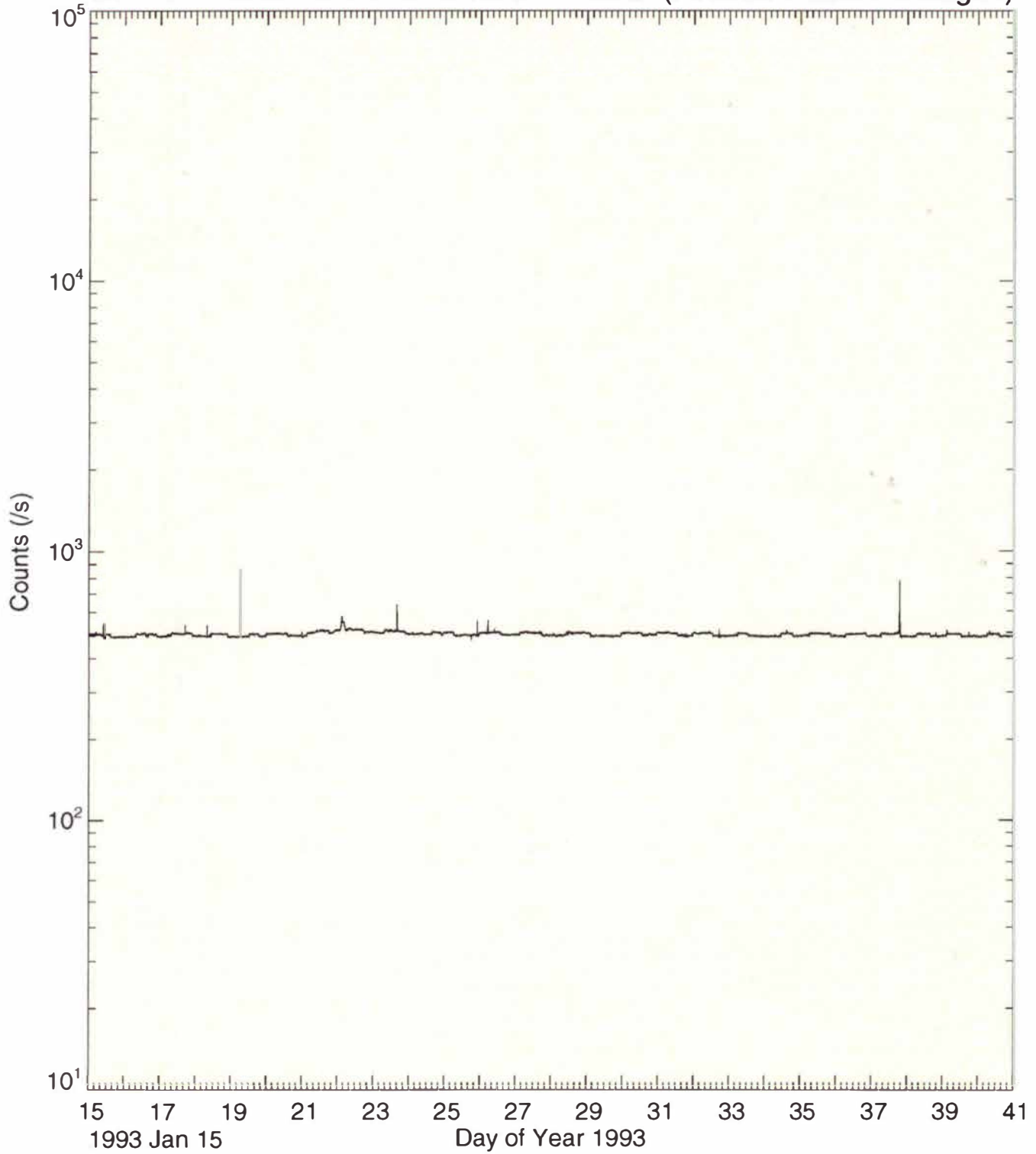


ESA ULYSSES DATA SYSTEM

GRB (Filtered 5 Min. Averages)



