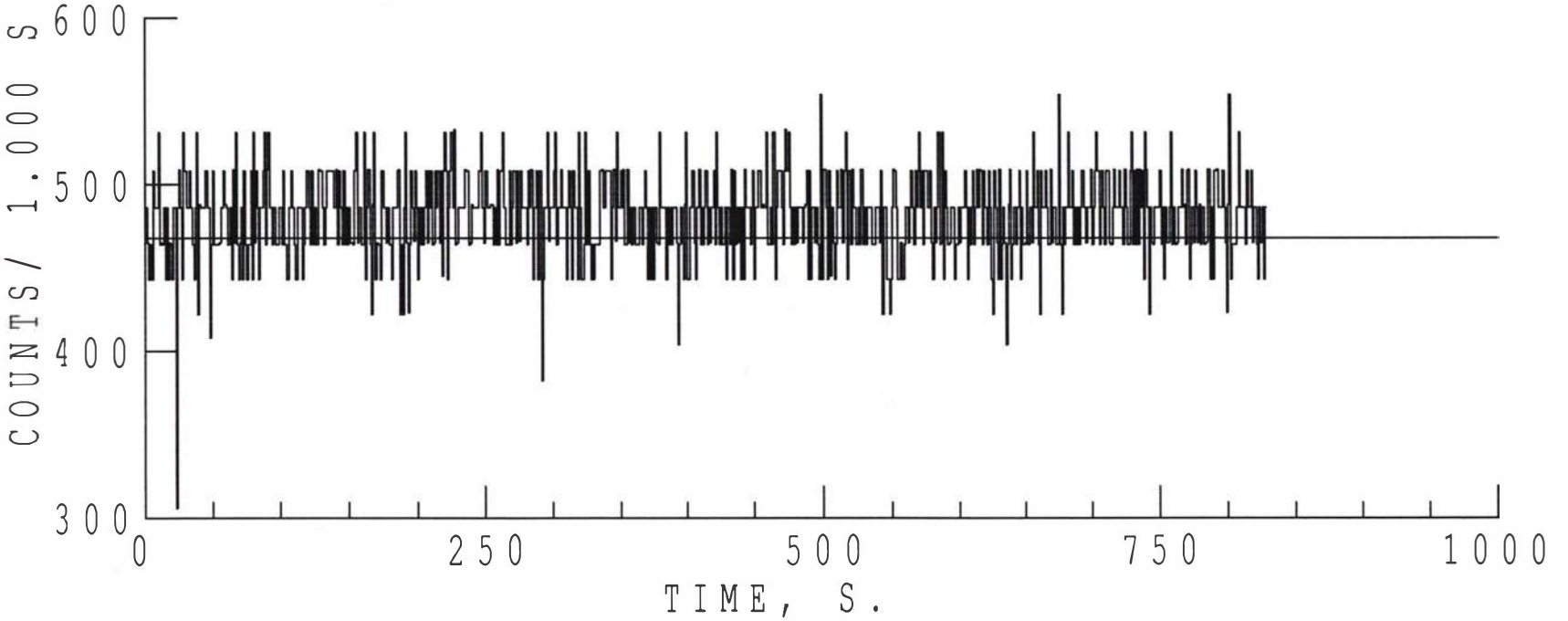
24/ 4/93 84420.008 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2315
EVENT OF 1993 APR 24 DAY OF YEAR=114
EVENT CROSSING TIME AT BATSE      : 69540. S. OR 19:19:00.0
COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION:  67.000    40.000
BATSE PEAK COUNTING RATE:    5600     C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
POSITION OF ULYSSES ON 24/ 4/  93 IS:
RA=  143.649 DEC=  -12.060 DIST=     4.285 AU
BATSE-ULYSSES DISTANCE =  641095840. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 92.22 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=  -82.73 SECS.
CROSSING TIME AT ULYSSES     IS 69457. S. OR   19:17:37 +/-  419.74 SECONDS
```

M


```
From MEEGAN@ssl.msfc.nasa.gov Sun Apr 25 19:52:48 1993
Date:    Sun, 25 Apr 1993 21:52:54 -0500 (CDT)
From: MEEGAN@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #    Date      TJD      sec    Max ct/s    RA    Dec
   2315    930424     9101    69540      5600    067    +40
```

MAIL

Helio corr removed

Date: Oct 29 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ Does T_0 in data file agree with T_0 in plot?

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

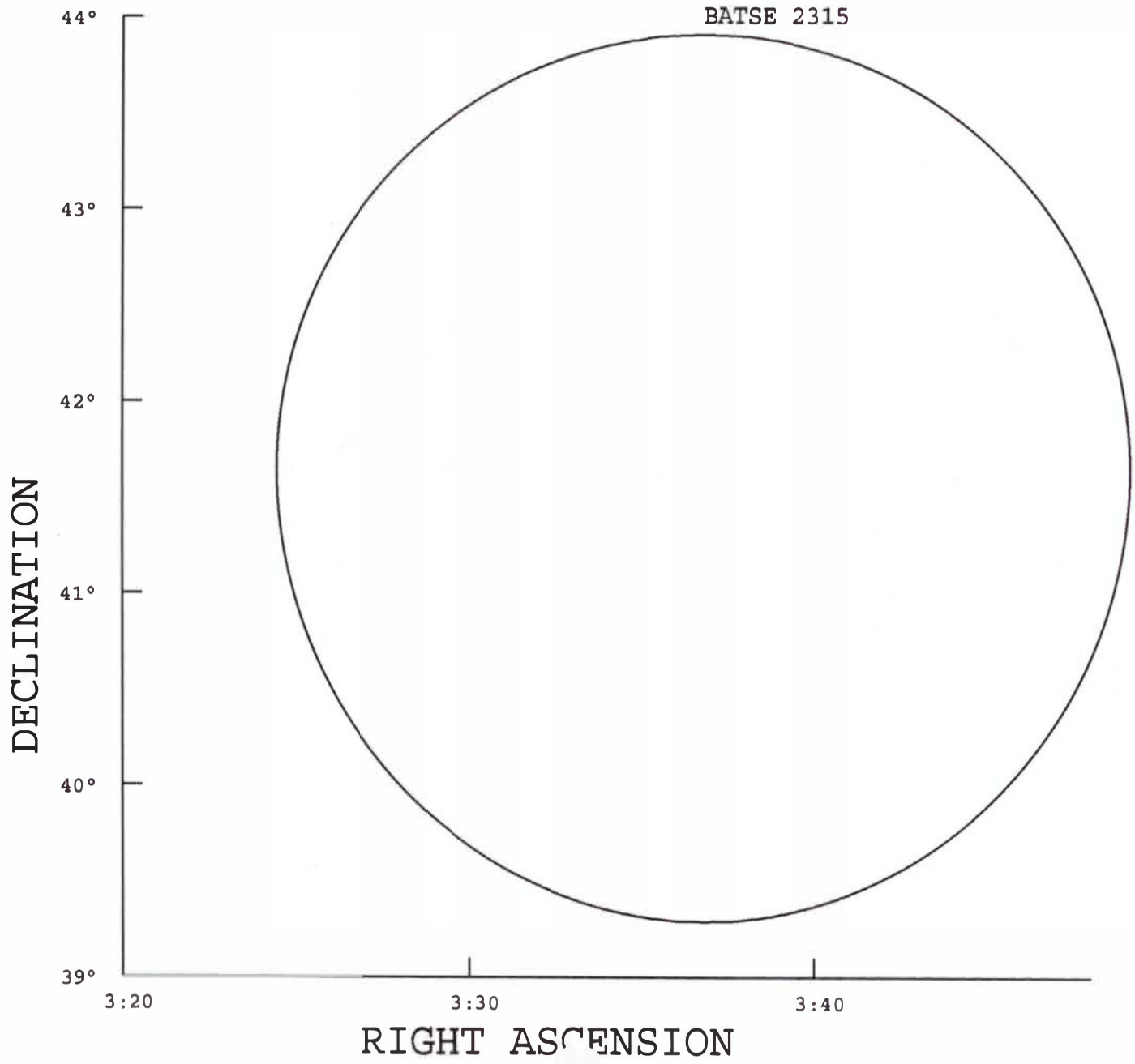
☐ Geocentric time used?

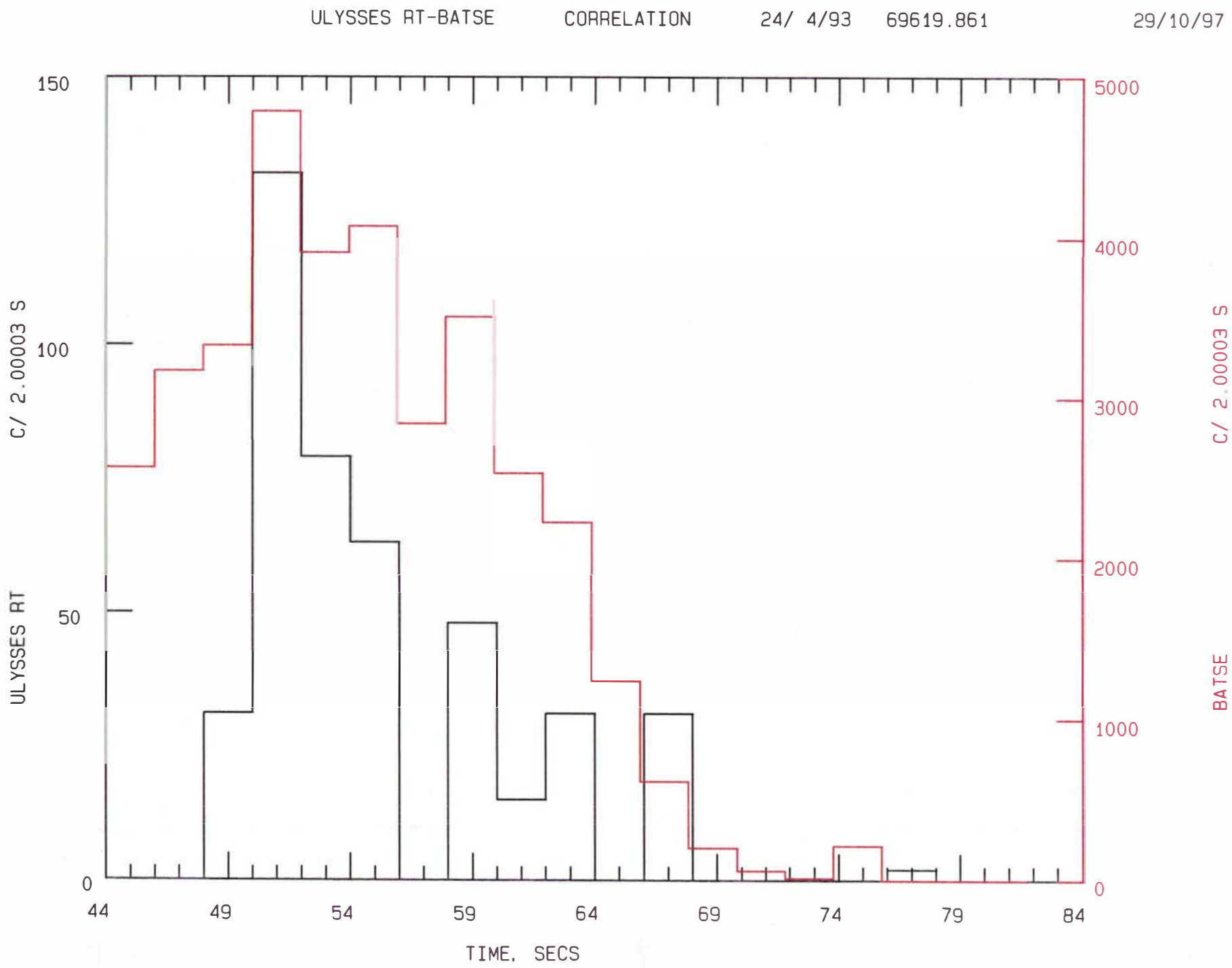
☑ ACCESS database updated?

EVENT OF APR 24, 1993 19:20

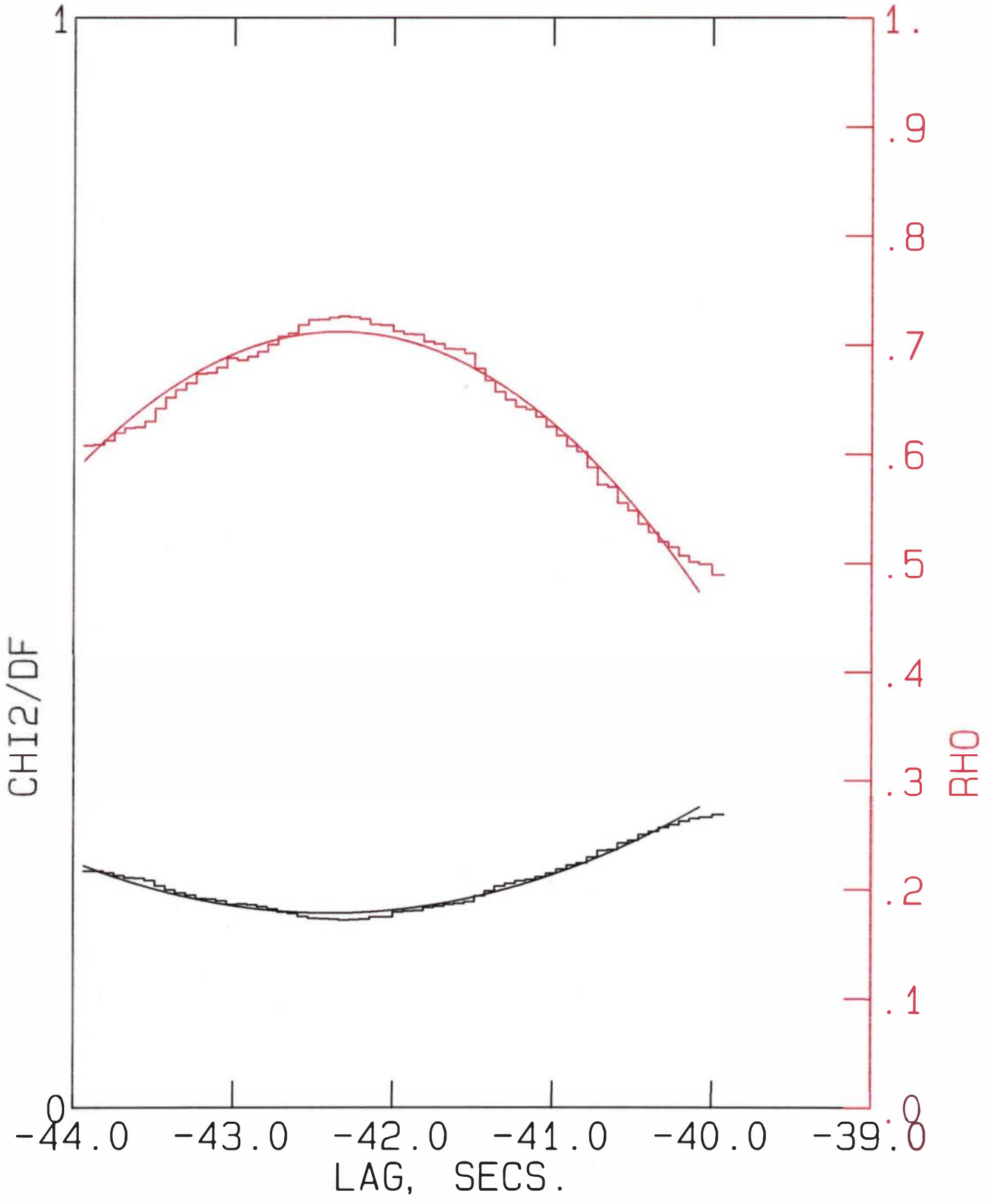
29/10/97

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE




ULYSSES RT-BATSE CORRELATION 24/ 4/93 69619.861 29/10/97
150
100
50
0
C/ 2.00003 S
ULYSSES RT
5000
4000
3000
2000
1000
0
C/ 2.00003 S
BATSE
44
49
54
59
64
69
74
79
84
TIME, SECS

ULYSSES RT-BATSE CORRELATION 24/ 4/93 69619.861



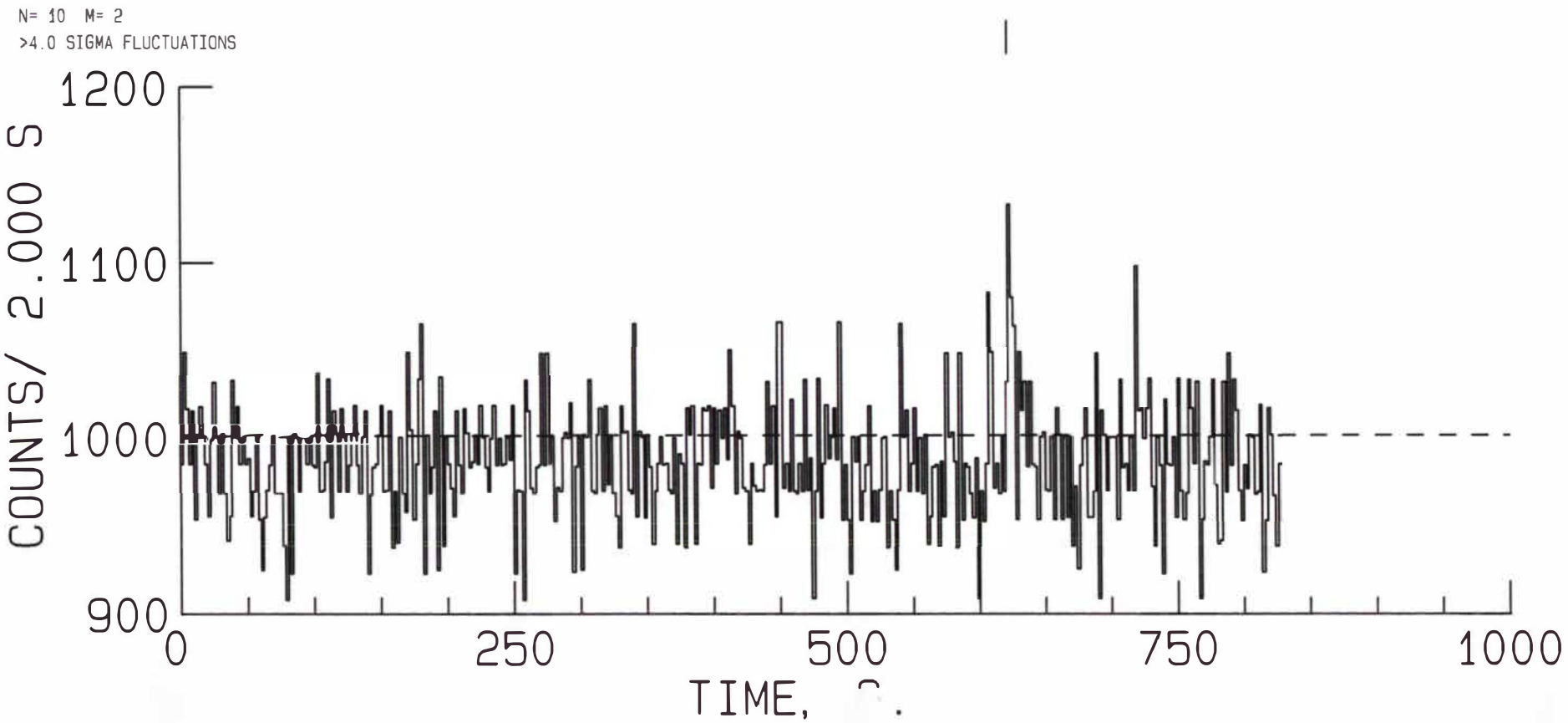
ULYSSES RT

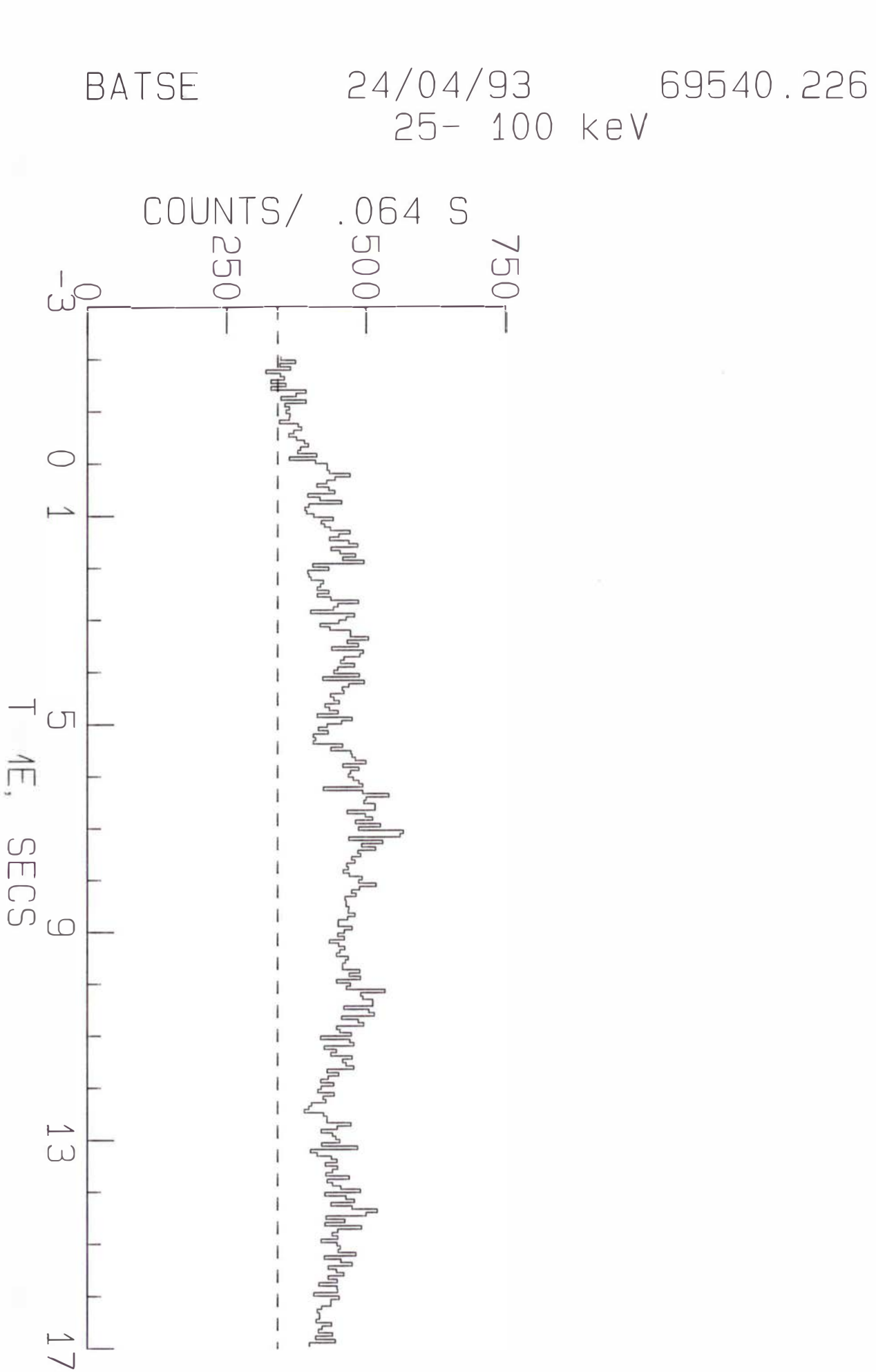
29/10/97

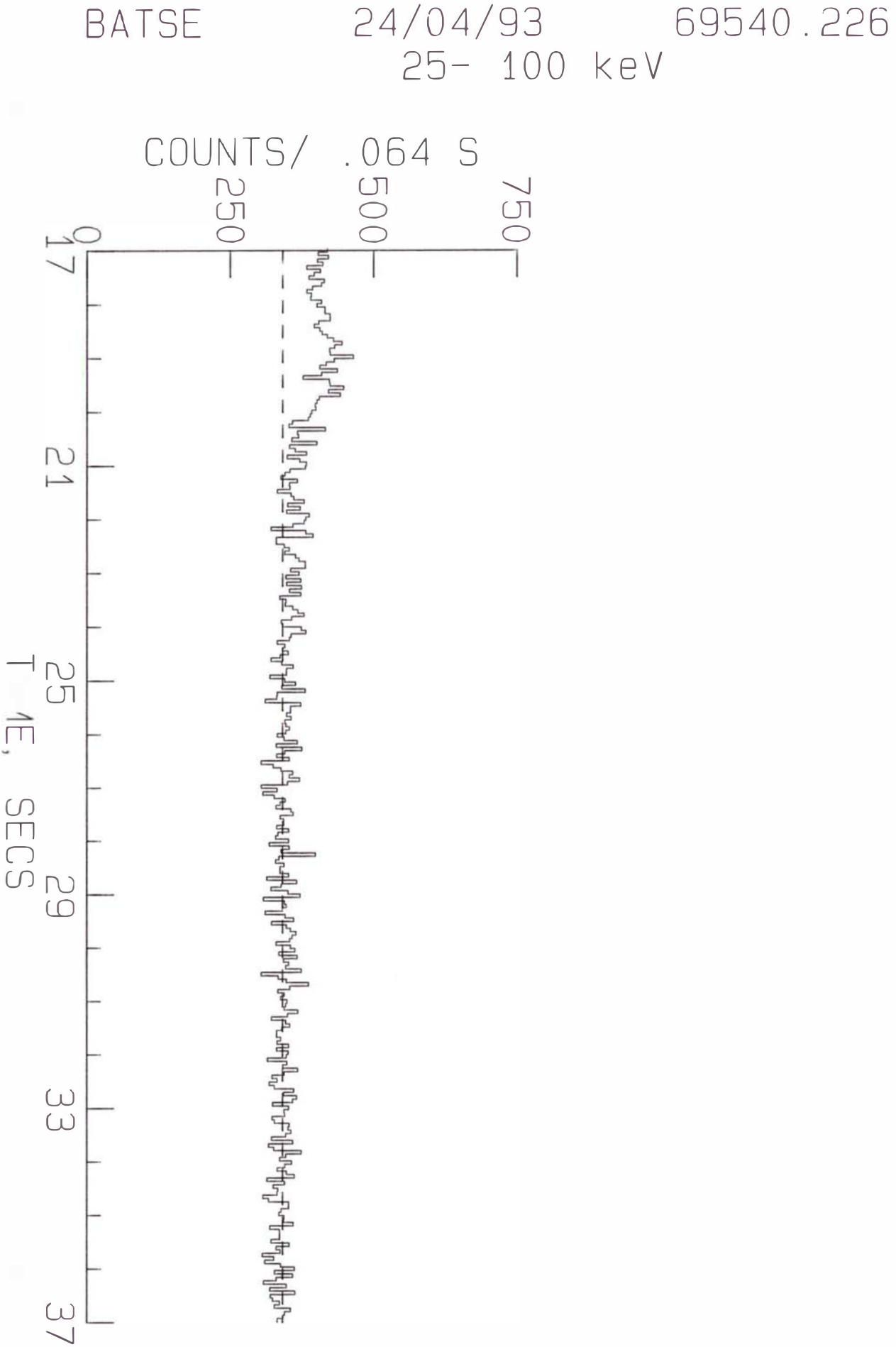
24/ 4/93 69048.022 s

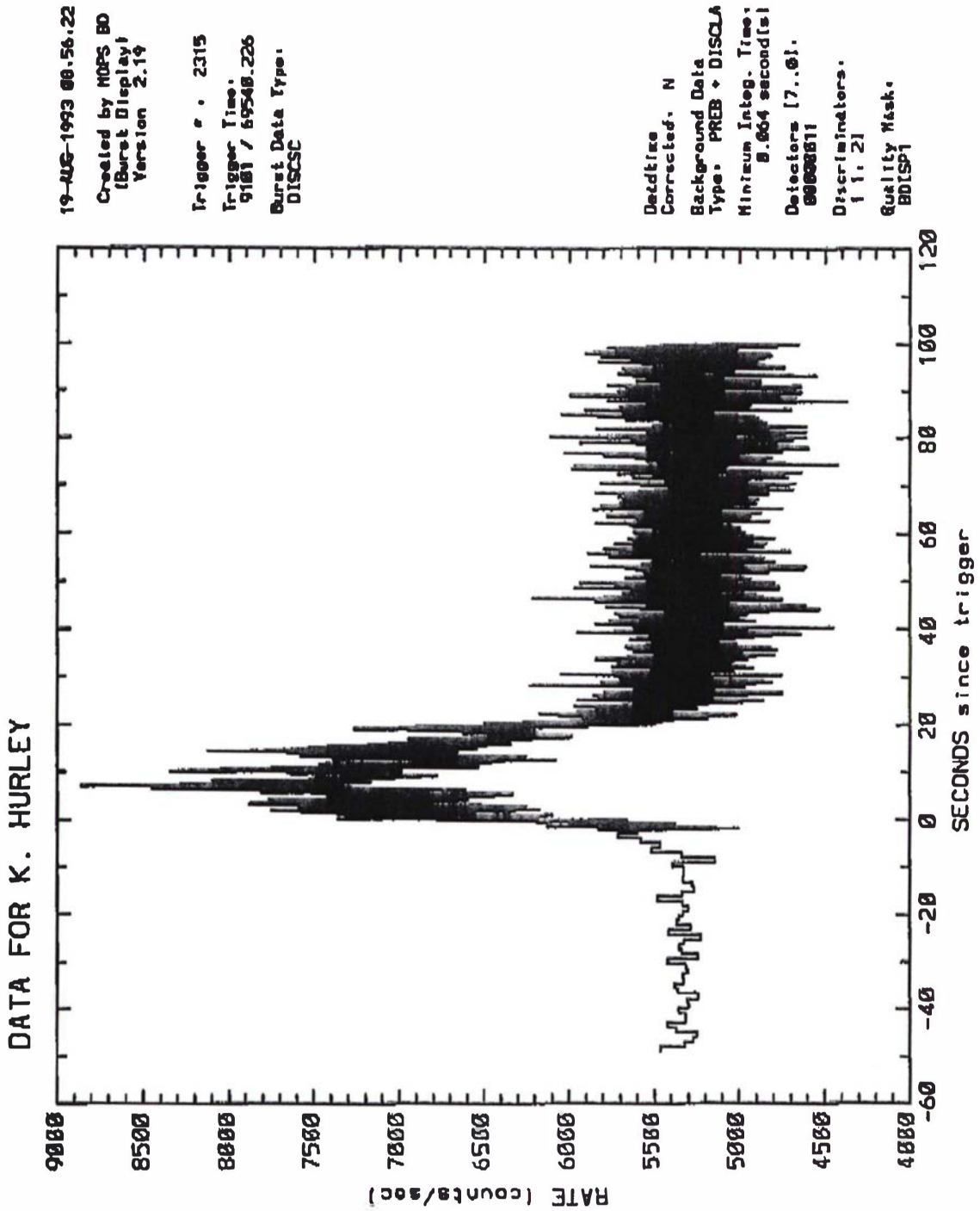
0.250 S INTERVALS REGROUPED BY 8

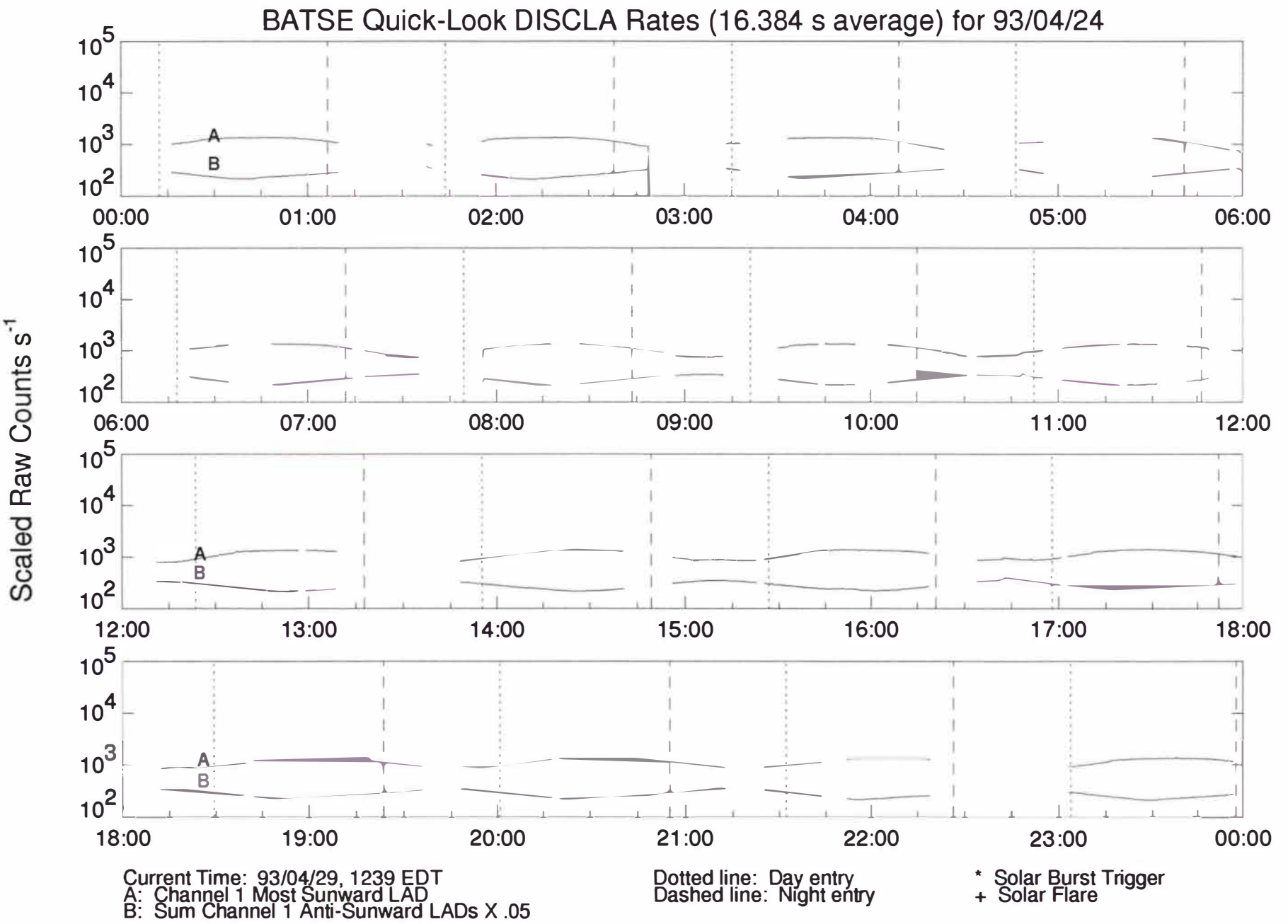
21- 145 keV

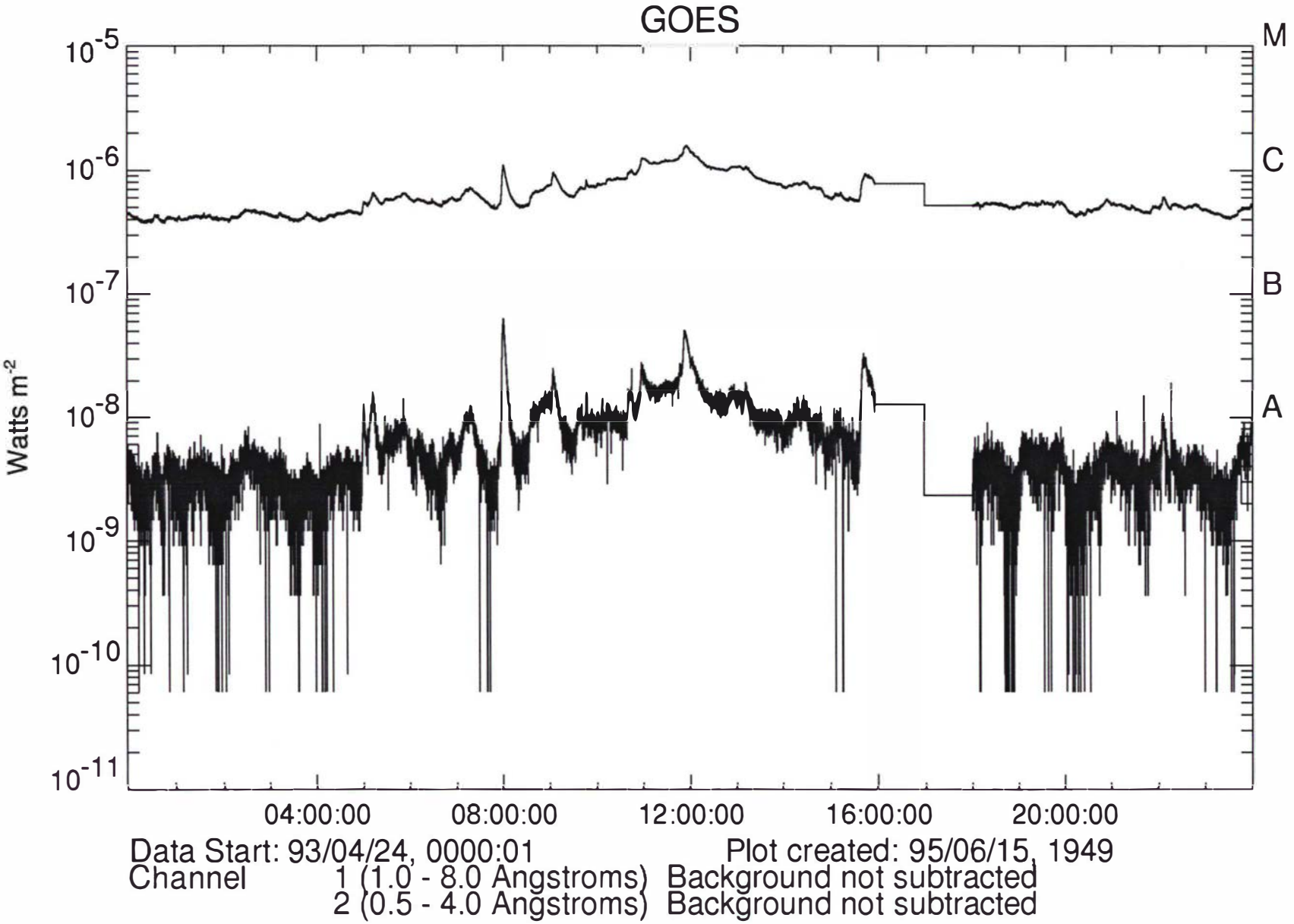



BATSE 24/04/93 69540.226
25- 100 keV
COUNTS/ .064 S
0
250
500
750
-3
0
1
5
9
13
17
T 4E, SECS


BATSE 24/04/93 69540.226
25- 100 keV
COUNTS/ .064 S
0
250
500
750
17
21
25
29
33
37
TIME, SECS

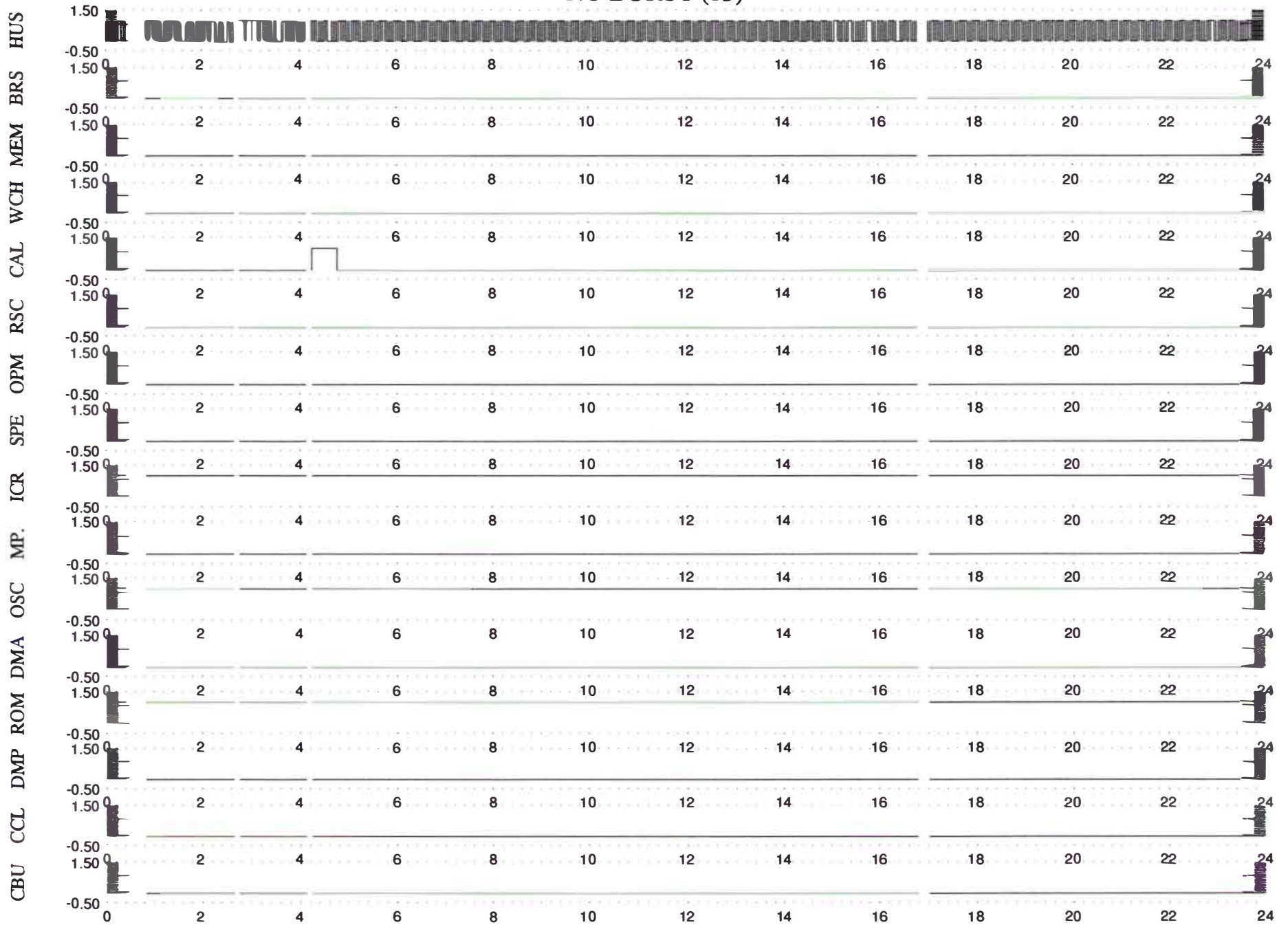

19-AUG-1993 08.56.22
Created by MOPS BD
(Burst Display)
Version 2.19
Trigger # . 2315
Trigger Time:
9181 / 69548.226
Burst Data Type:
DISCSC
Deadtime
Corrected?. N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
Discriminators:
1 1 1 2]
Quality Mask:
BDISP1
DATA FOR K. HURLEY
RATE (counts/sec)
SECONDS since trigger
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
-60
-40
-20
0
20
40
60
80
100
120


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/24
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/29, 1239 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare


GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/24, 0000:01
Plot created: 95/06/15, 1949
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 114, year 1993 to day 114, year 1993 6/12/93

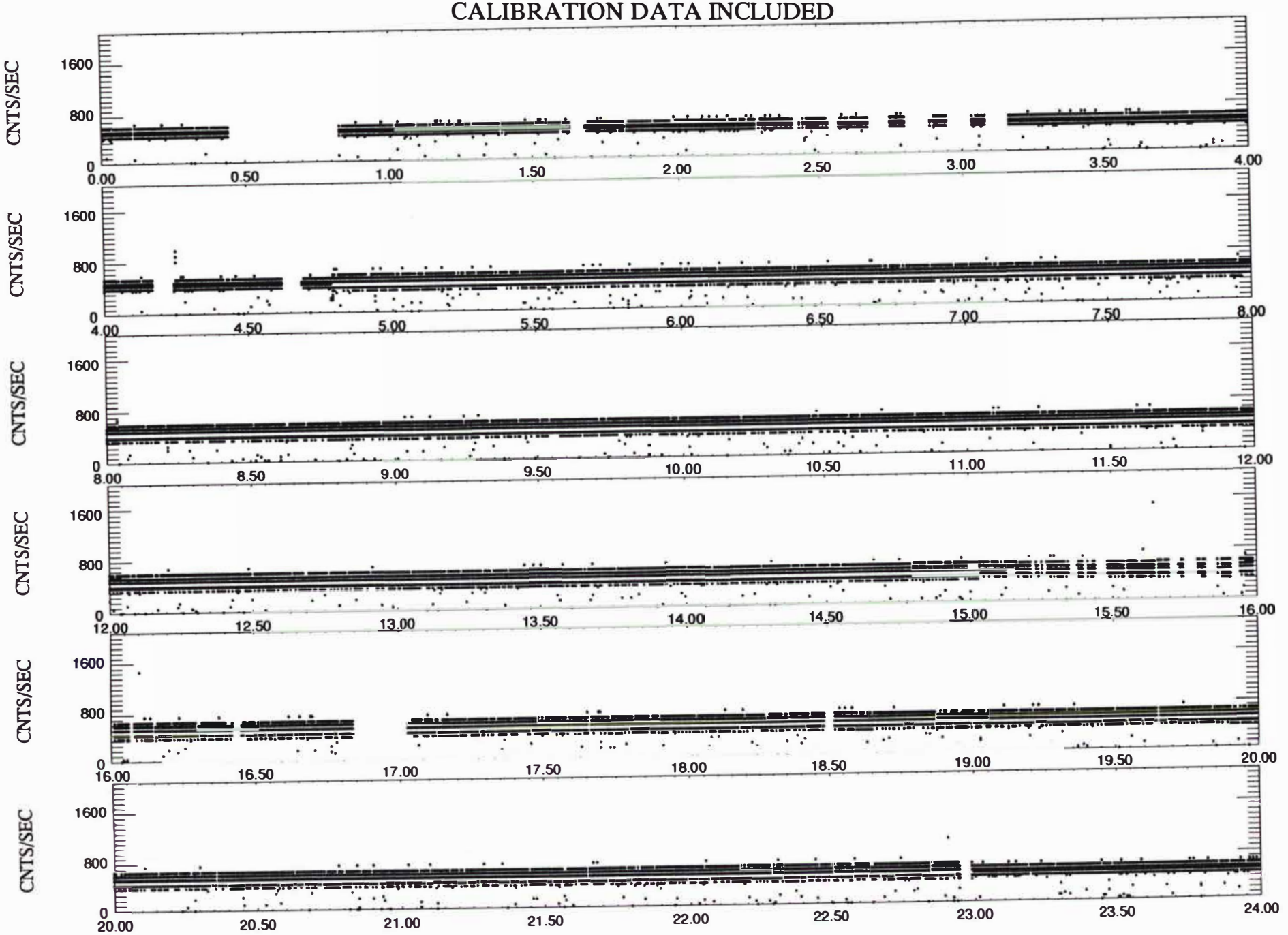
NO BURST (15)



UNIV AL TIME

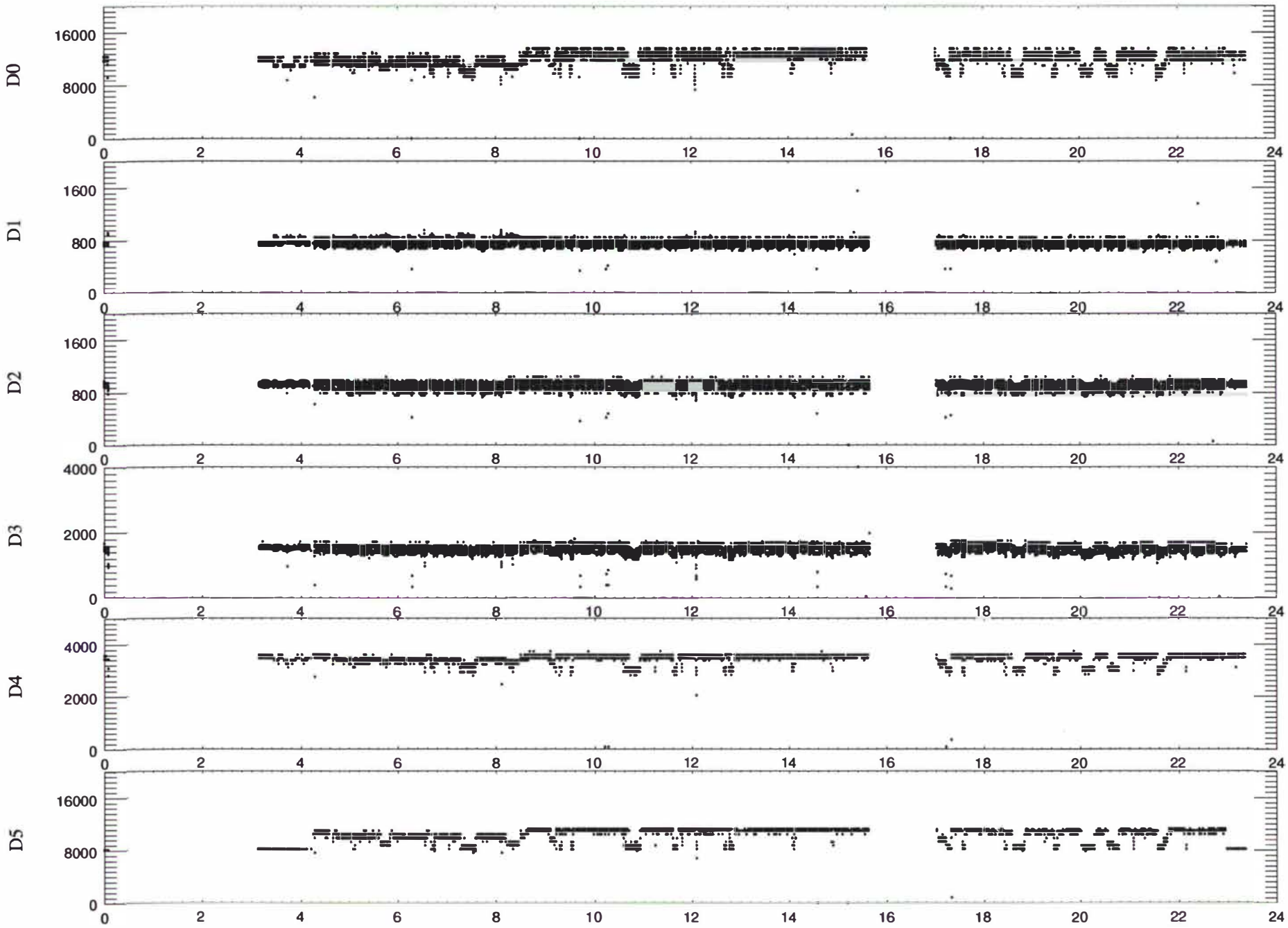
HUS 2A, MODE 1, NOT AVERAGED EDR day 114, year 1993 to day 114, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIVERSAL TIME

HUS 2B COUNTS / SEC QEDR day 114, year 1993 to day 114, year 1993 4/26/93



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2316
EVENT OF 1993 APR 25 DAY OF YEAR=115
EVENT CROSSING TIME AT BATSE      : 37049. S. OR 10:17:29.0
COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION:  20.000  -34.000
BATSE PEAK COUNTING RATE:  12000     C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
POSITION OF ULYSSES ON 25/ 4/  93 IS:
RA=  143.555 DEC=  -12.010 DIST=     4.296 AU
BATSE-ULYSSES DISTANCE =  642741440. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 70.62 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=  711.48 SECS.
CROSSING TIME AT ULYSSES     IS 37760. S. OR   10:29:20 +/-  411.94 SECONDS




Apr 26 16:14 1993  standard input Page 16


From BRAINERD@ssl.msfc.nasa.gov Mon Apr 26 14:45:17 1993
Date:    Mon, 26 Apr 1993 16:45:24 -0500 (CDT)
From: BRAINERD@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2316   930425    9102   37049    12000   020   -34

                          RI

                  BATSE BURST TRIGGER
NO.: 02316

TIME: TJD=9102 SECONDS=37049

TYPE: BURST                     SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE:       SIGMA

INTENSITY:          COUNTS/CM2

LOCATION: ZENITH=162.4  AZIMUTH=044.6  ERROR=      DEGREES

COMMENTS:
BURST OF 60 SECOND DURATION.  FAST RISE, EXPONENTIAL DECAY, DOUBLE PEAK.
BURST OBSERVED ABOVE 300 KEV.  PRECURSOR 60 SECONDS BEFORE TRIGGER.
```