.93.001.00.11.12.576

HUS monthly long term thermal data

818

RET

E002 2ARADTMP S/C

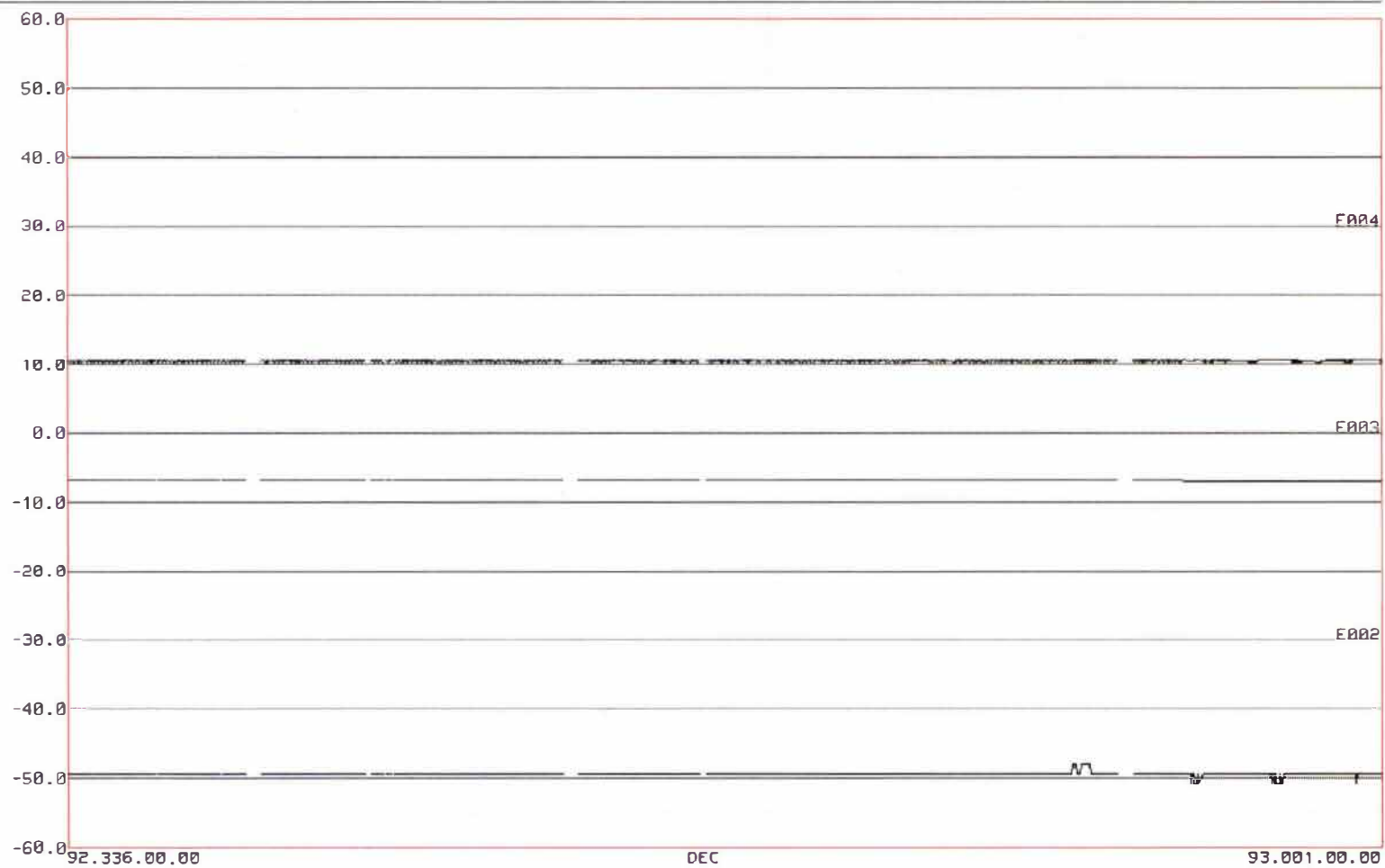
-7.1

E003 2BSENTMP S/C

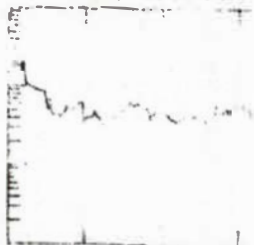
-49.3

E004 2ASENSTMP EX

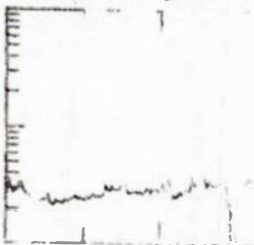
10.18



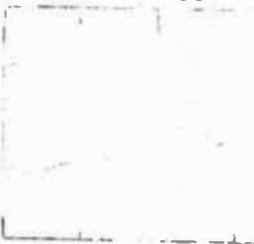
WATER 11.10



WATER 11.10



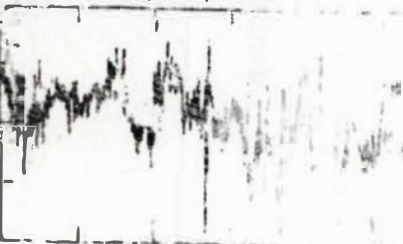
WATER 11.10



WATER 11.10



WATER 11.10



WATER 11.10



February 14, 1994

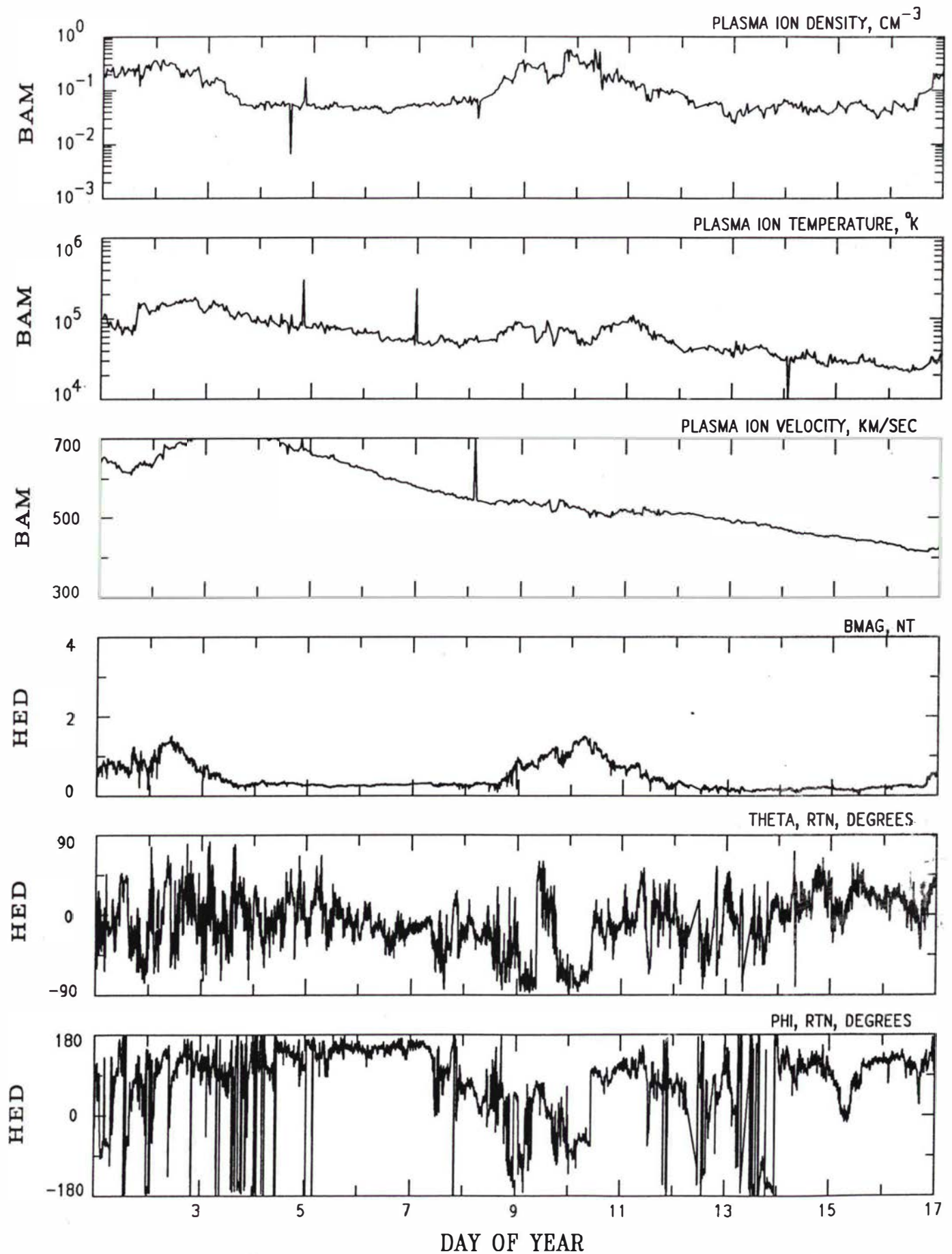
Dear Ulysses Investigator:

Please replace BAM-HED common data record plots for the period
"93 001 Jan 1 00:00:00 - 93 304 Oct 31 23:59:59" with the enclosed.
Corrections have been made to the plot program, processing HED data.

Regina Sakurai, JPL

ULYSSES CDR - SOLAR WIND PLASMA AND MAGNETIC FIELD

93 001 JAN 1 00:00:00.000 - 93 017 JAN 17 00:00:00.000



100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

100-100000

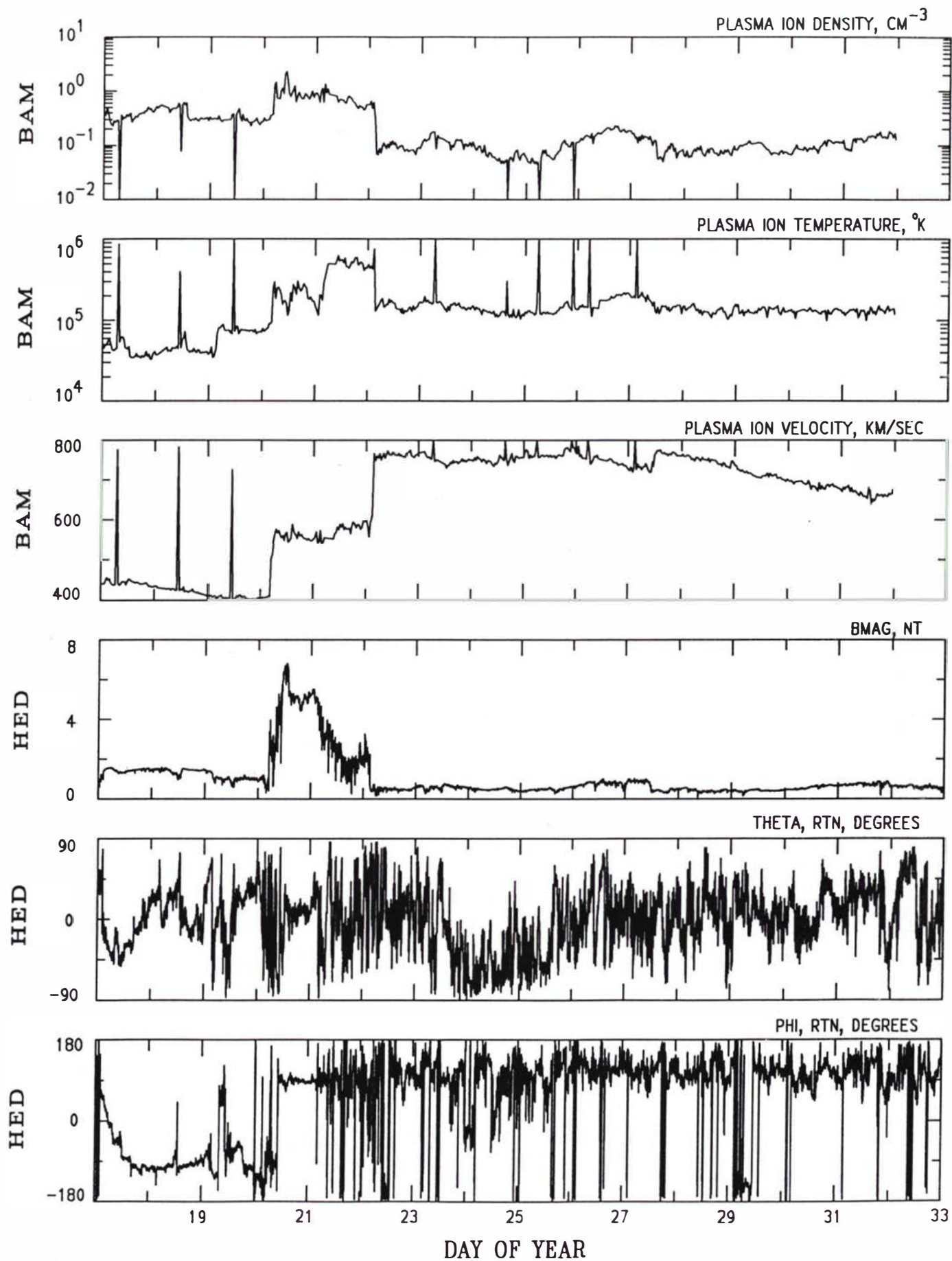
100-100000

100-100000

100-100000

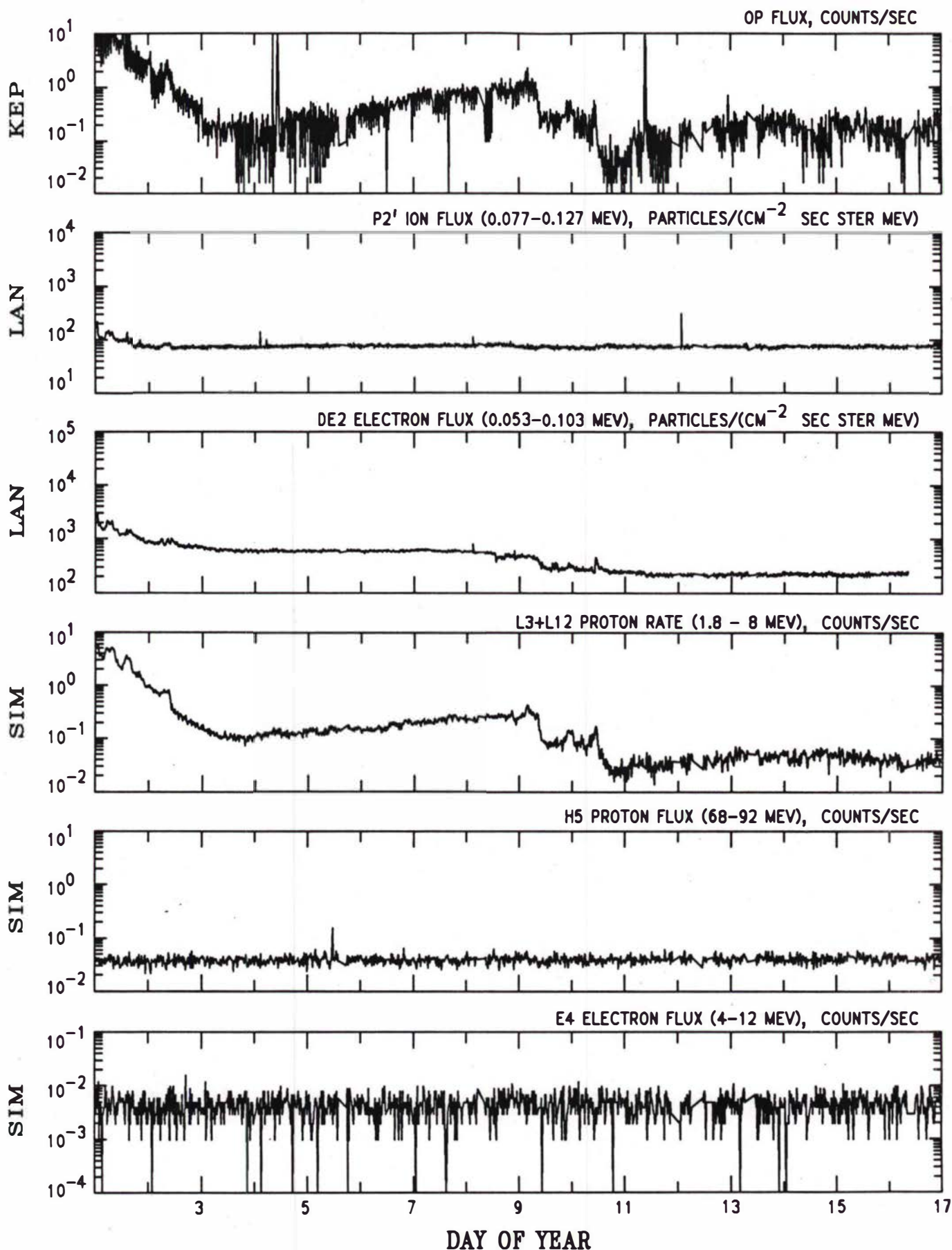
ULYSSES CDR - SOLAR WIND PLASMA AND MAGNETIC FIELD

93 017 JAN 17 00:00:00.000 - 93 033 FEB 2 00:00:00.000



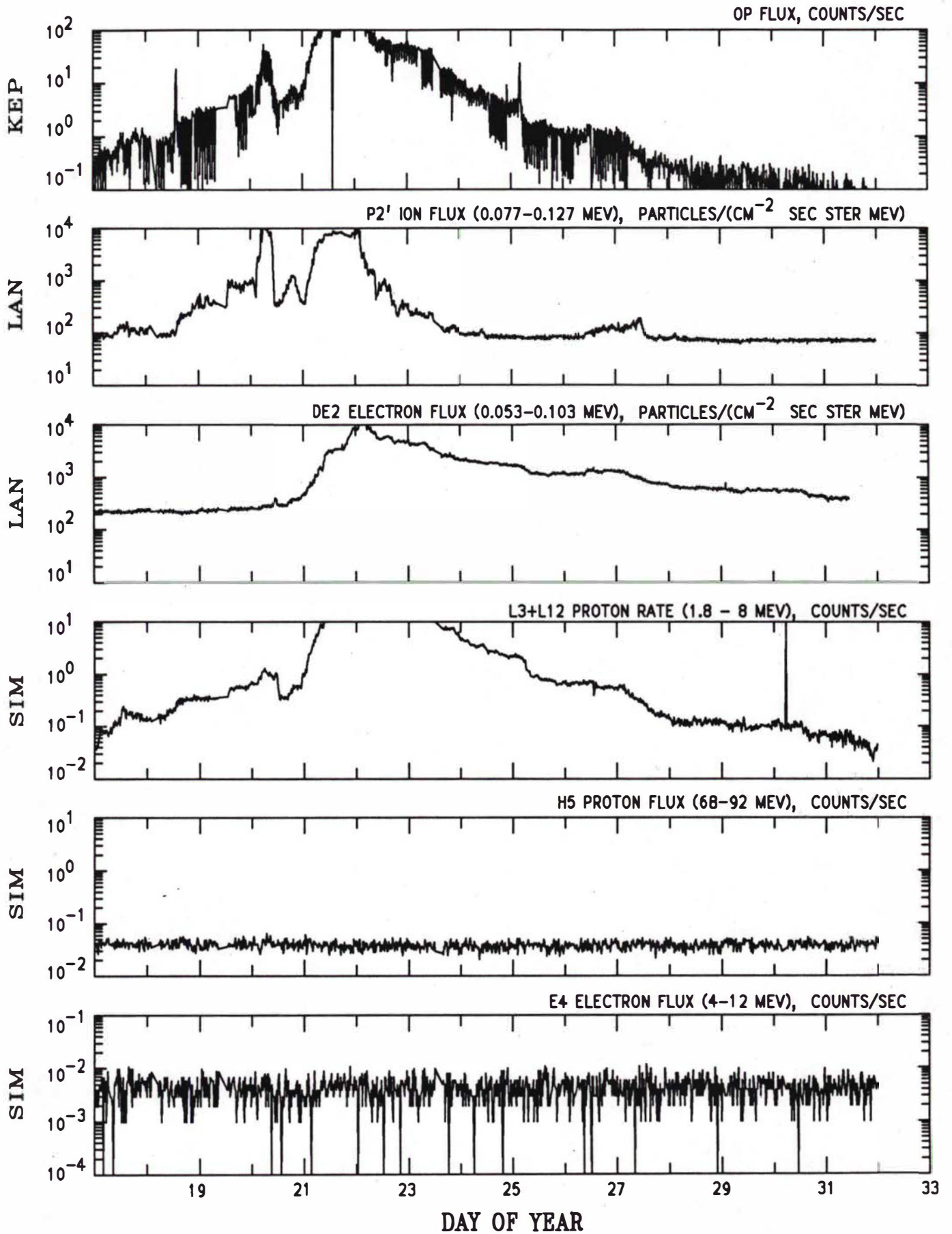
ULYSSES CDR - ENERGETIC PARTICLES, LOW ENERGY IONS AND COSMIC RAY

93 001 JAN 1 00:00:00.000 - 93 017 JAN 17 00:00:00.000



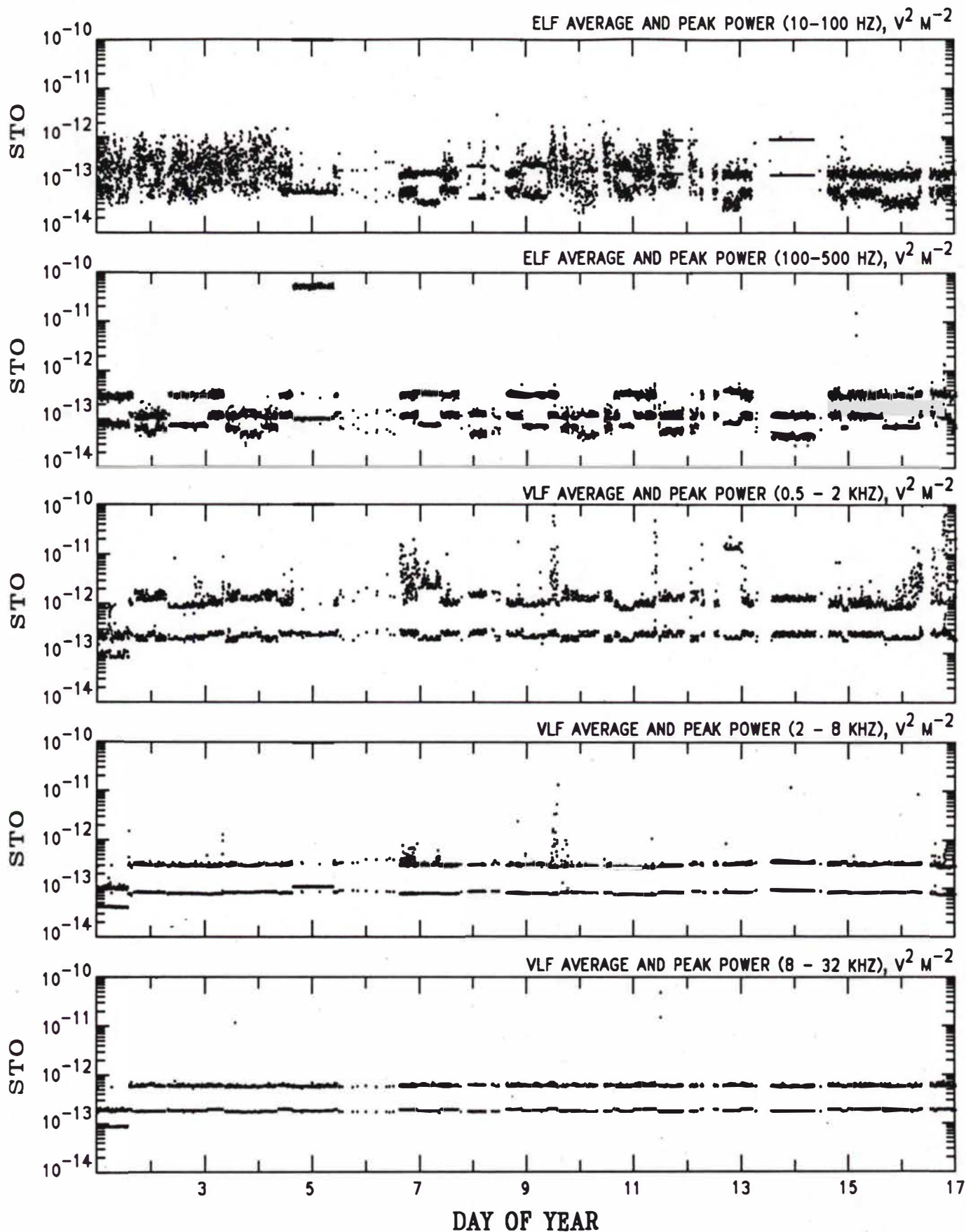
ULYSSES CDR - ENERGETIC PARTICLES, LOW ENERGY IONS AND COSMIC RAY

93 017 JAN 17 00:00:00.000 - 93 033 FEB 2 00:00:00.000



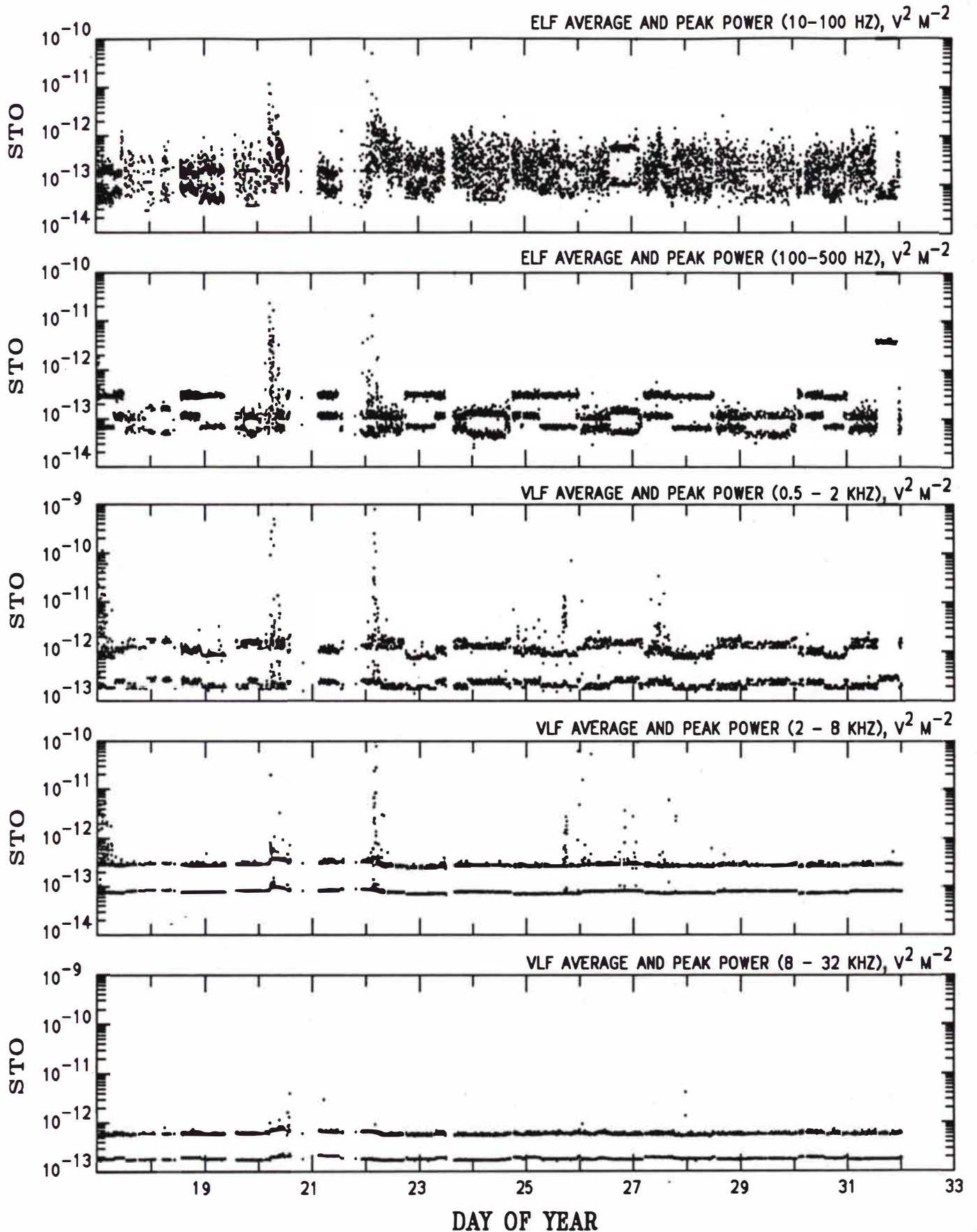
ULYSSES CDR - PLASMA WAVE

93 001 JAN 1 00:00:00.000 - 93 017 JAN 17 00:00:00.000



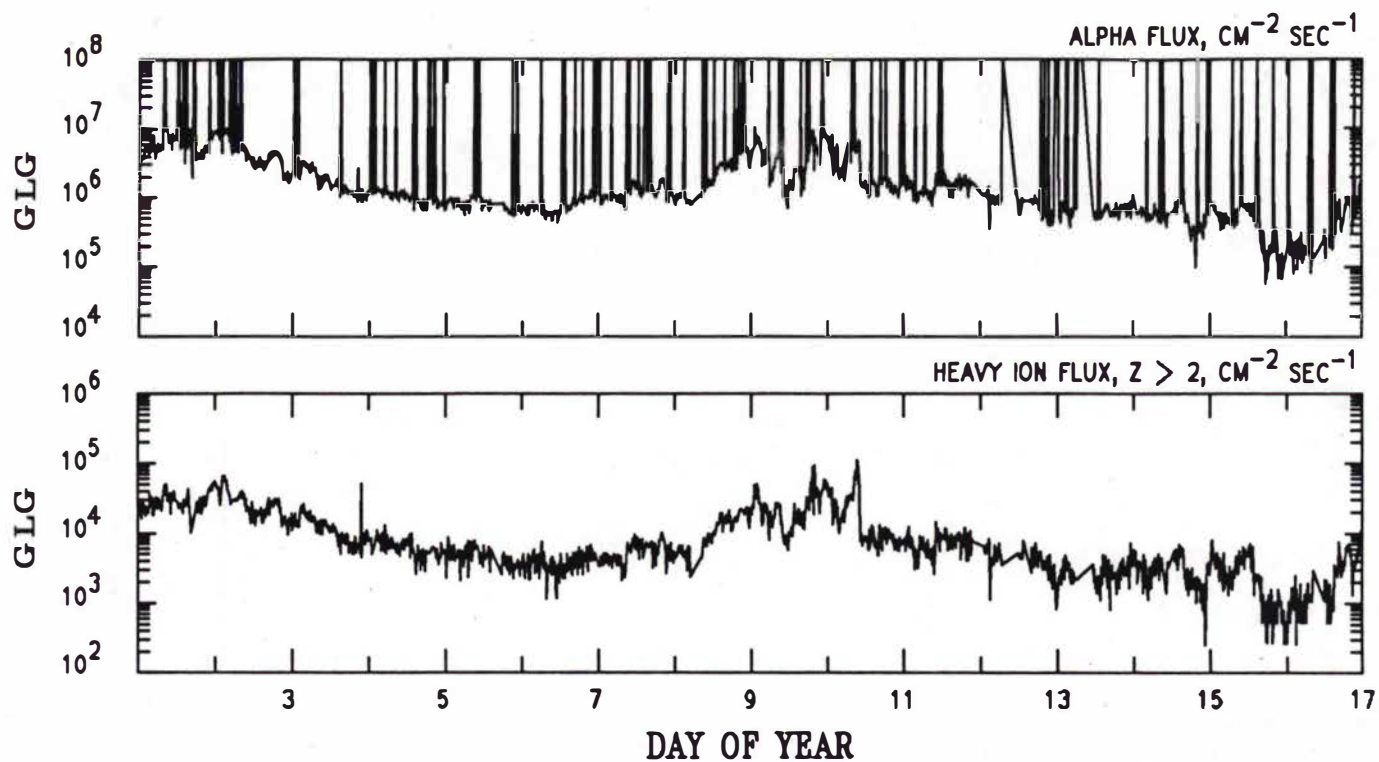
ULYSSES CDR - PLASMA WAVE