Helio corr removed

Date: Dec 18 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

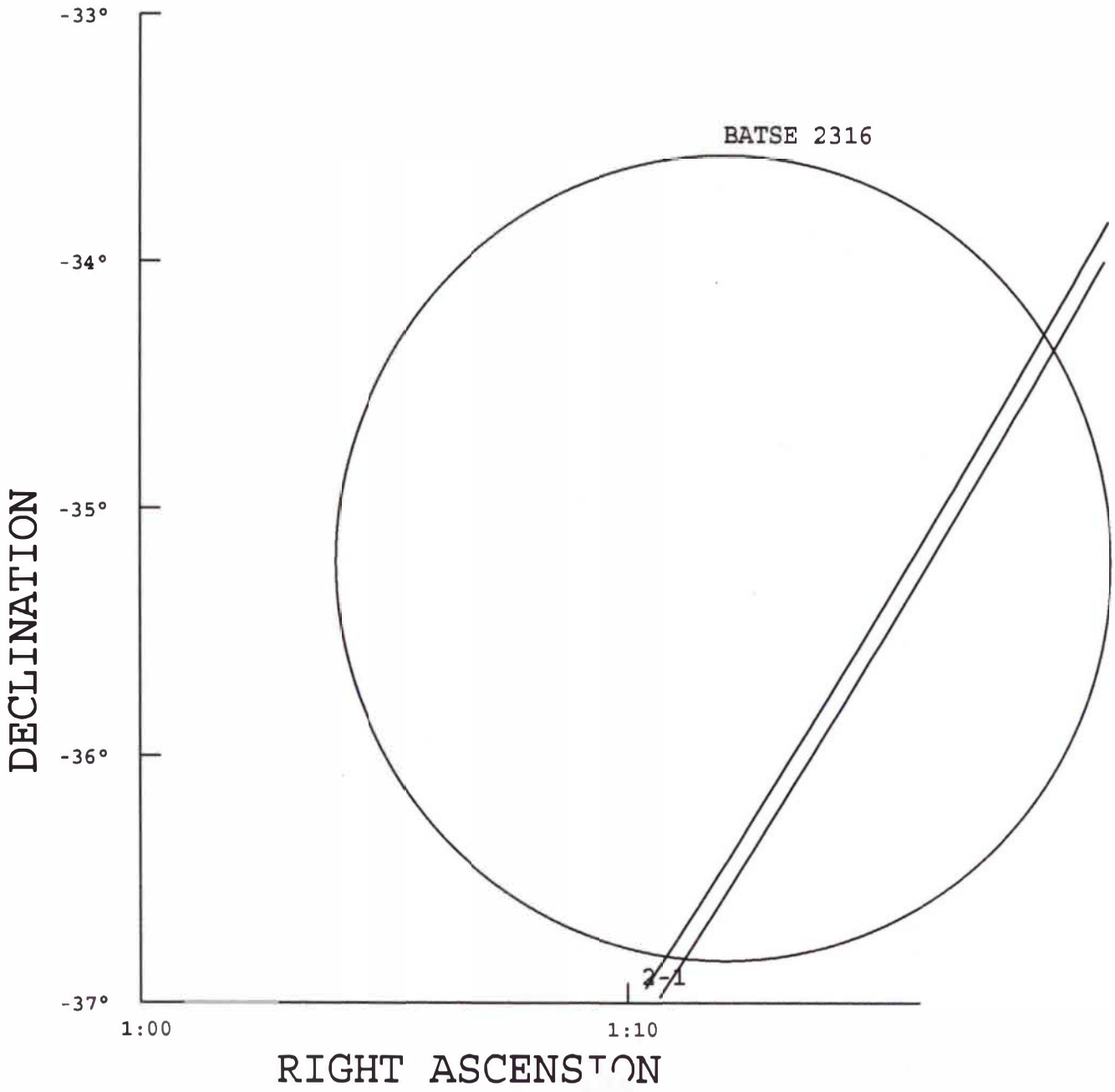
☐ Geocentric time used?

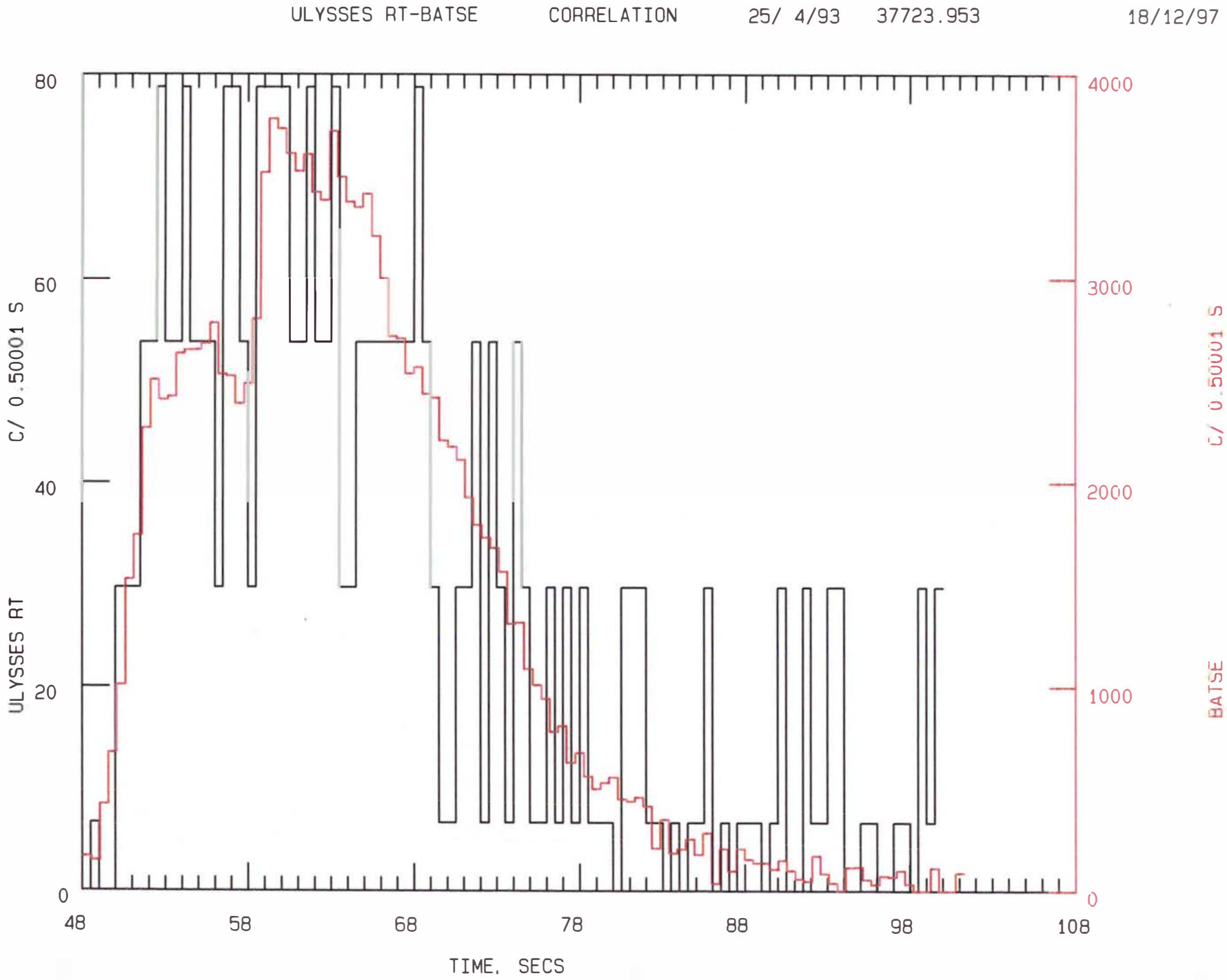
☑ ACCESS database updated?

EVENT OF APR 25, 1993 10:28

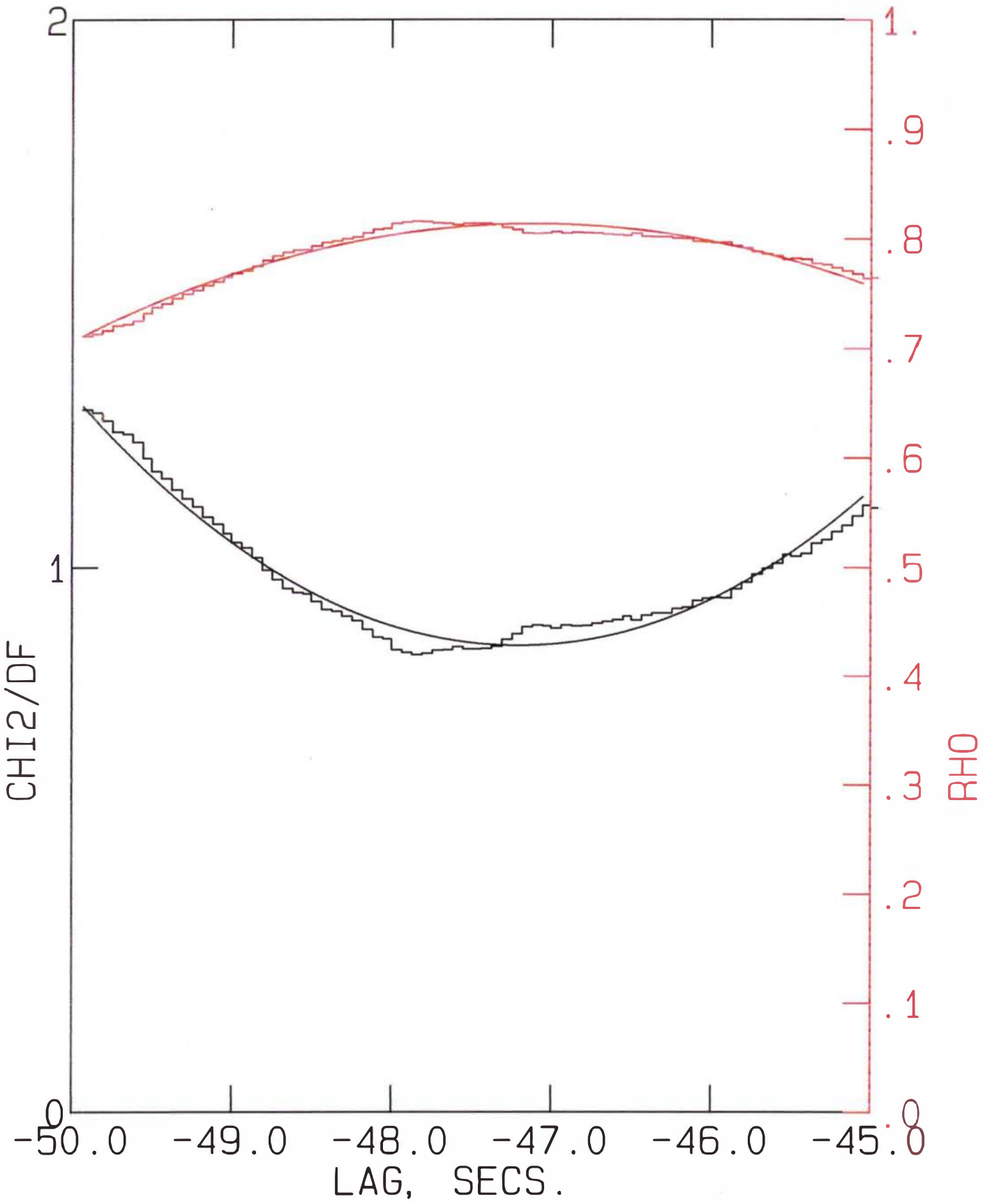
18/12/97

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE




ULYSSES RT-BATSE CORRELATION 25/ 4/93 37723.953 18/12/97
80
60
40
20
0
C/ 0.50001 S
ULYSSES RT
4000
3000
2000
1000
0
C/ 0.50001 S
BATSE
48
58
68
78
88
98
108
TIME, SECS

ULYSSES RT-BATSE CORRELATION 25/ 4/93 37723.953



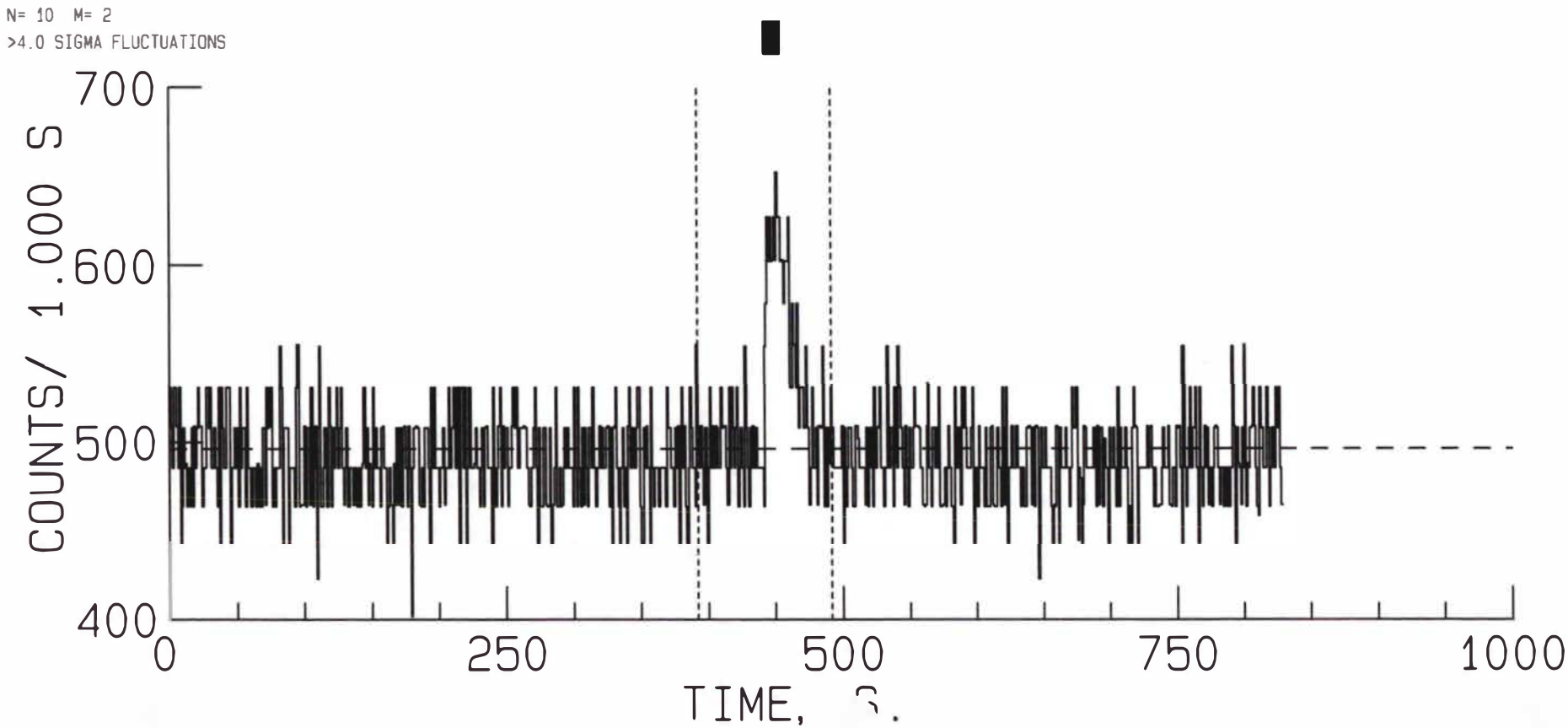
ULYSSES RT

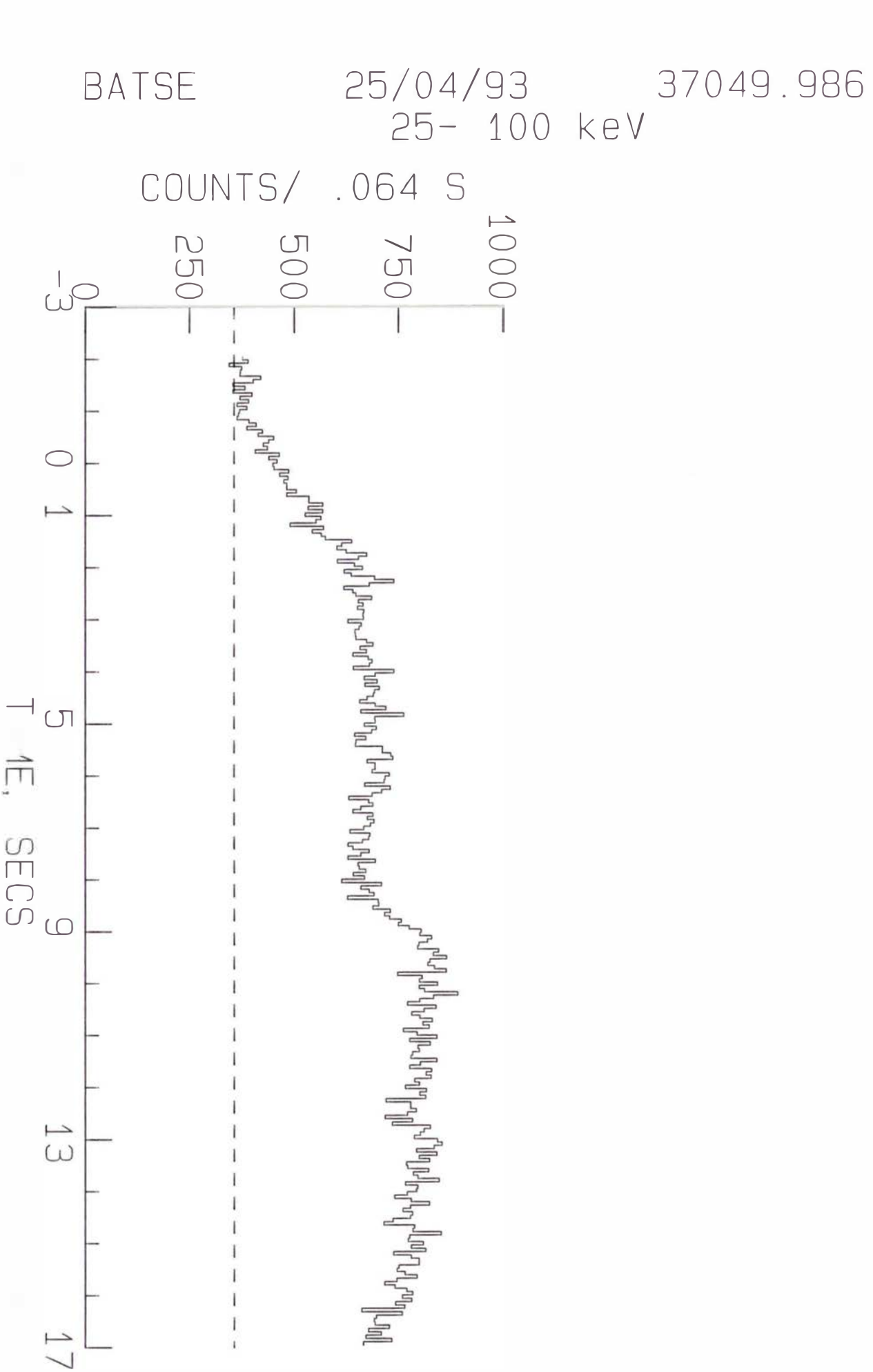
18/12/97

25/ 4/93 37332.120 s

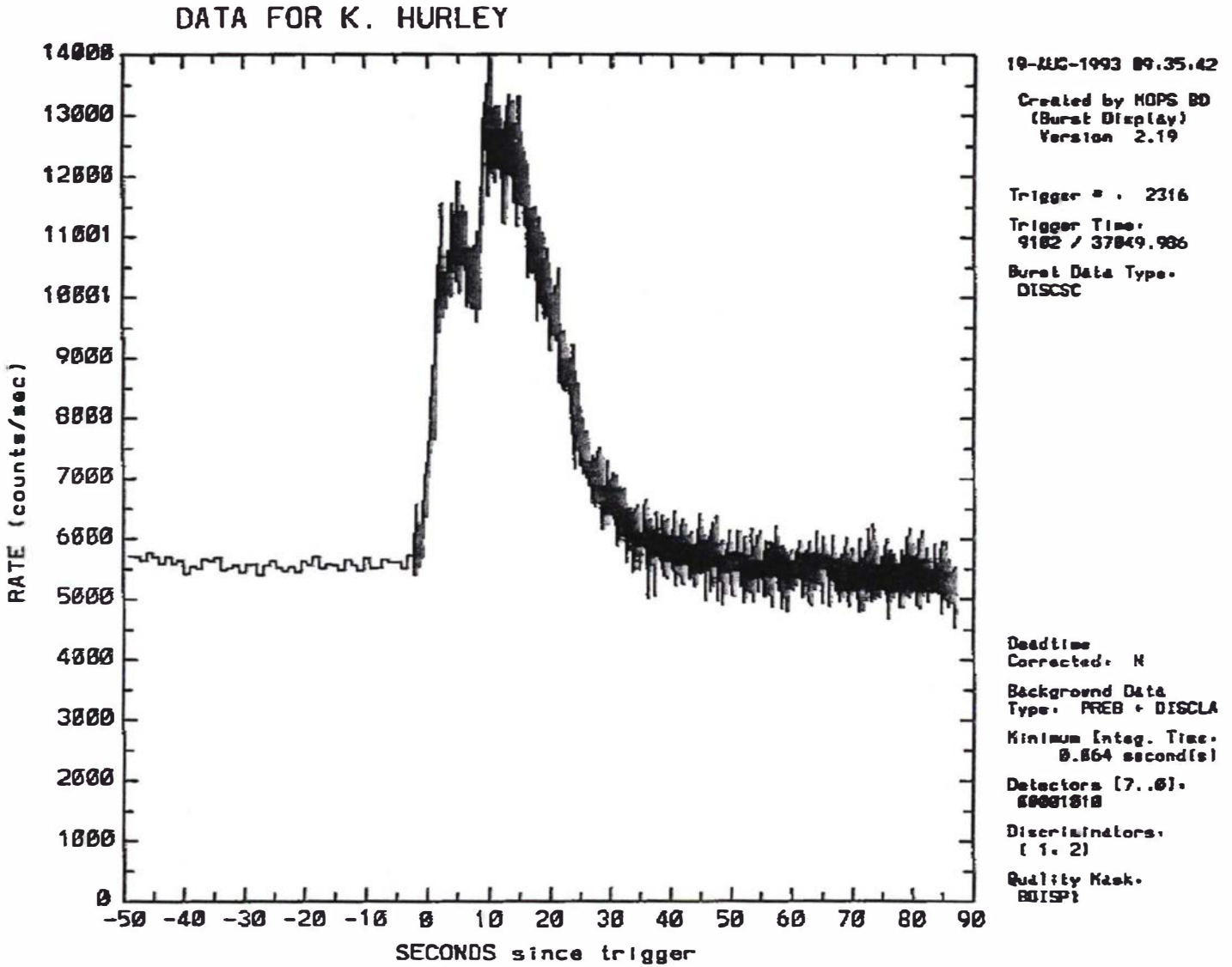
0.500 S INTERVALS REGROUPED BY 2

21- 145 keV




BATSE 25/04/93 37049.986
25- 100 keV
COUNTS/ .064 S
250
500
750
1000
-3
0
1
5
9
13
17
T, SECS

BATSE 25/04/93 37049.986
25- 100 keV
COUNTS/ .064 S
0
250
500
750
1000
17
21
25
29
33
37
T, SECS


DATA FOR K. HURLEY
RATE (counts/sec)
SECONDS since trigger
19-AUG-1993 09:35:42
Created by MOPS BD
(Burst Display)
Version 2.19
Trigger # . 2316
Trigger Time:
9182 / 37849.986
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
00001010
Discriminators:
(1, 2)
Quality Mask:
BDISP1

****
BATSEARCH PROGRAM
****

BATSE BURST # 2317
EVENT OF 1993 APR 25 DAY OF YEAR=115
EVENT CROSSING TIME AT BATSE : 53687. S. OR 14:54:47.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 254.000 59.000
BATSE PEAK COUNTING RATE: 29000 C/S
EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 25/ 4/ 93 IS:
RA= 143.555 DEC= -12.010 DIST= 4.296 AU
BATSE-ULYSSES DISTANCE = 642741440. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 69.25 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 759.67 SECS.
CROSSING TIME AT ULYSSES IS 54447. S. OR 15:07:26 +/- 409.61 SECONDS

Apr 26 16:14 1993 standard input Page 17

From BRAINERD@ssl.msfc.nasa.gov Mon Apr 26 14:48:23 1993
Date: Mon, 26 Apr 1993 16:48:29 -0500 (CDT)
From: BRAINERD@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2317	930425	9102	53687	29000	254	+59

NO - but should have been

BATSE BURST TRIGGER
NO.: 02317

TIME: TJD=9102 SECONDS=53687

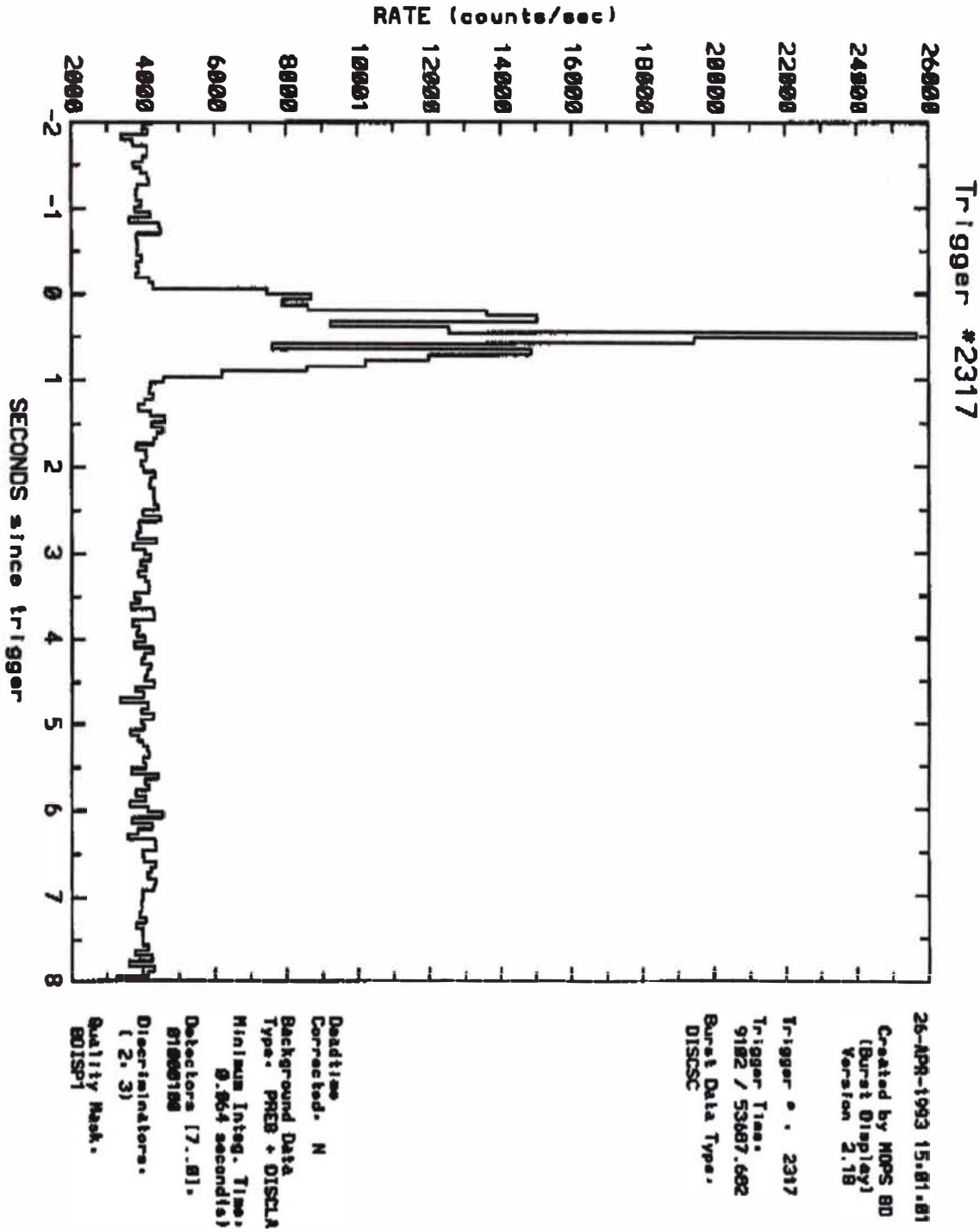
TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

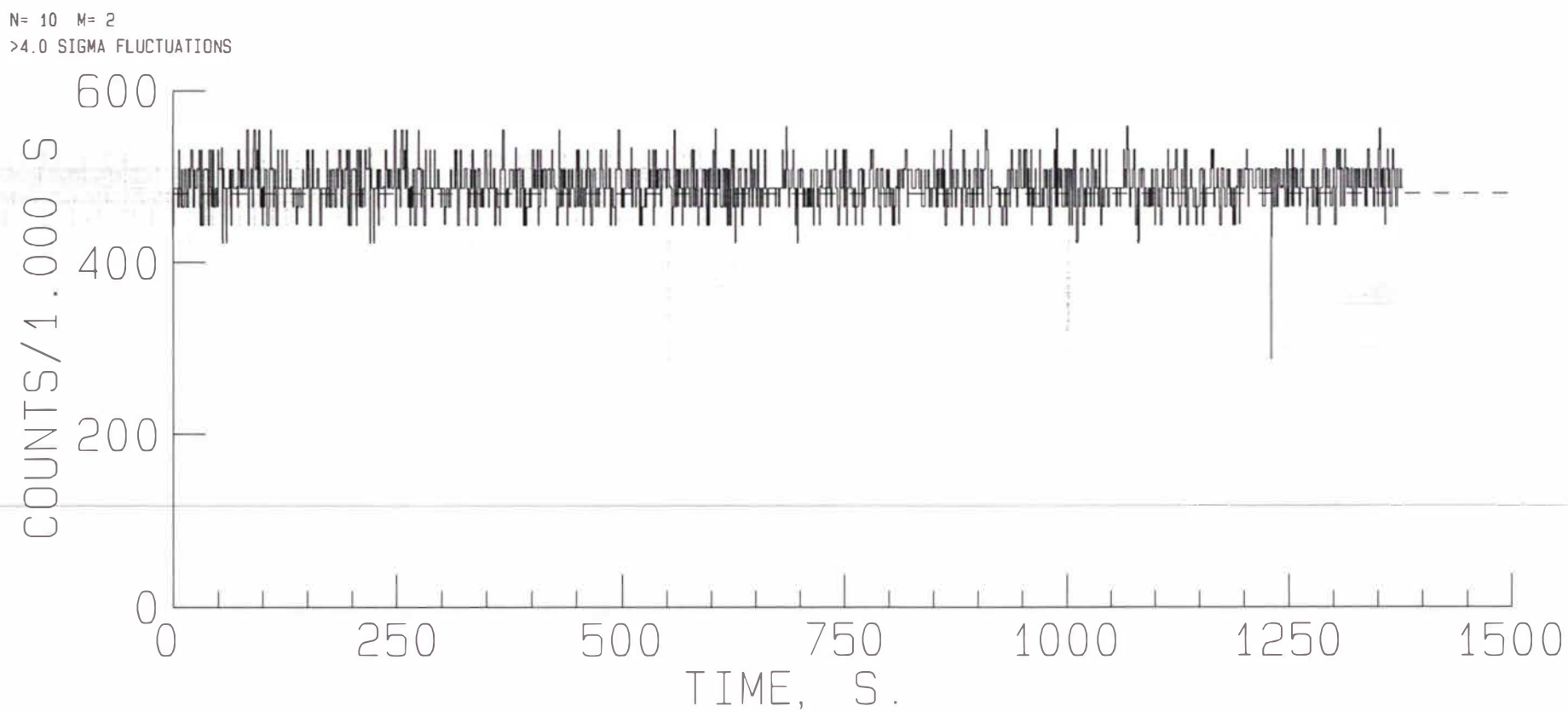
LOCATION: ZENITH=046.1 AZIMUTH=295.2 ERROR= DEGREES

COMMENTS:
BURST OF 1 SECOND DURATION. CONSISTS OF THREE SPIKES.
NOT OBSERVED ABOVE 300 KEV.


RATE (counts/sec)
Trigger #2317
SECONDS since trigger
26-APR-1993 15:01:01
Created by MDPS BD
(Burst Display)
Version 2.18
Trigger # : 2317
Trigger Time:
9182 / 53687.682
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 seconds)
Detectors [7..0]:
Discriminators:
(2, 3)
Quality Mask:
BDISP1

28/ 4/93

ULYSSES RT
25/ 4/93 54036.375 s
0.500 S INTERVALS REGROUPED BY 2
0- 0 keV



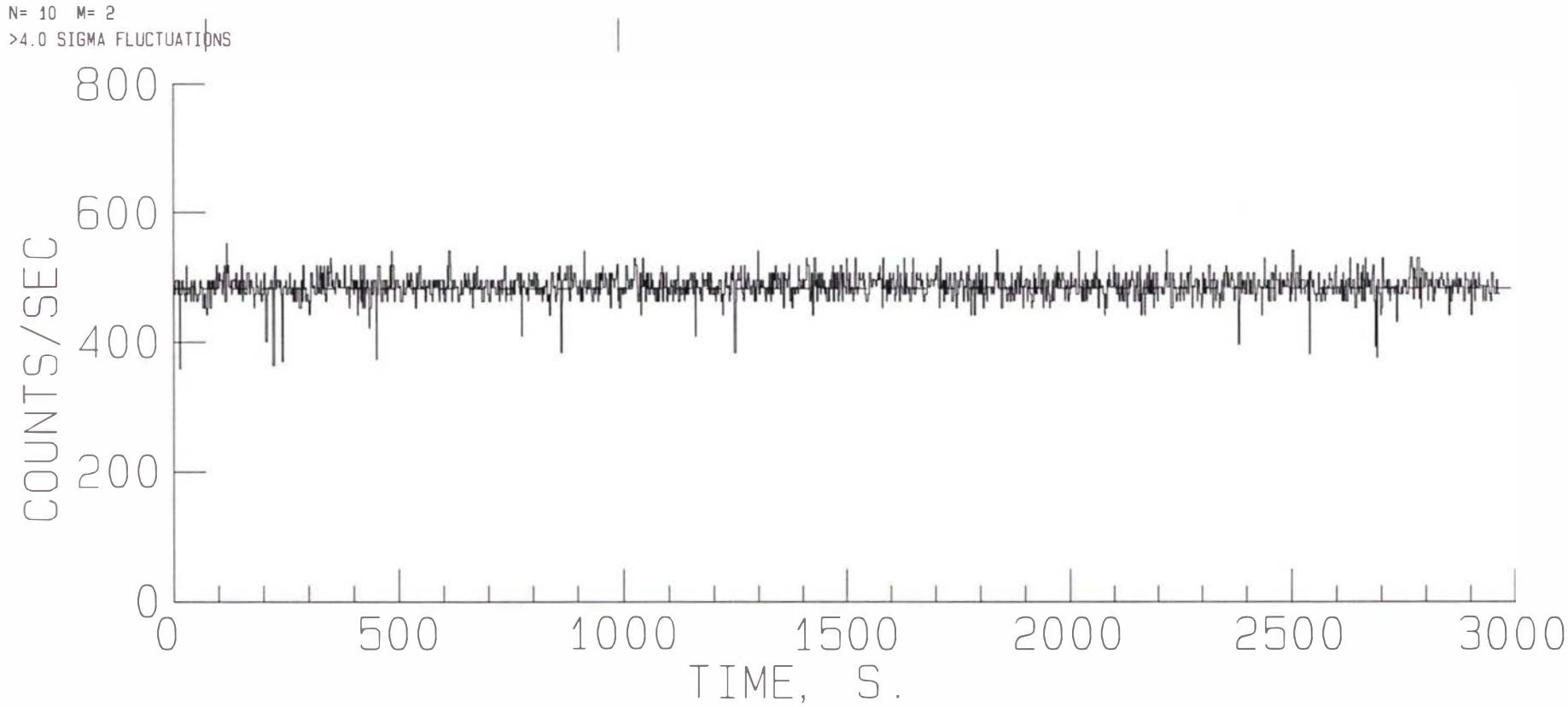
7/ 5/93

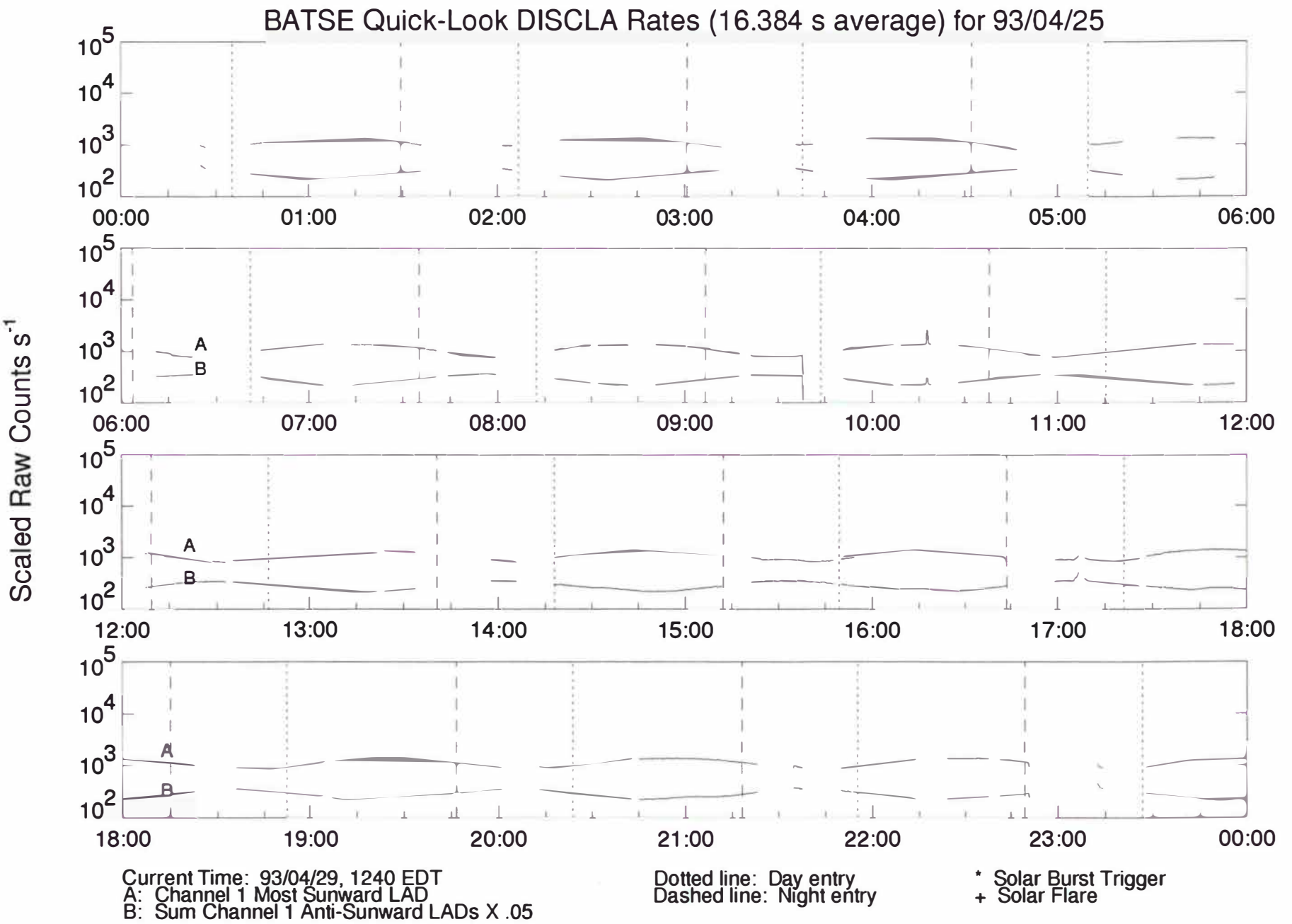
ULYSSES RT

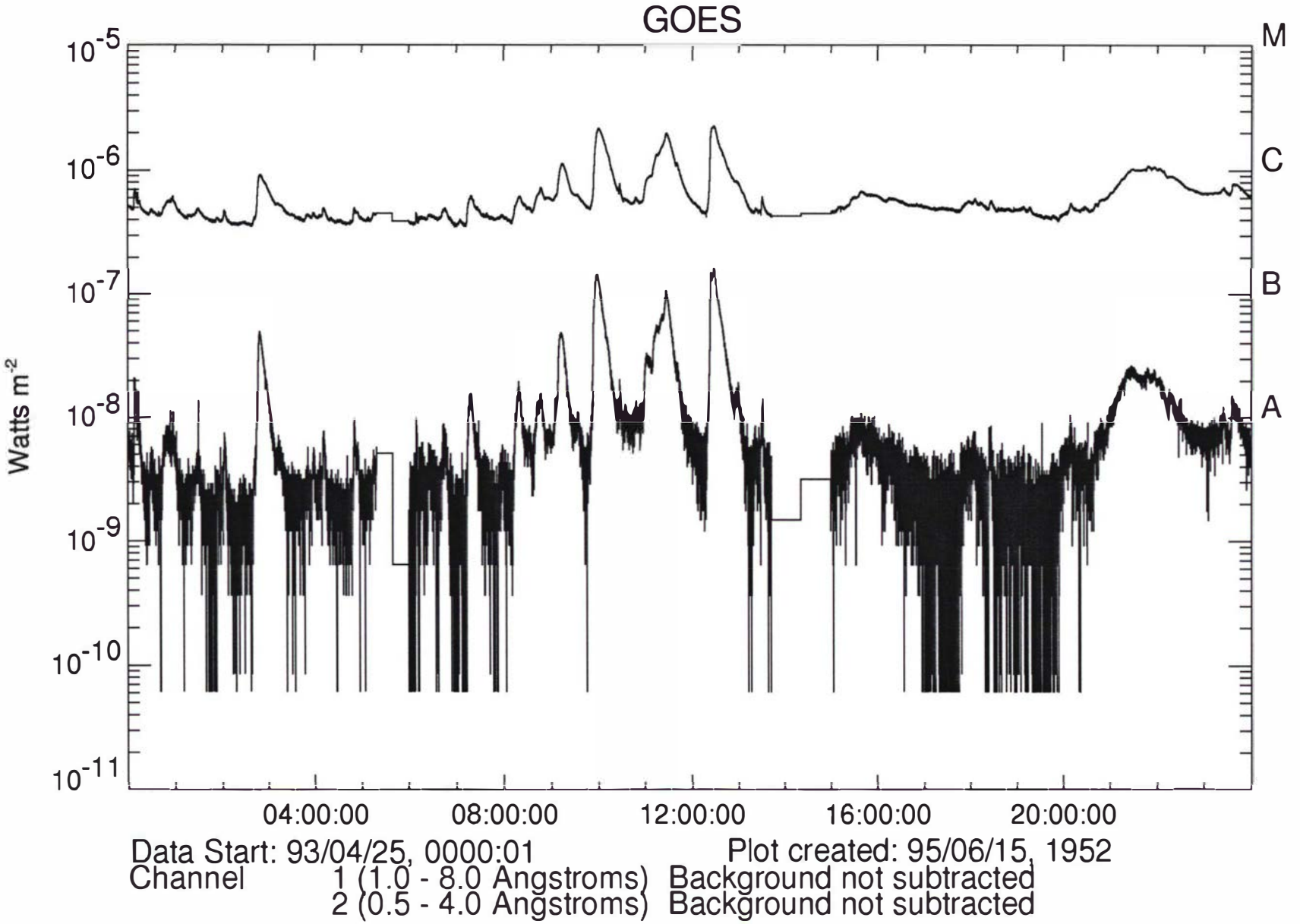
25/ 4/93 53460.367 s (Expanded time window)