93 017 JAN 17 00:00:00.000 - 93 033 FEB 2 00:00:00.000



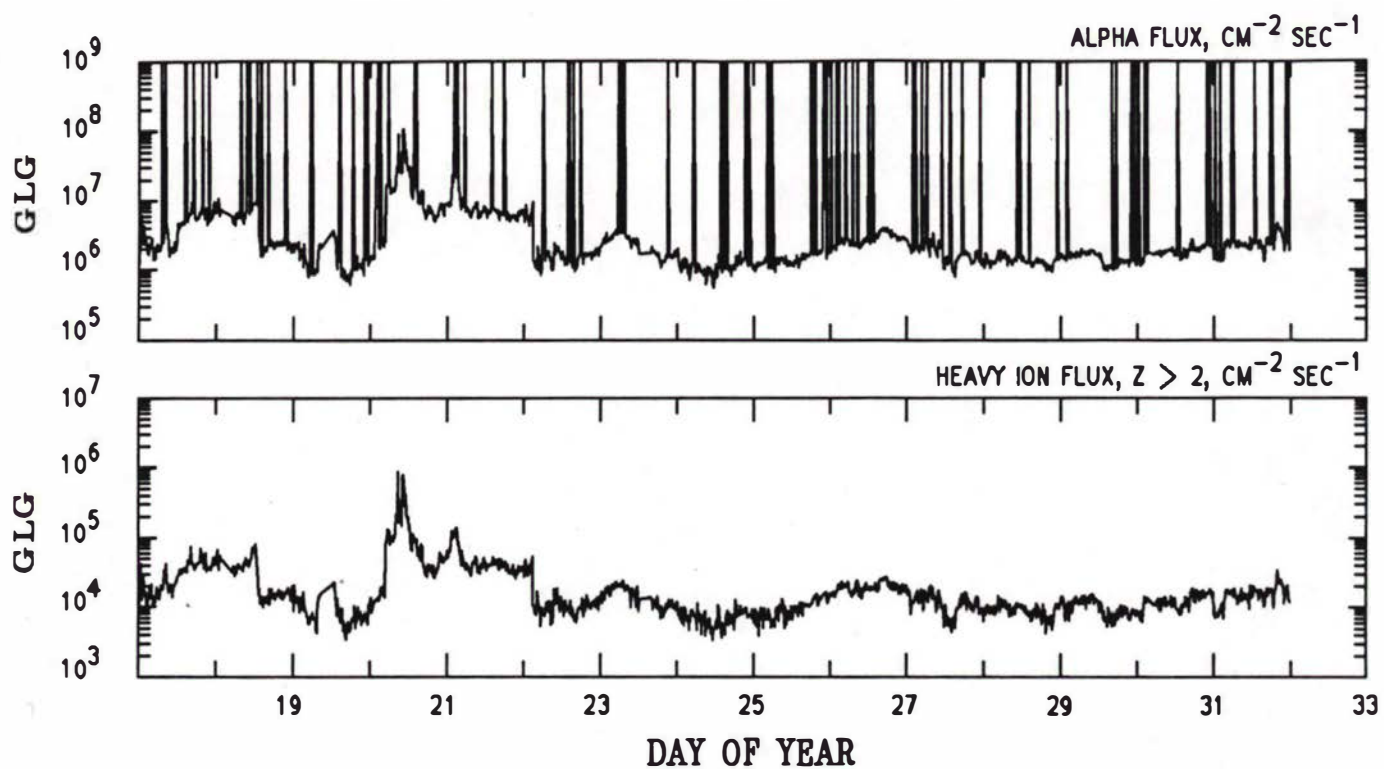
ULYSSES CDR - SOLAR WIND ION COMPOSITION

93 001 JAN 1 00:00:00.000 - 93 017 JAN 17 00:00:00.000



ULYSSES CDR - SOLAR WIND ION COMPOSITION

93 017 JAN 17 00:00:00.000 - 93 033 FEB 2 00:00:00.000

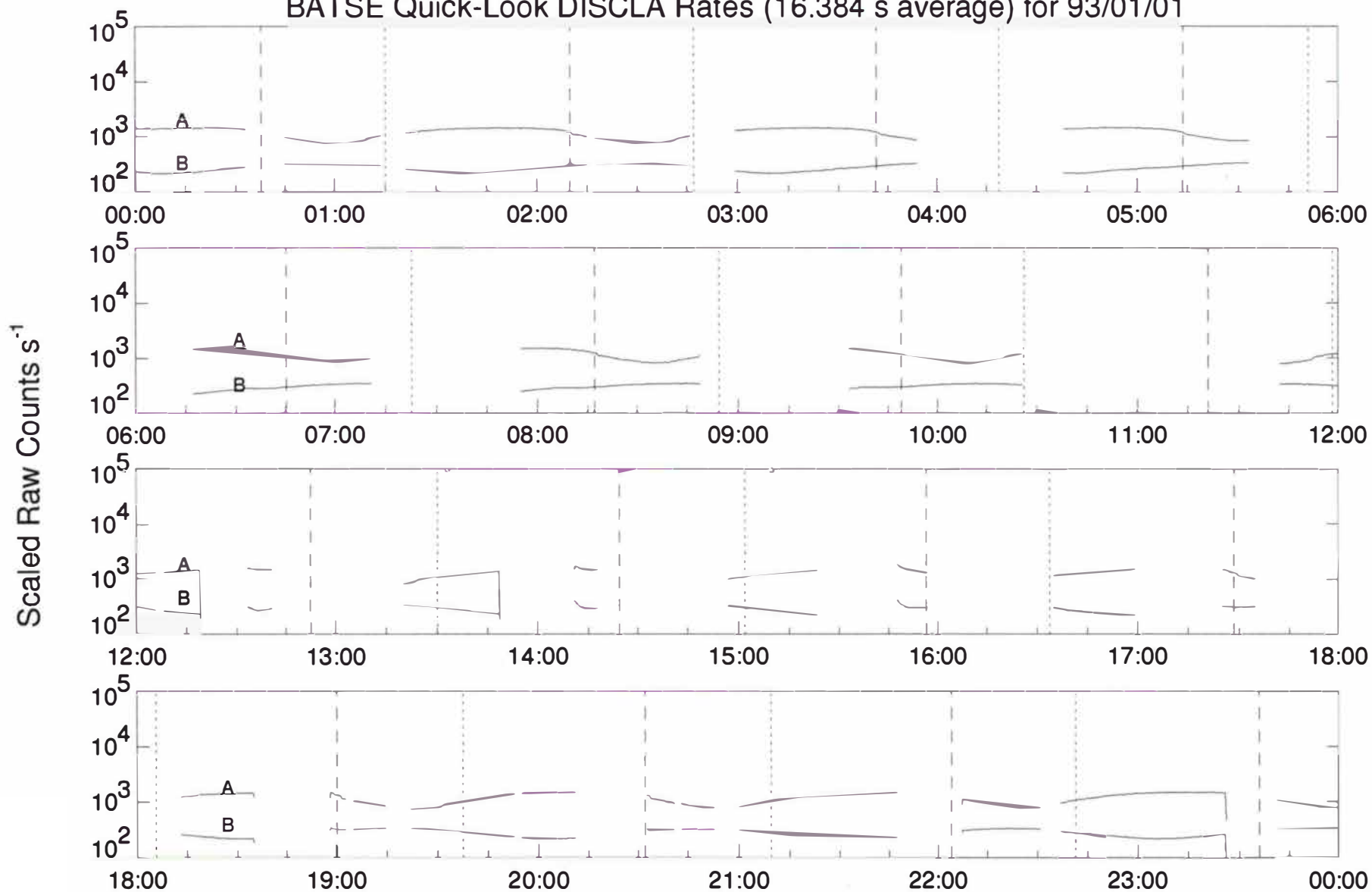


From 7::khurley@14 Wed Feb 17 12:18:52 1993
Date: Tue, 2 Feb 93 23:55:07 -0800
From: 7::khurley@14
To: "khurley@sunspot.ssl.berkeley.edu"%jpldig.span@JPLDIG.jpl.nasa.gov
Content-Length: 3201

Last updated : Monday, 1st February 1993

1st Jan	Routine operations.
2nd Jan	Routine operations.
3rd Jan	Earth pointing manoeuvre.
4th Jan	KEP EPAC IFC.
5th Jan	HET calibration.
6th Jan	HET reset.
7th Jan	Earth pointing manoeuvre.
8th Jan	LAN calibration.
9th Jan	Routine operations.
10th Jan	Routine operations.
11th Jan	KEP EPAC IFC. Earth pointing manoeuvre.