0.500 S INTERVALS REGROUPED BY 4

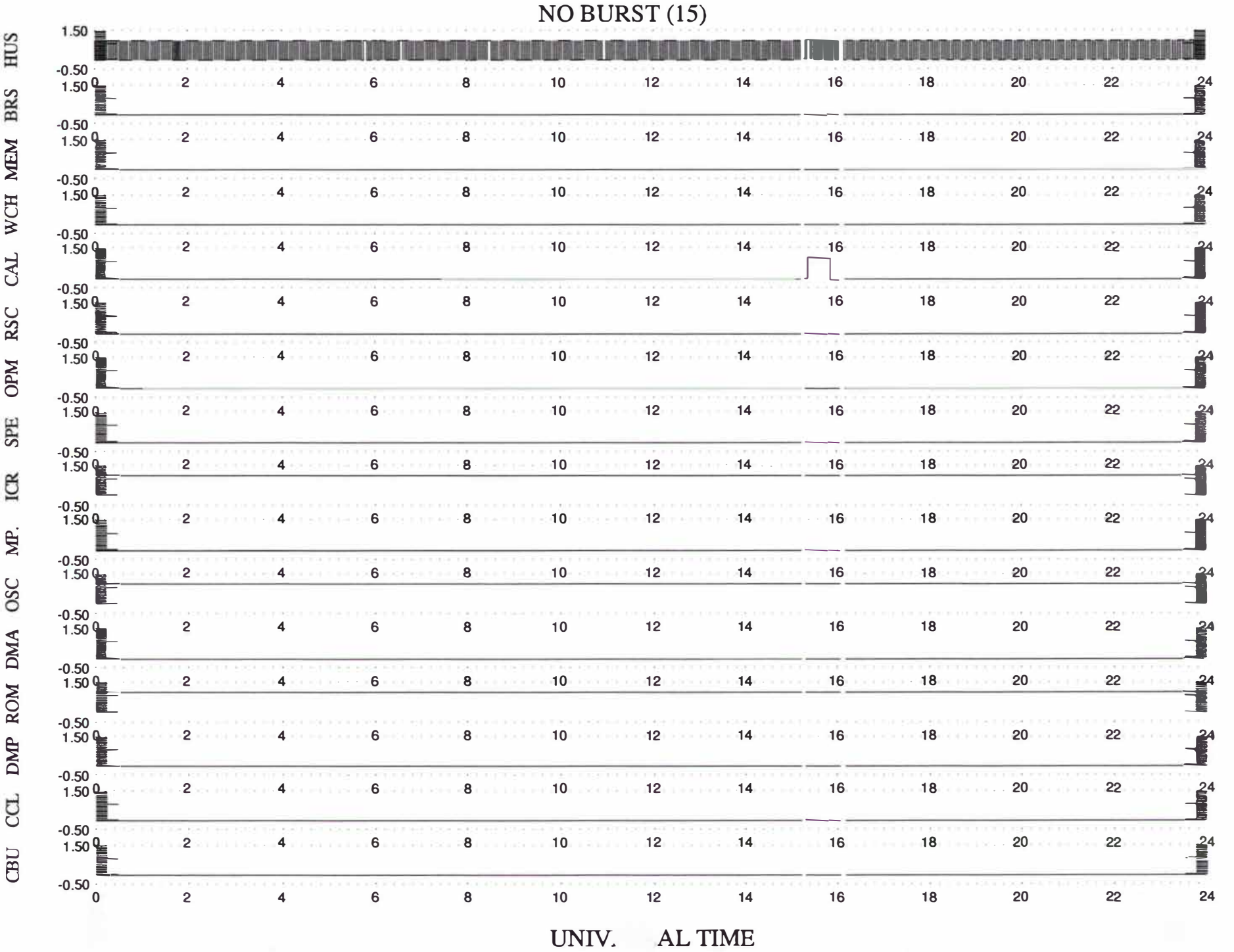
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/25
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
00:00
01:00
02:00
03:00
04:00
05:00
06:00
A
B
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/29, 1240 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

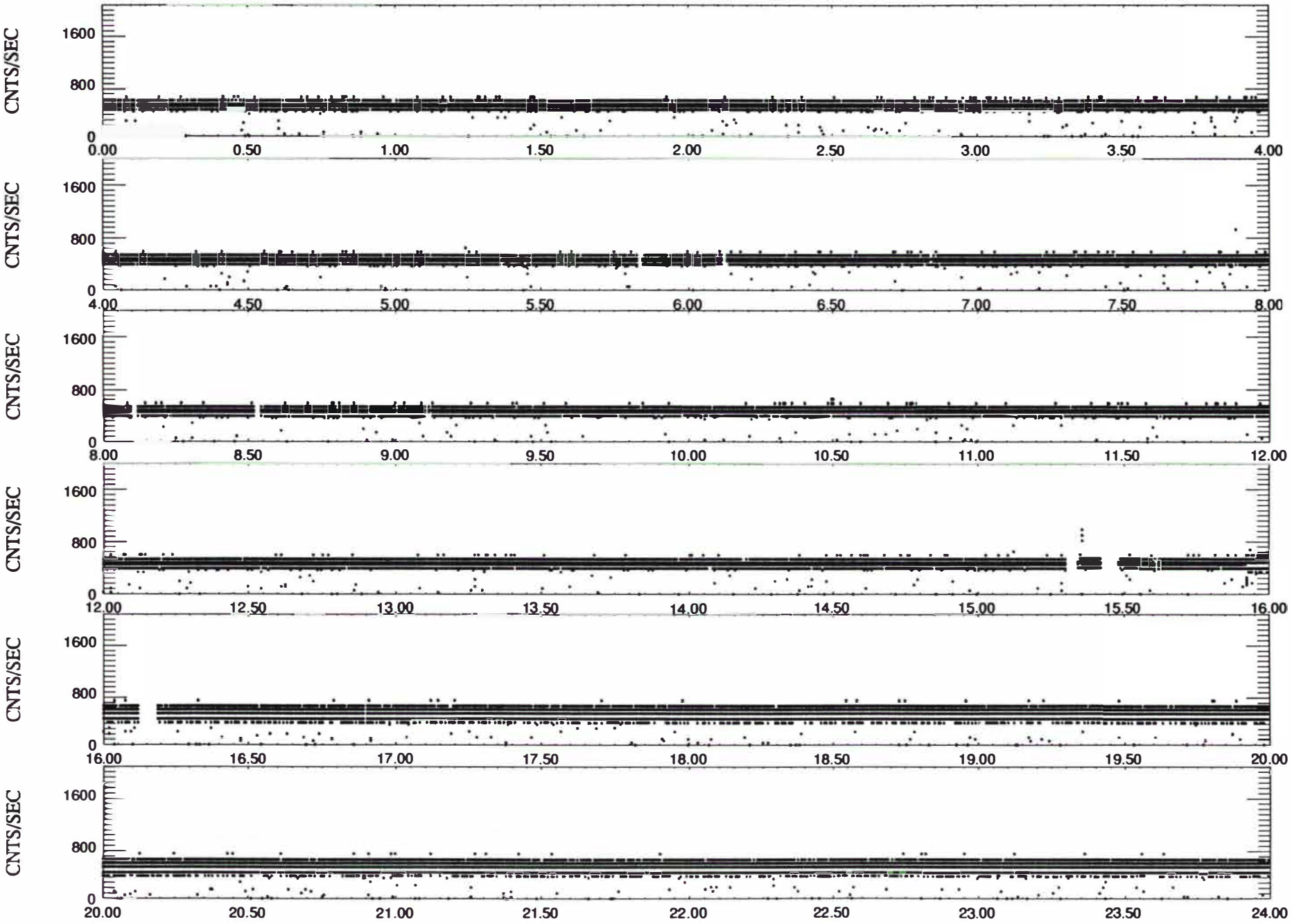

GOES
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
M
C
B
A
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/25, 0000:01
Plot created: 95/06/15, 1952
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 115, year 1993 to day 115, year 1993 6/12/93



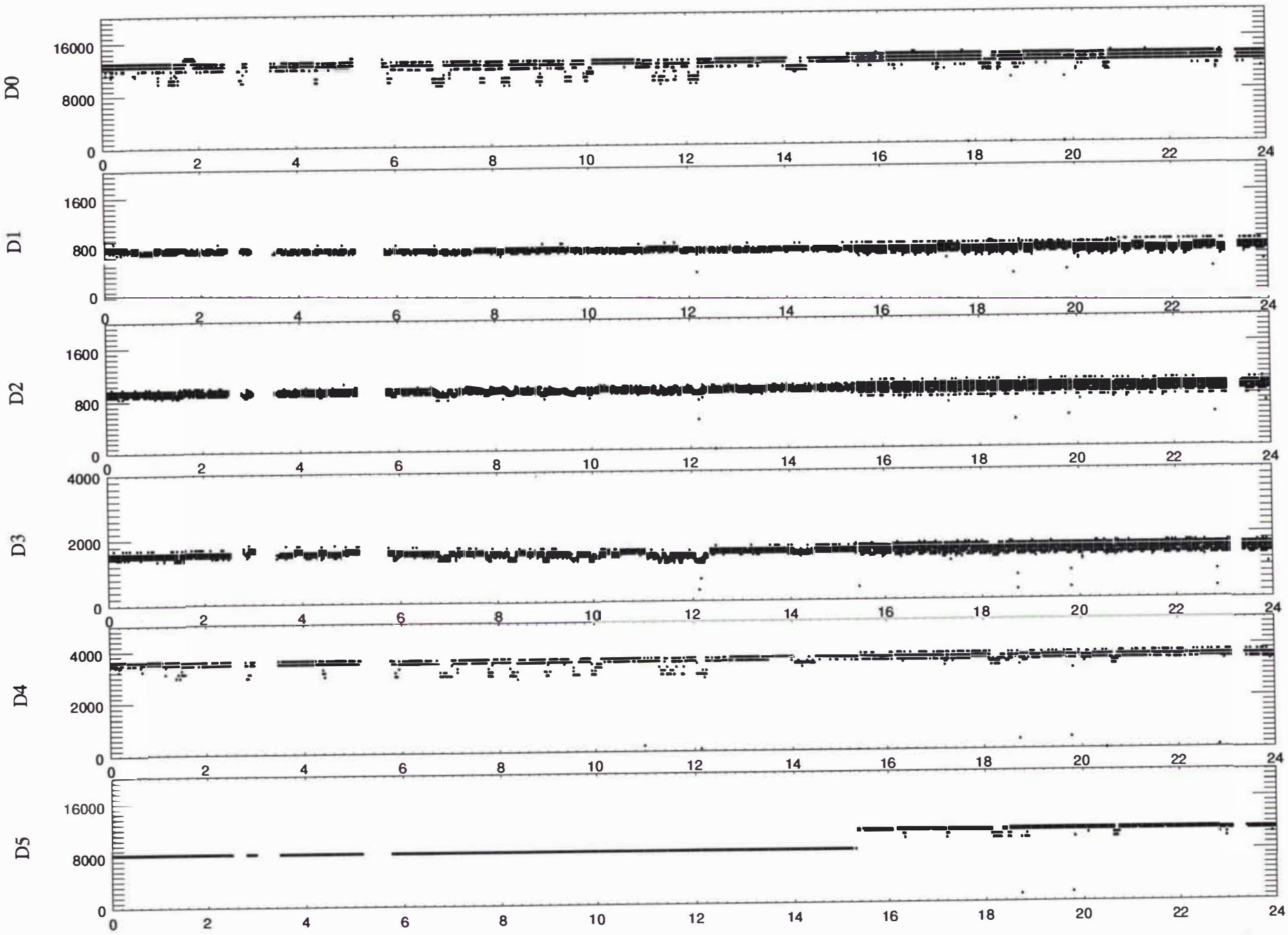
HUS 2A, MODE 1, NOT AVERAGED EDR day 115, year 1993 to day 115, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIV SAL TIME

HUS 2B COUNTS / SEC QEDR day 115, year 1993 to day 115, year 1993 4/28/93



Kommerz

UNTRIGGERED

ULYSSES RT

21/ 5/97

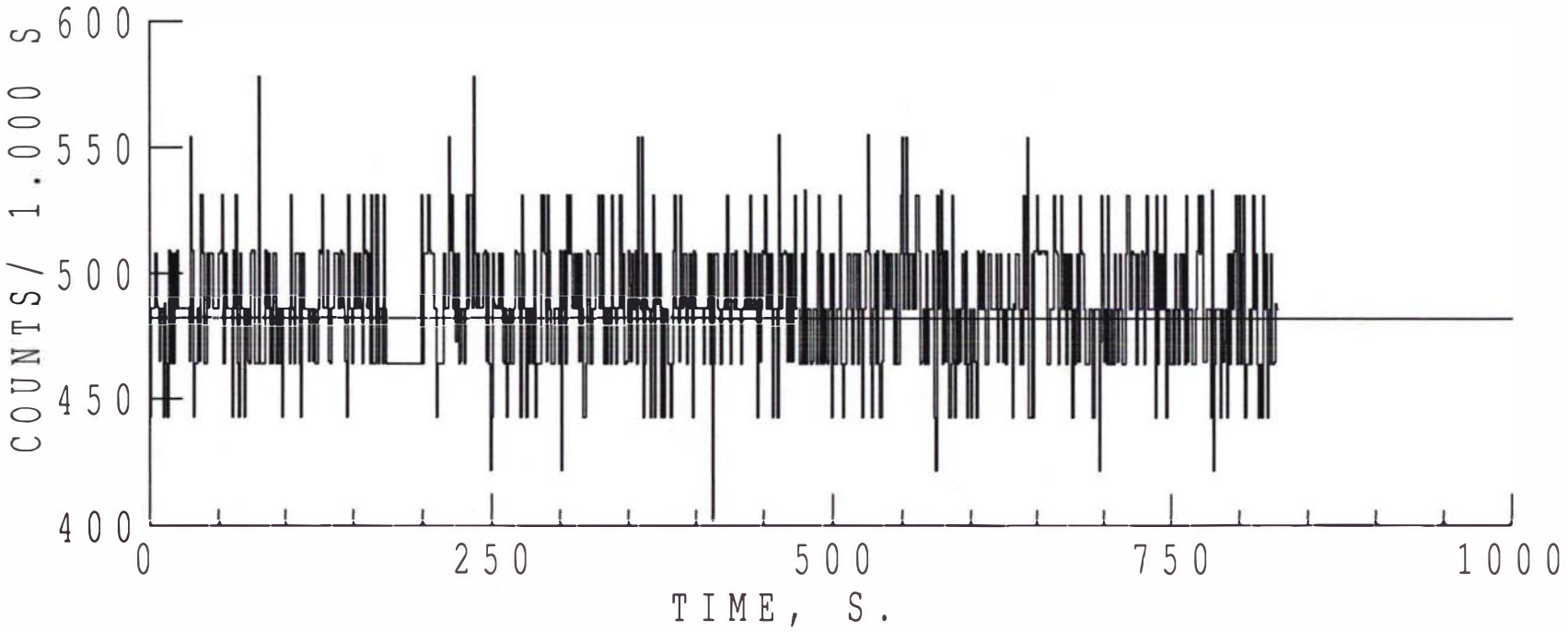
26/ 4/93 41076.012 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2318
EVENT OF 1993 APR 26 DAY OF YEAR=116
EVENT CROSSING TIME AT BATSE      : 33573. S. OR 09:19:33.0
COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION:  49.000  -24.000
BATSE PEAK COUNTING RATE:    3000     C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
POSITION OF ULYSSES ON 26/ 4/  93 IS:
RA=  143.465 DEC=  -11.961 DIST=     4.308 AU
BATSE-ULYSSES DISTANCE =  644416960. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 90.84 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=  -31.64 SECS.
CROSSING TIME AT ULYSSES     IS 33541. S. OR   09:19:01 +/-  422.67 SECONDS
```

~~Weak~~ RI NO

```
Apr 28 15:44 1993  standard input Page 1


From KOSHUT@fender.msfc.nasa.gov Wed Apr 28 08:52:16 1993
Date:    Wed, 28 Apr 1993 10:52:50 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2318   930426    9103   33573     3000   049   -24


                BATSE BURST TRIGGER
NO.: 2318

TIME: TJD=9103 SECONDS=33573

TYPE: BURST                     SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:       SIGMA