12th Jan	HUS datation test (time-tagged) via DSS 61. Complete DSS 12 pass lost because of maser failure. Some of outage covered by extra downlink pass via DSS 42.
012.06:45-11:20 SCET	Unrecoverable real-time data loss.
13th Jan 013.07:46-11:05 SCET	HED calibration. Unrecoverable real-time data loss due to maser failure at DSS12.
14th Jan	Earth pointing manoeuvre cancelled because of possibility of losing DSS 12 track (maser failure). Earth pointing manoeuvre monitored via DSS 42.
15th Jan	Routine operations. STO Daily command sequence not sent due to transmitter failure at DSS12.
16th Jan	Routine operations.
17th Jan	Earth pointing manoeuvre.
18th Jan	KEP EPAC IFC.
19th Jan	KEP GAS Monthly Health Check.
20th Jan	Earth pointing manoeuvre.
21st Jan	Routine operations.
22nd Jan	Routine operations.

BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/01



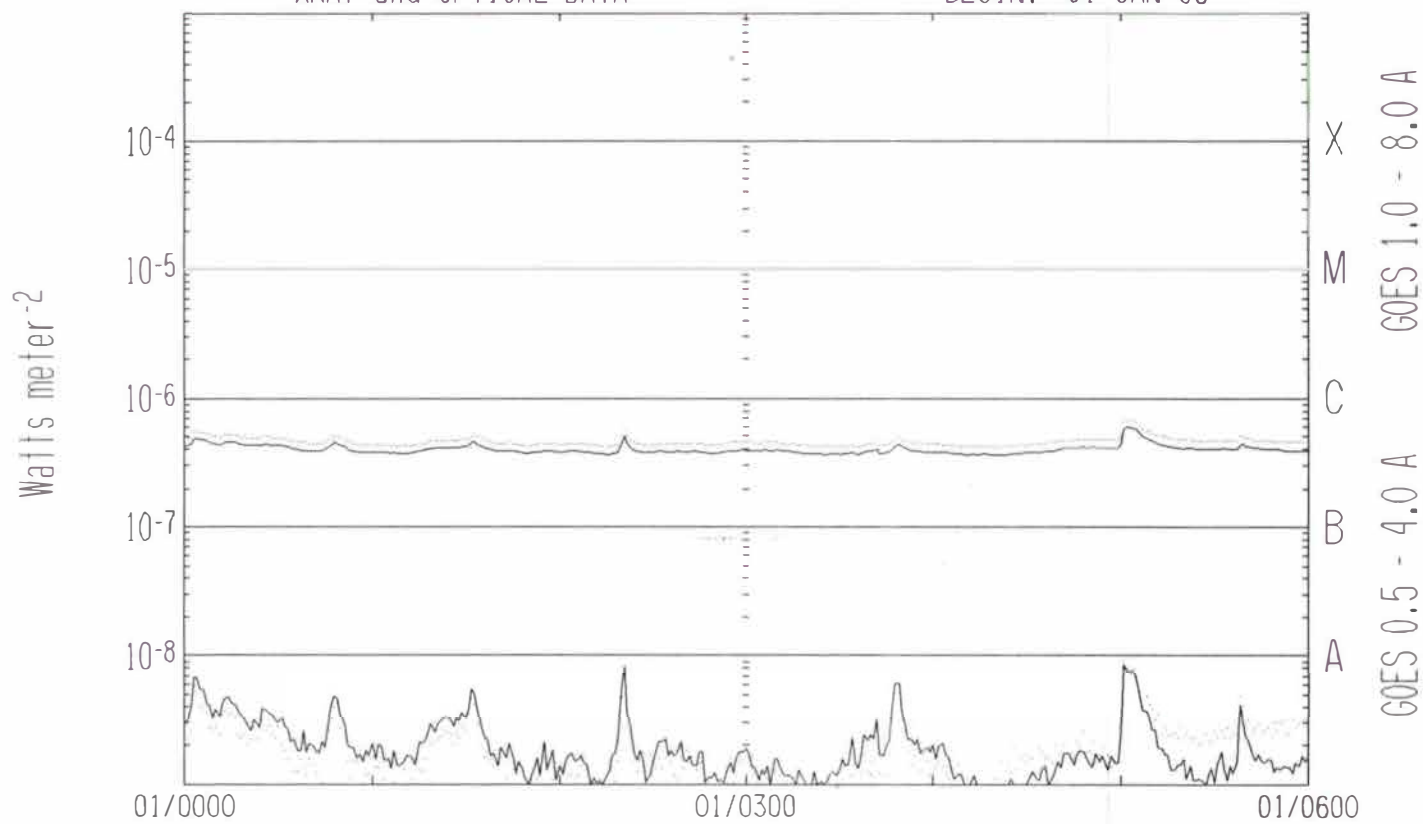
Current Time: 93/01/04, 1437 EDT
 A: Channel 1 Most Sunward LAD
 B: Sum Channel 1 Anti-Sunward LADs X .05