INTENSITY:          COUNTS/CM2

LOCATION: ZENITH=44.    AZIMUTH=58.    ERROR=      DEGREES

COMMENTS:
BURST OF ~ 50 SECONDS DURATION, WITH PEAK AT ~ TRIGGER + 15 SECONDS.
NO EMISSION OBSERVED ABOVE 300 KEV.
```

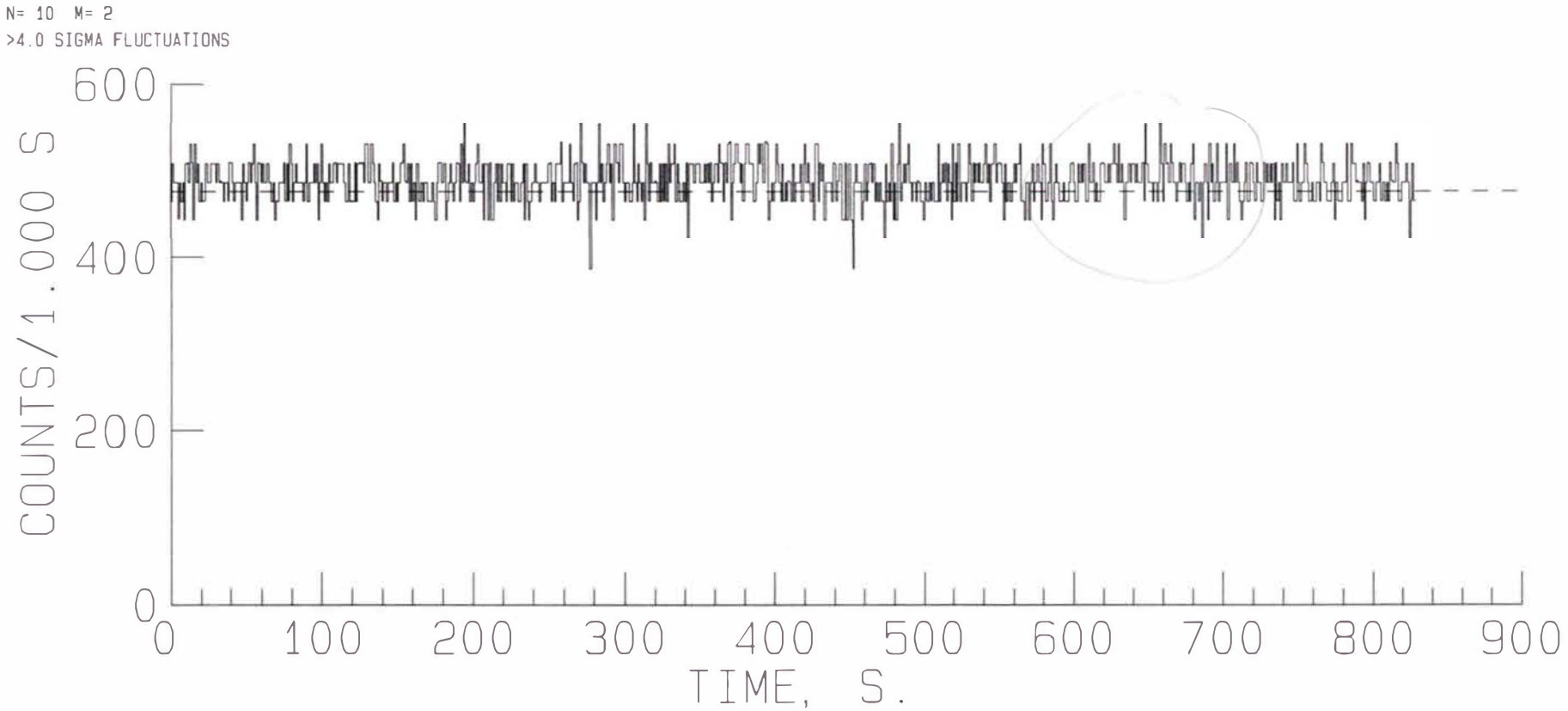
29/ 4/93

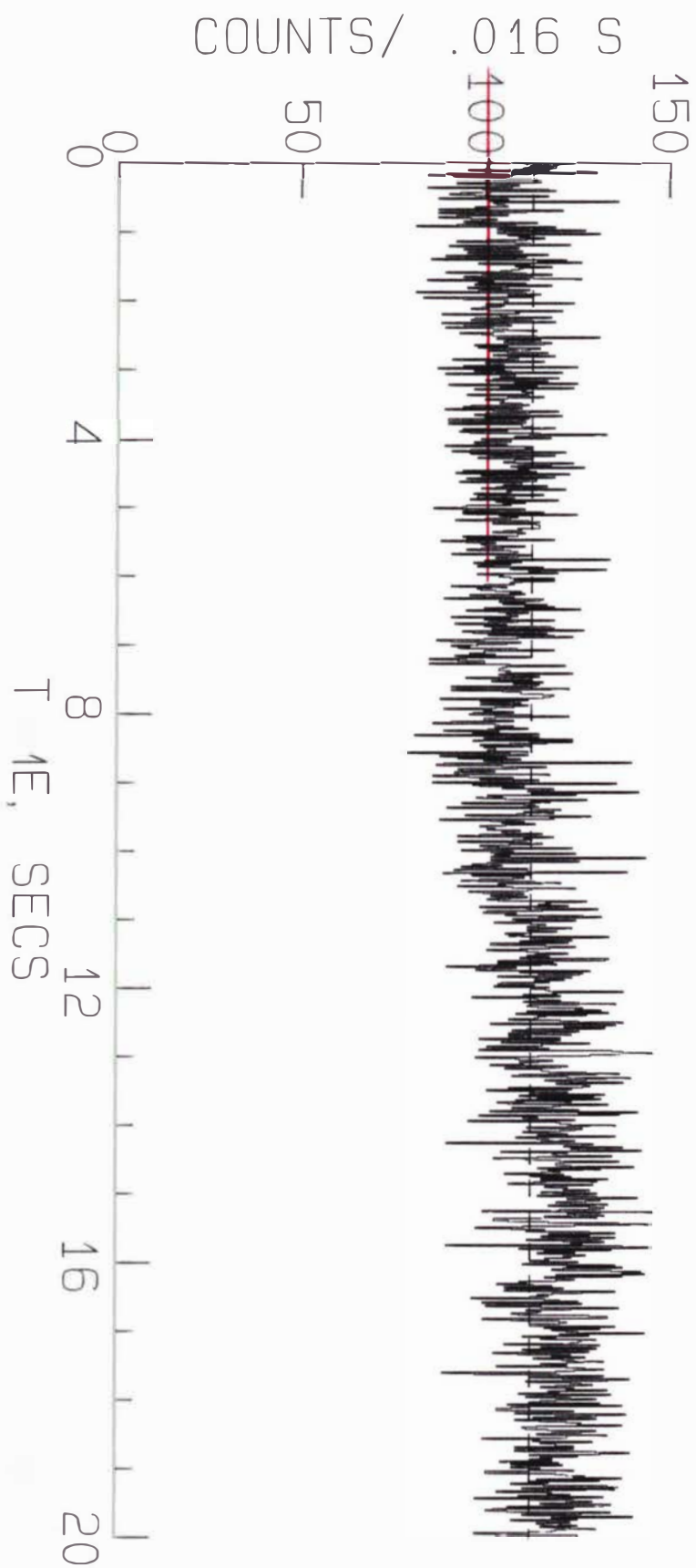
ULYSSES RT

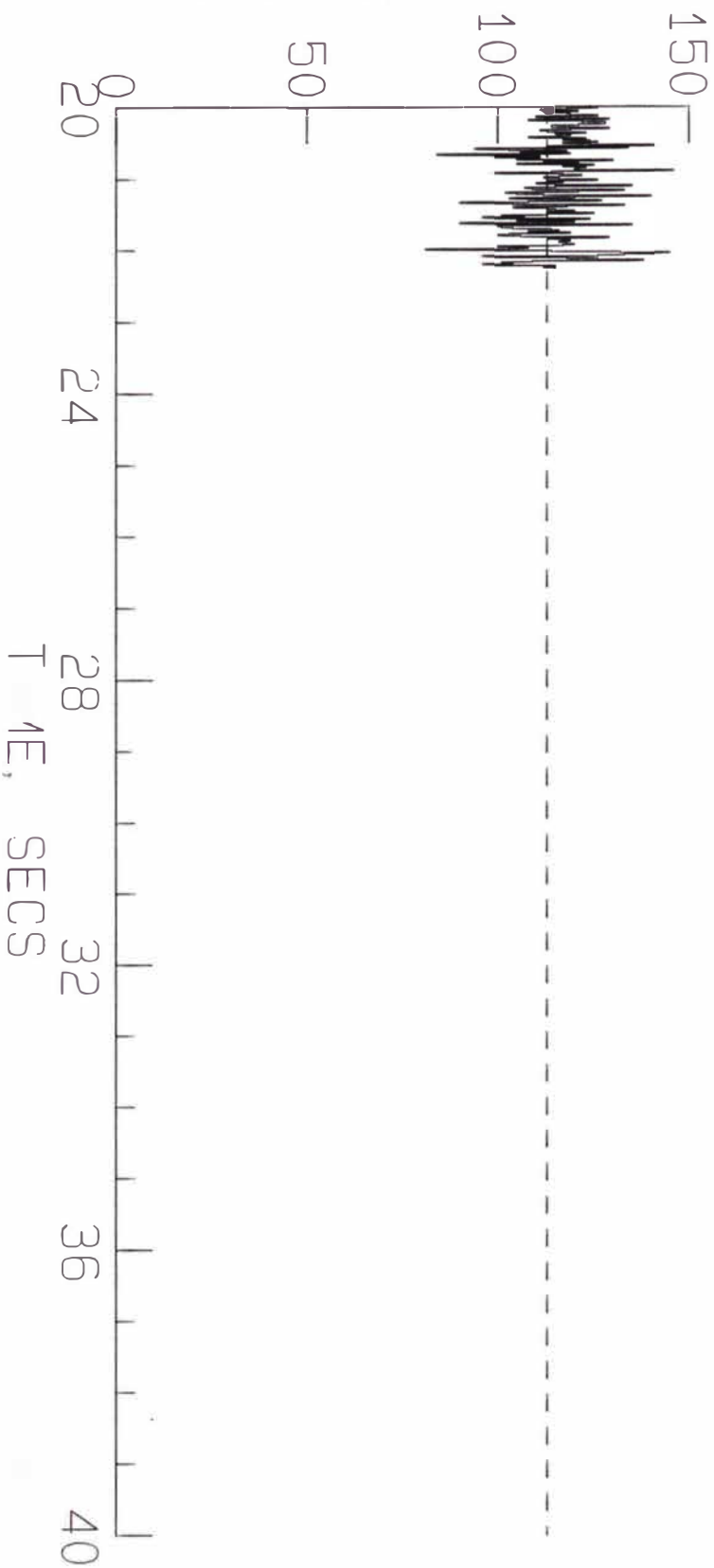
26/ 4/93 33120.391 s

0.500 S INTERVALS REGROUPED BY 2

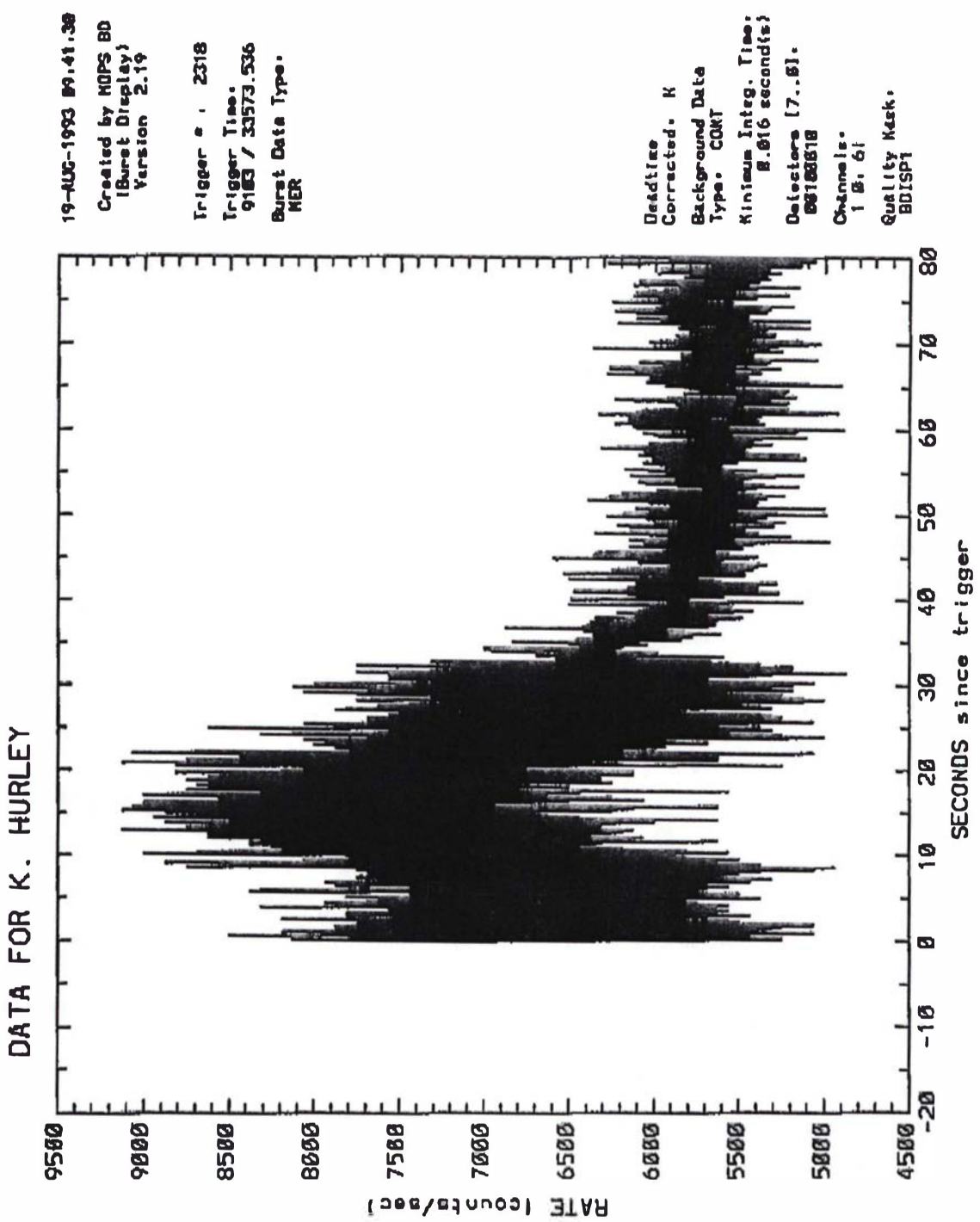
0- 0 keV




BATSE 26/04/93 33573.536
25- 100 keV
COUNTS/ .016 S
0
50
100
150
0
4
8
12
16
20
T, SECS


BATSE 26/04/93 33573.536
25- 100 keV
COUNTS/ .016 S
0
50
100
150
20
24
28
32
36
40
T - 1E, SECS

4/ 9/93


19-AUG-1993 09:41:38
Created by MOPS BD
(Burst Display)
Version 2.19
Trigger # : 2318
Trigger Time:
9183 / 33573.536
Burst Data Type:
MER
Deadtime
Corrected: N
Background Data
Type: CONT
Minimum Integ. Time:
0.016 seconds(s)
Detectors [7..0]:
08100010
Channels:
1 0: 6i
Quality Mask:
BDISP1
DATA FOR K. HURLEY
RATE (counts/sec)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
-20
-10
0
10
20
30
40
50
60
70
80
SECONDS since trigger

****
BATSEARCH PROGRAM
****

BATSE BURST # 2319
EVENT OF 1993 APR 26 DAY OF YEAR=116
EVENT CROSSING TIME AT BATSE : 45632. S. OR 12:40:32.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 70.000 13.000
BATSE PEAK COUNTING RATE: 16000 C/S
EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 26/ 4/ 93 IS:
RA= 143.465 DEC= -11.961 DIST= 4.308 AU
BATSE-ULYSSES DISTANCE = 644416960. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=102.98 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -482.93 SECS.
CROSSING TIME AT ULYSSES IS 45149. S. OR 12:32:29 +/- 406.32 SECONDS

From KOSHUT@fender.msfc.nasa.gov Wed Apr 28 08:53:08 1993
Date: Wed, 28 Apr 1993 10:53:45 -0500 (CDT)
From: KOSHUT@fender.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2319	930426	9103	45632	16000	070	+13

Strong RI

BATSE BURST TRIGGER

NO.: 02319

TIME: TJD=9103 SECONDS=45632

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=84. AZIMUTH=45. ERROR= DEGREES

COMMENTS:
BURST OF ~ 50 SECONDS, CONSISTING OF MULTIPLE PEAKS. THE PEAK RATE
IS OBSERVED AT TRIGGER + 3 SECONDS. EMISSION ABOVE 3000 KEV IS OBSERVED.

Helio corr removed

Date: Nov 4 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☑ If MER data were used, is a 30 ms systematic error included?

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

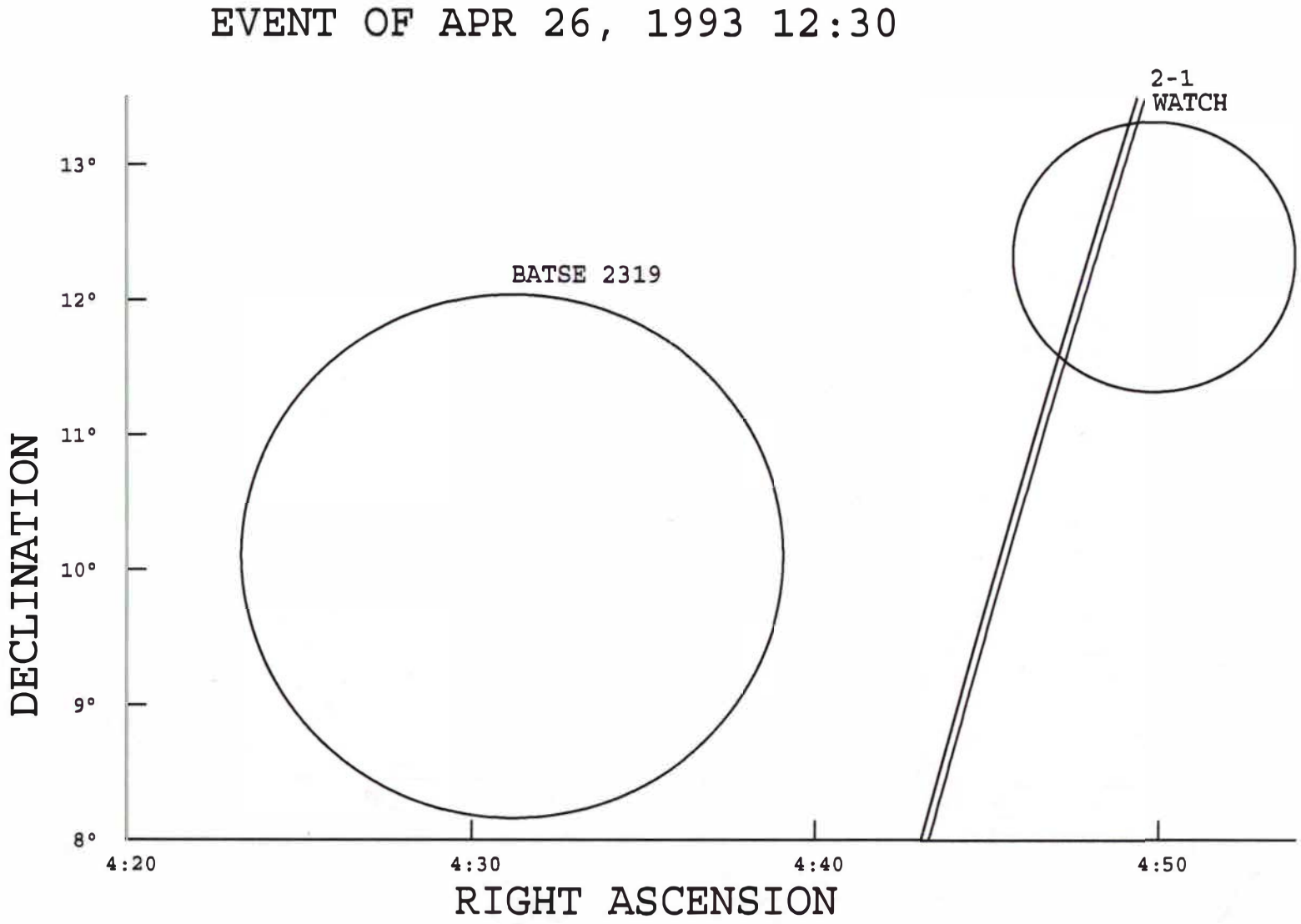
☐ 2000 coordinates used?

☐ Geocentric time used?

☑ ACCESS database updated?

29/ 3/99

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE



WATCH-EURECA Gamma Ray Bursts. Niels Lund, Soren Brandt & Alberto Castro-Tira
Danish Space Research Institute.

Version 1.0 Aug. 9. 1993.

The data given below is pre-publication data. The data should not be quoted without prior consultations with the above authors. The list is prepared in support of searches for counterparts or multi-spacecraft identifications.
The positional uncertainty is 1 degree error circle radius.

#	date	UT-time	sd	l(s)	m(s)	m/l	position(J2000)		t	comments	#Wm	sdp	theta	phi
1	920824	10:53					--------	-------	2	Weak (BATSE)				
2	921004	14:00:21		?	15	>5	14h37.5m	34.1d	1	Two peaks			63.2	222.1
3	921022	15:20:57		60	55	>5	16h56.7m	-09.5d	2	Two peaks				
4	921118	22:11					--------	-------	2	Weak (BATSE)				
5	921207	16:00:48		?	16	>5	20h36.1m	-41.8d	1	Two peaks			65.9	136.3
6	921218	02:30					--------	-------	2	Weak (BATSE)				
7	930106	15:37					--------	-------	2	Weak (BATSE)				
8	930201	16:42:12					--------	-------	2	Weak (BATSE?)				
7	930217	14:44					--------	-------	2	Weak (BATSE)				
8	930318	12:31:28		?	30	>5	10h03.3m*	-20.0d*	2	BATSE trig 95s early?				
9	930410	14:19							1					
10	930426	12:40:35		?	18	>5			1					
11	930502	13:52					--------	-------	2	Weak (BATSE)				
12	930610								1					
13	930614	03:40:32		11	9	2	11h20.7m	+23.1d	1					

#	date	UT-time	sd	l(s)	m(s)	m/l	position(J2000)	t	comments	#Wm

comments:
UT-time: Time for peak count rate in Med CsI band. Note time resolution!
*) Times marked with an asterisk are not yet well calibrated to UT.
sd: Standard deviations above background (in count rates).
l(s): Duration in 6-10 keV band (Low NaI channel)
m(s): Duration in 10-180 keV band (Med CsI channel)
m/l: Hardness: (sd(Med NaI)+sd(Med CsI)) / sd(Low NaI) (NOTE: EURECA energy bands)
Positions marked with asterisk can not be determined more than once from the WATCH data!
t: Best time resolution available: 1, 4, 8, 16 motor rotations (approx. 0.9 s)
m: 1 motor rotation in 4 ms steps
r: raw memory (4 ms steps)
#Wm Telemetry session and WATCH unit identifier
sdp: Standard deviations above background in final modulation pattern used for source localization. As a rough guide, the statistical uncertainty in the source position is 240/sdp arcminutes. In most cases the systematic errors dominates the error budget.

theta and phi: Source position in WATCH instrument coordinates.

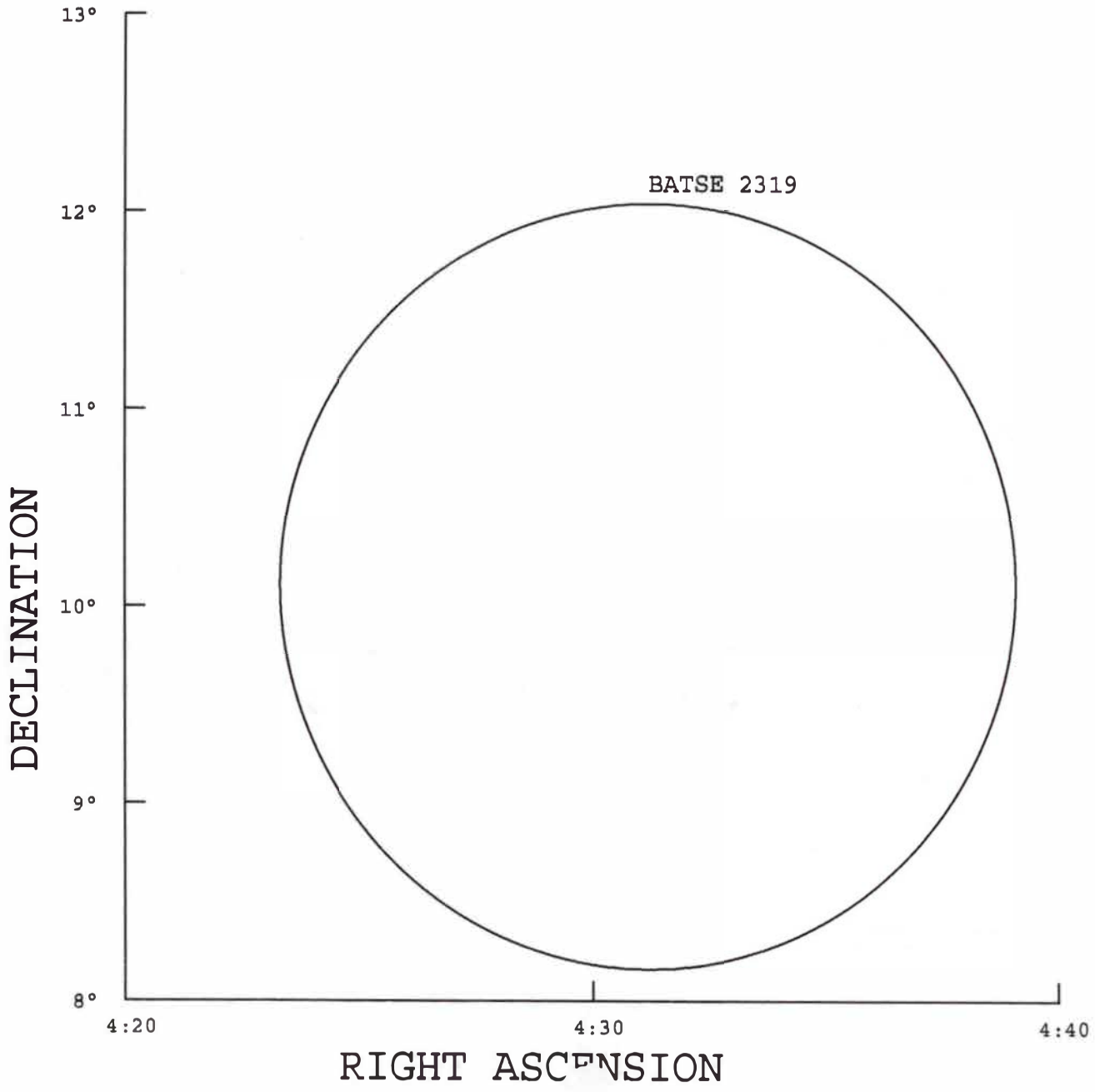
WATCH-GRANAT Gamma Ray Bursts. Niels Lund, Alberto Castro-Tirado & Soren Brandt,
Danish Space Research Institute.

Version 2.0 Aug. 9. 1993.

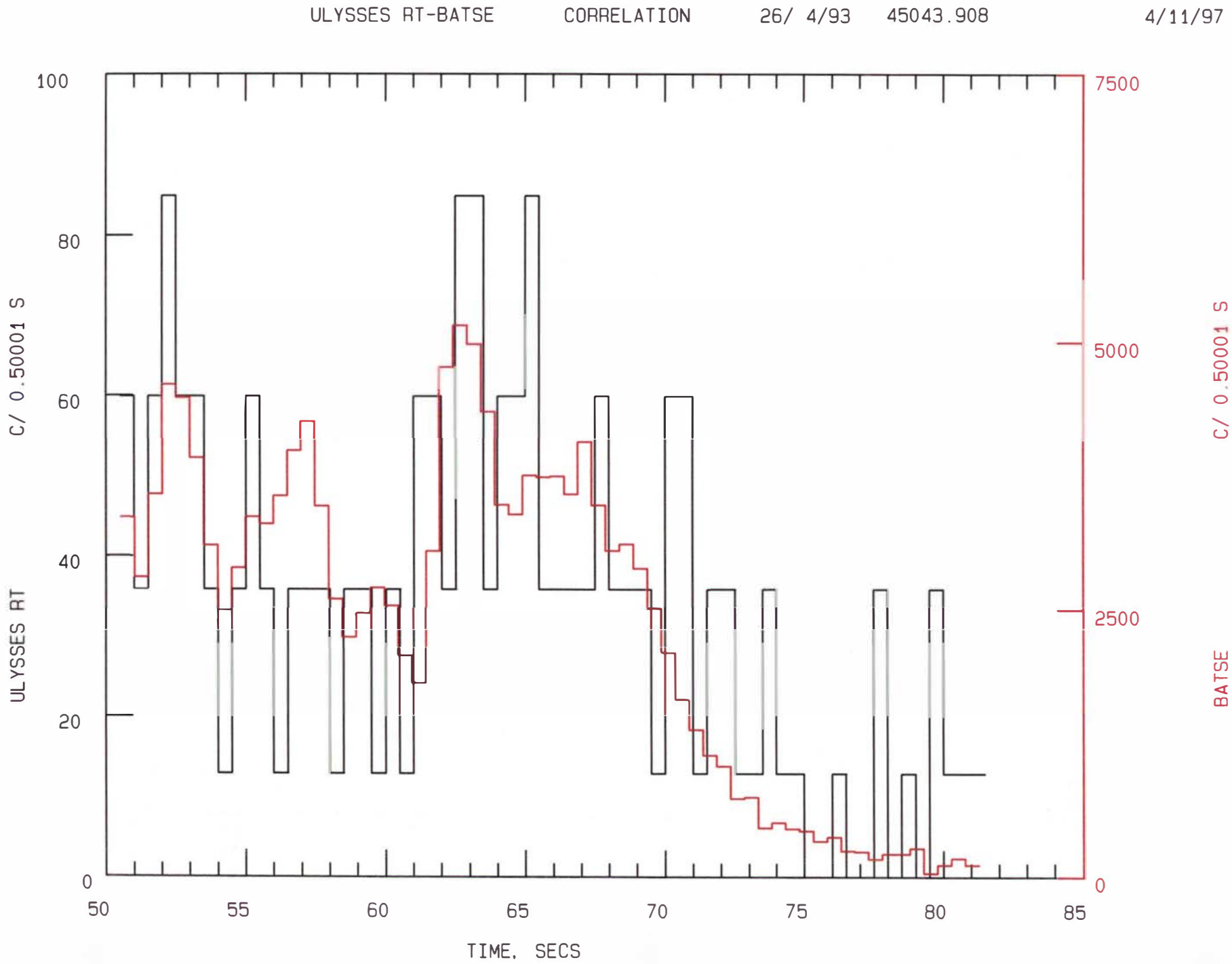
The data given below is pre-publication data. The data should not be quoted without prior

EVENT OF APR 26, 1993 12:30

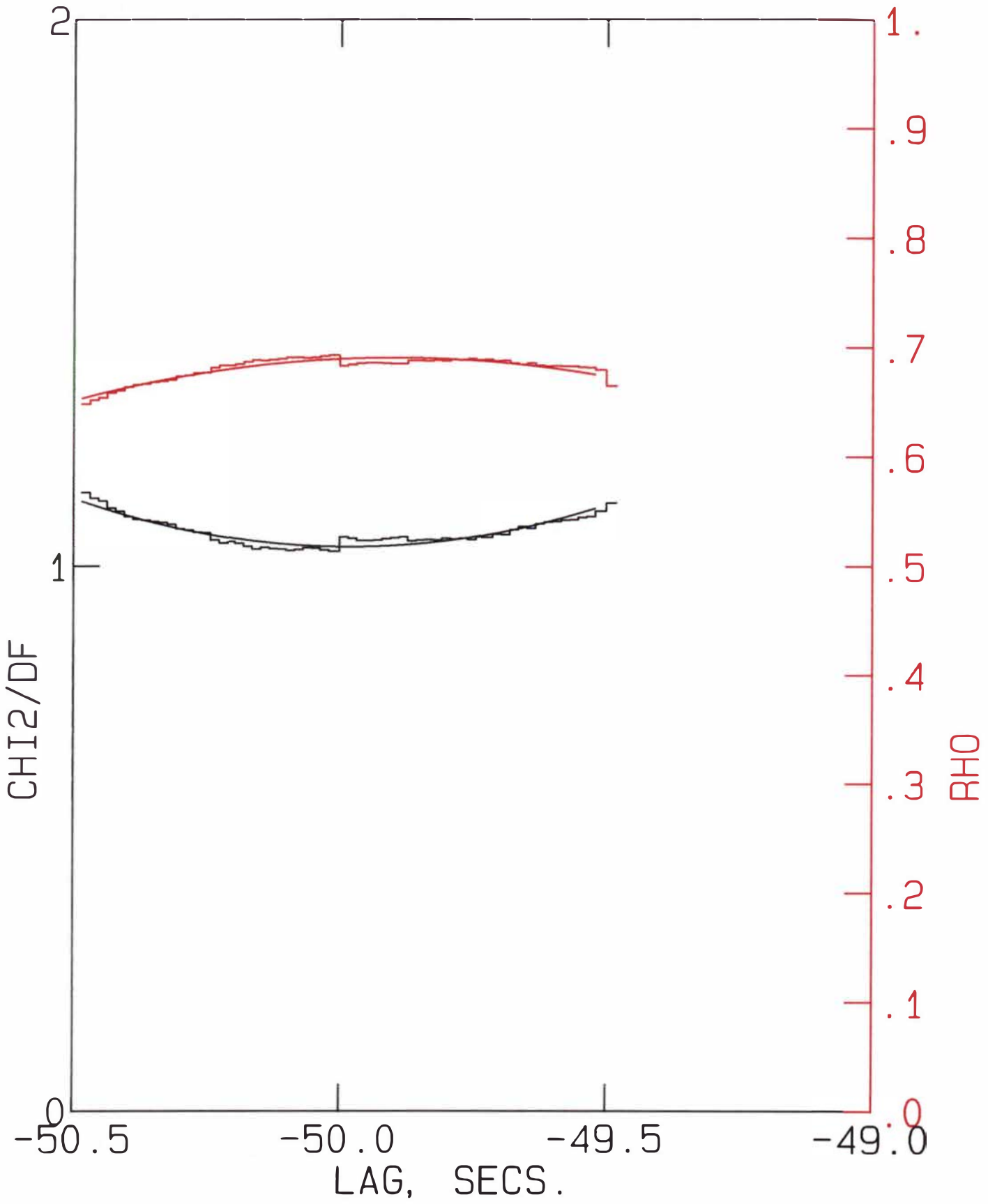
4/11/97

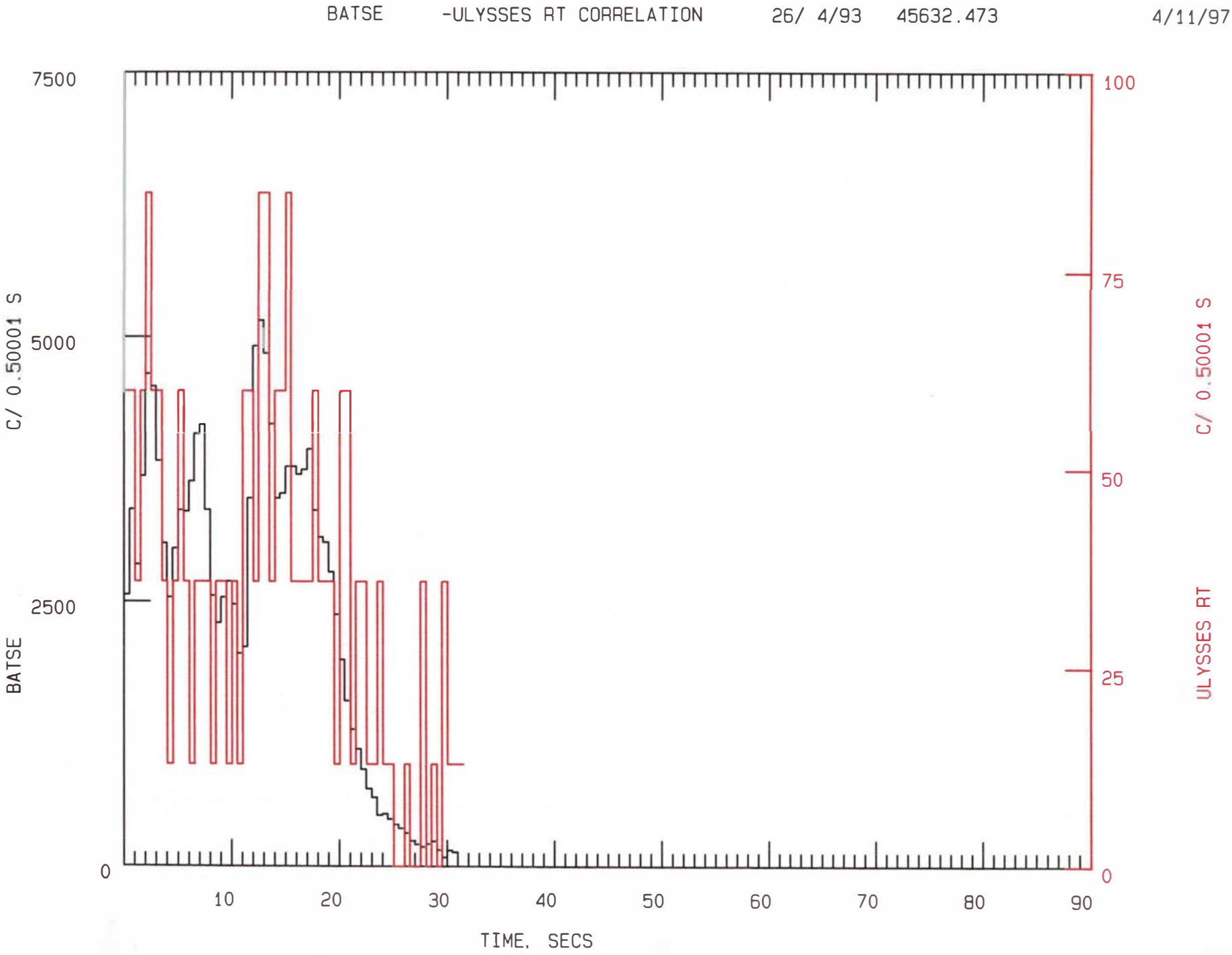


N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE

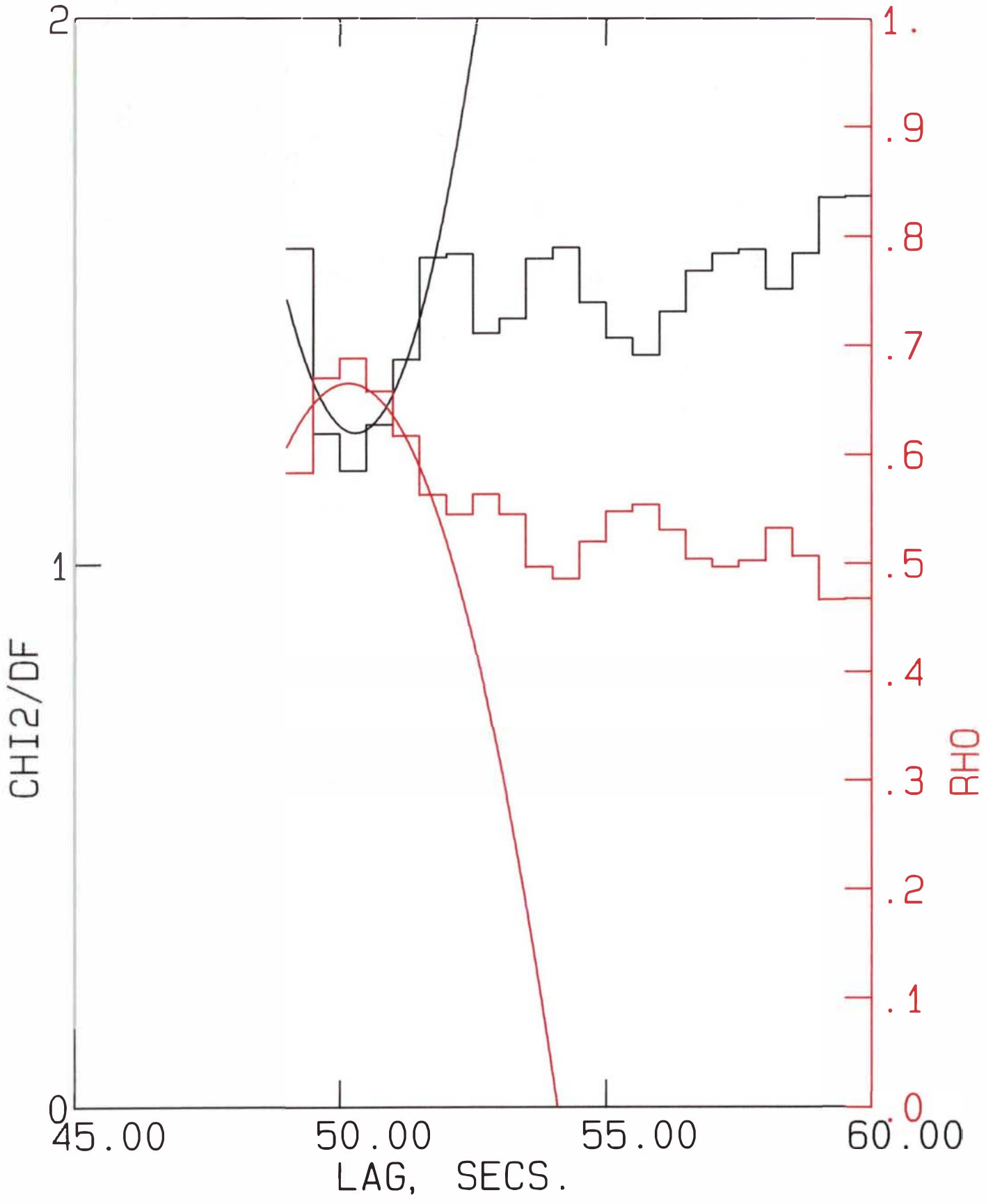

ULYSSES RT-BATSE CORRELATION 26/ 4/93 45043.908 4/11/97
100
80
60
40
20
0
C/ 0.50001 S
ULYSSES RT
7500
5000
2500
0
C/ 0.50001 S
BATSE
50
55
60
65
70
75
80
85
TIME, SECS

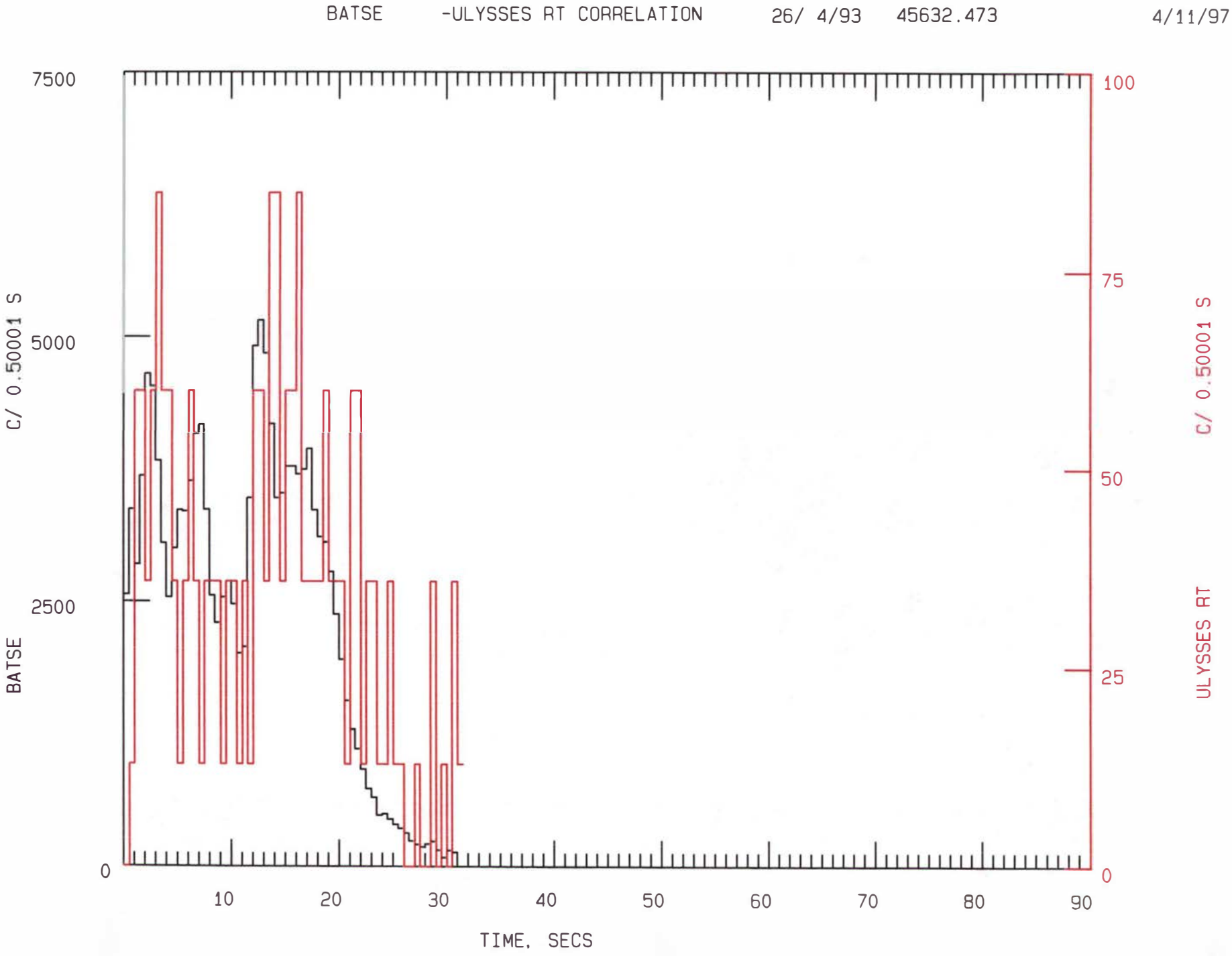
ULYSSES RT-BATSE CORRELATION 26/ 4/93 45043.908




BATSE -ULYSSES RT CORRELATION 26/ 4/93 45632.473 4/11/97
7500
5000
2500
0
C/ 0.50001 S
BATSE
100
75
50
25
0
C/ 0.50001 S
ULYSSES RT
10
20
30
40
50
60
70
80
90
TIME, SECS

BATSE -ULYSSES RT CORRELATION 26/ 4/93 45632.473




BATSE -ULYSSES RT CORRELATION 26/ 4/93 45632.473 4/11/97
7500
5000
2500
0
C/ 0.50001 S
BATSE
100
75
50
25
0
C/ 0.50001 S
ULYSSES RT
10
20
30
40
50
60
70
80
90
TIME, SECS

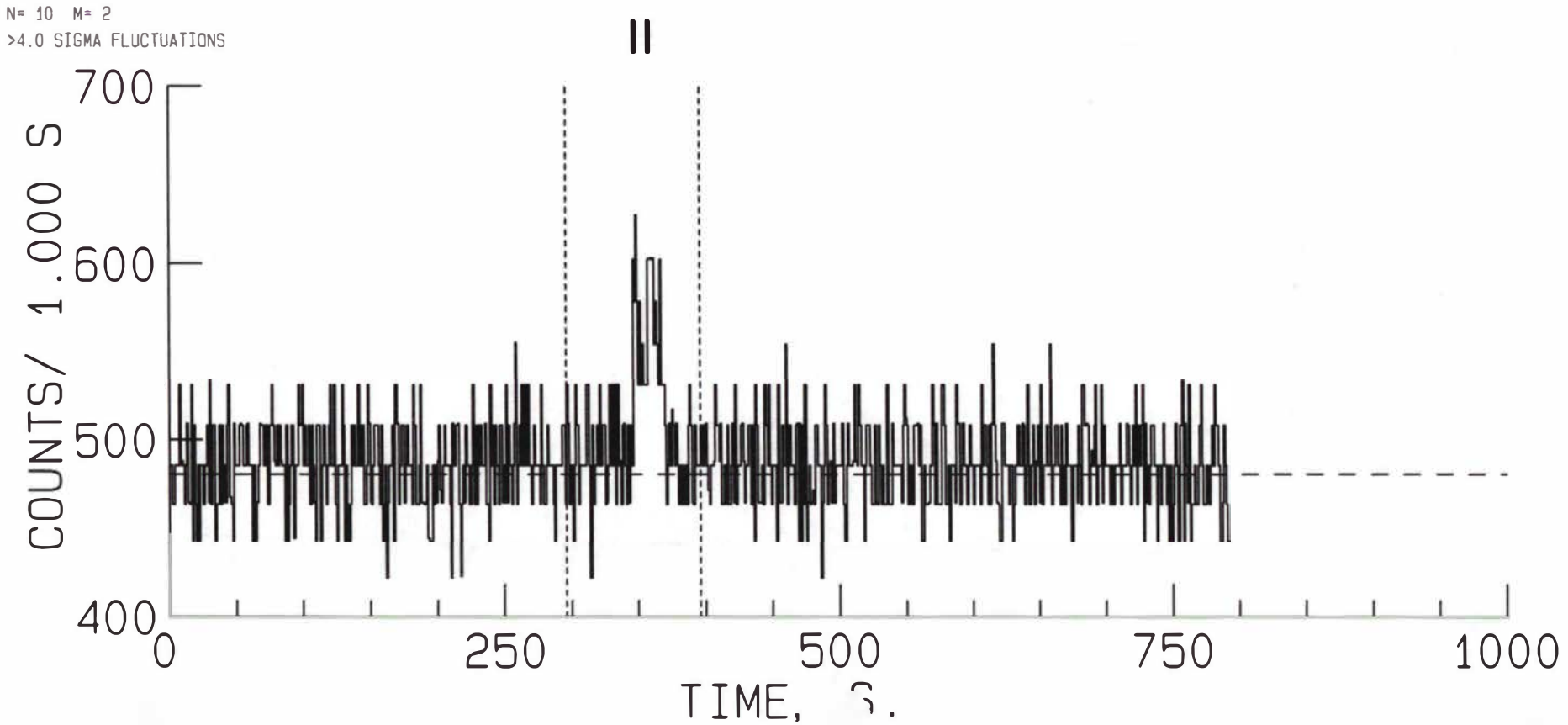
ULYSSES RT

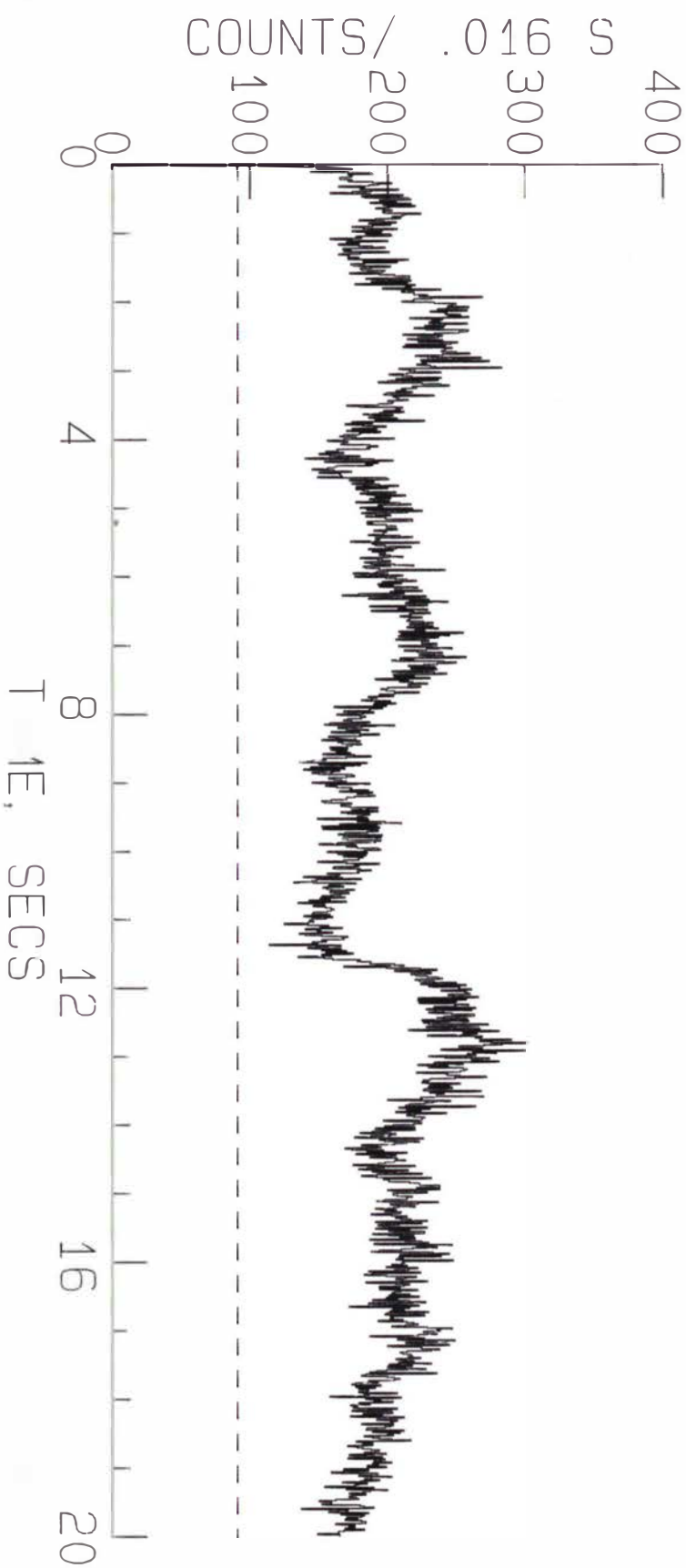
4/11/97

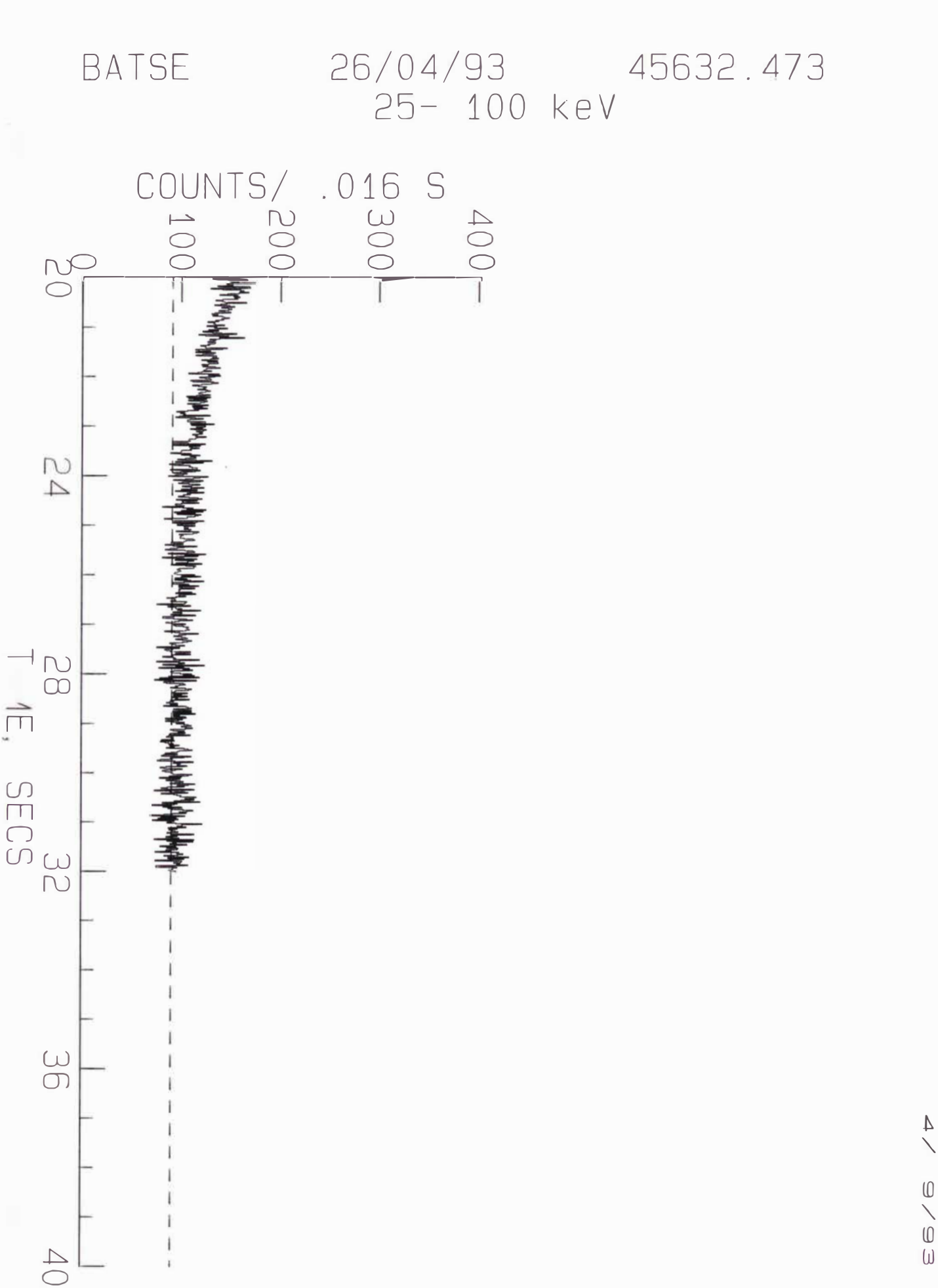
26/ 4/93 44748.069 s

0.500 S INTERVALS REGROUPED BY 2

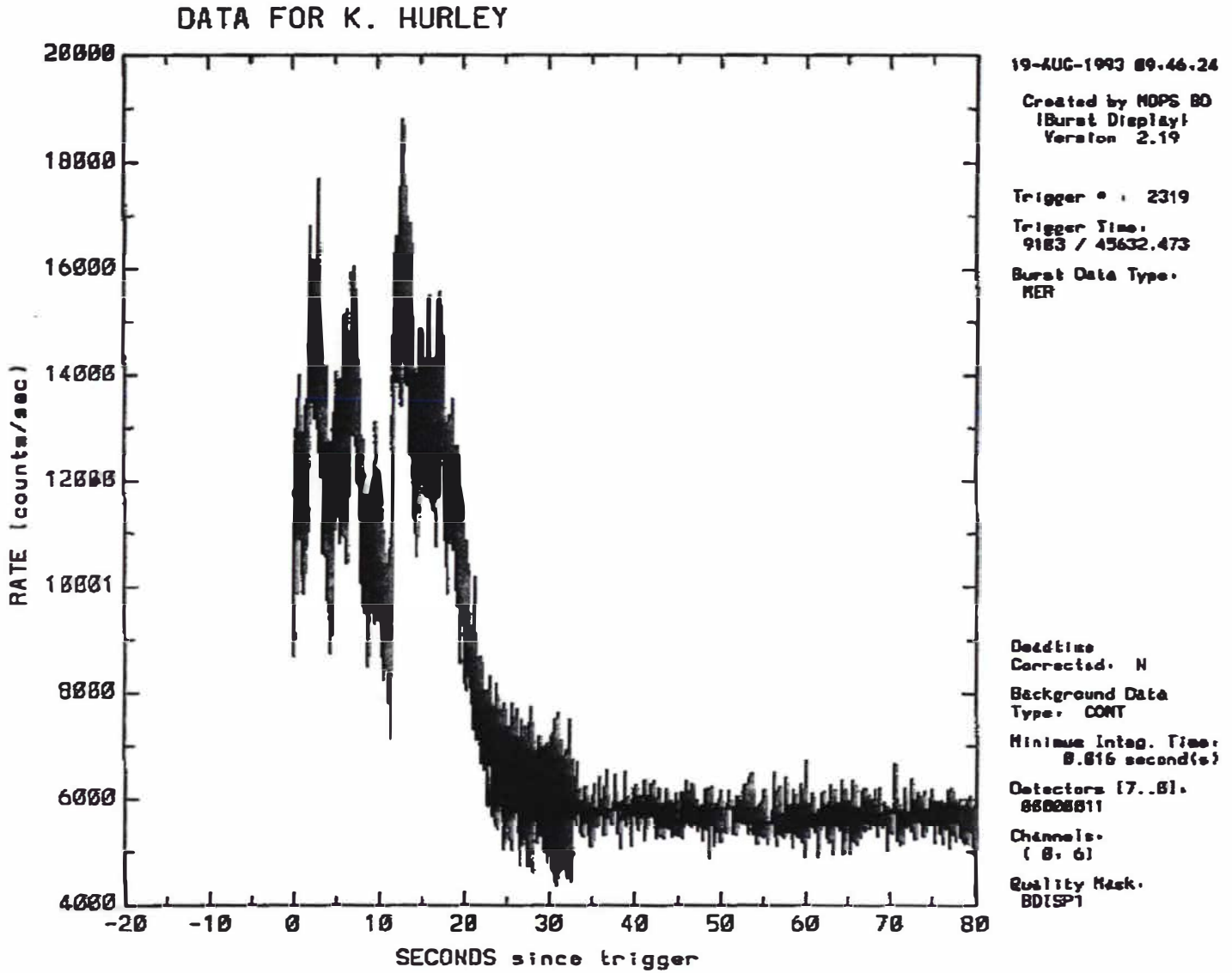
21- 146 keV

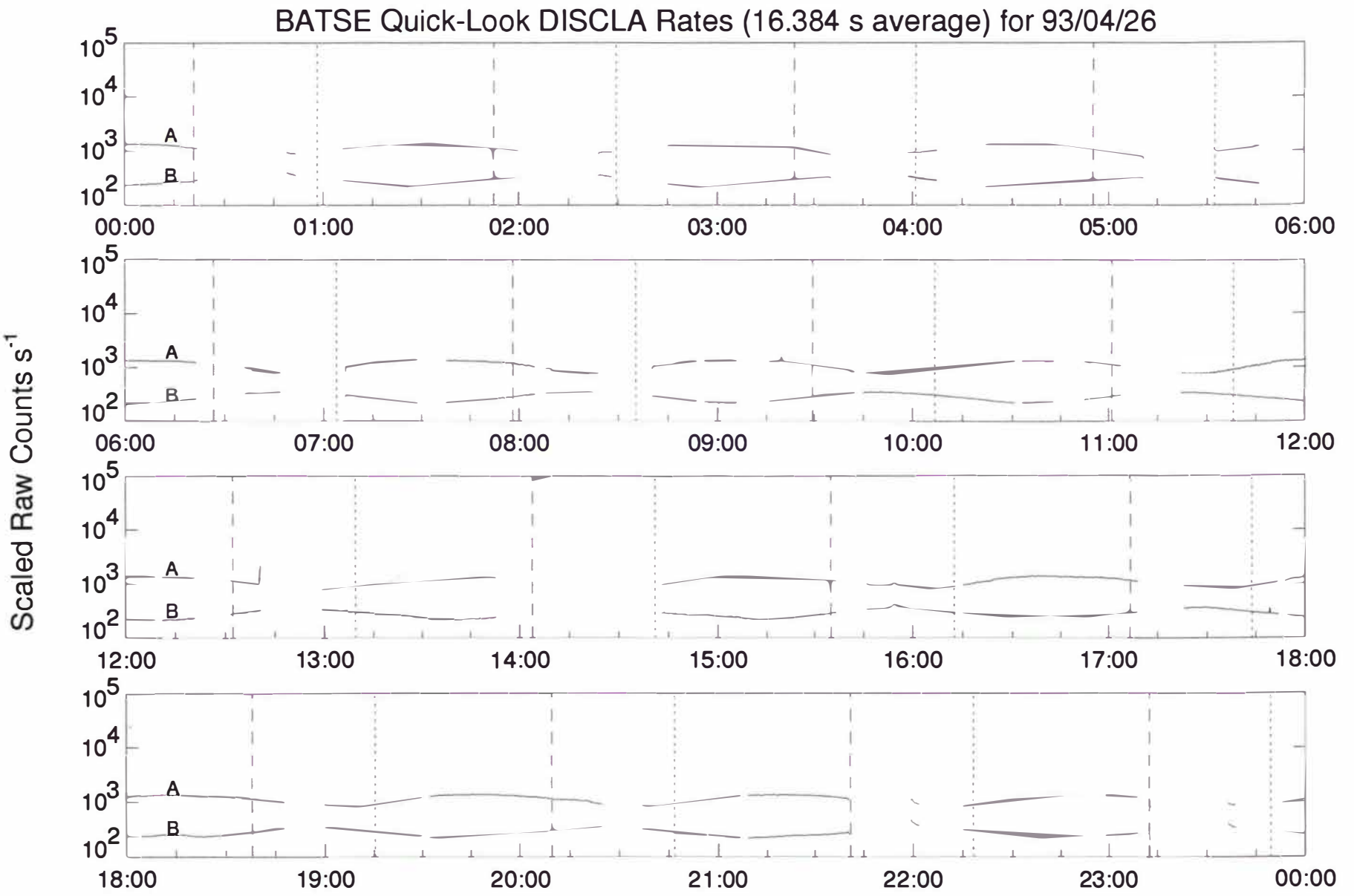


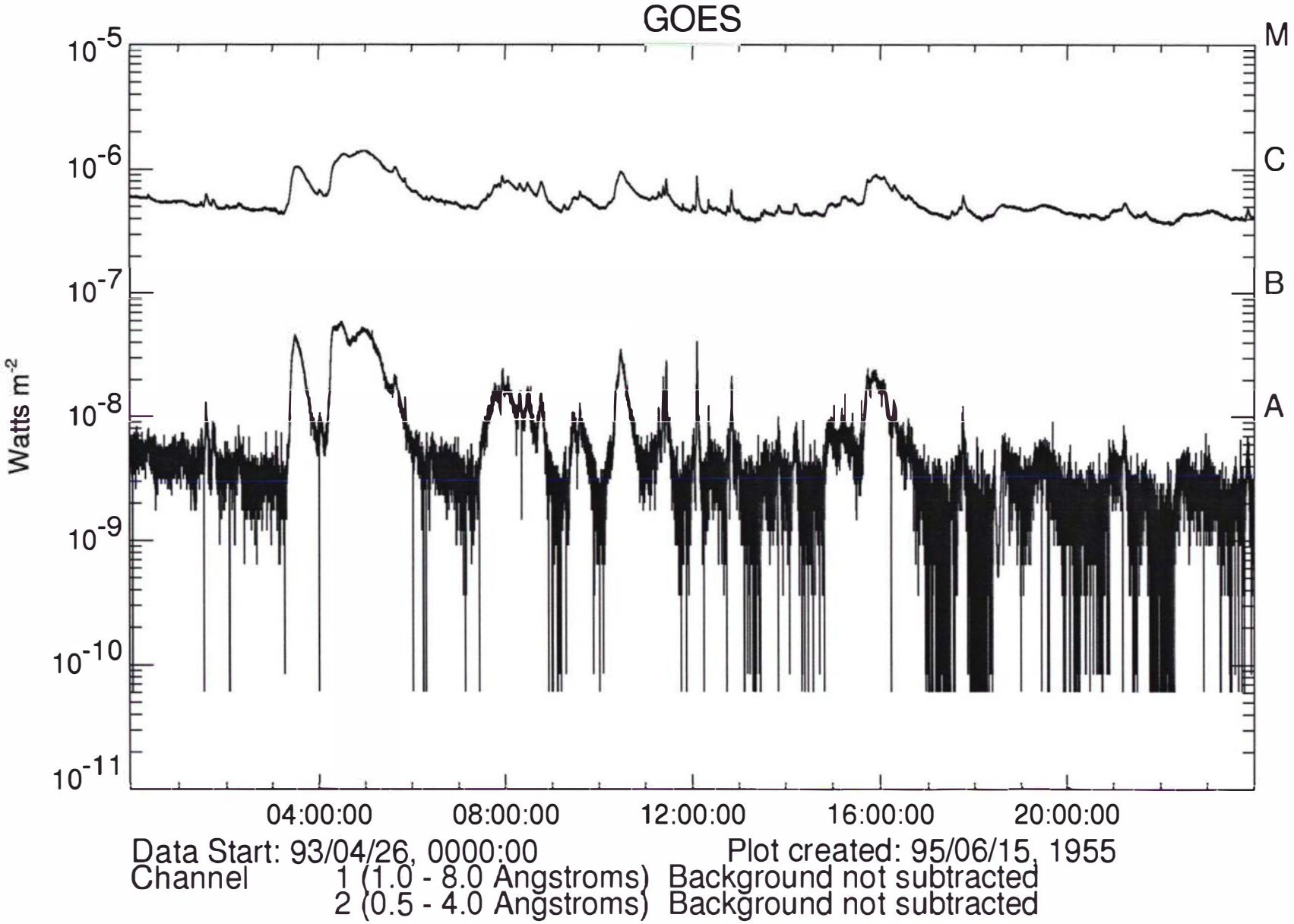

BATSE 26/04/93 45632.473
25- 100 keV
COUNTS/ .016 S
0
100
200
300
400
0
4
8
12
16
20
T 1E, SECS


BATSE 26/04/93 45632.473
25- 100 keV
COUNTS/ .016 S
0
100
200
300
400
20
24
28
32
36
40
T 1E, SECS

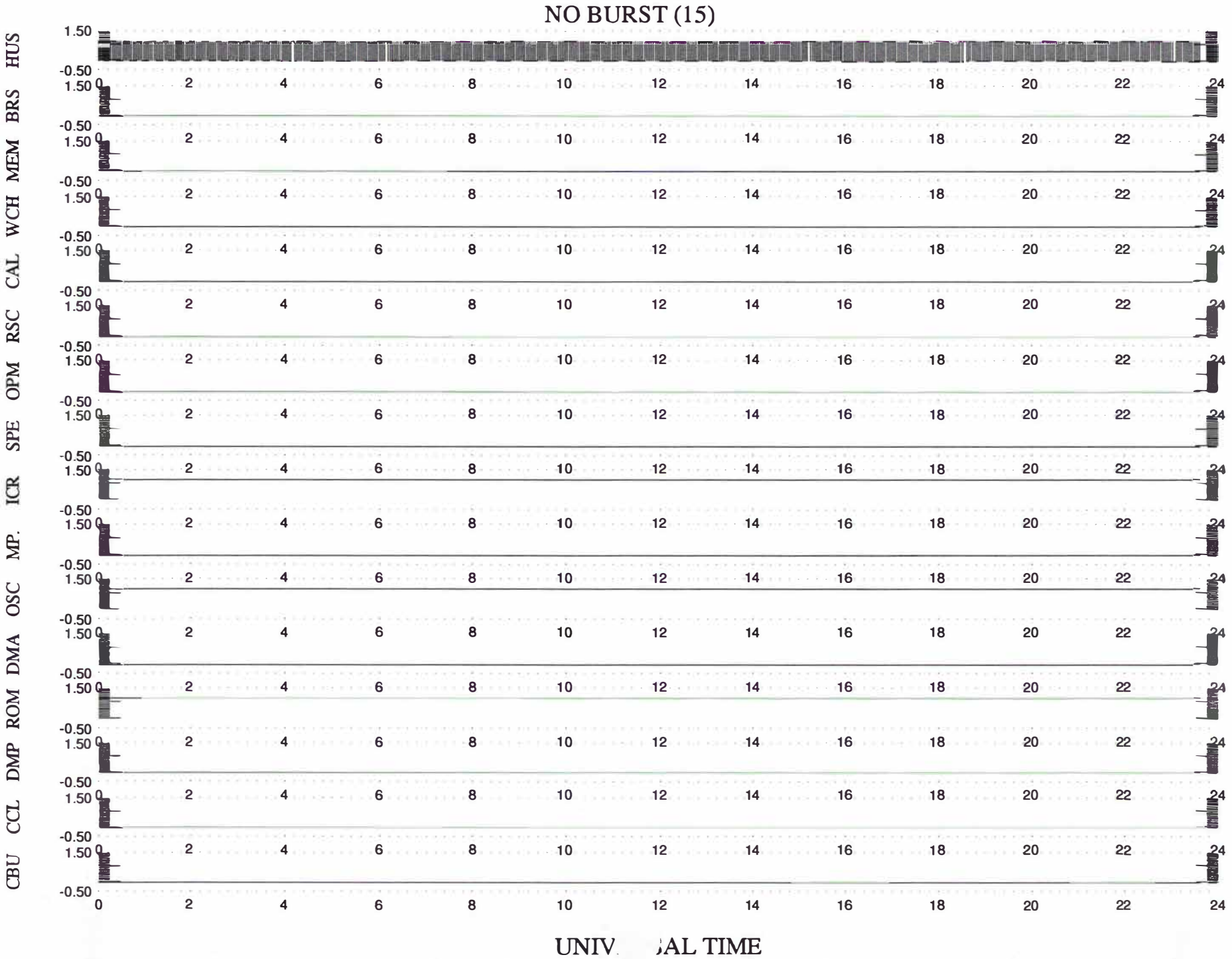
4/ 9/93


DATA FOR K. HURLEY
RATE (counts/sec)
20000
18000
16000
14000
12000
10000
8000
6000
4000
-20
-10
0
10
20
30
40
50
60
70
80
SECONDS since trigger
19-AUG-1993 09.46.24
Created by MOPS BD
(Burst Display)
Version 2.19
Trigger # : 2319
Trigger Time:
9183 / 45632.473
Burst Data Type:
MER
Deadtime
Corrected: N
Background Data
Type: CONT
Minimum Integ. Time:
0.016 second(s)
Detectors [7..0]:
00000011
Channels:
(0: 6)
Quality Mask:
BDISP1


BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/26
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/29, 1241 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

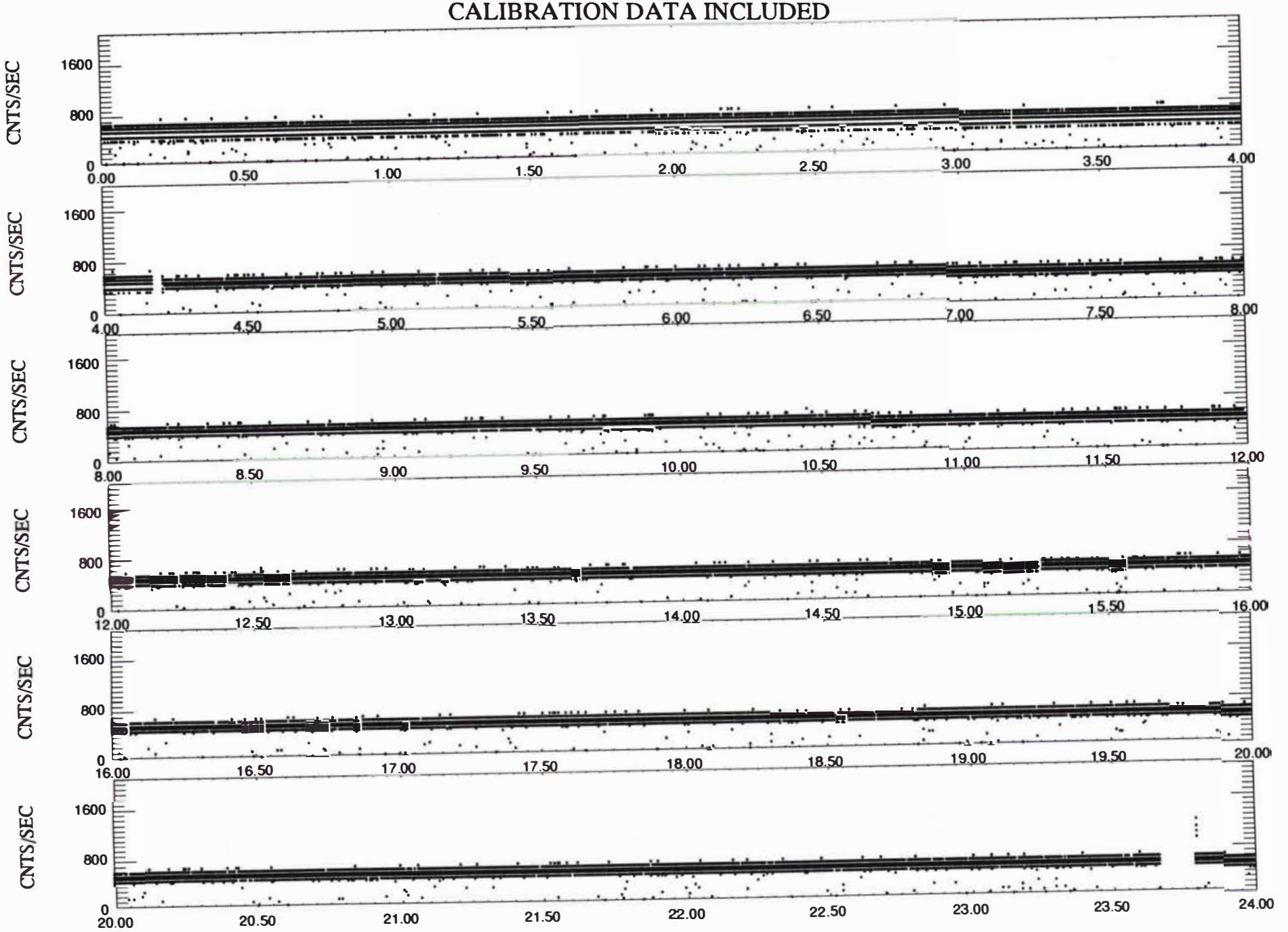

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/26, 0000:00
Plot created: 95/06/15, 1955
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 116, year 1993 to day 116, year 1993 6/12/93



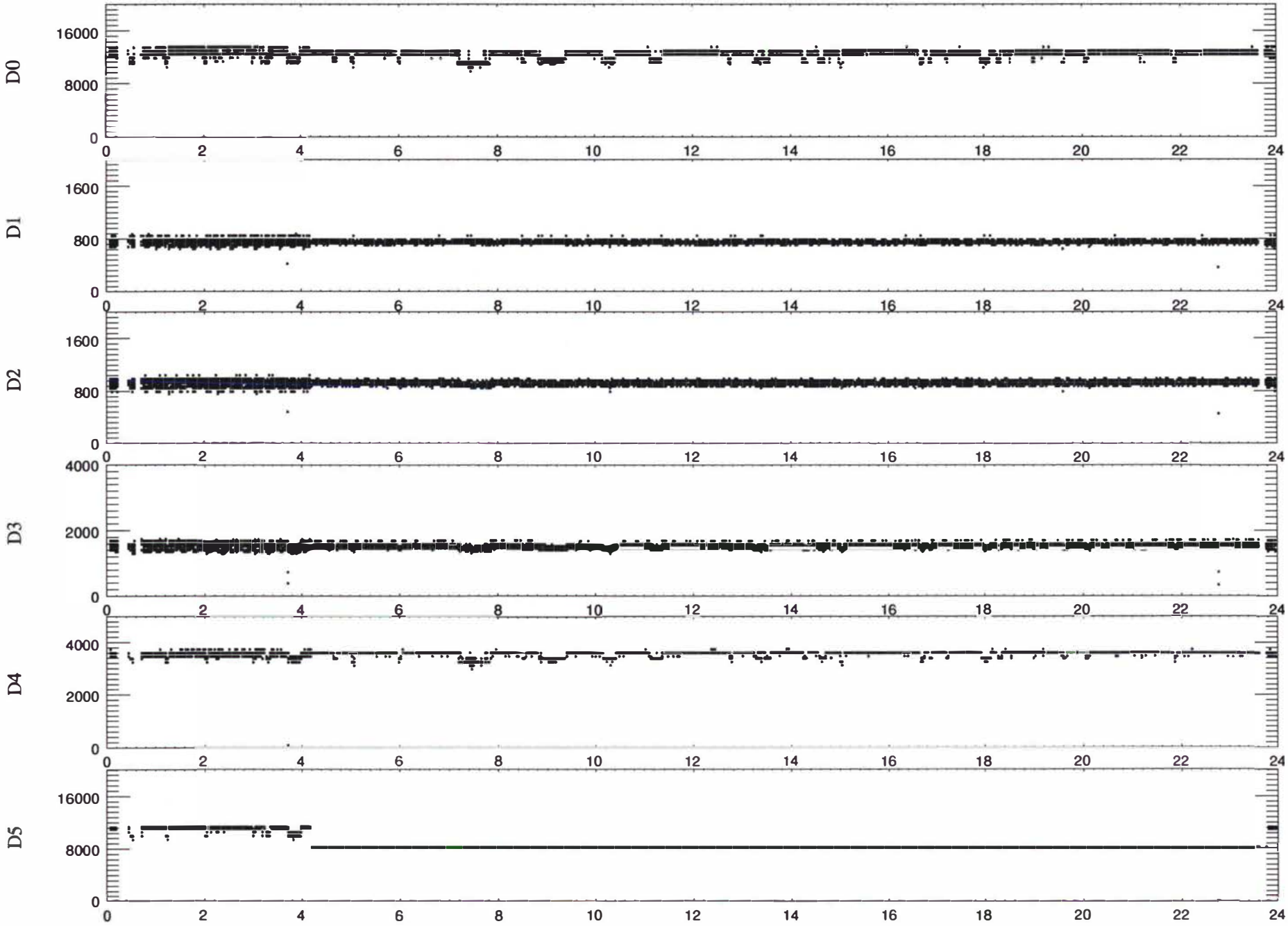
HUS 2A, MODE 1, NOT AVERAGED EDR day 116, year 1993 to day 116, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIV! AL TIME

HUS 2B COUNTS / SEC QEDR day 116, year 1993 to day 116, year 1993 4/28/93



Kommers

UNTRIGGERED

ULYSSES RT

21/ 5/97

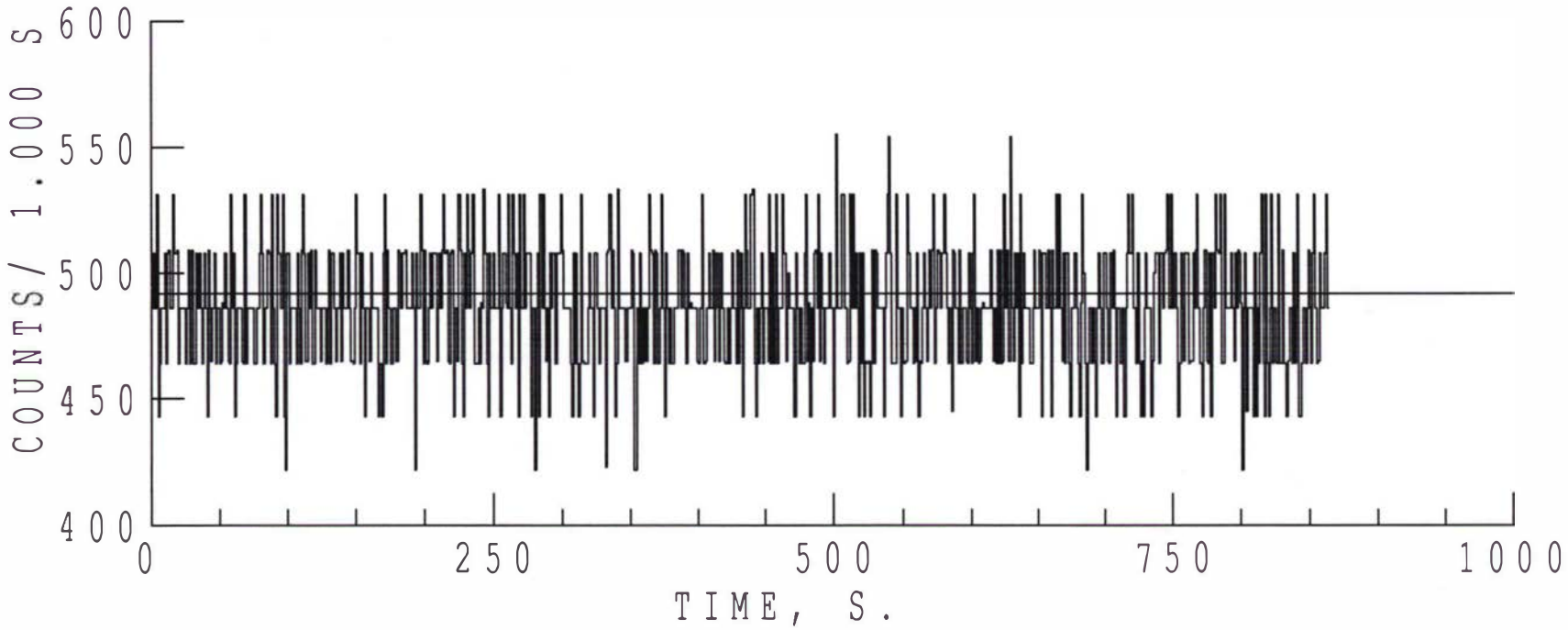
27/ 4/93 50760.008 s

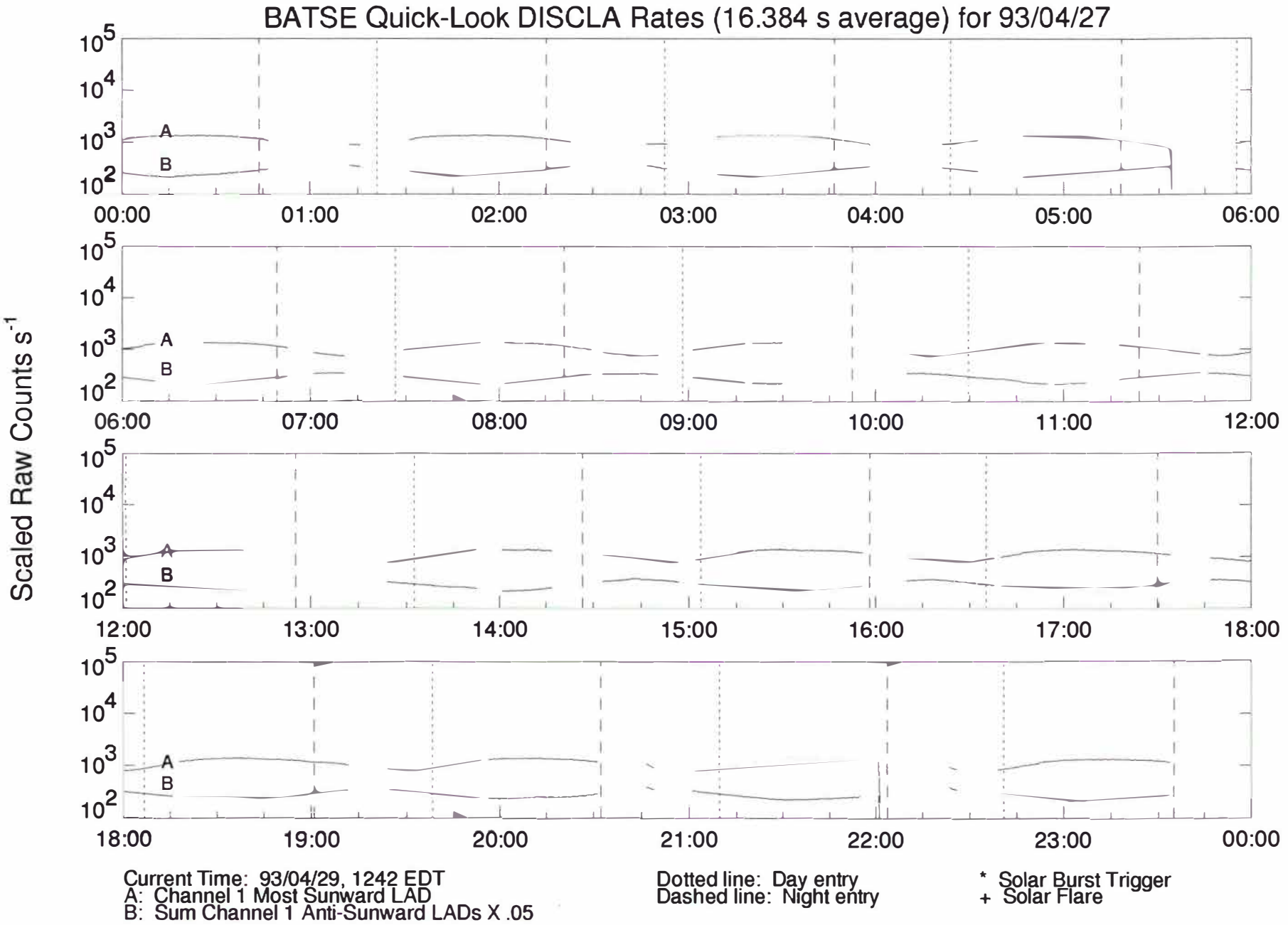
0.500 S INTERVALS REGROUPED BY 2

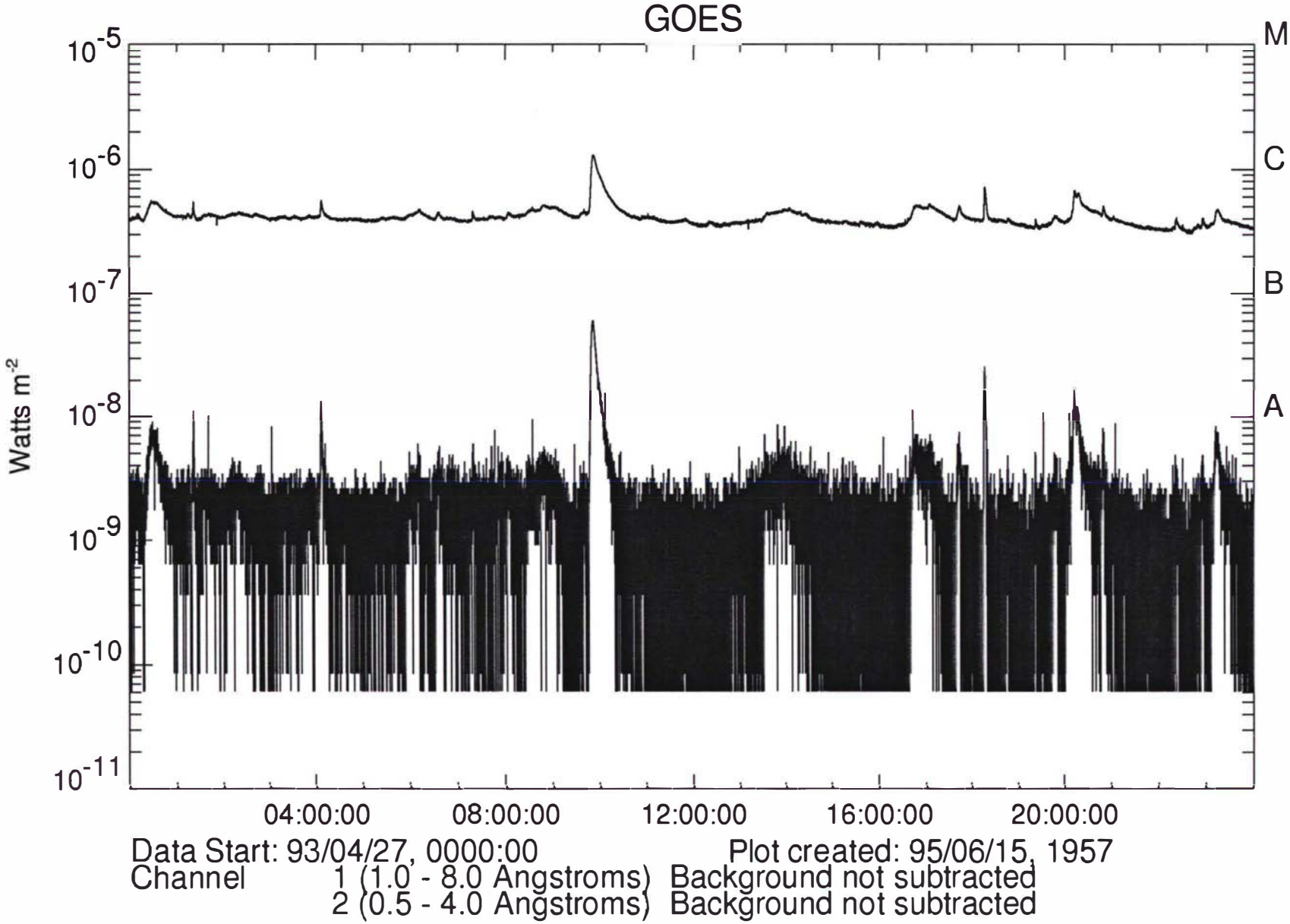
0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

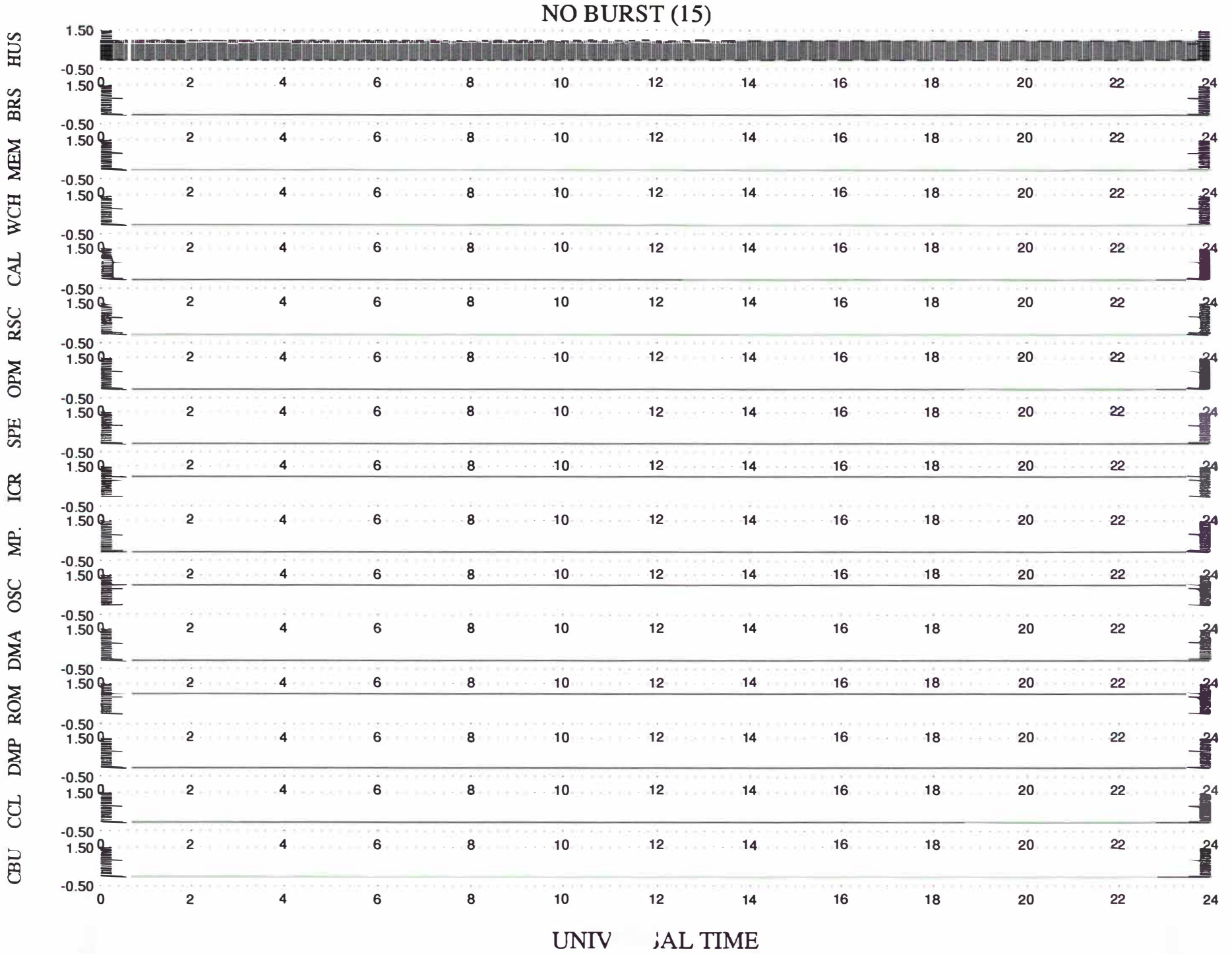
N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/27
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/04/29, 1242 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

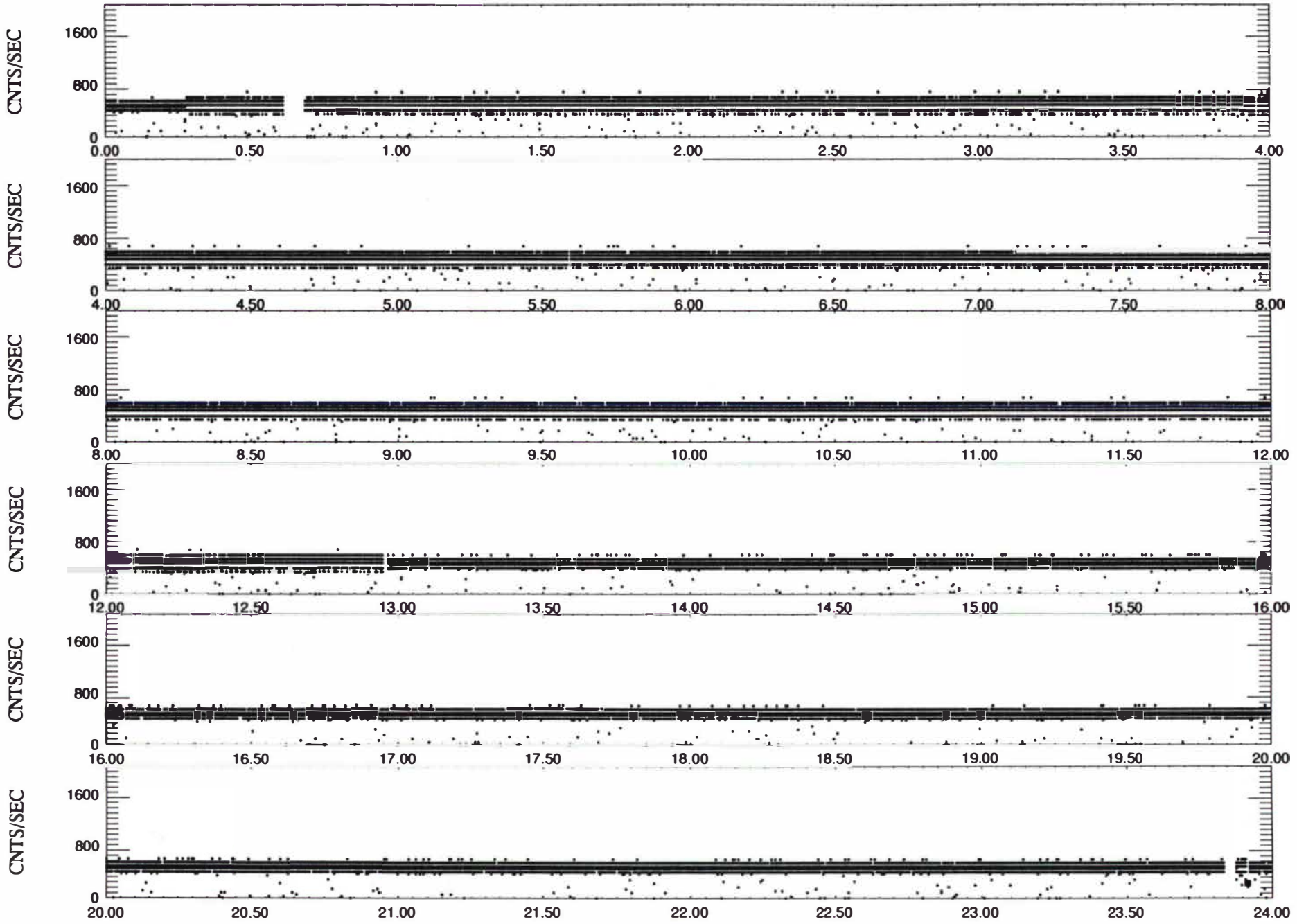

GOES
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
M
C
B
A
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/27, 0000:00
Plot created: 95/06/15, 1957
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 117, year 1993 to day 117, year 1993 6/12/93



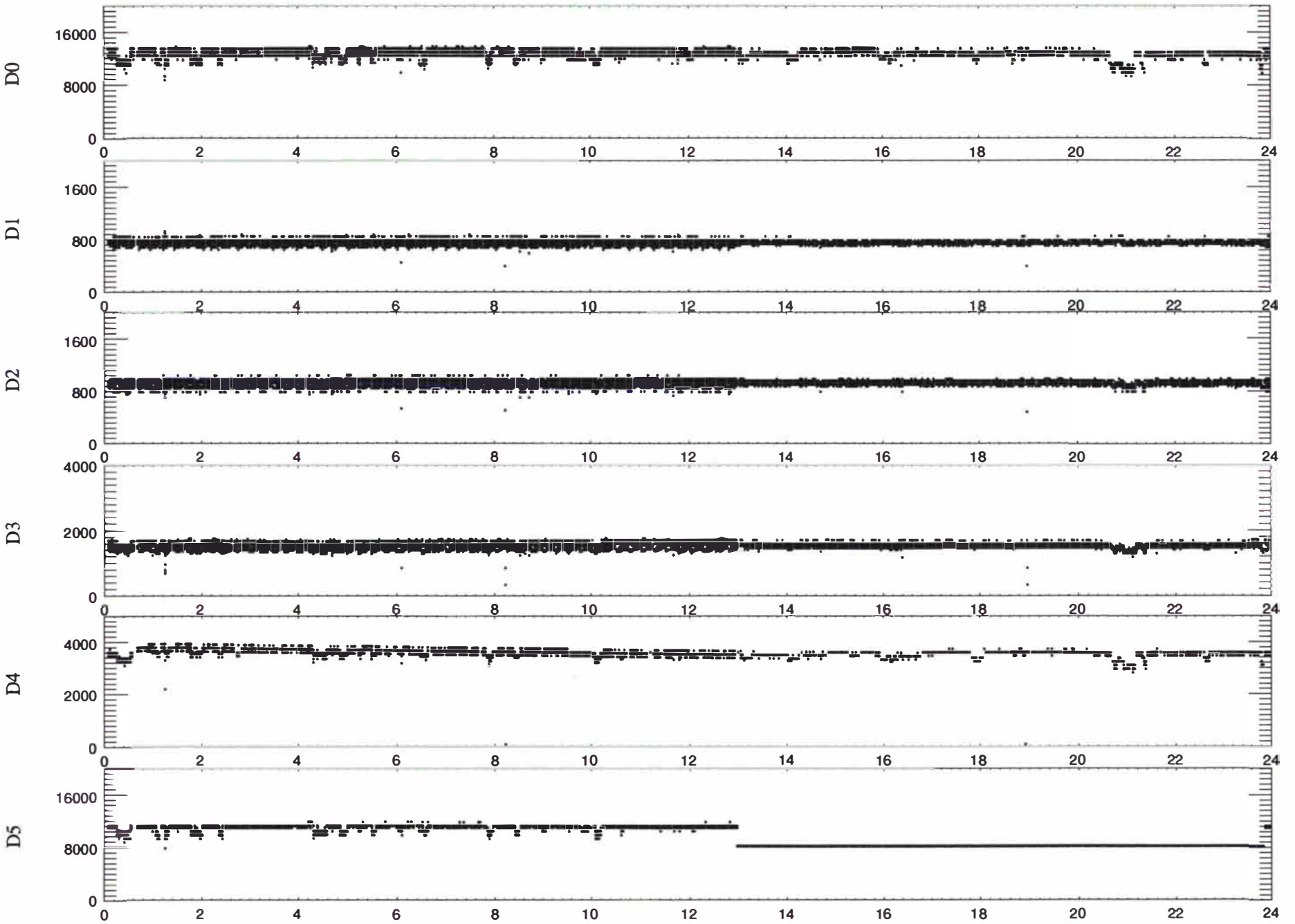
HUS 2A, MODE 1, NOT AVERAGED EDR day 117, year 1993 to day 117, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIV SAL TIME

HUS 2B COUNTS / SEC QEDR day 117, year 1993 to day 117, year 1993 4/30/93



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

 BATSE BURST #     2320
 EVENT OF 1993 APR 28 DAY OF YEAR=118
 EVENT CROSSING TIME AT BATSE      :  4032. S. OR 01:07:12.0
 COORDINATES ARE     .000     .000       6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 135.000  -52.000
 BATSE PEAK COUNTING RATE:  45000    C/S
 EVENT CROSSING TIME AT ULYSSES    WILL BE FOUND
 POSITION OF ULYSSES ON 28/ 4/  93 IS:
 RA=  143.298 DEC=  -11.865 DIST=    4.330 AU
 BATSE-ULYSSES DISTANCE =  647797920. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=139.31 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1638.38 SECS.
 CROSSING TIME AT ULYSSES    IS  2394. S. OR   00:39:53 +/-  269.72 SECONDS
```



```
From BHAT@ssl.msfc.nasa.gov Thu Apr 29 11:28:16 1993
Date:    Thu, 29 Apr 1993 13:28:38 -0500 (CDT)
From: BHAT@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

 BATSE #   Date     TJD     sec   Max ct/s   RA   Dec
   2320   930428    9105   04032    45000   135   -52
```

RI

```
                  BATSE BURST TRIGGER
 NO.:  2320

 TIME: TJD=9015 SECONDS=04032

 TYPE: BURST                     SOLAR FLARE TRIGGER SIGNAL:N

 SIGNIFICANCE:       SIGMA

 INTENSITY:          COUNTS/CM2

 LOCATION: ZENITH=102.9  AZIMUTH=131.4  ERROR=      DEGREES

 COMMENTS:
 THIS BURST HAS SINGLE SMOOTH PROFILE OF ABOUT 1.5 S LONG. IT HAS A VERY SHARP
 RISE TIME AND SLOWER DECAY TIME. SEEN ABOVE 300 KEV
```

Helio corr removed

Date: Dec 18 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

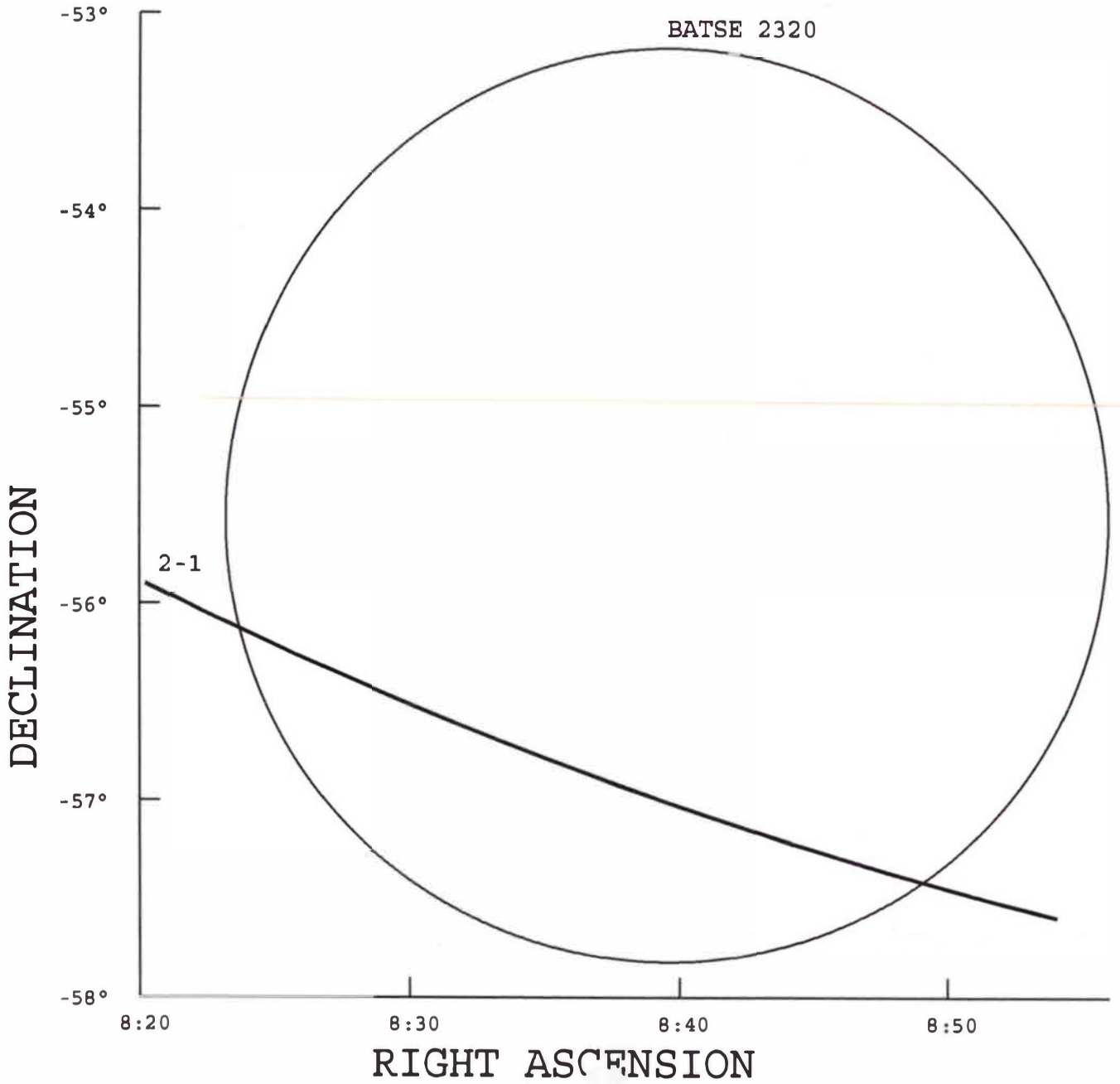
☐ Geocentric time used?

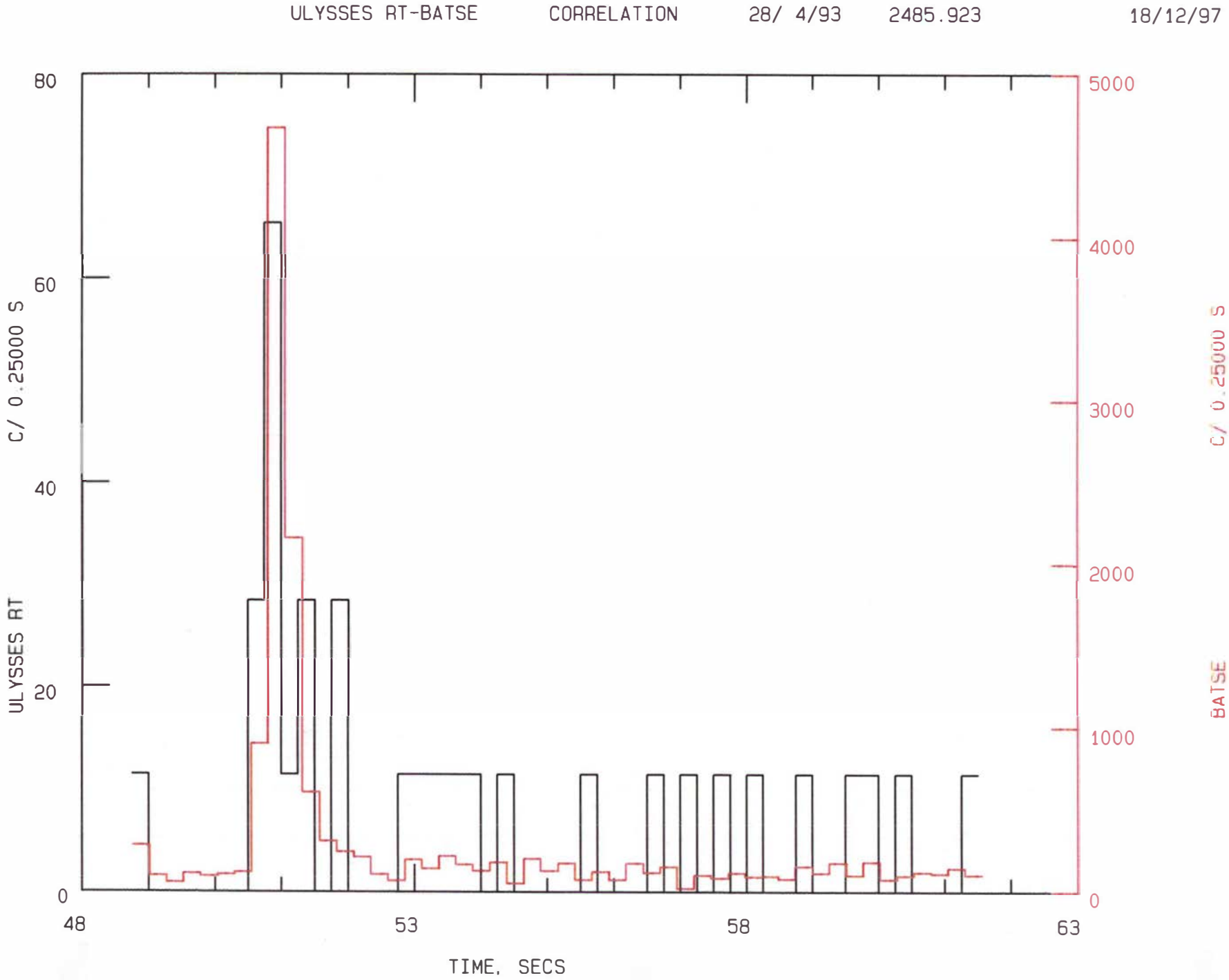
☑ ACCESS database updated?