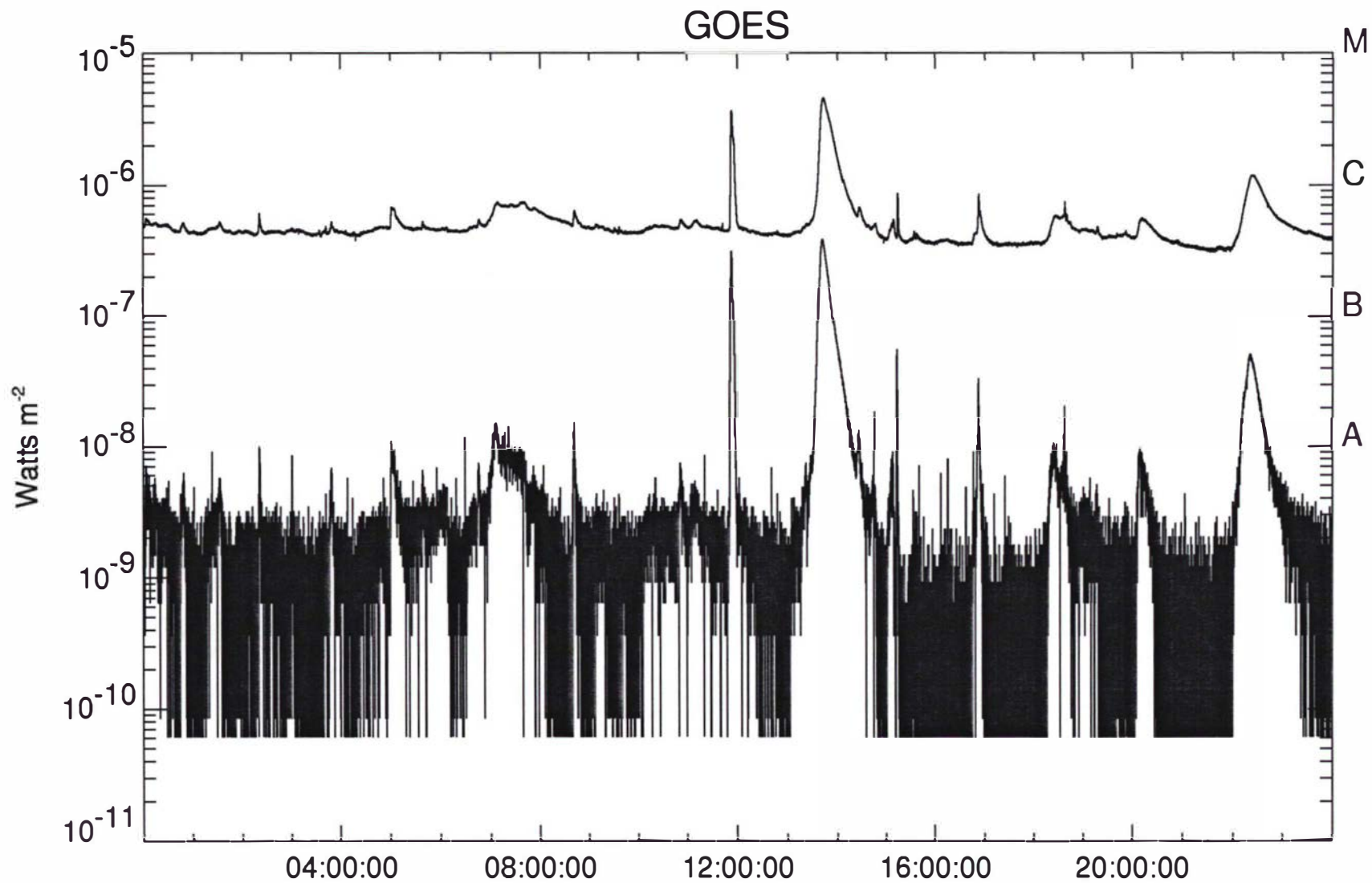
Dotted line: Day entry
 Dashed line: Night entry

* Solar Burst Trigger
 + Solar Flare

XRAY and OPTICAL DATA

BEGIN: 01 JAN 93





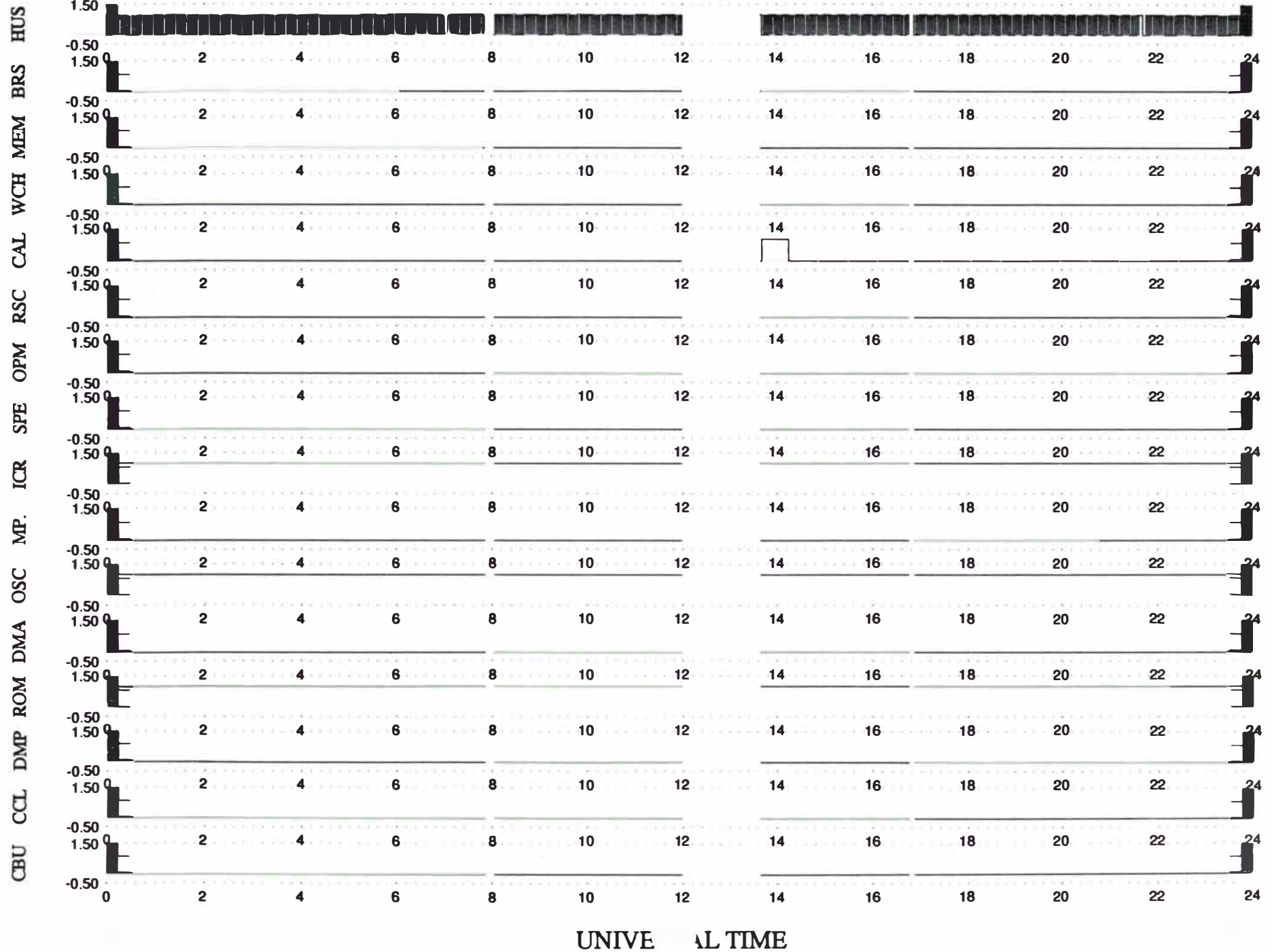
Data Start: 93/01/01, 0000:00

Plot created: 95/05/31, 2132

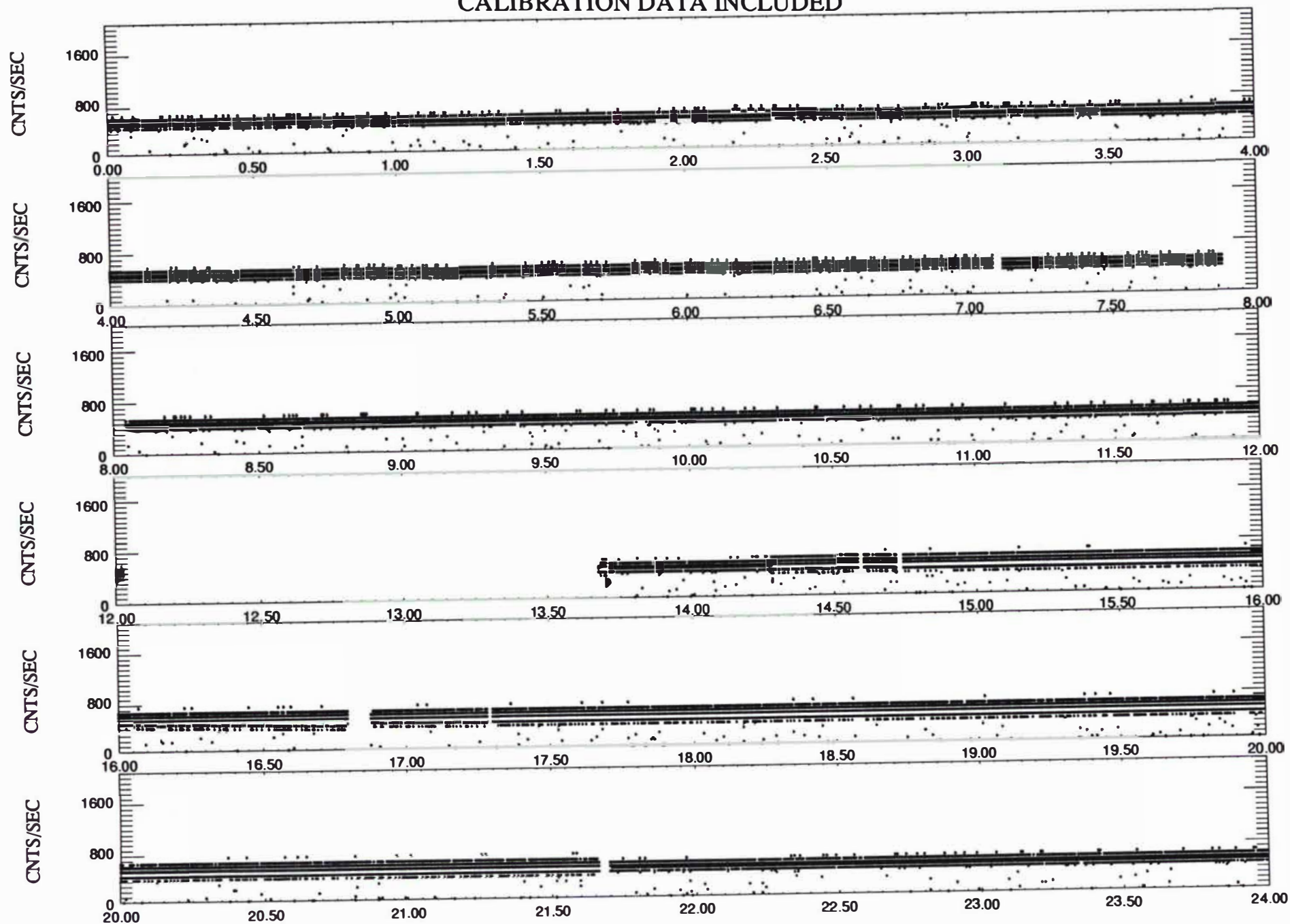
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

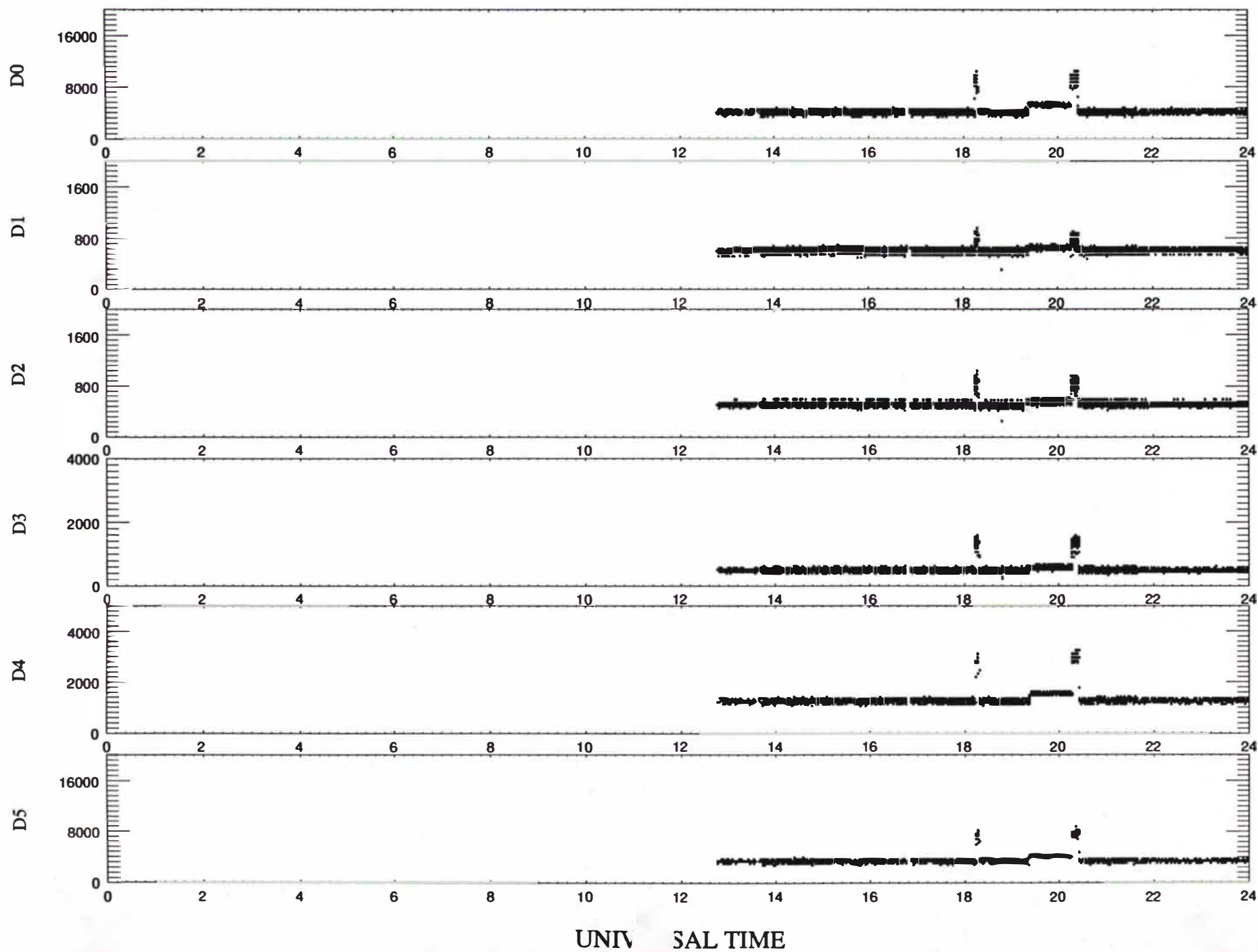
NO BURST (3)



CALIBRATION DATA INCLUDED



UNIV TIME



CATSEARCH PROGRAM

BATSE BURST # 2114
EVENT OF 1993 JAN 2 DAY OF YEAR= 2
EVENT CROSSING TIME AT BATSE : 40559. S. OR 11:15:59.2
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 220.800 9.400
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 2/ 1/ 93 IS:
RA= 165.431 DEC= -12.317 DIST= 4.665 AU
BATSE-ULYSSES DISTANCE = 697869040. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=120.86 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1193.97 SECS.
CROSSING TIME AT ULYSSES IS 39365. S. OR 10:56:05.2 +/- 378.81 SECONDS

NO

From BRIGGS@ssl.msfc.nasa.gov Sun Jan 3 13:43:05 1993
Date: Sun, 3 Jan 1993 15:47:29 -0600 (CST)
From: BRIGGS@ssl.msfc.nasa.gov (Michael S. Briggs, 205-544-7716, Code ES-64, M
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02114

TIME: TJD=8989 SECONDS=40559

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=41.8 AZIMUTH=49.5 ERROR= DEGREES

COMMENTS:

WEAK BURST OF ABOUT 8 SECONDS DURATION. BARELY VISIBLE ABOVE 300 KEV.

From BRIGGS@ssl.msfc.nasa.gov Sun Jan 3 13:54:33 1993
Date: Sun, 3 Jan 1993 15:59:12 -0600 (CST)
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
2114	930102	8989	40559	2800	228	+15