EVENT OF APR 28, 1993 0:41

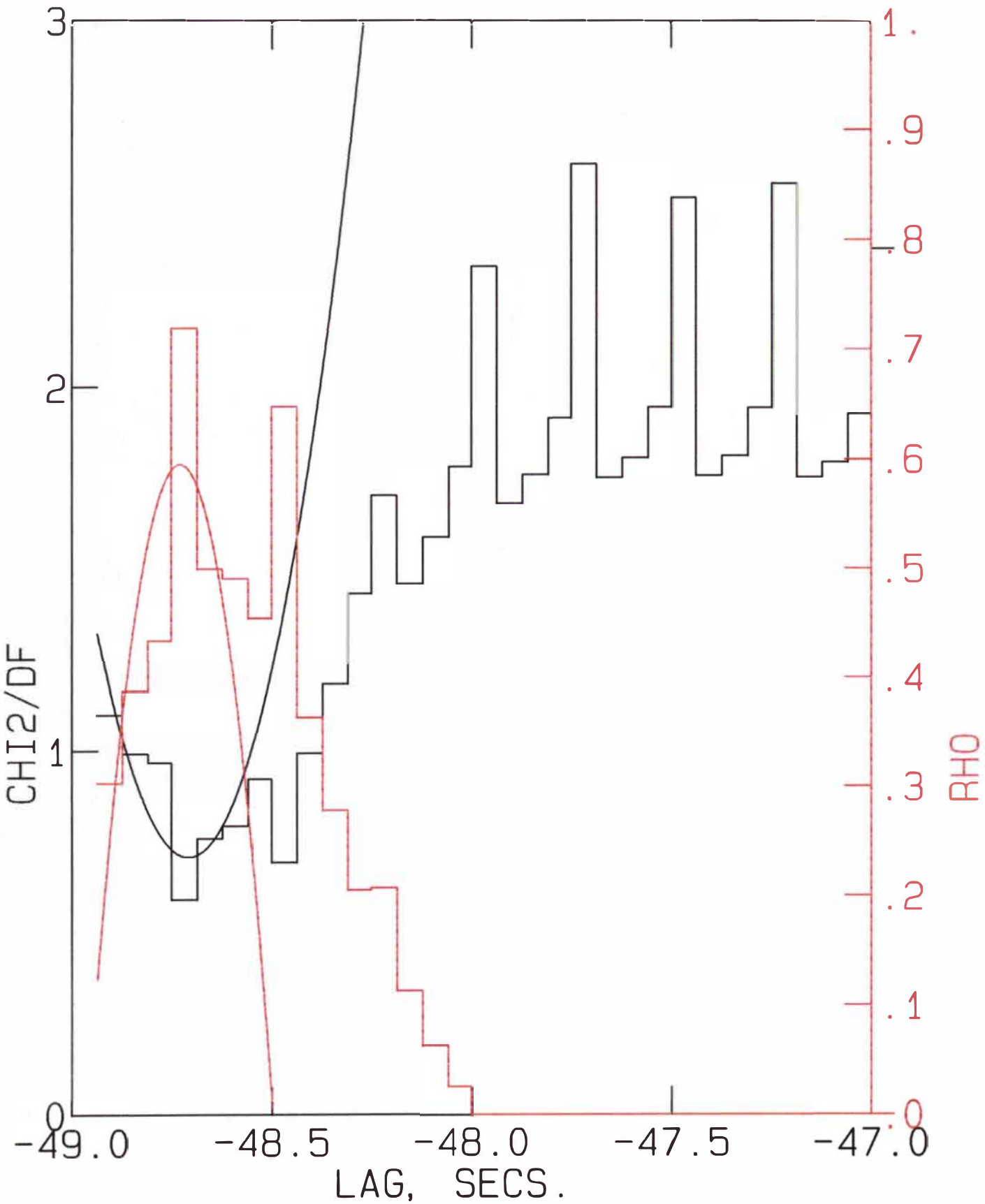
18/12/97

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE




ULYSSES RT-BATSE CORRELATION 28/ 4/93 2485.923 18/12/97
80
60
40
20
0
C/ 0.25000 S
ULYSSES RT
5000
4000
3000
2000
1000
0
C/ 0.25000 S
BATSE
48
53
58
63
TIME, SECS

ULYSSES RT-BATSE CORRELATION 28/ 4/93 2485.923



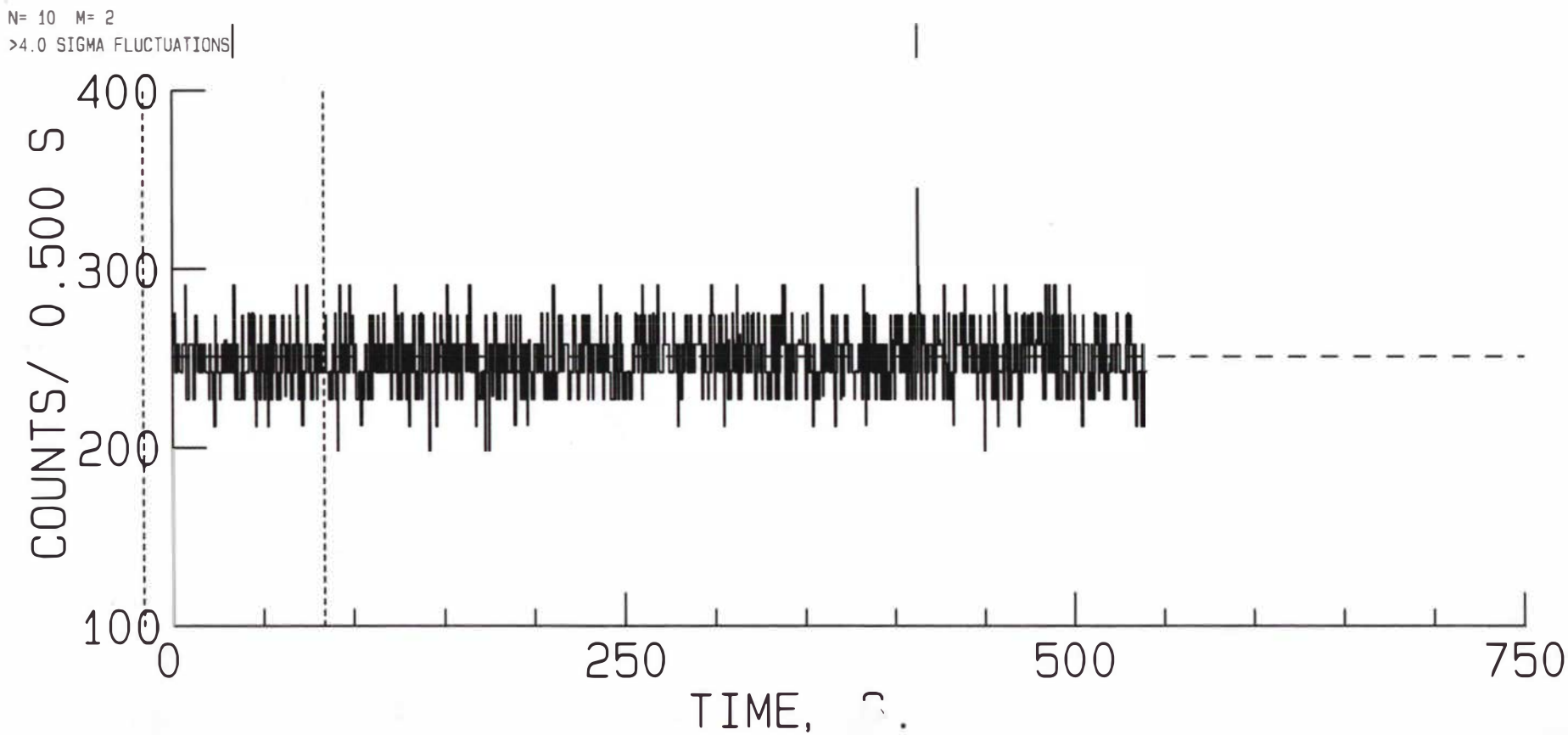
ULYSSES RT

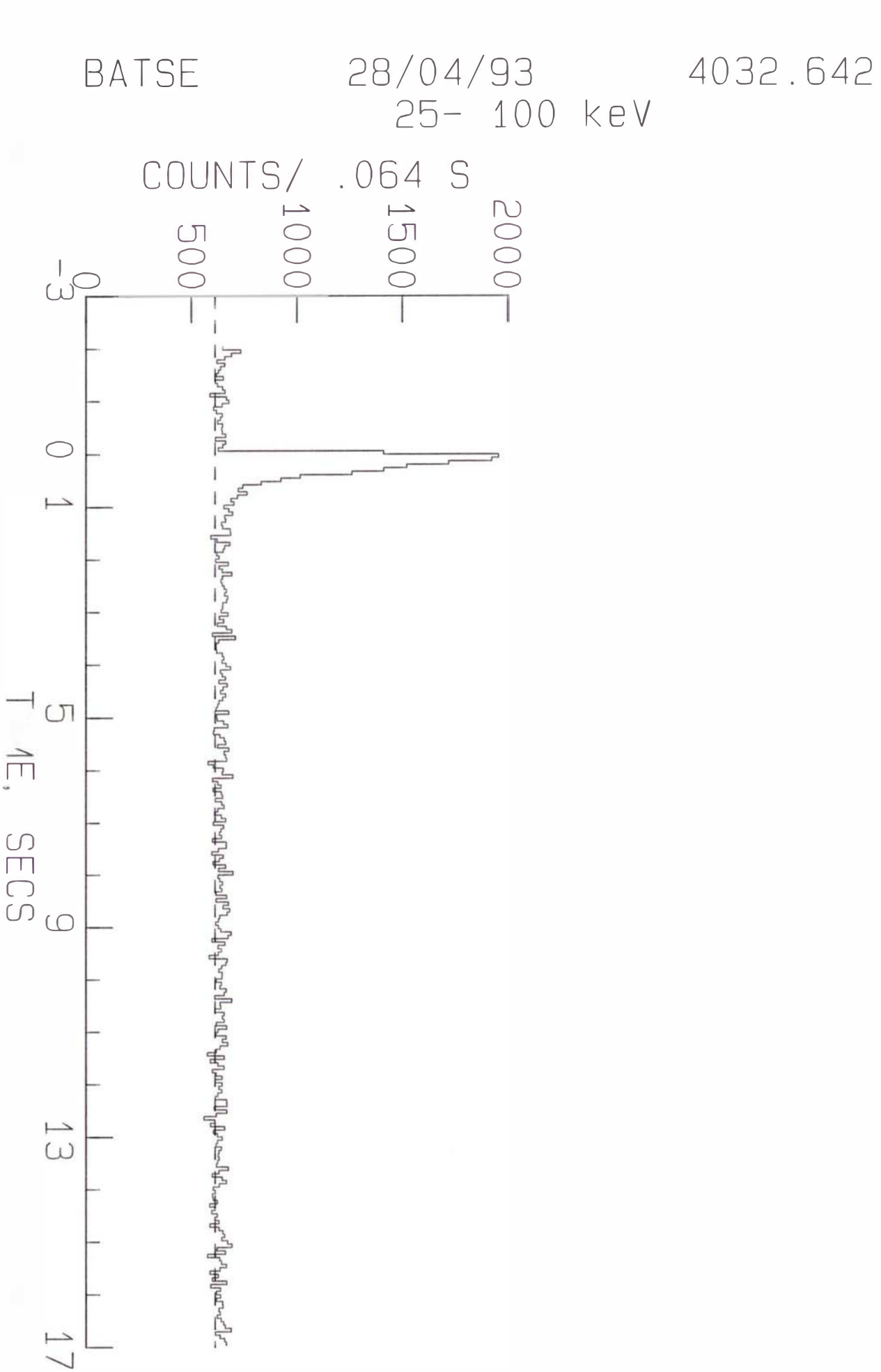
18/12/97

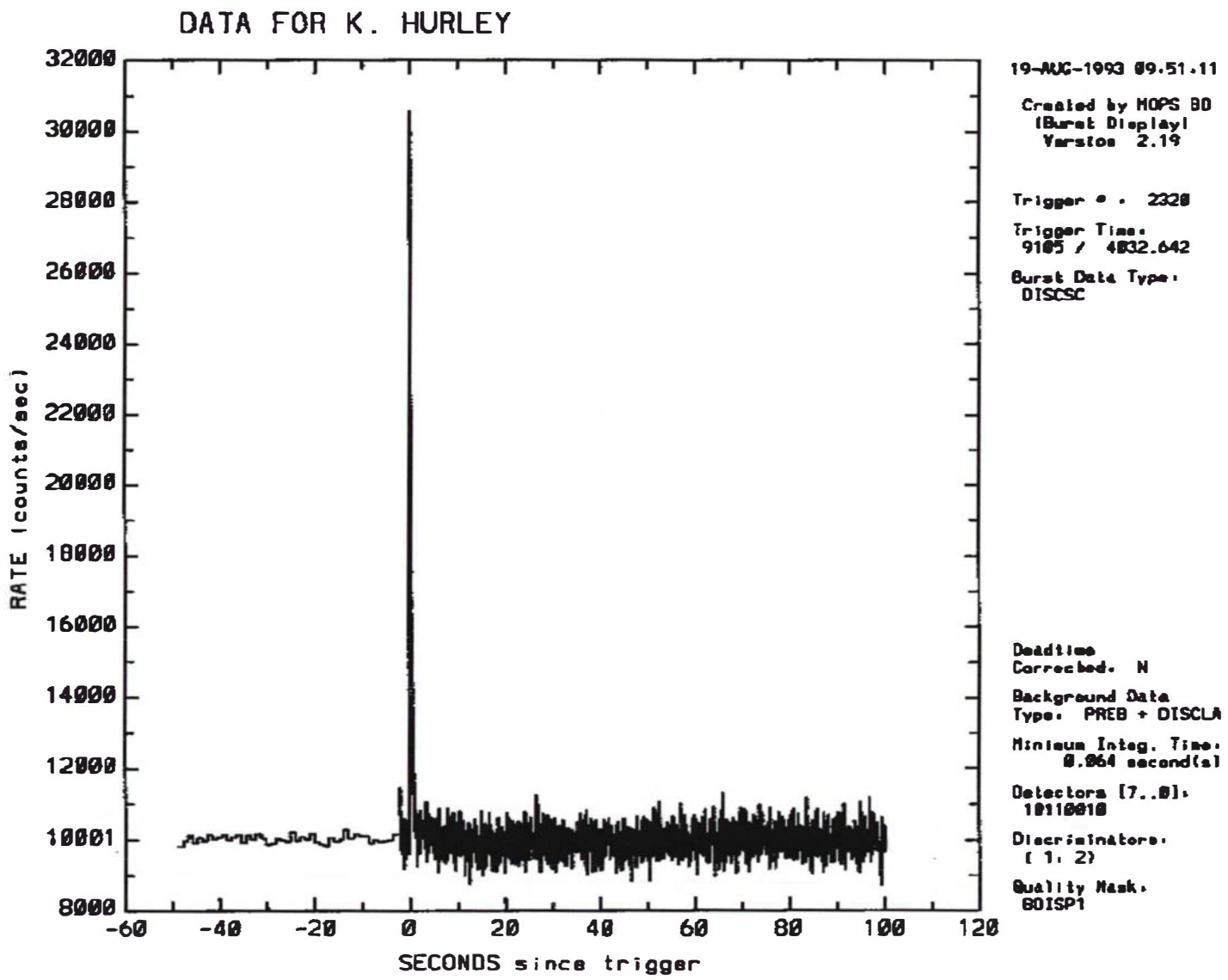
28/ 4/93 2124.092 s

0.250 S INTERVALS REGROUPED BY 2

21- 146 keV




BATSE 28/04/93 4032.642
25- 100 keV
COUNTS/ .064 S
500
1000
1500
2000
-3
0
1
5
9
13
17
T, SECS


DATA FOR K. HURLEY
RATE (counts/sec)
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
10001
8000
-60
-40
-20
0
20
40
60
80
100
120
SECONDS since trigger
19-AUG-1993 09.51.11
Created by HOPS BD
(Burst Display)
Version 2.19
Trigger # : 2328
Trigger Time:
9105 / 4832.642
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
10110010
Discriminators:
(1, 2)
Quality Mask:
GOISP1

From root Thu Mar 10 14:22 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
          id AA05865; Thu, 10 Mar 94 14:22:44
Received: from SSTDP2.LANL.GOV by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
        id AA23477; Thu, 10 Mar 1994 13:30:14 +0800
Date: Thu, 10 Mar 1994 14:30:44 -0700 (MST)
From: 046369@SSTDP2.LANL.GOV
To: khurley@space6.ssl.berkeley.edu
Message-Id: <940310143044.25e02930@SSTDP2.LANL.GOV>
Subject: dmsp observations
Content-Length: 2472
Status: R

FROM: SMTP%"JTERRELL.LANL.GOV" (JAMES TERRELL) 3/10/04
TO: SMTP%"KHURLEY@SPACE6.SSL.BERKELEY.EDU"
SUBJ: DMSP OBSERVATIONS

Kevin:
Here are more additions, questions, or corrections for your GRB list of 930217.
Some of the errors for DMSP data seem to be the matter of interpreting
"NA" as used by me. It means, unless otherwise specified, no peak
apparent in the 20-sec averaged data, but 2-sec data not obtained
and examined. Thus it is not an absolute NO (or N/O unless it is known
that the spacecraft view was obscured by the earth).
Thus NA means that any peak which might show up in full data is
pretty weak, anyway. In your list NA should be left blank, I believe.
We now have data processed through 930128! Thus we will be needing
more events to look for in the DMSP data.--Jim

DATE	UT	DMSP
910208	32238U	DMSP8YES AT 32415.7, 9YES AT 32415.5, 10SAA
910421	33245	DMSP NA (NOT NO) (I.E., SHOULD BE BLANK IN YOUR LIST)
910627	16159	DMSP NA (NOT NO)
910717	16386	DMSP N/O (NOT NO)
911118	68260	DMSP N/O (NO DATA)
920110	33478	DMSP NA (NOT NO)
920229	69677	DMSP NA (NOT N/O)
920404	47506	DMSP NA (NOT N/O)
920414	84166	DMSP NA (NOT N/O) (GRO GRB AT 84163!)
920714	47069	DMSP NA (NOT NO)
920718	77563	DMSP NA (NOT N/O)
920727	43145U	(ULYSSES TIME) BATSE YES AT ? (DMSP NA)
921022	55259	DMSP NA (NOT N/O)
921209	41738	DMSP NA (NOT N/O)
930106	56259	WHY LISTED TWICE (56260)?
930106	56260	DMSP10YES AT 55260.4 (8SAA,11SR)
930309	11269	DMSP NA (NOT NO)
930318	44993U	DMSP NA (BATSE YES! ULYSSES TIME?)
930329	11365	DMSP NA (NOT N/O)
930406	26185	DMSP NA (NOT N/O)
930428	4032	DMSP NA (NOT N/O)
930506	65631	DMSP NA (NOT NO)
930511	892U	(ULYSSES TIME) DMSP NO
930825	31643U	DMSP8YES AT 33477.4(100/S),11YES AT 33477.0(500/S), 10SR
930922	12830U	DMSP NA (NOT NO)
930922	23086U	(BATSE YES AT ?) DMSP10YES AT 23088.1(270/S),8?,11YES AT 22085.1
930925	73995U	DMSP NA (NOT NO)
930929	31751	(CORRECTED ULYSSES TIME) DMSP NO
931006	18161	(CORRECTED ULYSSES TIME) TO 931111 34178, NUMEROUS: DMSP NA
931006	69587U	DMSP NA (NOT NO)
931006	77510U	(ULYSSES TIME?)(BATSE YES AT ?) DMSP NA (NOT NO)
931031	14795	DMSP11YES AT 14796.8,14810.8 (8SAA,10SAA)
931103	59142	DMSP10YES AT 59152.4,158.4,11YES AT 59151.0,155.0 (8SR)
931131	60360	IS THIS DATE FOR SURE? (DMSP NA, 93/11/30)
931204	35290	DMSP8YES AT 35301.3,10NO AT 156DEG, 11NR
931217	65953U	10YES AT 64188.0,192.0,232.0, 11NO AT 64188 (8SR AT 64188)

920622	25504	8SA 10NR 11SA
920627	46956	NA
920711	53140	YES--58157
920718	77563	8NA 10SA 11NA
920720	11524	8NA/OBSC 10NA/OBSC 11SR
920824	39183	YES--39186
920902	1736	YES--1743
921009	24070	YES--24073
921022	55259	8ND 10NA 11NA
921123	22711	YES--22727
921123	46583	YES--46542
921207	57647	YES--57649
921209	41738	8NR 10NA 11NR
930106	56259	YES--56260
930110	6698	8NA 10NR 11NA
930120	84700	YES--84779
930131	68231	YES--68231
930201	60115	YES--60129
930309	11269	NA
930329	11365	8NA 10SR 11NA
930405	32089	YES--32105
930406	26185	8NA 10NR 11NA
930428	04032	8NA 10NA 11SR
930506	53571	YES--53578
930506	65631	NA

From root Thu Feb 3 13:55 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA00852; Thu, 3 Feb 94 13:55:12
Received: from SSTDP2.LANL.GOV by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
id AA13978; Thu, 3 Feb 1994 12:59:12 +0800
Date: Thu, 3 Feb 1994 14:00:37 -0700 (MST)
From: 046369@SSTDP2.LANL.GOV
To: KHURLEY@space6.ssl.berkeley.edu
Message-Id: <940203140037.23c05074@SSTDP2.LANL.GOV>
Subject: DMSP OBSERVATIONS OF GRO GRB
Content-Length: 2739
Status: R

FROM: SMTP%"TERRELL@ESSDP2.LANL.GOV" (ESSDP2::TERRELL) (JAMES TERRELL 94/02/03)
TO: SSL::KOUVELIOTOU AND GIBSON::COLE (CHRYSSA KOUVELIOTOU AND STAYCE COLE)
CC: SMTP%"KHURLEY@SPACE6.SSL.BERKELEY.EDU" (KEVIN HURLEY)
SUBJ: DMSP OBSERVATIONS OF GRO GRB

Chryssa and Stayce:
Thanks very much for the listing of strong Batse bursts sent to me 11/1/93.
I have now managed to check all of them against DMSP data, and find that
many of them were also detected by DMSP8,9,10, or 11. Probably the higher percent
of detections in recent data is due to more extraction of full data. In many
cases such added effort would not be necessary if source direction
(and consequent obscuration of some DMSP satellites) were known to me.
I would appreciate data on more strong events. Here is the present list:

NOTES:
NA: Not apparent in 20-second averaged data (extracting the 2-sec data is
a more time-consuming task, not undertaken in every case).
NA?: Some slight indication of a peak in 20-second averaged data.
SA: South Atlantic Anomaly, obscuring data with high background rates.
SR: South Radiation Belt background.
NR: North Radiation Belt background.
ND: No data for this time.
YES: Burst definitely detected by one or more DMSP satellites (8,9,10,11).
NO: No evidence of a peak in 2-sec data. (NO/OBSC: Obscured by Earth)

DATE	UT	DMSP
910421	33245	8NO 9SR 10NR
910627	16159	8NA 9NR 10ND
910629	71750	8NA 9SR 10NA
910703	18225	8NA 9NA? 10SR
910717	16386	8NA 9SA 10SR
910718	76051	8NA 9SA 10SA
910802	2718	ND
910814	69275	ND
911024	76208	ND
911104	54283	YES--54286 PEAK
911109	12459	8NO 9NR 10NO
911118	68260	ND
911119	23343	YES--23342
911126	46129	8SR 9SR 10NO
911127	15730	YES--15739
911202	73731	YES--73733
911209	66959	8SR 9SR 10NR 11ND
920226	29730	8SA 9NA? 10SA 11SA
920229	69769	8SR 9ND 10NA 11NA
920311	8246	YES--8431
920315	15569	8NA 9NR 10NA 11NA
920325	62258	YES--62256
920404	47506	8NA 10NA? 11NR
920406	9855	8NO/OBSC 10SR 11SR/OBSC
920414	84163	NA
920517	11877	YES--11883
920525	12423	YES--12427

can be narrowed.

* 4 20 JAN 93 20 23:31:40 84700 2 BATSE #2138. GRS sensitivity was compromised by the abnormally long 60 s bins. Even so, a fairly convincing response is seen in two consecutive bins at about 23:35. It should be possible to refine the time using "centroiding". Unfortunately, MO was not very far away yet. A moderately significant hard-to-soft spectral evolution is seen.

5 22 JAN 93 22 12:21:18 44478 2 BATSE #2142. No GRS response was seen near the predicted time of 12:18:34.

* 6 27 JAN 93 27 16:14:25 58465 2 BATSE #2149. A weak GRS enhancement in band1 (120-240 keV) is seen in consecutive bins at the predicted time. Sensitivity was again compromised by 60 s binning, but this was a long event. I think the response is real (though perhaps useless for time-of-arrival).

7 10 MAR 93 69 07:19:20 26360 2 BATSE #2232. No GRS response near the predicted time. However, two crucial bins are missing, probably due to poor data quality. They cannot be recovered.

8 28 APR 93 118 01:07:12 4032 2 BATSE #2320. No GRS response near the predicted time.

9 31 MAY 93 151 15:53:38 57218 2 BATSE #2362. No GRS response near the predicted time.

10 6 JUN 93 157 07:18:48 26328 2 BATSE #2375. No GRS response near the predicted time.

*11 12 JUN 93 163 00:44:17 2657 2 BATSE #2387. Clear response in 1 or 2 bins at 00:43:37.

*12 12 JUN 93 163 08:53:57 32037 2 BATSE #2389. Clear response in one bin at 09:07:48.

13 14 JUN 93 165 03:40:30 13230 2 BATSE #2393. No response near the predicted time. This is surprising, because the event was intense and the spacecraft apparently was not blocking the detector.

14 14 JUN 93 165 16:34:37 59677 2 BATSE #2394. No response near the predicted time, although there was a data gap that ended at 16:39:34. This was a weak event that probably should not have been seen by GRS.

*15 28 JUN 93 179 03:20:36 12036 1 Ulysses only. Definite response at 03:35:09.0. Note that the fractional second on the printout is incorrect.

16 6 JUL 93 187 05:13:30 18810 2 BATSE #2431. The one-and-only known triggered event. David Palmer has done some arrival time analysis. Have I sent you any data on this event? Do you want any? (Trigger data and mapping data are mutually exclusive.)

17 6 JUL 93 187 08:09:10 29350 2 BATSE #2432. No response near the predicted time.

18 8 JUL 93 189 05:12:38 18758 2 BATSE #2433. No response near the predicted time.

19 11 JUL 93 192 03:32:01 12721 2 BATSE #2441. No response near the predicted time.

20 14 JUL 93 195 16:12:53 58373 2 BATSE #2446. No response near the predicted time.

*21 20 JUL 93 201 14:35:09 52509 2 BATSE #2450. Definite response, probably in two bins, at about 14:49.

From root Wed Jan 26 09:21 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
          id AB01596; Wed, 26 Jan 94 09:21:57
Received: from lpl.arizona.edu (hindmost.LPL.Arizona.EDU) by sunspot.ssl.berkeley.edu (5.0/SM]
        id AA26699; Wed, 26 Jan 1994 08:26:17 +0800
Received: from peewee.lpl.arizona.edu by lpl.arizona.edu (4.1/hindmost-MX-1.4)
        id AA04397; Wed, 26 Jan 94 09:28:59 MST
Received: by peewee.lpl.arizona.edu (5.0/SMI-SVR4)
        id AA02684; Wed, 26 Jan 94 09:32:09 MST
Date: Wed, 26 Jan 94 09:32:09 MST
From: jlaros@peewee.lpl.arizona.edu (John Laros)
Message-Id: <9401261632.AA02684@peewee.lpl.arizona.edu>
To: khurley@sunspot.ssl.berkeley.edu
Subject: MO bursts
Content-Type: X-sun-attachment
Content-Length: 5685
Status: R

X-Sun-Data-Type: text
X-Sun-Data-Description: text
X-Sun-Data-Name: text
X-Sun-Charset: us-ascii
X-Sun-Content-Lines: 16

Kevin,

Here it comes: MO time history and ephemeris data on all 27 of the Ulysses events for which there was GRS coverage. It looks like about 10 bursts were actually detected by GRS. Please note that the time history files have a line at the end, labelled "Ensemble values", that was not in the sample I sent you. These are empirically determined means and sigmas for the data set. For reasons that have not yet been determined, the empirical sigmas are larger than the theoretical ones at the lower energies.

If there were any intense non-Ulysses bursts during the MO lifetime, such as WATCH events, would you please send me the information on them?

Thanks,

John

X-Sun-Data-Type: default
X-Sun-Data-Description: default
X-Sun-Data-Name: ulysses.lst
X-Sun-Charset: us-ascii
X-Sun-Content-Lines: 106

MO/GRS Burst Coverage of Ulysses Events

(* indicates probable GRS detection of the burst)

	DATE	DOY	TIME	T,SEC	NSAT (1=Ulysses, 2=GRO)	
1	4 OCT 92	278	13:38:27	49107	1	Ulysses/PVO/WATCH. MO was only 10 lt-sec away, and the sensitivity was seriously degraded by high background rates. If the WATCH time of 14:00:21 is accurate, then there is no GRS detection. However, there may be some GRS candidates within a few minutes of 14:00.
2	22 OCT 92	296	15:20:59	55259	2	BATSE #1997. There was no significant GRS response near 15:21. A leakage current glitch (a low bin followed by a high bin) is seen at 15:24.
3	13 DEC 92	348	14:56:42	53802	1	Ulysses only. There is no clear GRS response. This event merits further consideration only if the time window at MO

28/ 3/94

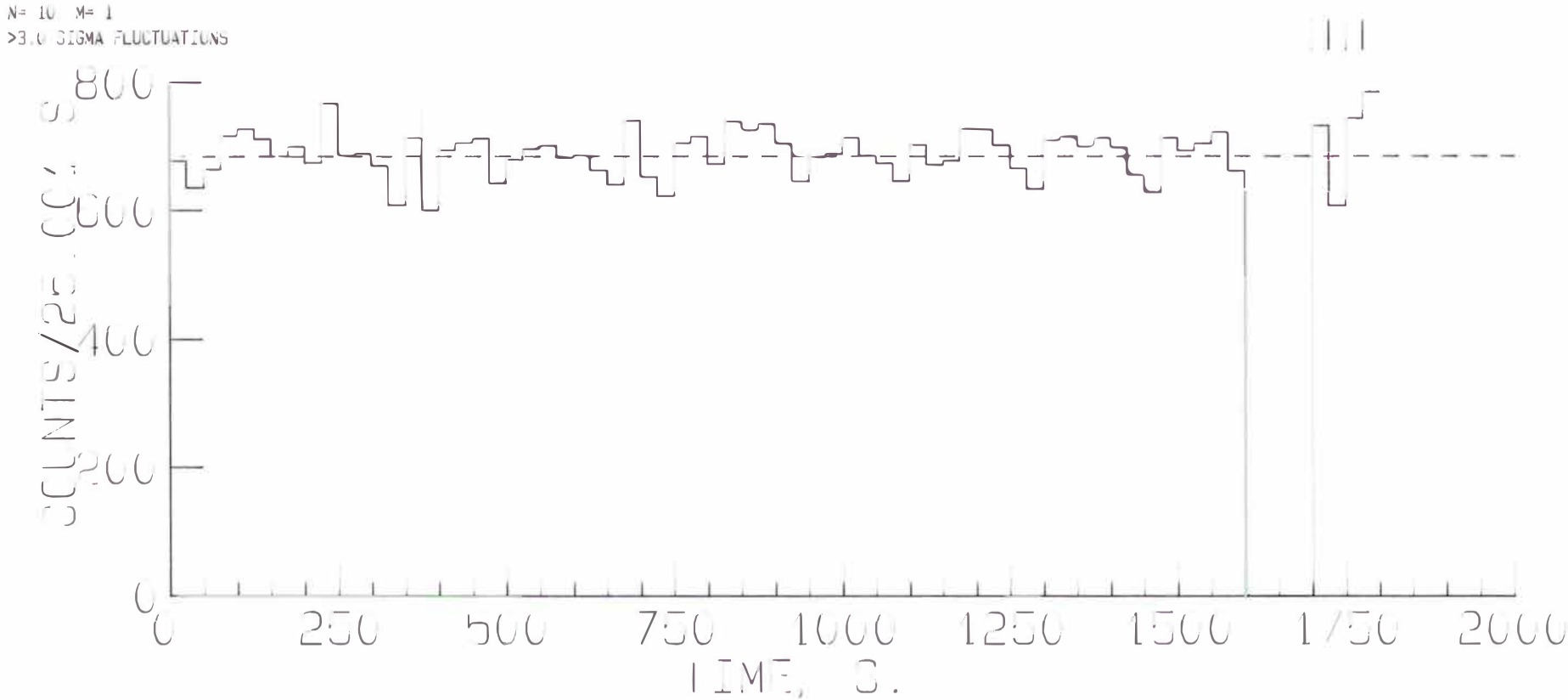
MU-HT

28/ 1/33

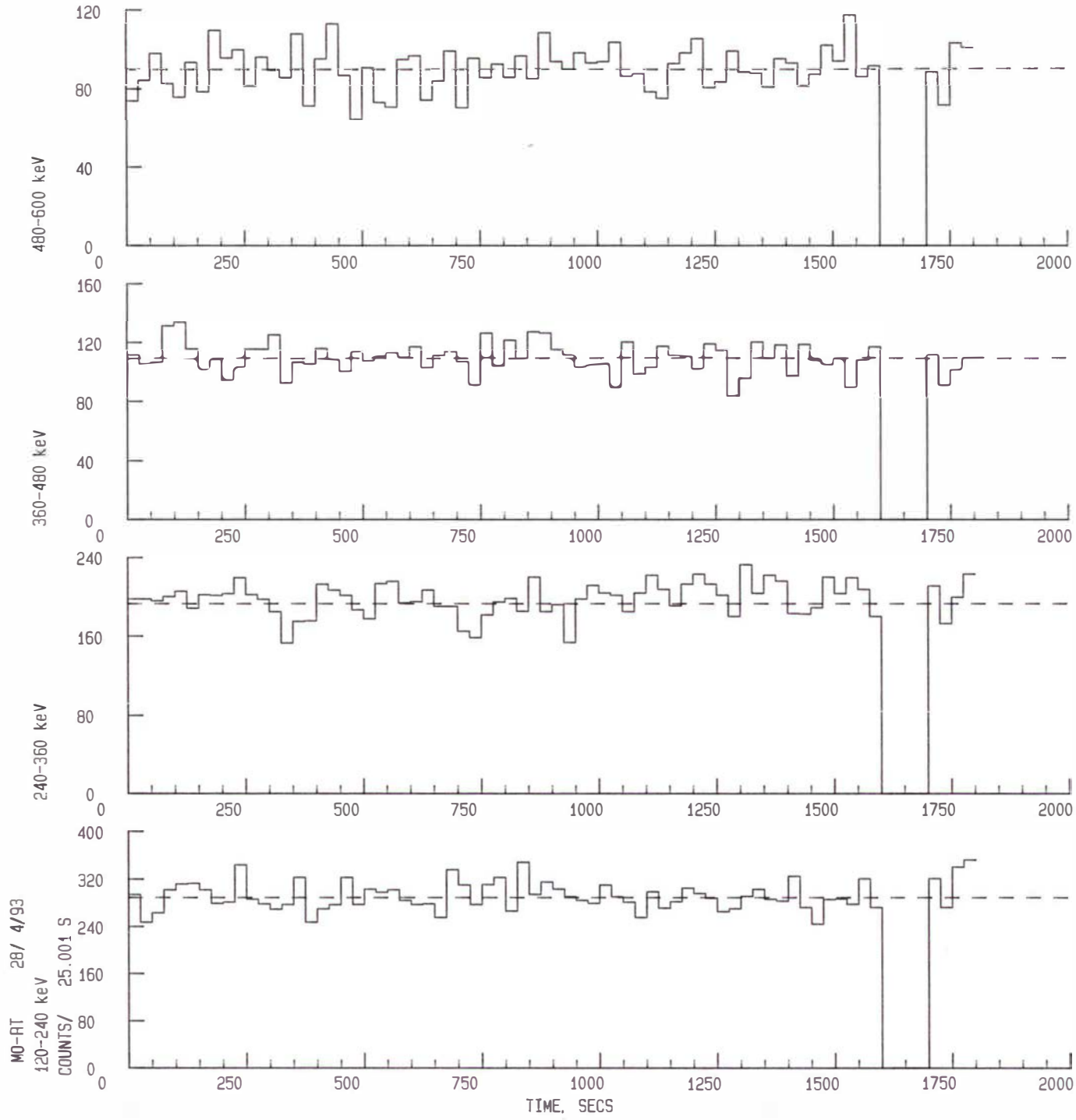
2898.691 s.

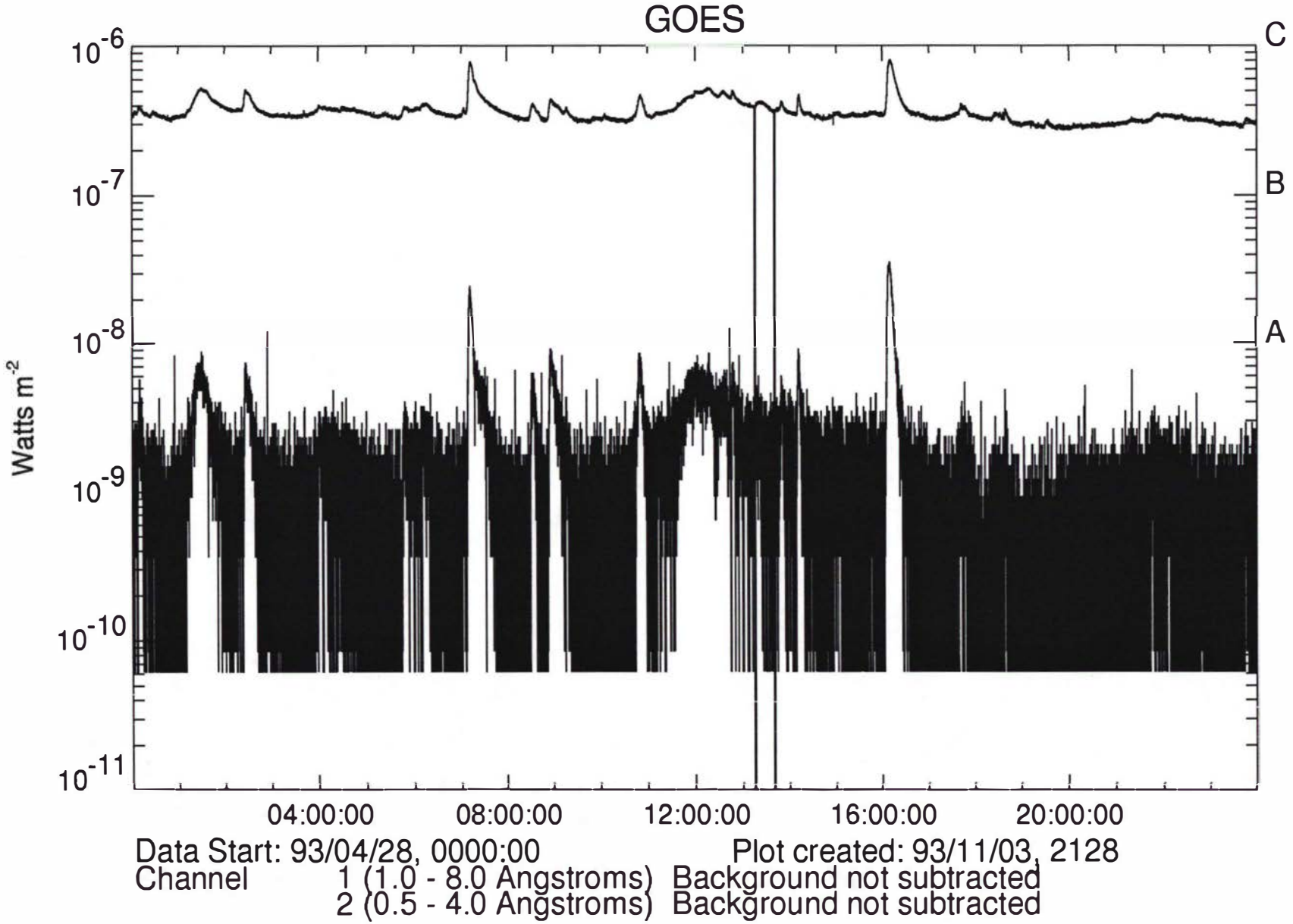
25.001 S. INTERVALS REGROUPED BY 1

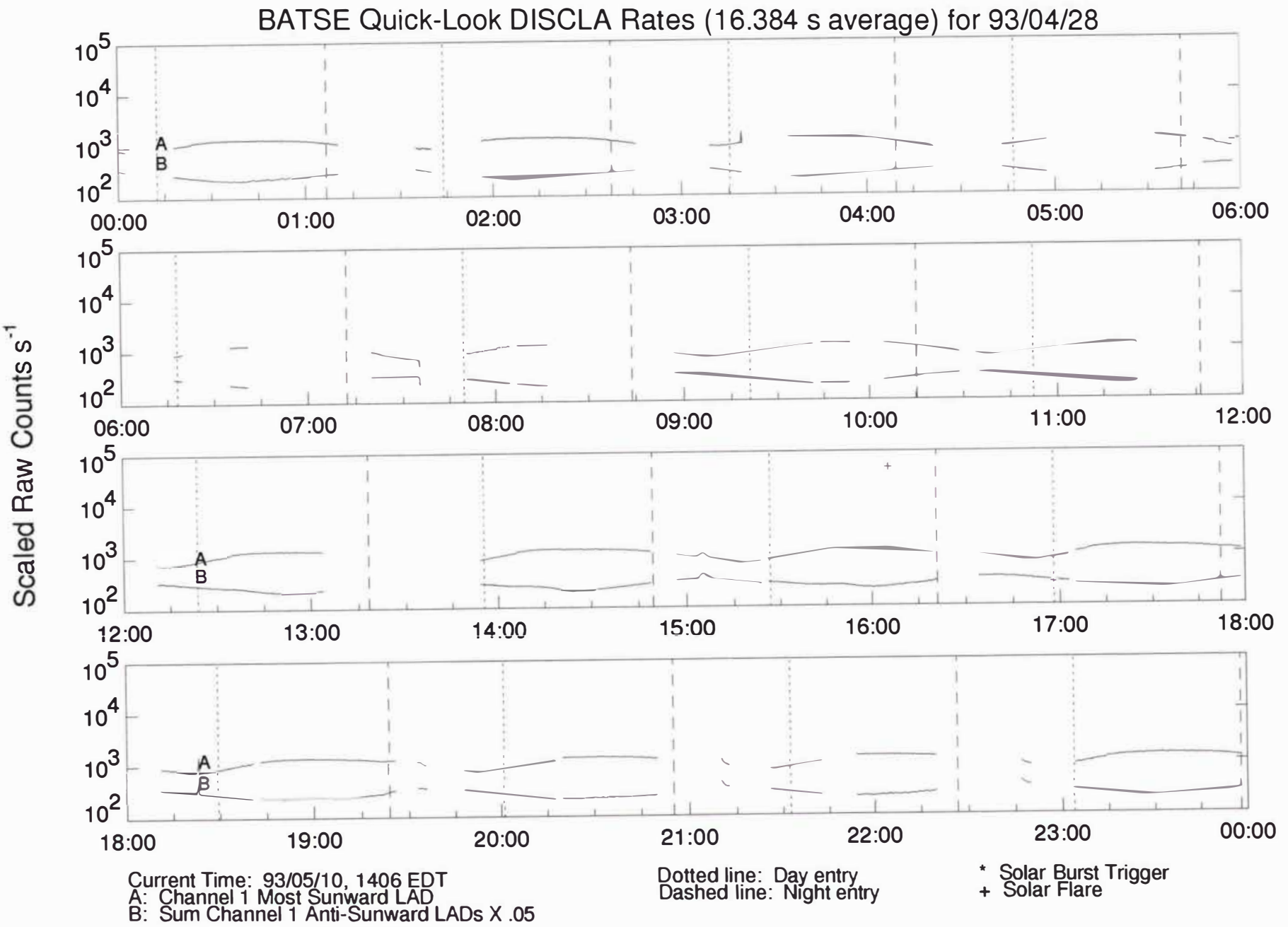
120- 600 keV



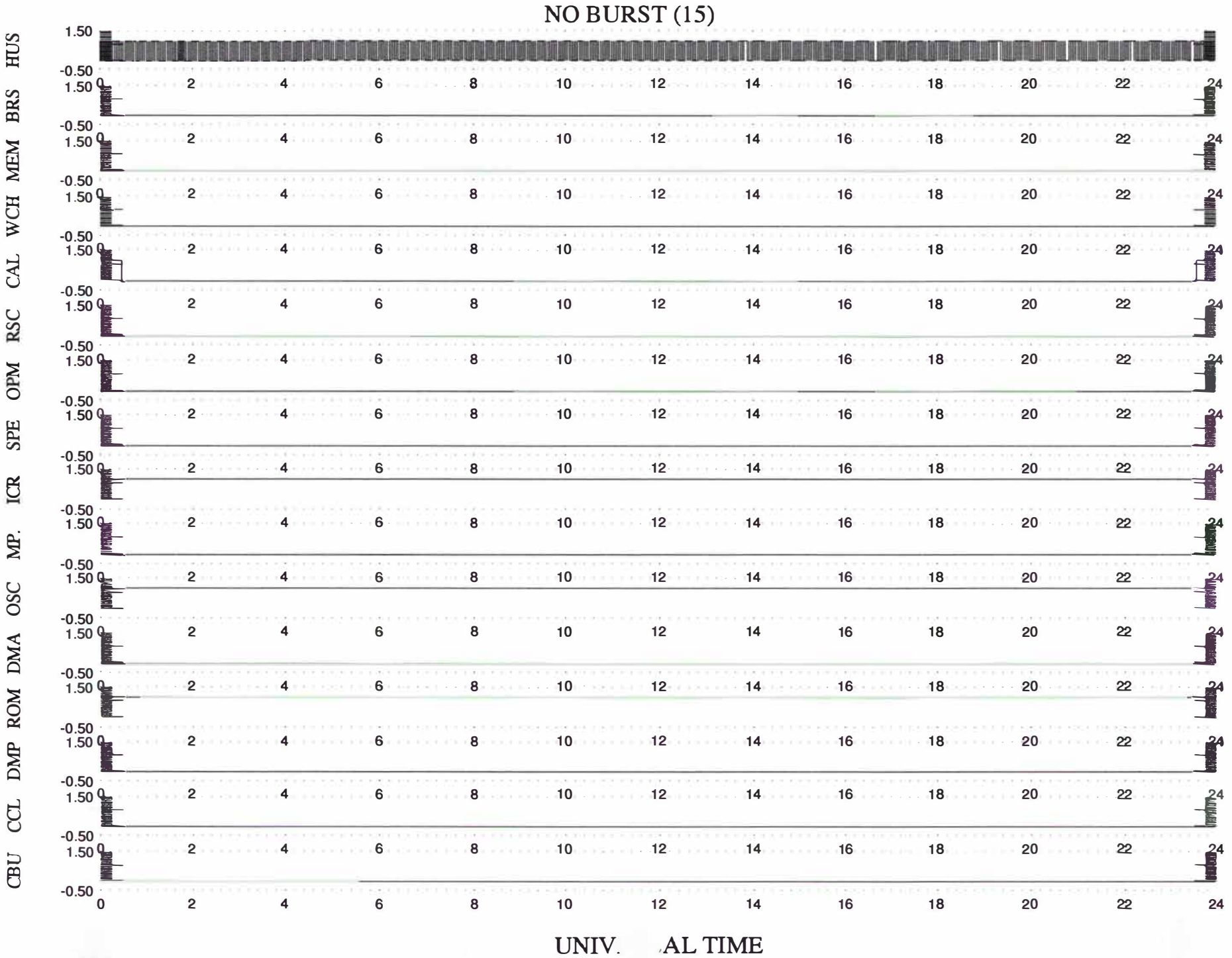
28/ 3/94


480-600 keV
360-480 keV
240-360 keV
120-240 keV
MO-AT 28/ 4/93
COUNTS/ 25.001 S
TIME, SECS


GOES
C
B
A
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/28, 0000:00
Plot created: 93/11/03, 2128
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

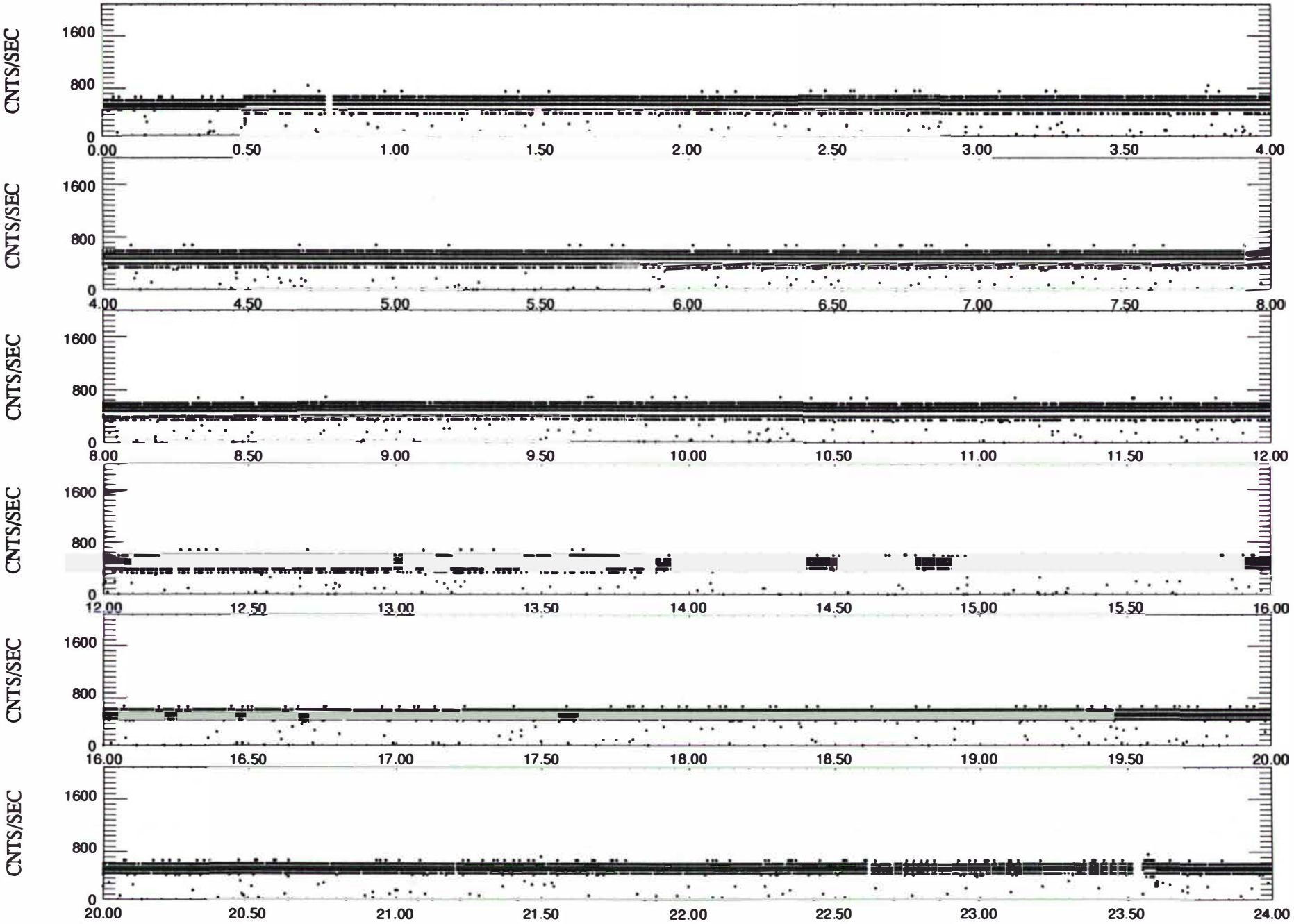

BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/28
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/05/10, 1406 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

HUS MODES EDR day 118, year 1993 to day 118, year 1993 6/12/93



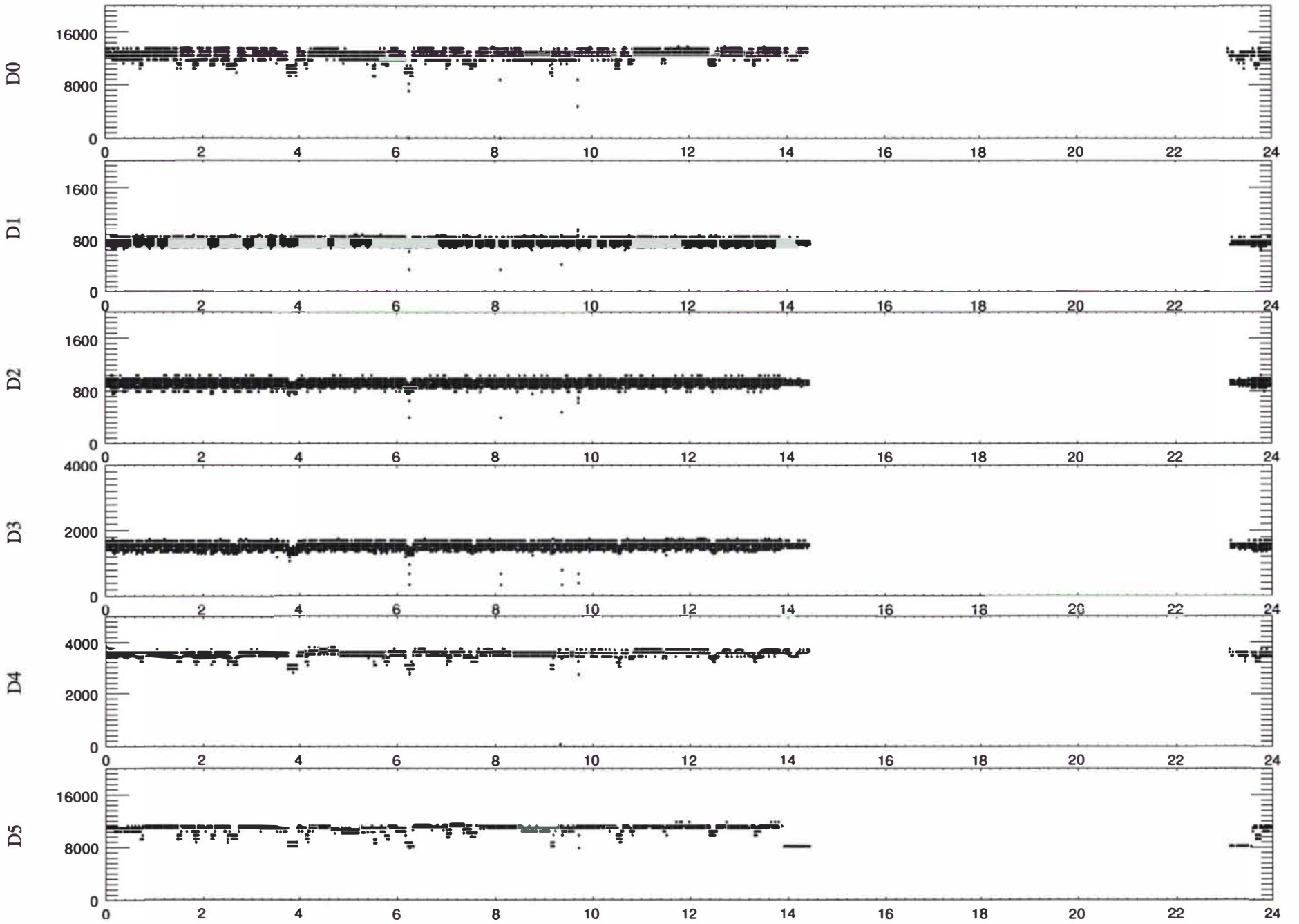
HUS 2A, MODE 1, NOT AVERAGED EDR day 118, year 1993 to day 118, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIV SAL TIME

HUS 2B COUNTS / SEC QEDR day 118, year 1993 to day 118, year 1993 4/30/93



Kommers

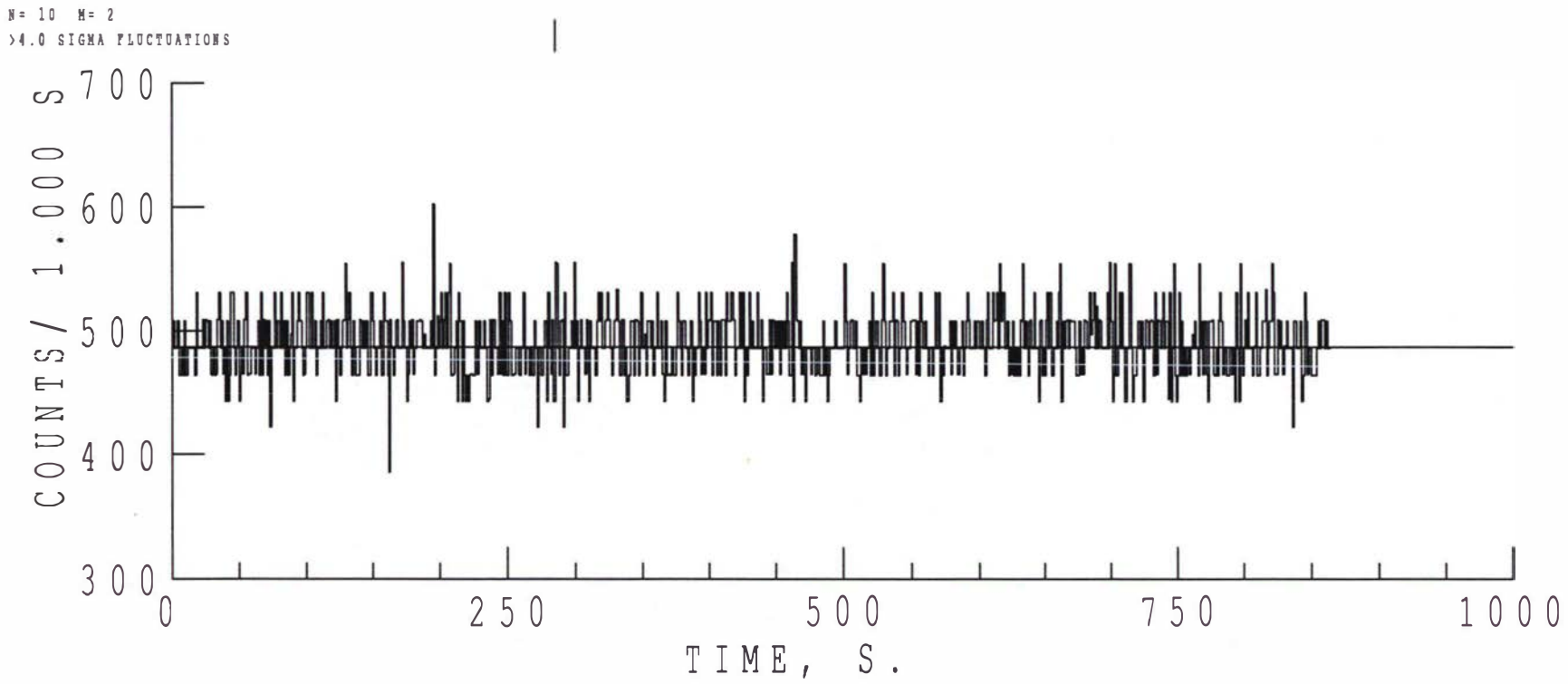
UNTRIGGERED

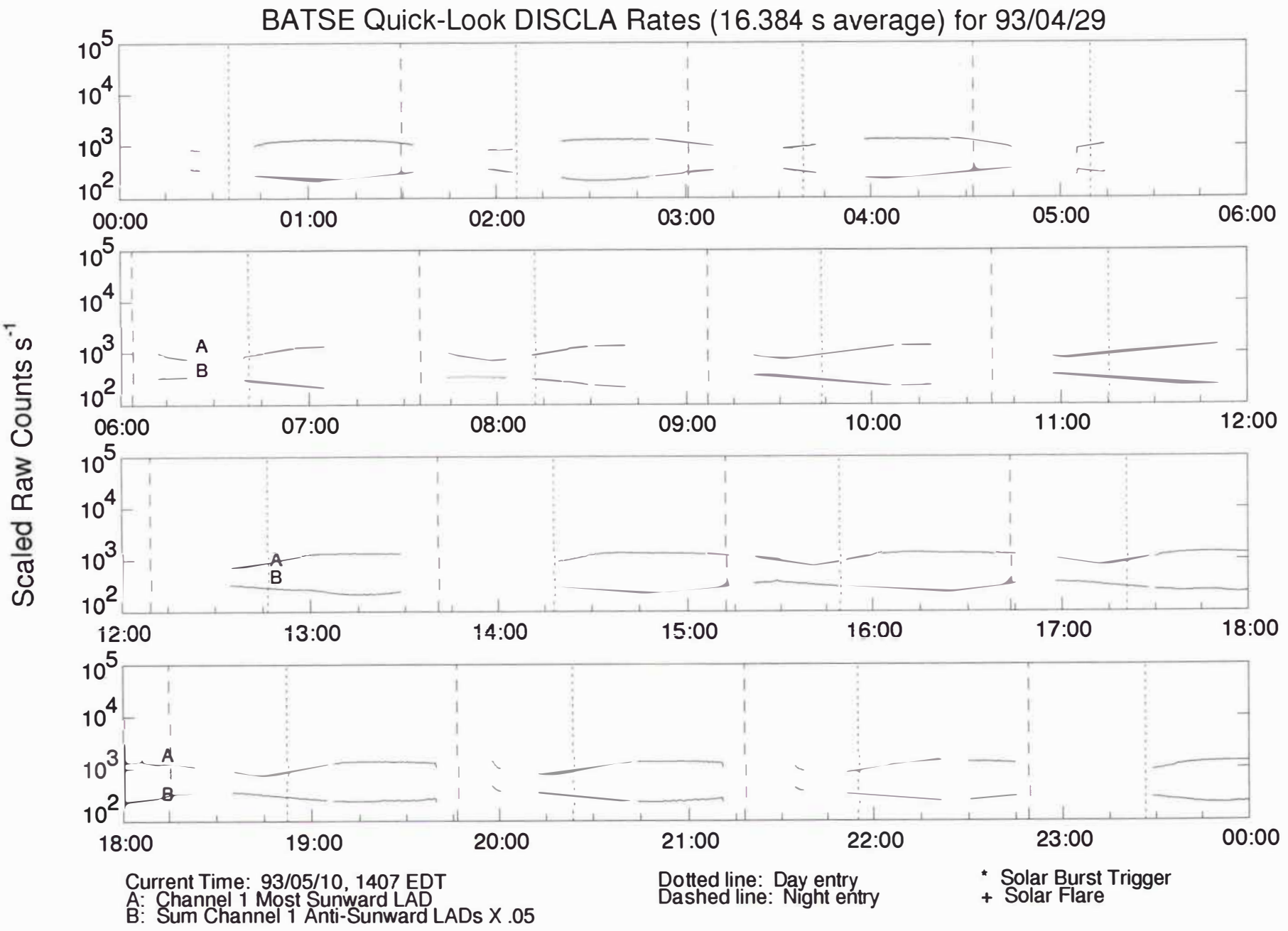
ULYSSES RT 21/ 5/97

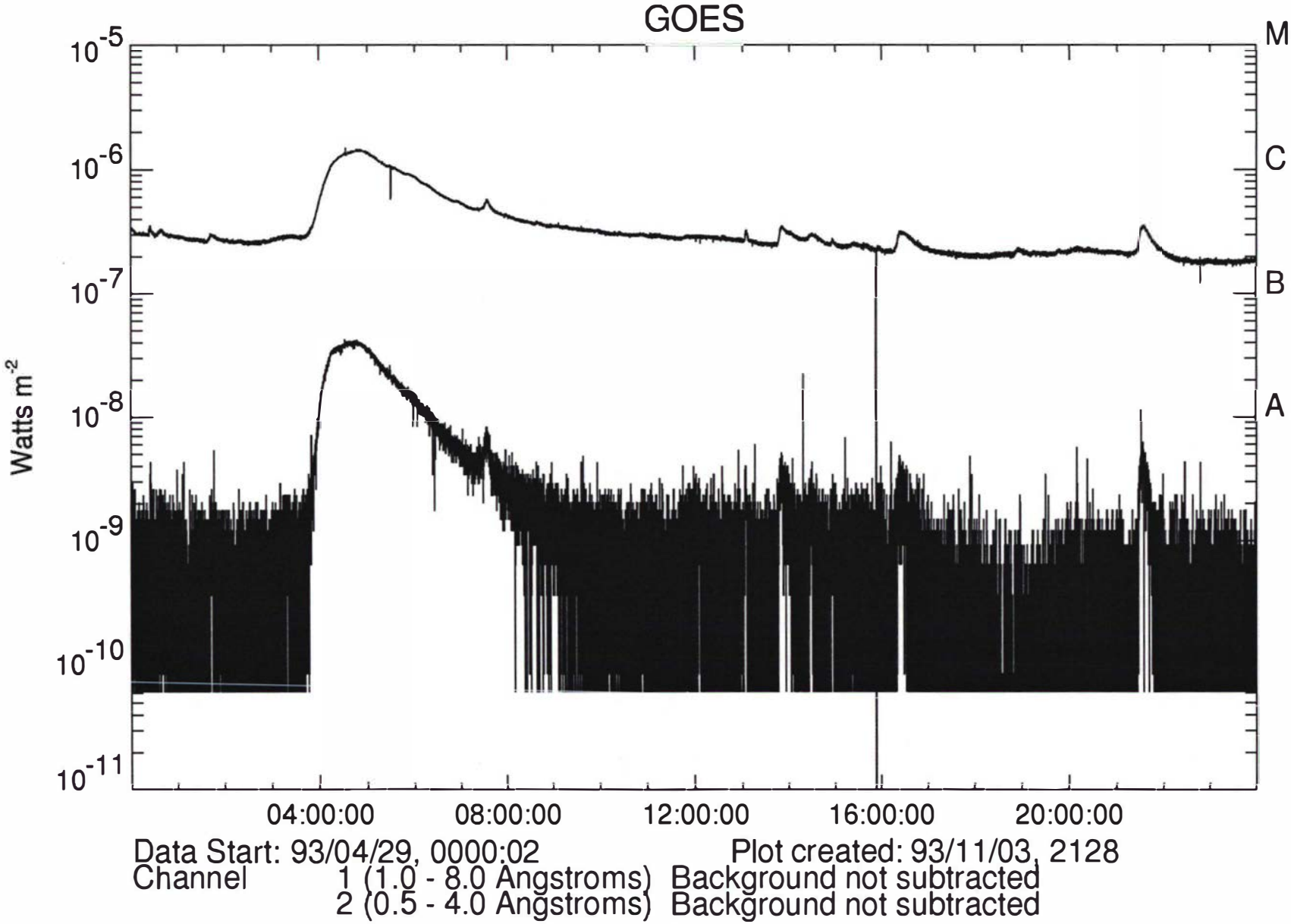
29/ 4/93 65052.402 s

0.500 S INTERVALS REGROUPED BY 2

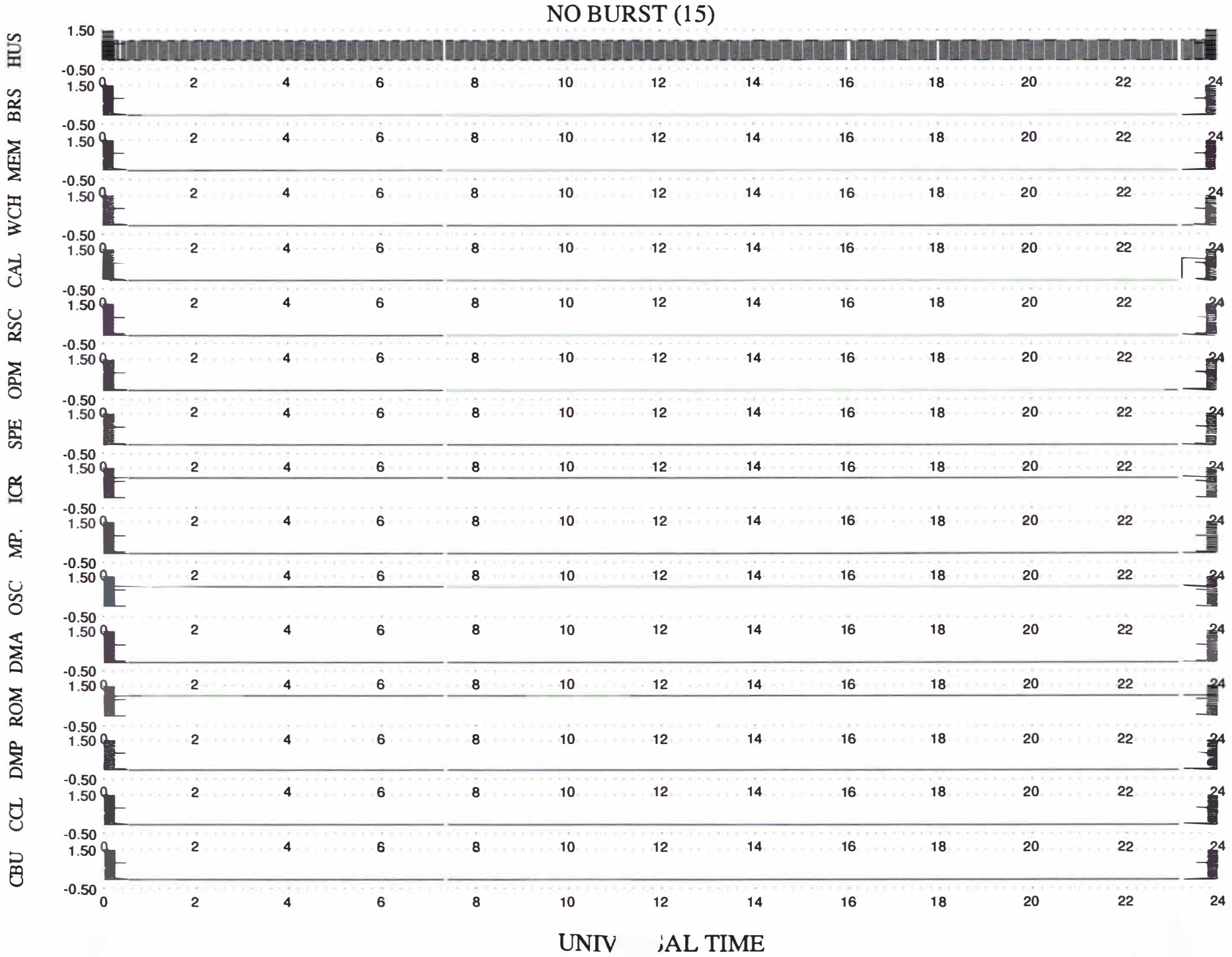
0- 0 keV




BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/29
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
A
B
Current Time: 93/05/10, 1407 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

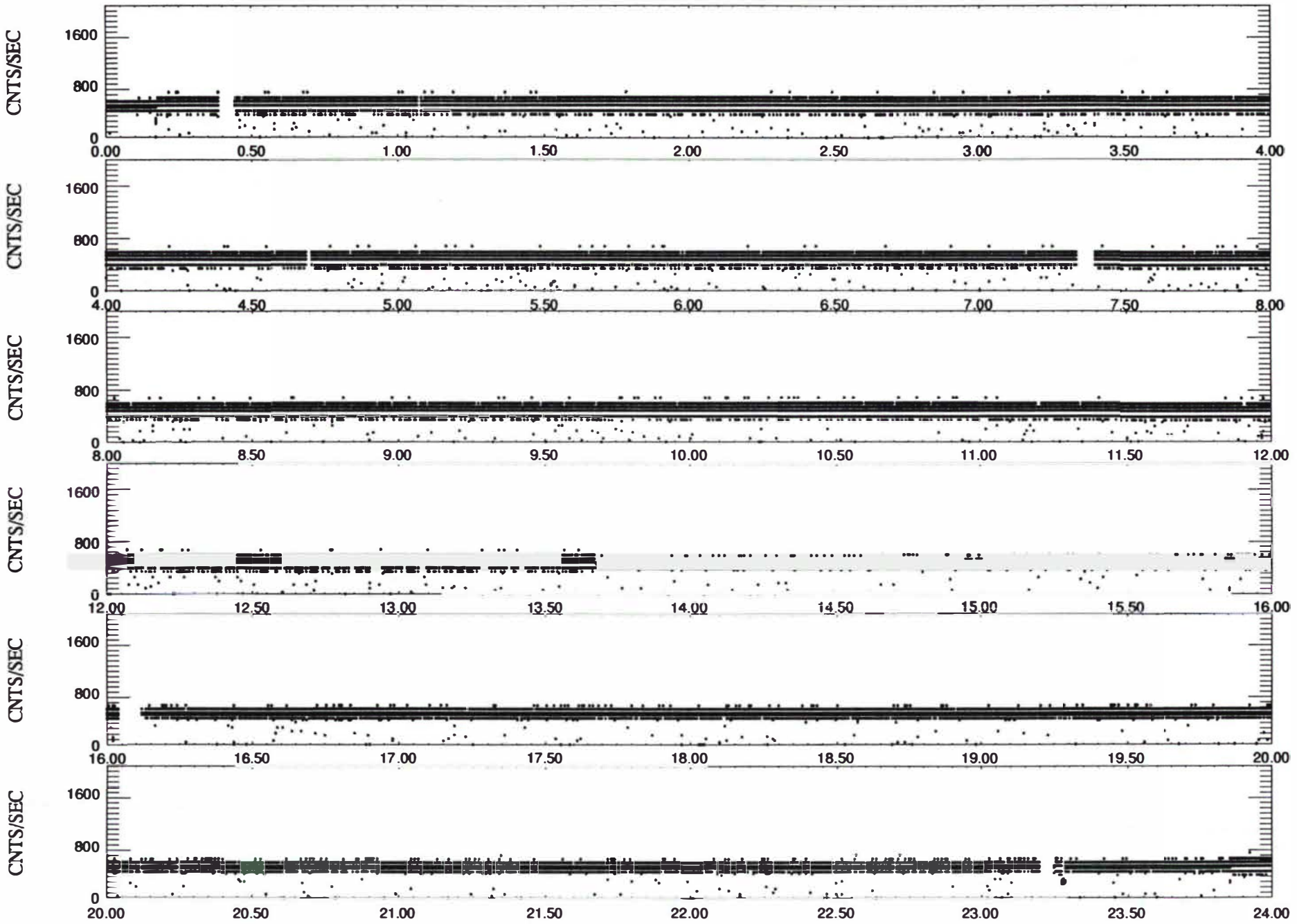

GOES
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
10-11
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/29, 0000:02
Plot created: 93/11/03, 2128
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS MODES EDR day 119, year 1993 to day 119, year 1993 6/12/93



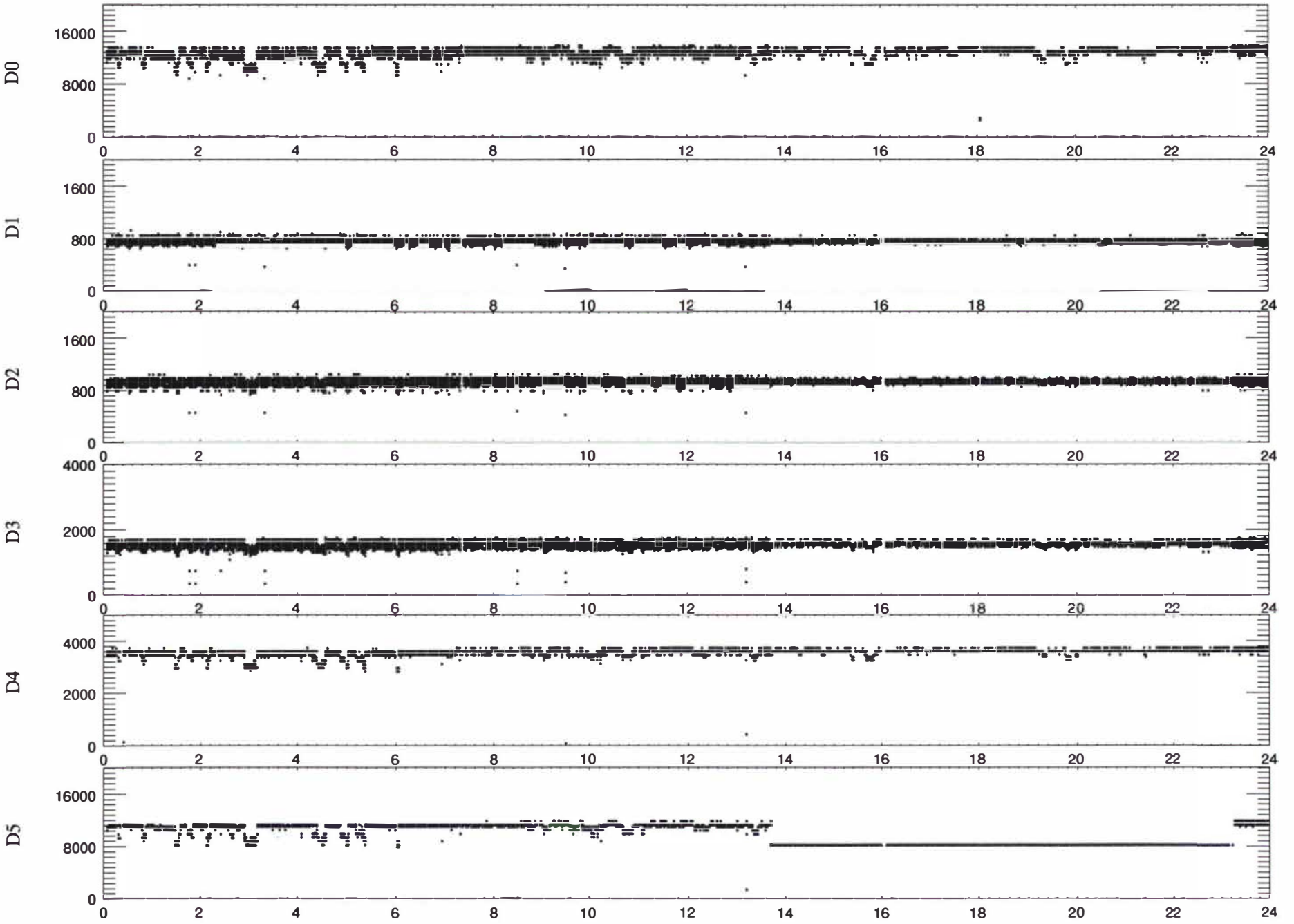
HUS 2A, MODE 1, NOT AVERAGED EDR day 119, year 1993 to day 119, year 1993 6/12/93

CALIBRATION DATA INCLUDED



UNIV SAL TIME

HUS 2B COUNTS / SEC QEDR day 119, year 1993 to day 119, year 1993 5/4/93



```
          ********************
          *BATSEARCH PROGRAM*
          ********************

BATSE BURST #     2321
EVENT OF 1993 APR 30 DAY OF YEAR=120
EVENT CROSSING TIME AT BATSE      : 54078. S. OR 15:01:18.0
COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 106.000    21.000
BATSE PEAK COUNTING RATE:  29000     C/S
EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
POSITION OF ULYSSES ON 30/ 4/  93 IS:
RA=  143.146 DEC=  -11.772 DIST=     4.353 AU
BATSE-ULYSSES DISTANCE =  651253680. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=130.95 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1423.74 SECS.
CROSSING TIME AT ULYSSES     IS 52654. S. OR   14:37:34 +/-  313.24 SECONDS
```



```
From SHARIFF@ssl.msfc.nasa.gov Mon May  3 09:58:20 1993
Date: Mon, 3 May 1993 11:58:12 -0500 (CDT)
From: SHARIFF@ssl.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu, "BATSE::KOUVELIOTOU"@ssl.msfc.nasa.gov
Cc: SHARIFF@ssl.msfc.nasa.gov
Subject: BATSE burst
Content-Length: 108

 BATSE #   Date     TJD     sec    Max ct/s   RA   Dec
   2321    930430    9107   54078    29000   106   +21
```

saved in mk/
batse.2321

RI

From SHARIFF@ssl.msfc.nasa.gov Mon May 3 09:42:59 1993
Date: Mon, 3 May 1993 11:38:42 -0500 (CDT)
From: SHARIFF@ssl.msfc.nasa.gov
To: jryan@unh.edu, GROBAD@ESTEC.BITNET, "LHEAVX::CLINE"@ssl.msfc.nasa.gov,
"LHEAVX::KWOK"@ssl.msfc.nasa.gov, "15733::SCHAEFER"@ssl.msfc.nasa.gov,
"CASS09::BAND"@ssl.msfc.nasa.gov, "CASS09::GRUBER"@ssl.msfc.nasa.gov,
"CASS09::MATTESON"@ssl.msfc.nasa.gov, PACIESAS@ssl.msfc.nasa.gov,
HORACK@ssl.msfc.nasa.gov, khurley@space6.ssl.berkeley.edu
Subject: Burst Trigger Message
Content-Length: 1215

BATSE BURST TRIGGER

NO.: 02321

TIME: TJD=9107 SECONDS=54078

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=065.5 AZIMUTH=062.1 ERROR= DEGREES

COMMENTS:
BURST. SINGLE PULSE WITH SUBSTRUCTURE. DUR ~15S. VISIBLE ABOVE 300KEV.

Helio corr removed

Date: Oct ~~28~~ 30 '97

BURST TRIANGULATION CHECKLIST

1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

☑ Were data checked by Joe Springer for 0.5 s errors?

☑ If a 2 spacecraft triangulation, was Ulysses time corrected for aberration?

☑ Is the order of the data in CORREL such that a vernier is done on the data with the best time resolution?

2. BATSE Data

☐ 2.042 s subtracted for bursts prior to June 25 1992 and DISCSC programs prior to Version 2.16 (August 28 1992)? N/A

☑ BATSE ephemeris for T_0?

☑ Error circle position and radius from public catalog used?

☐ If MER data were used, is a 30 ms systematic error included? N/A

3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

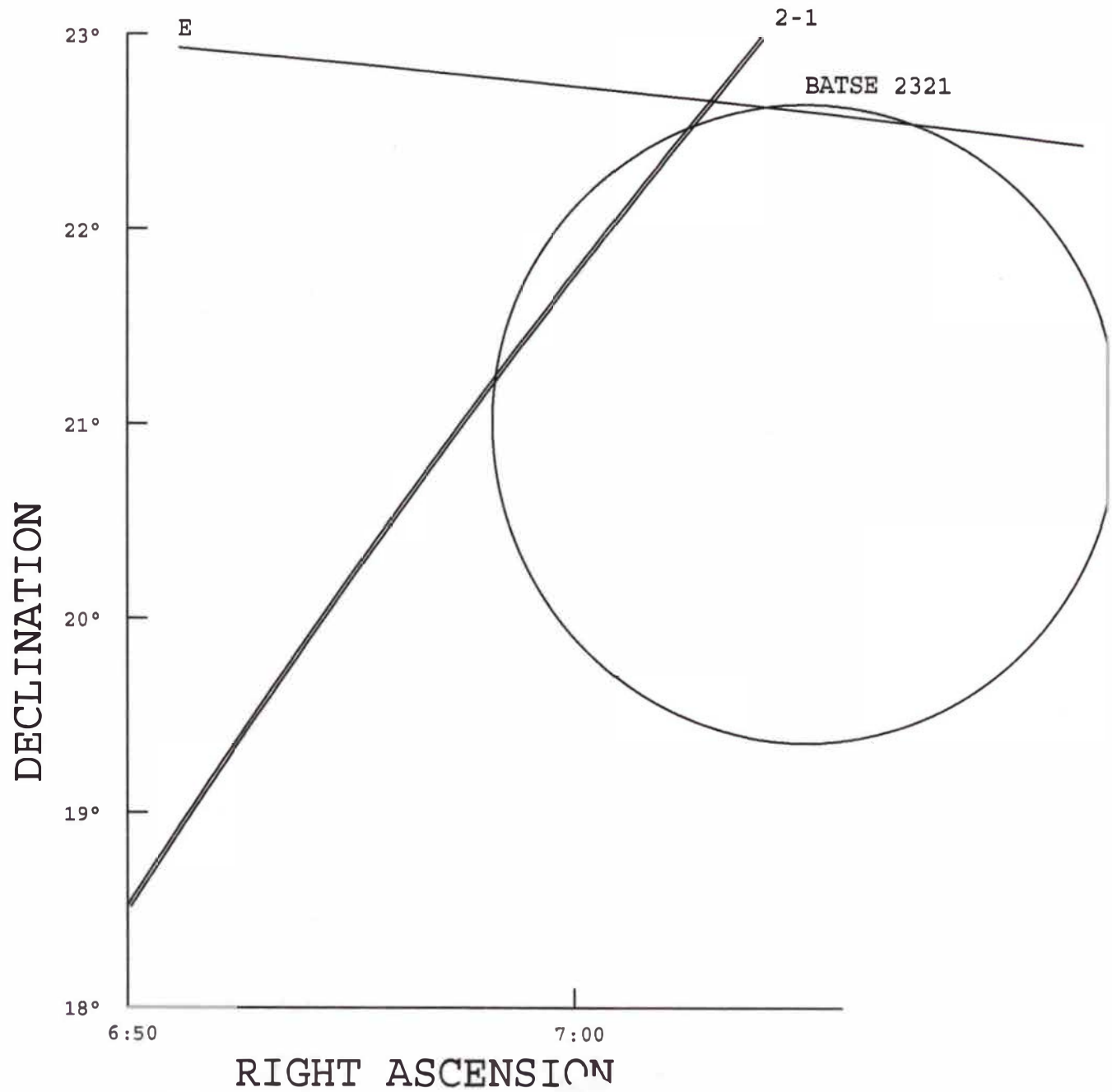
☐ 2000 coordinates used?

☐ Geocentric time used?

☑ ACCESS database updated?

EVENT OF APR 30, 1993 14:37

5/ 3/98

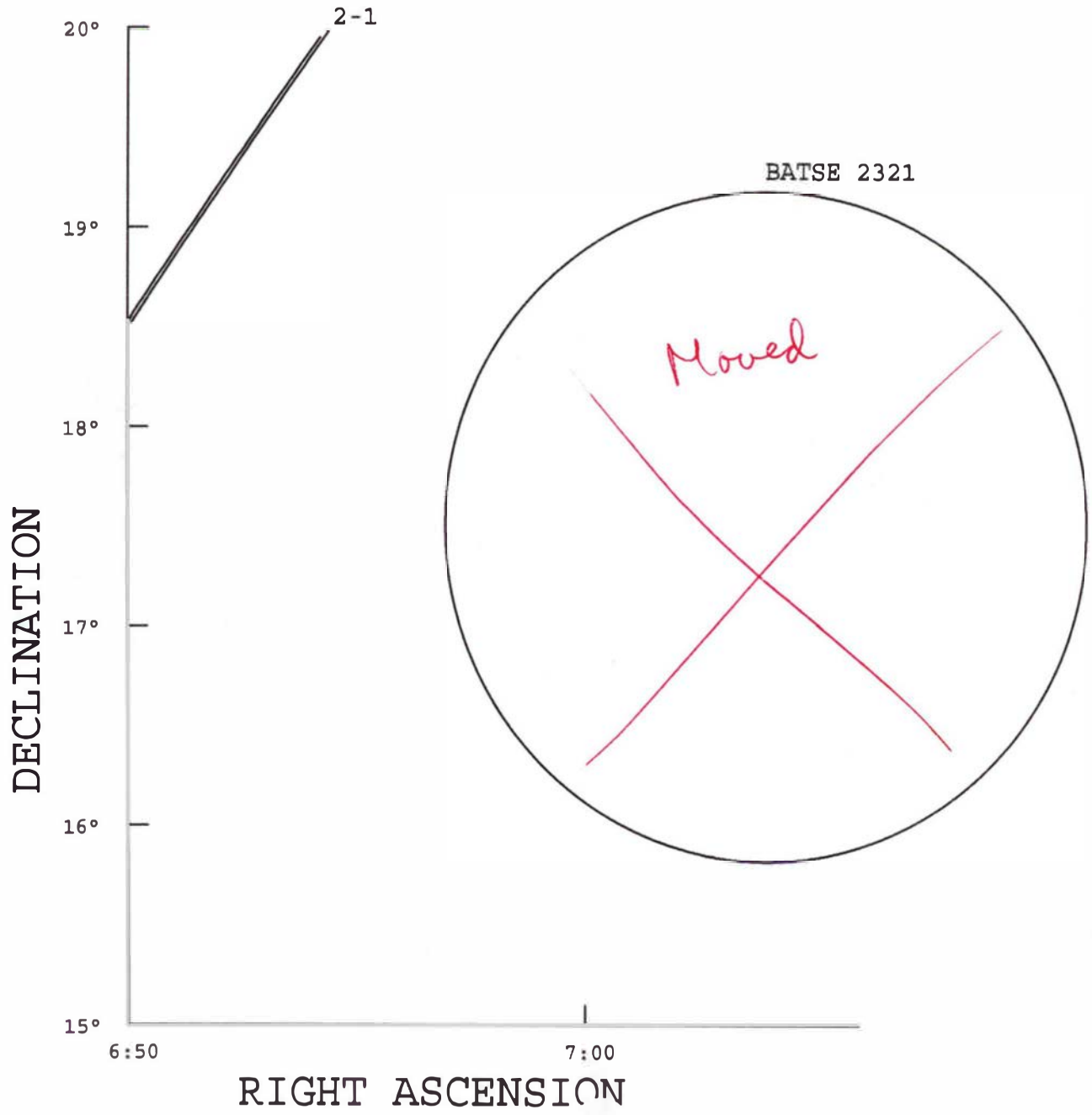


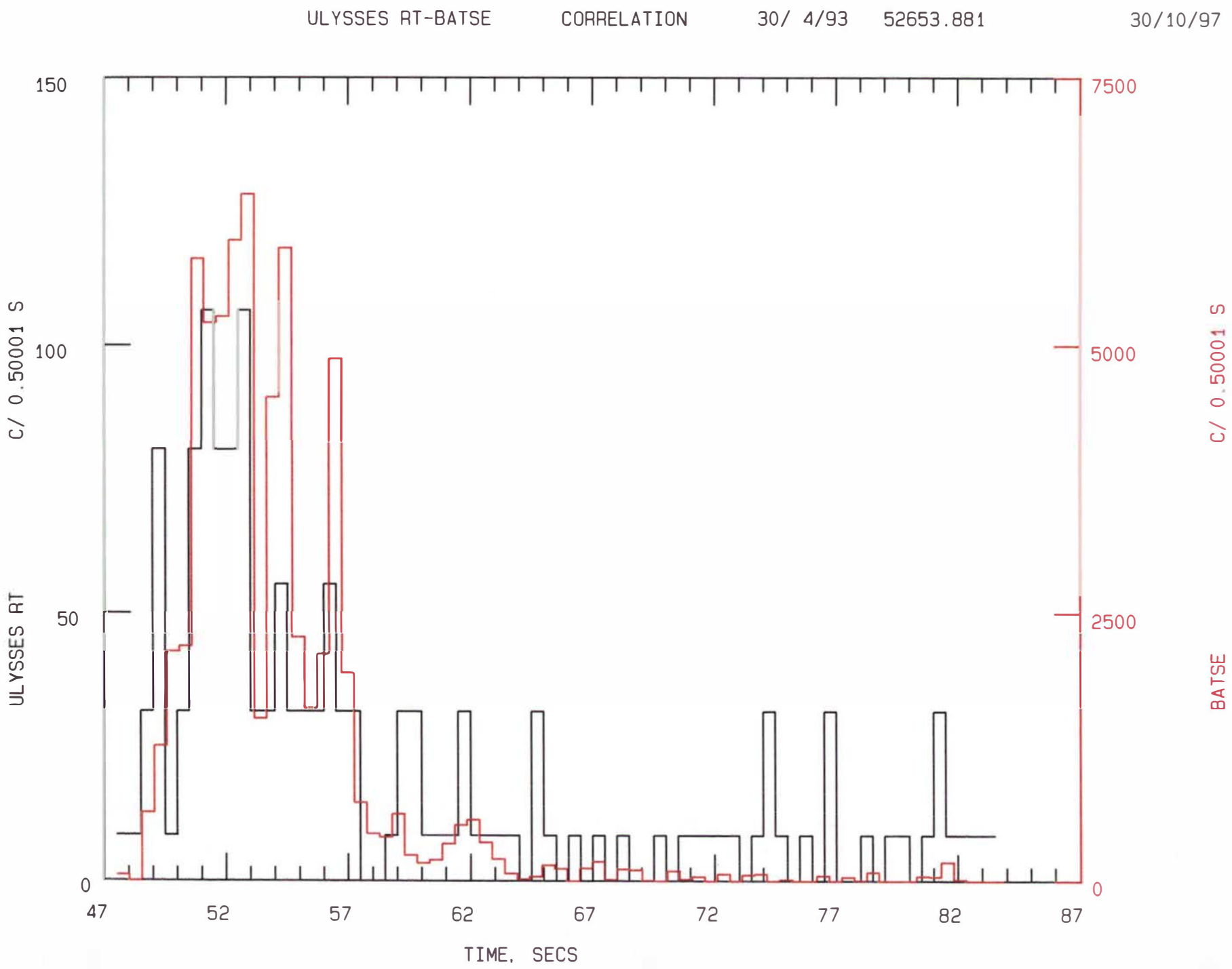
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE

EVENT OF APR 30, 1993 14:37

30/10/97

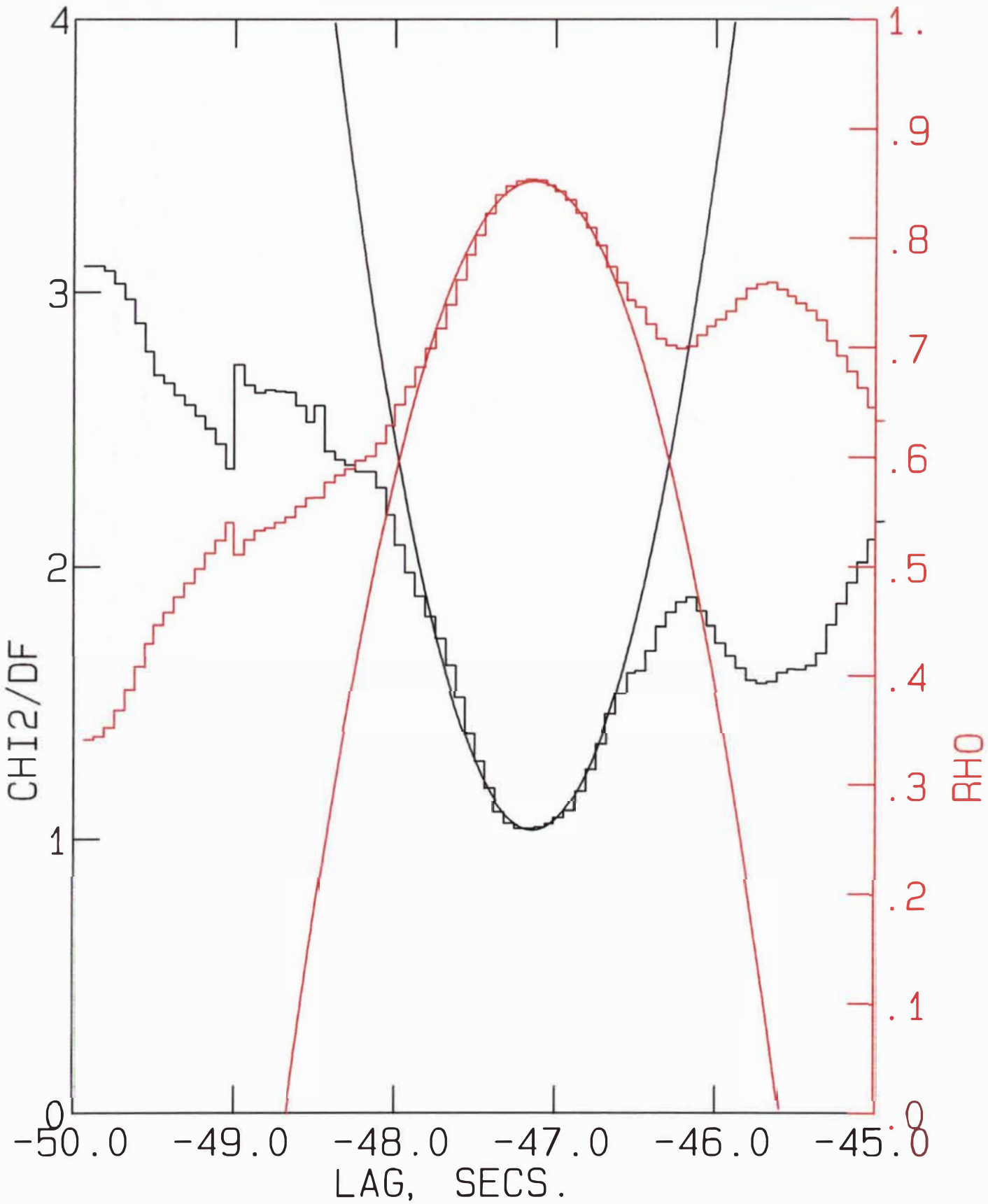
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE




ULYSSES RT-BATSE CORRELATION 30/ 4/93 52653.881 30/10/97
150
100
50
0
C/ 0.50001 S
ULYSSES RT
7500
5000
2500
0
C/ 0.50001 S
BATSE
47
52
57
62
67
72
77
82
87
TIME, SECS

30/10/97

ULYSSES RT-BATSE CORRELATION 30/ 4/93 52653.881

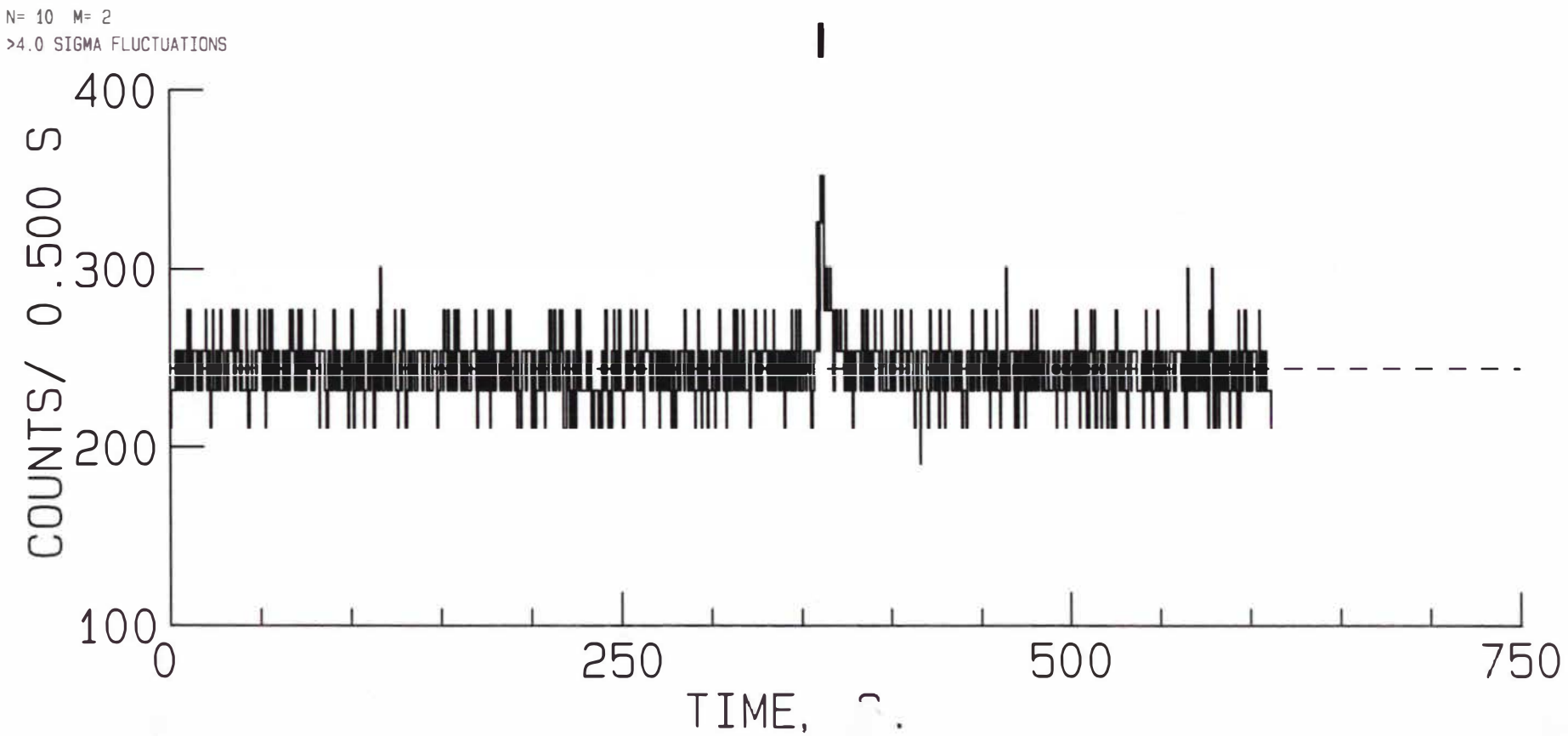


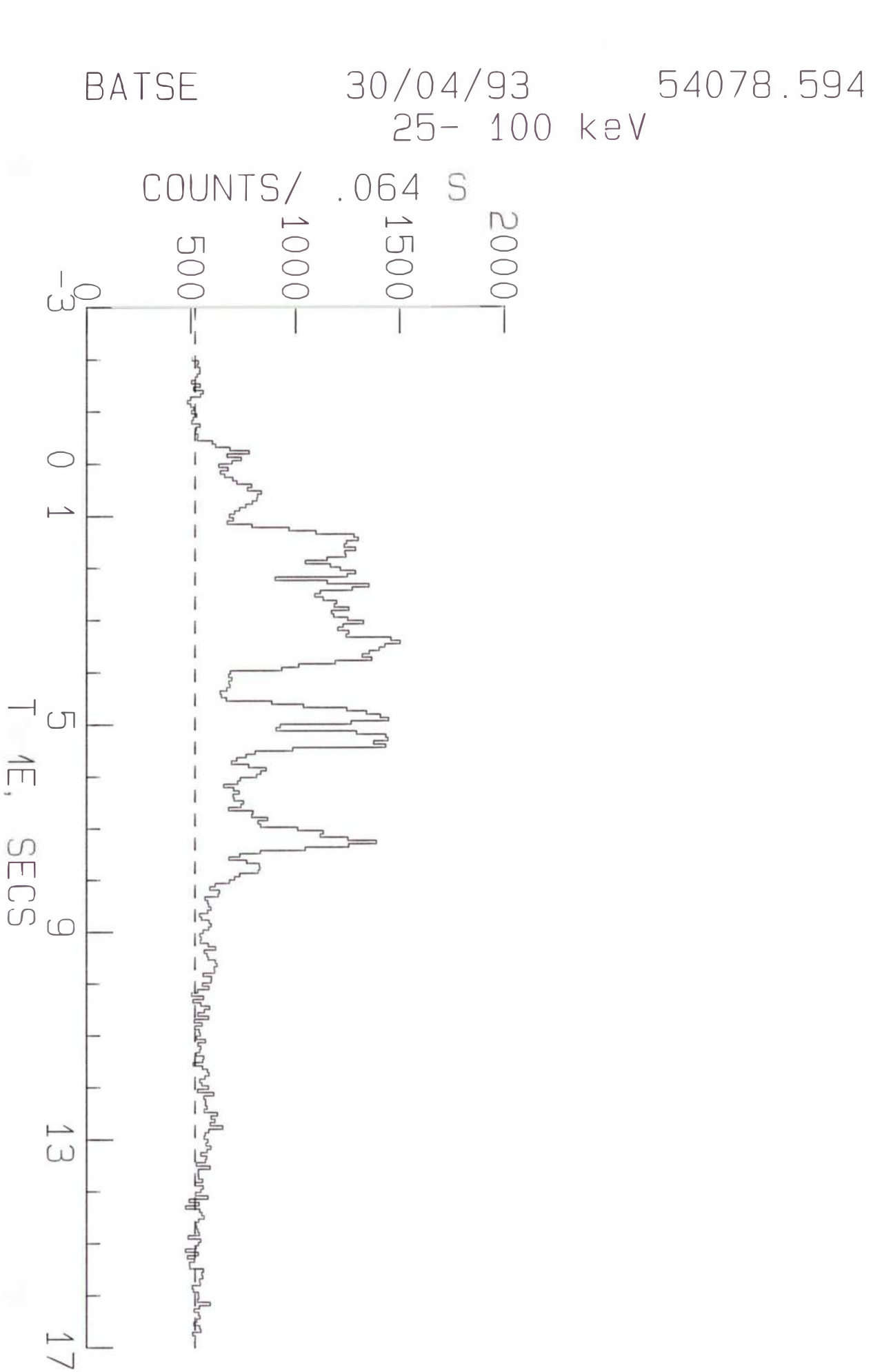
ULYSSES RT

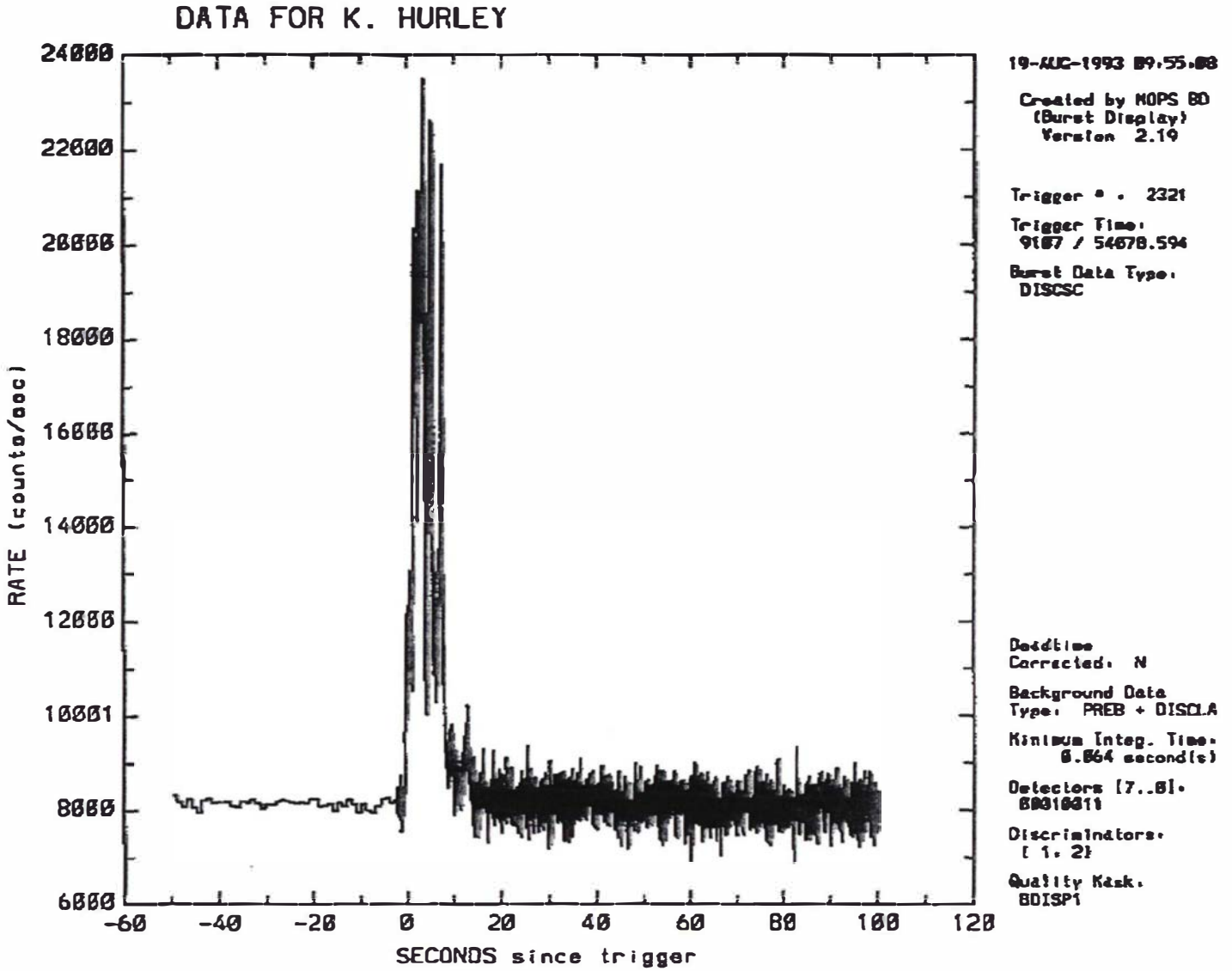
30/ 4/93 52344.044 s

21- 145 keV

30/10/97




BATSE 30/04/93 54078.594
25- 100 keV
COUNTS/ .064 S
500
1000
1500
2000
-3
0
1
5
9
13
17
T, SECS


DATA FOR K. HURLEY
RATE (counts/sec)
24000
22000
20000
18000
16000
14000
12000
10001
8000
6000
-60
-40
-20
0
20
40
60
80
100
120
SECONDS since trigger
19-AUG-1993 09:55:08
Created by MOPS BD
(Burst Display)
Version 2.19
Trigger # : 2321
Trigger Time:
9187 / 54678.594
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
00010011
Discriminators:
[1, 2]
Quality Mask:
BDISP1

```
          ********************
          *BATSEARCH PROGRAM*
          ********************
```

120

```
 BATSE BURST #     2322
 EVENT OF 1993 APR 30 DAY OF YEAR=120
 EVENT CROSSING TIME AT BATSE      : 85292. S. OR 23:41:32.0
 COORDINATES ARE     .000     .000        6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 341.000     2.000
 BATSE PEAK COUNTING RATE:    5000     C/S
 EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
 POSITION OF ULYSSES ON 30/ 4/  93 IS:
 RA=  143.146 DEC=  -11.772 DIST=     4.353 AU
 BATSE-ULYSSES DISTANCE =  651253680. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 20.22 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2038.48 SECS.
 CROSSING TIME AT ULYSSES     IS 87330. S. OR   24:15:30 +/-  211.31 SECONDS
```



```
From SHARIFF@ssl.msfc.nasa.gov Mon May  3 09:59:30 1993
Date: Mon, 3 May 1993 11:59:40 -0500 (CDT)
From: SHARIFF@ssl.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu, "BATSE::KOUVELIOTOU"@ssl.msfc.nasa.gov
Cc: SHARIFF@ssl.msfc.nasa.gov
Subject: BATSE burst
Content-Length: 108

 BATSE #   Date      TJD      sec    Max ct/s   RA    Dec
   2322    930430    9107    85292      5000    341   +02
```

JKL

```
                BATSE BURST TRIGGER
NO.: 02322

TIME: TJD=9107 SECONDS=85292

TYPE: BURST                      SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:        SIGMA

INTENSITY:           COUNTS/CM2

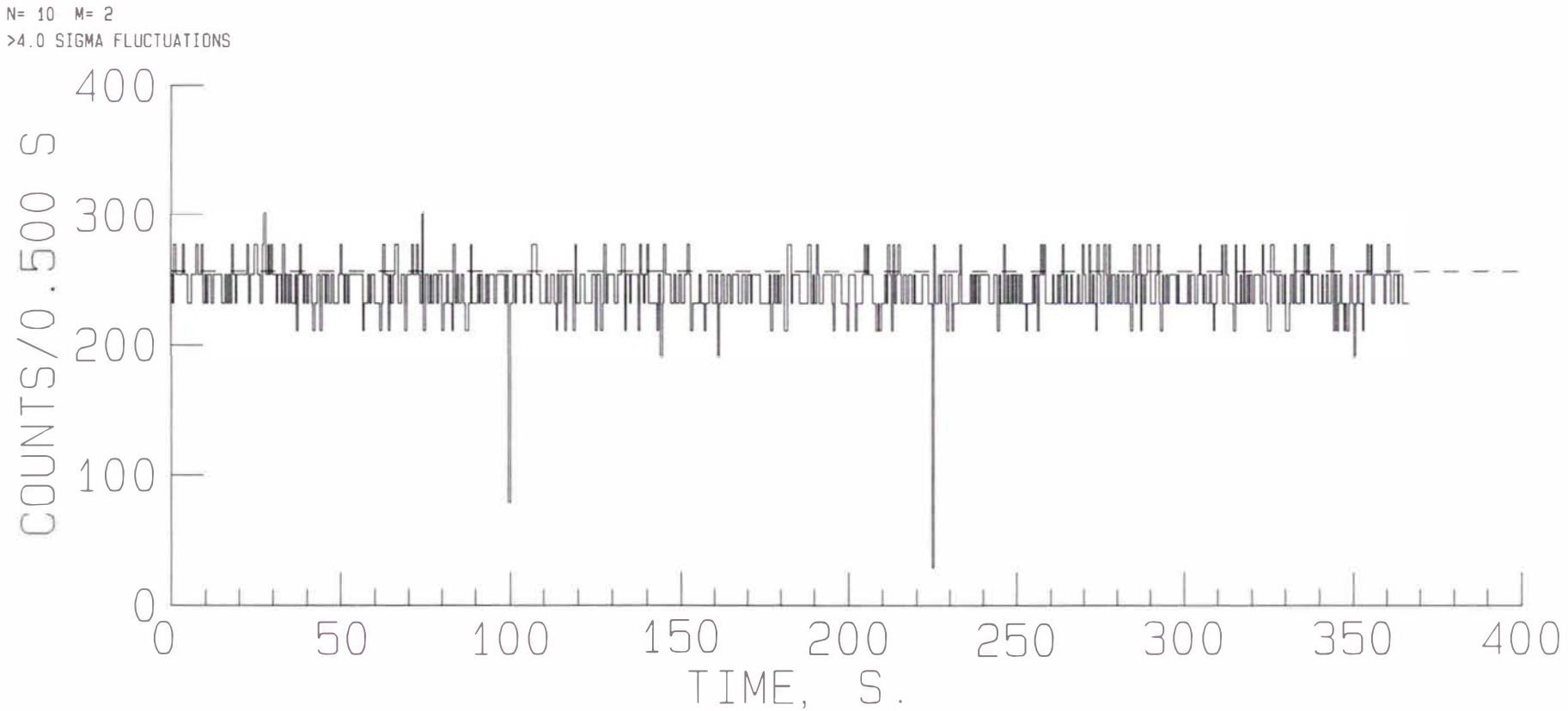
LOCATION: ZENITH=132.0  AZIMUTH=310.7  ERROR=       DEGREES

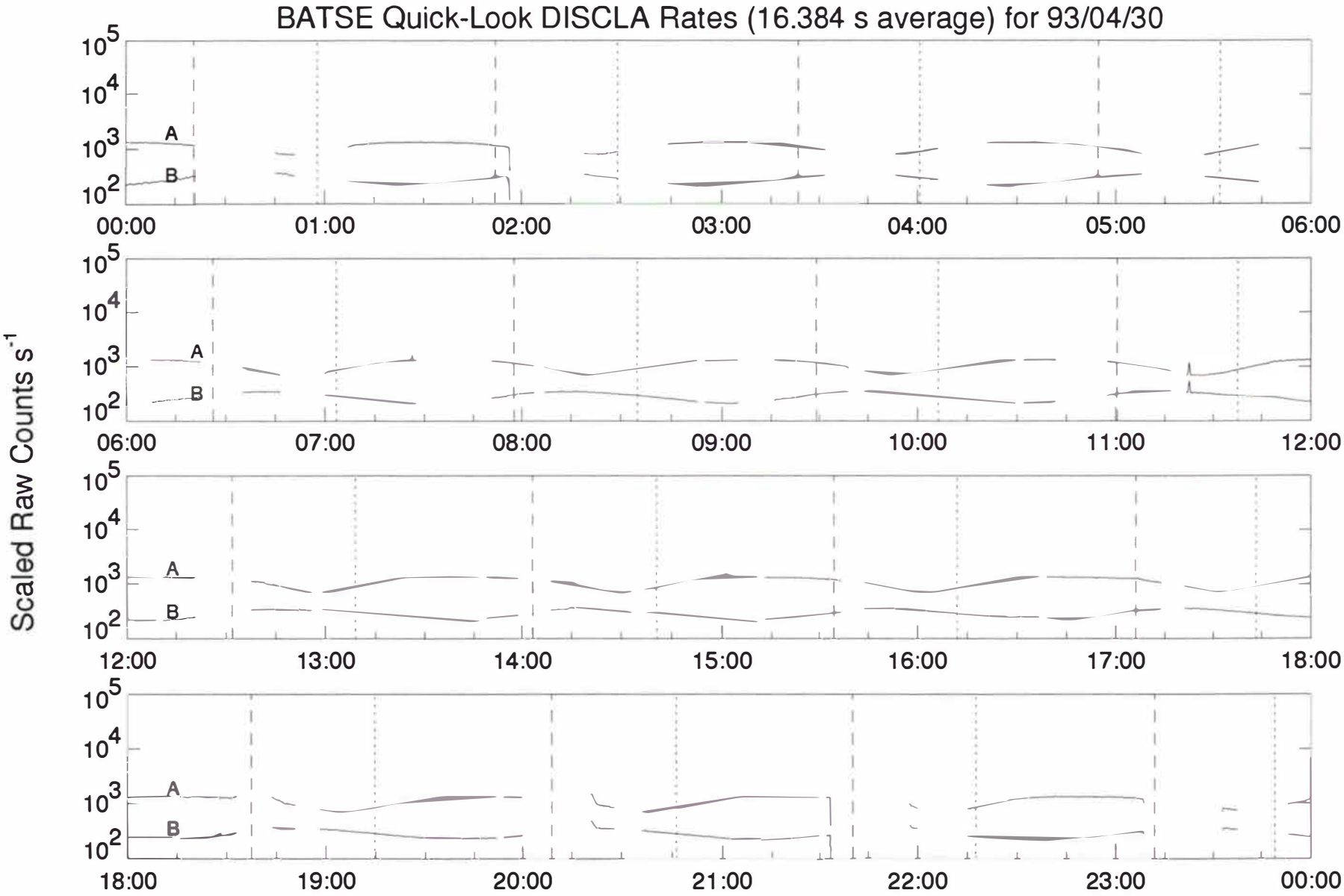
COMMENTS:
BURST, DOUBLE PULSE, DUR ~80S. VISIBLE ABOVE 300KEV.
```

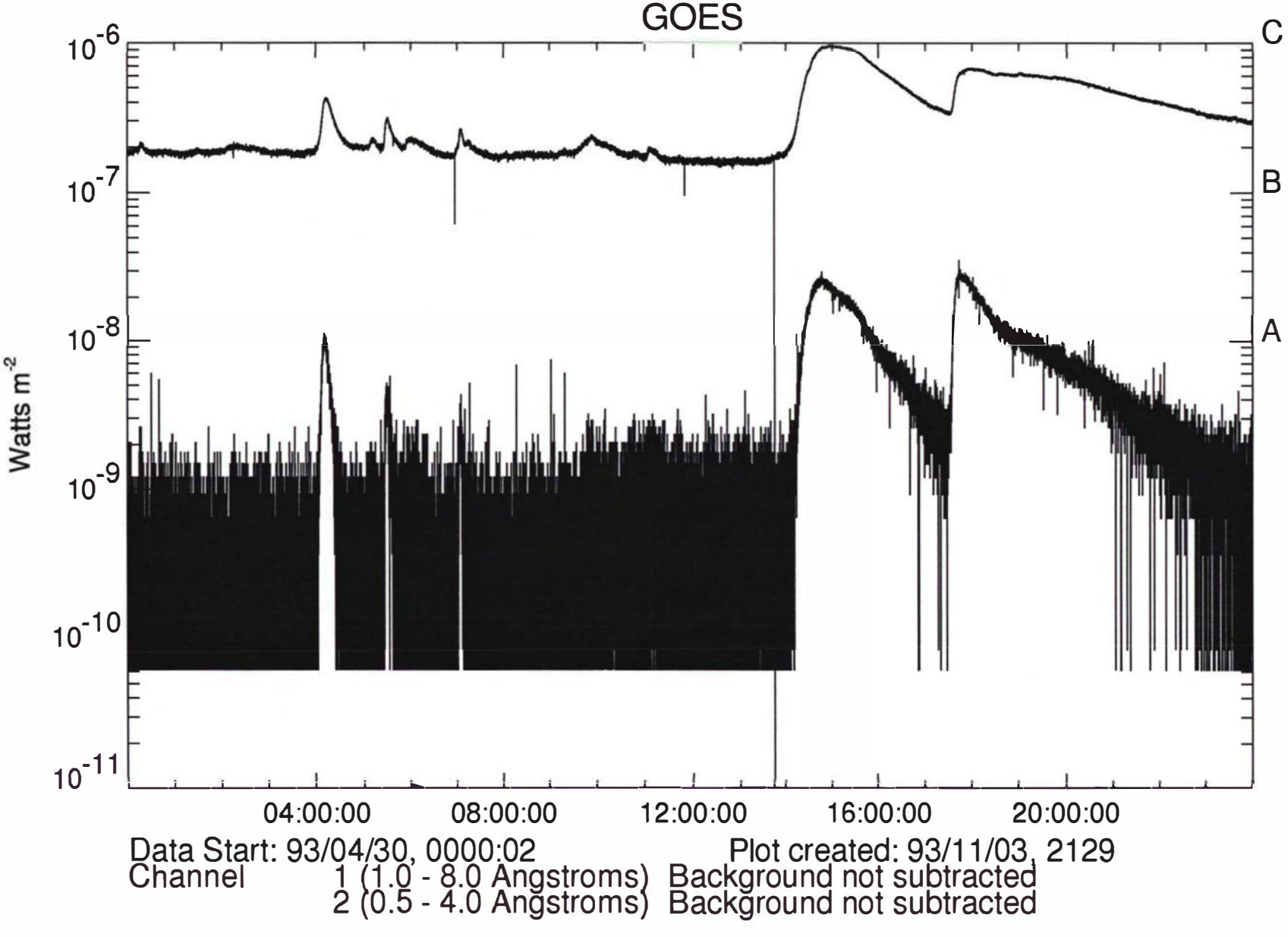
ULYSSES RT

1/ 5/93 720.085 s

0- 0 keV

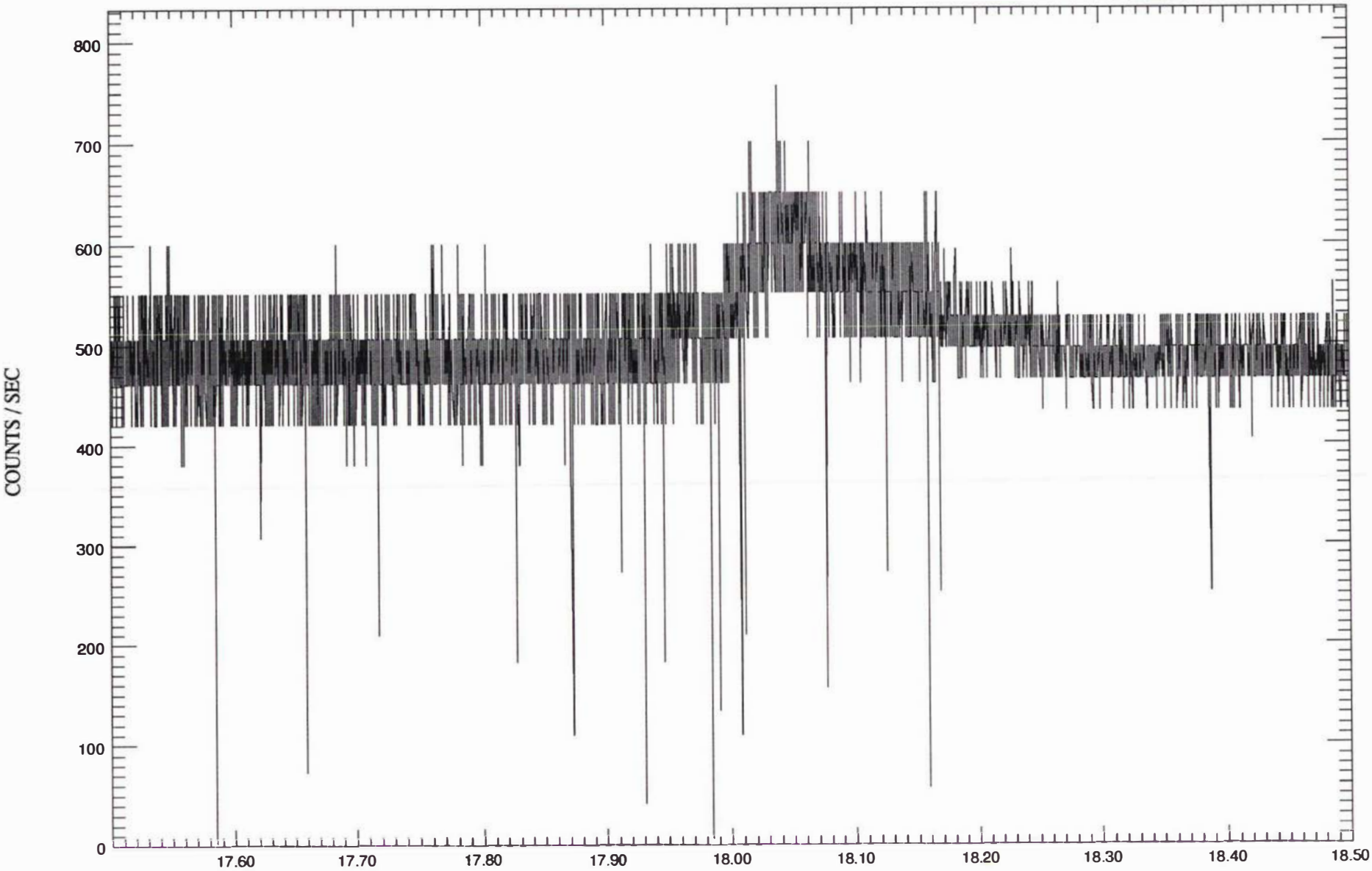



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/04/30
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 93/05/10, 1408 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

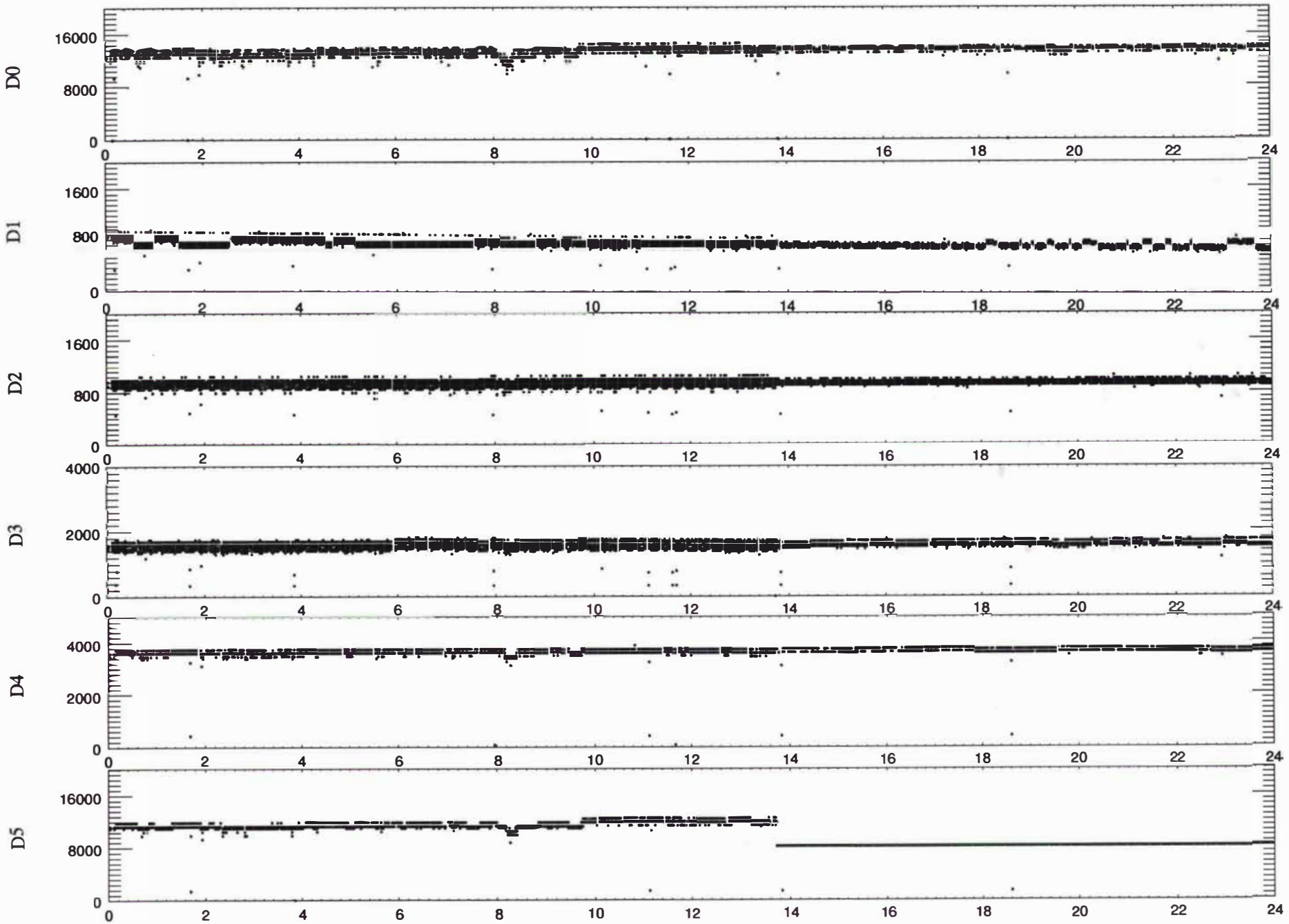

GOES
C
B
A
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
10^{-11}
Watts m^{-2}
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 93/04/30, 0000:02
Plot created: 93/11/03, 2129
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

HUS 2A, MODE 1, NOT AVERAGED QEDR day 120, year 1993 to day 120, year 1993 5/4/93

CALIBRATION DATA INCLUDED



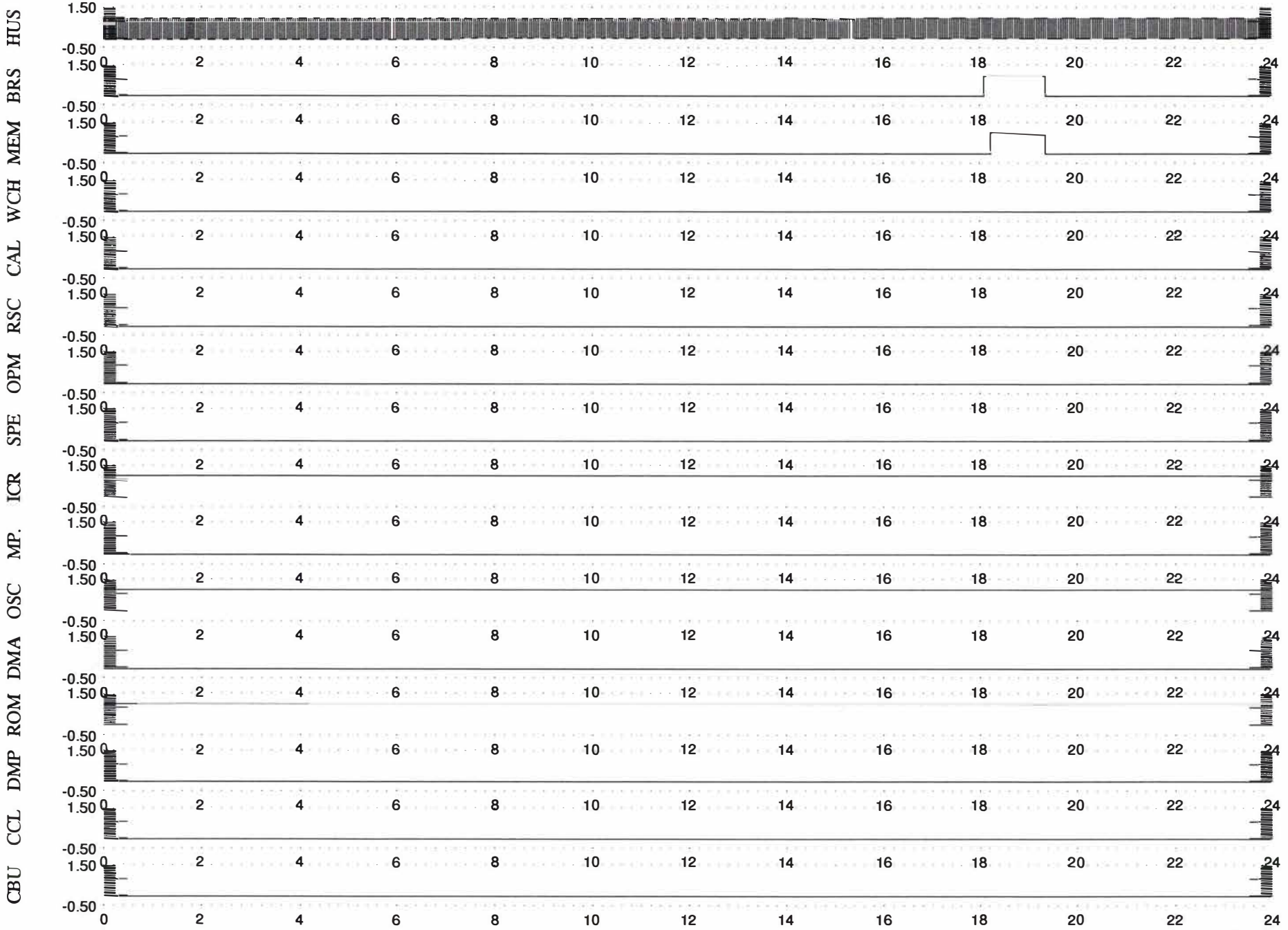
HUS 2B COUNTS / SEC QEDR day 120, year 1993 to day 120, year 1993 5/4/93



UNIV SAL TIME

HUS MODES EDR day 120, year 1993 to day 120, year 1993 6/12/93

BURST NUMBER 0

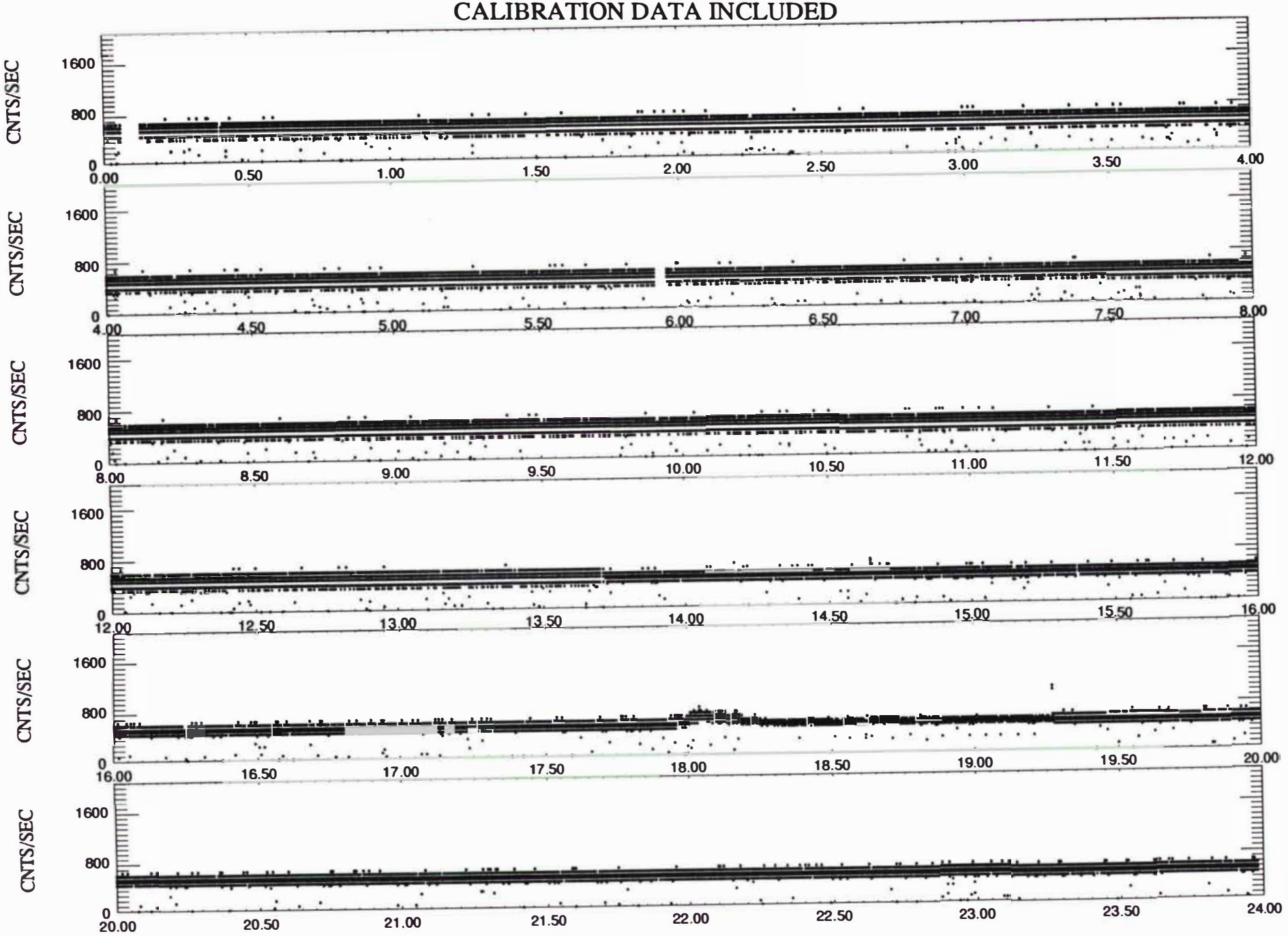


UNIV. AL TIME

EMS 1703

HUS 2A, MODE 1, NOT AVERAGED EDR day 120, year 1993 to day 120, year 1993 6/12/93

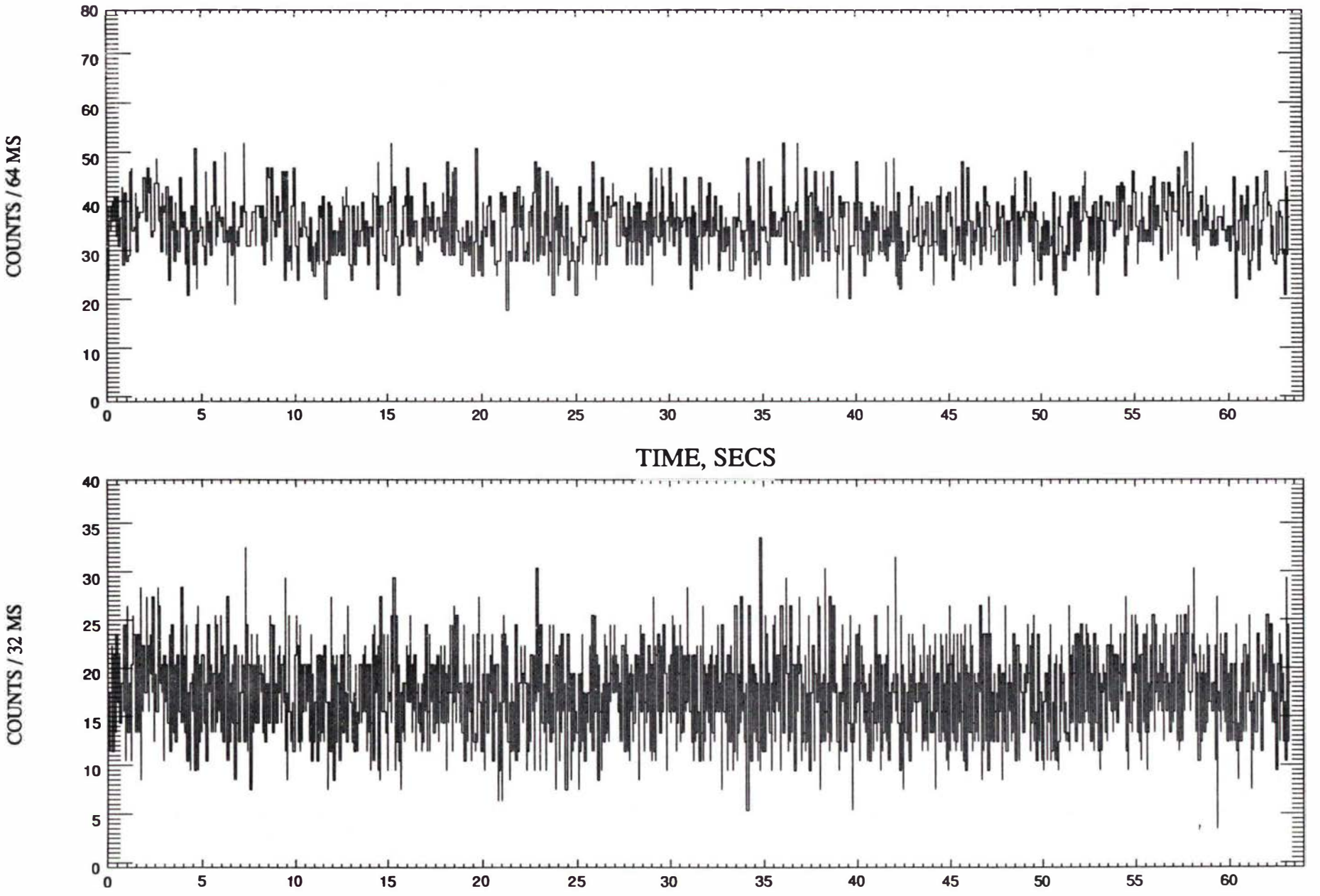
CALIBRATION DATA INCLUDED



UNIV SAL TIME

HUS 2A TRIGGERED DATA EDR day 120, year 1993 6/12/93

Burst Counter 0 at UT=18.020203035143 h=64872.731 s 18:01:12.731



B# 1