9 / 6 / 94

ULYSSES RT

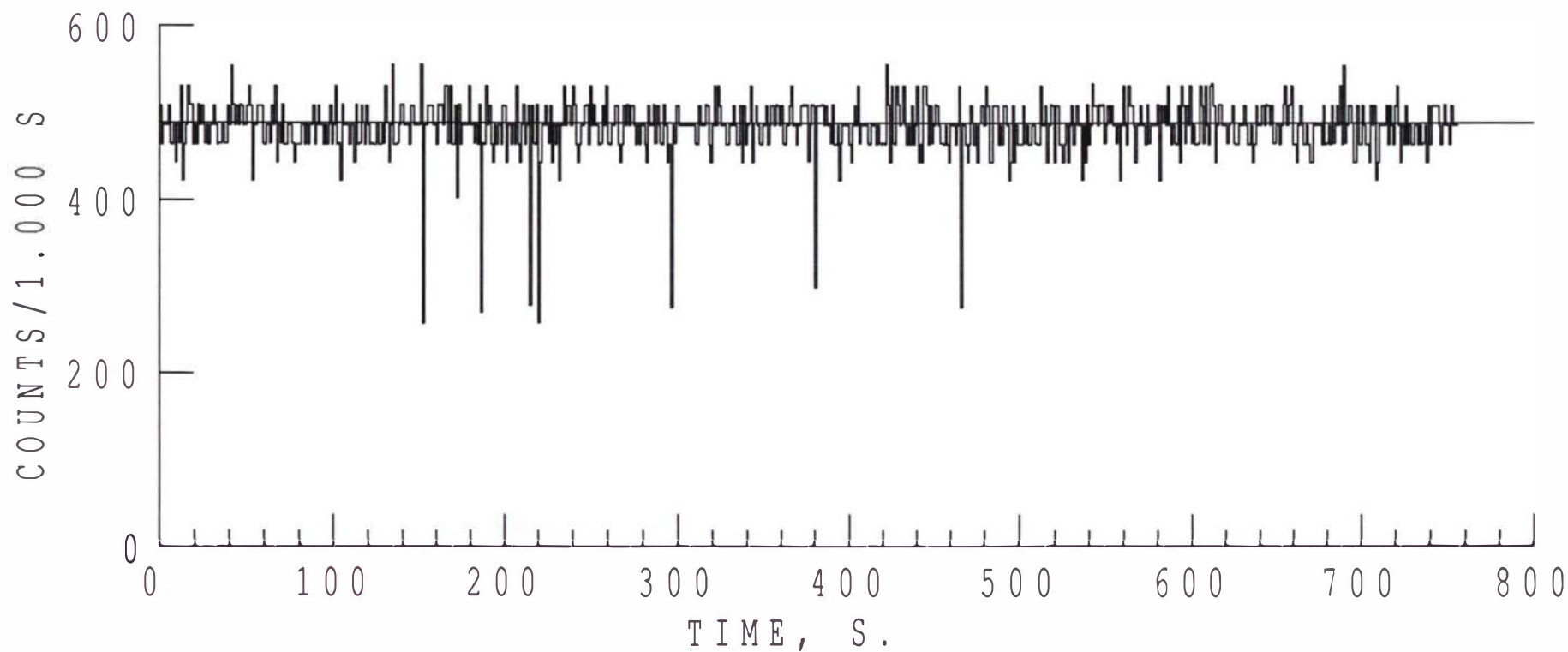
2 / 1 / 93 38988.055 s

0.500 S INTERVALS REGROUPED BY 2

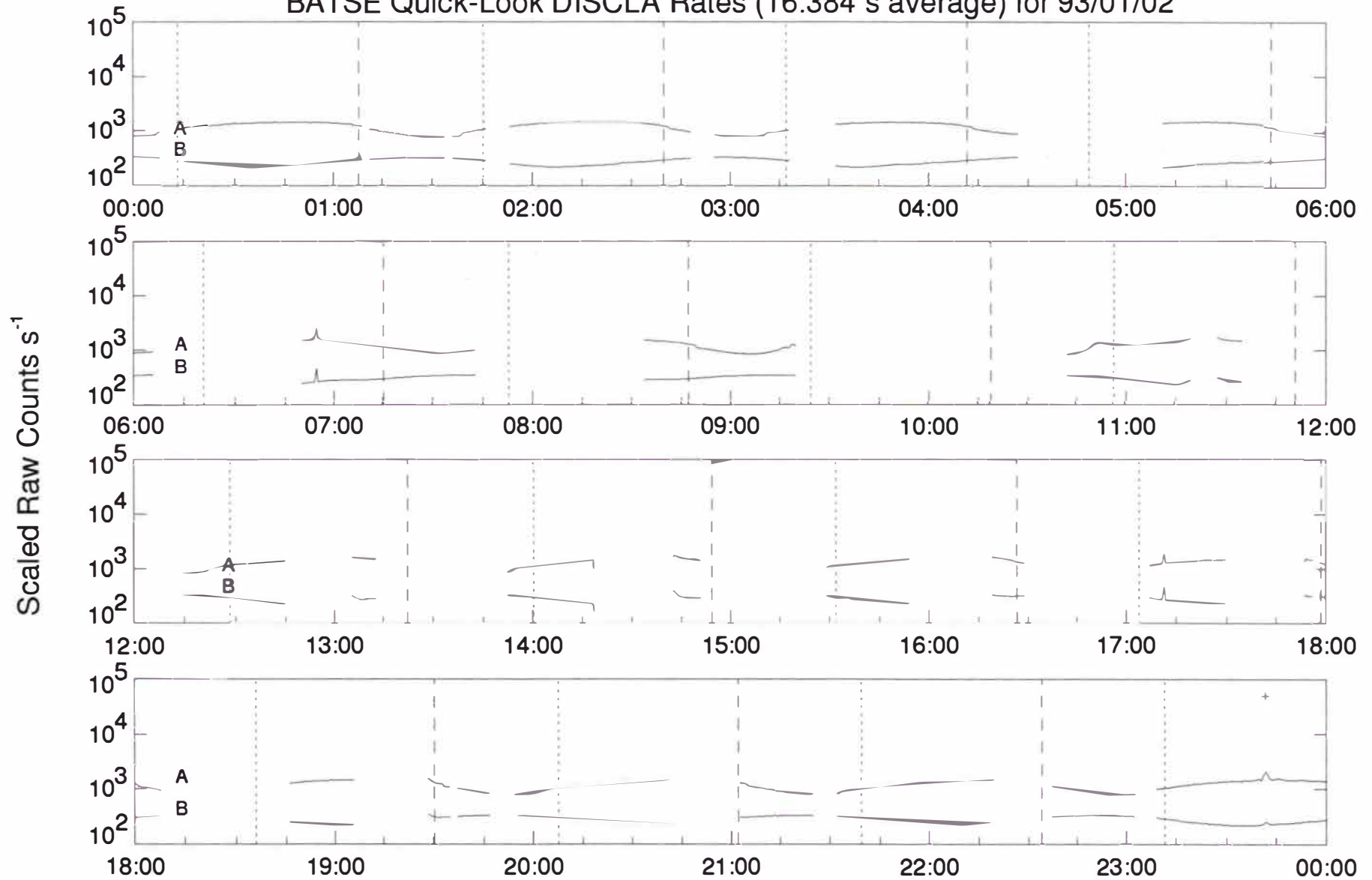
0 - 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



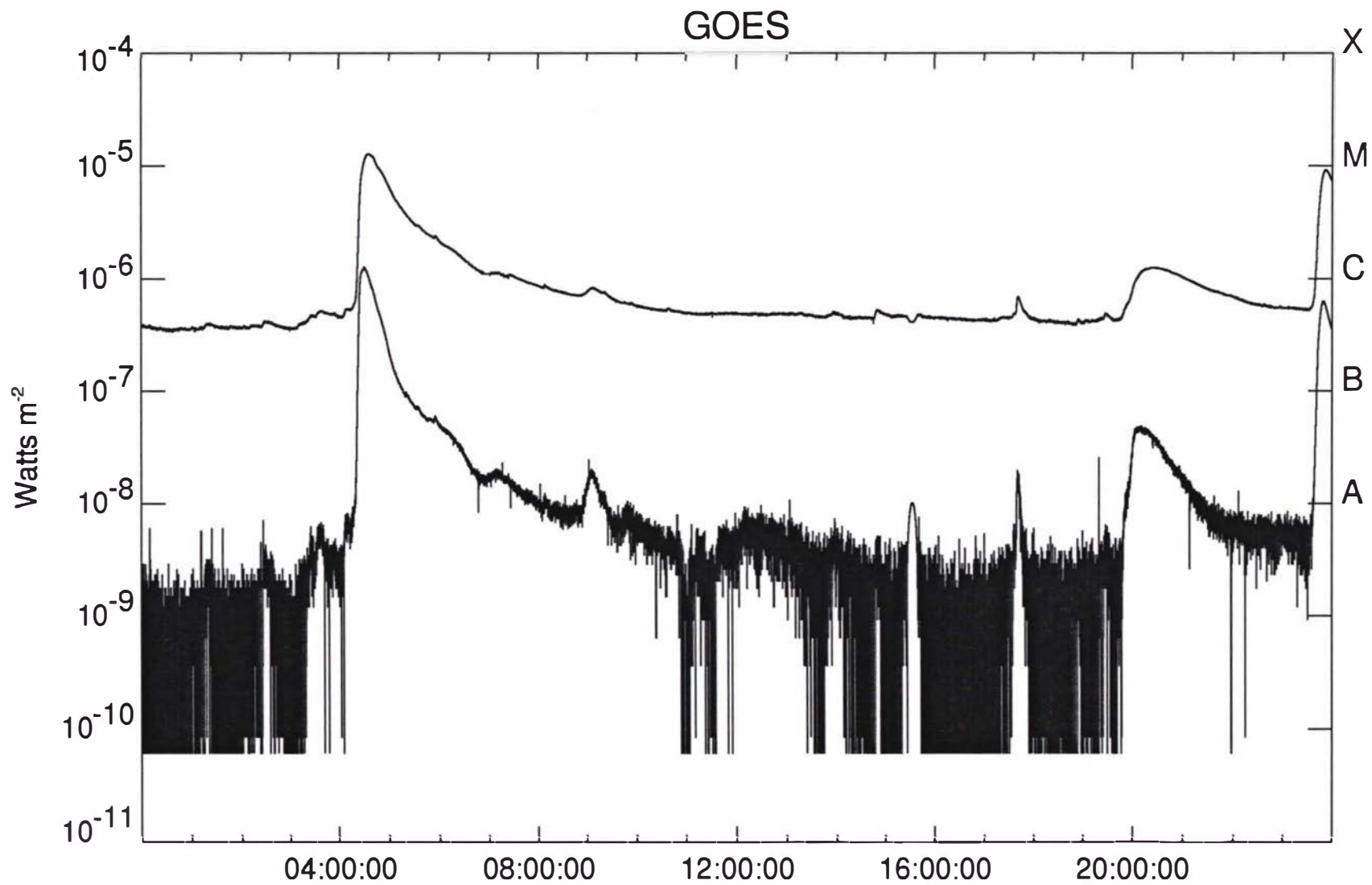
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/02



Current Time: 93/01/04, 1438 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



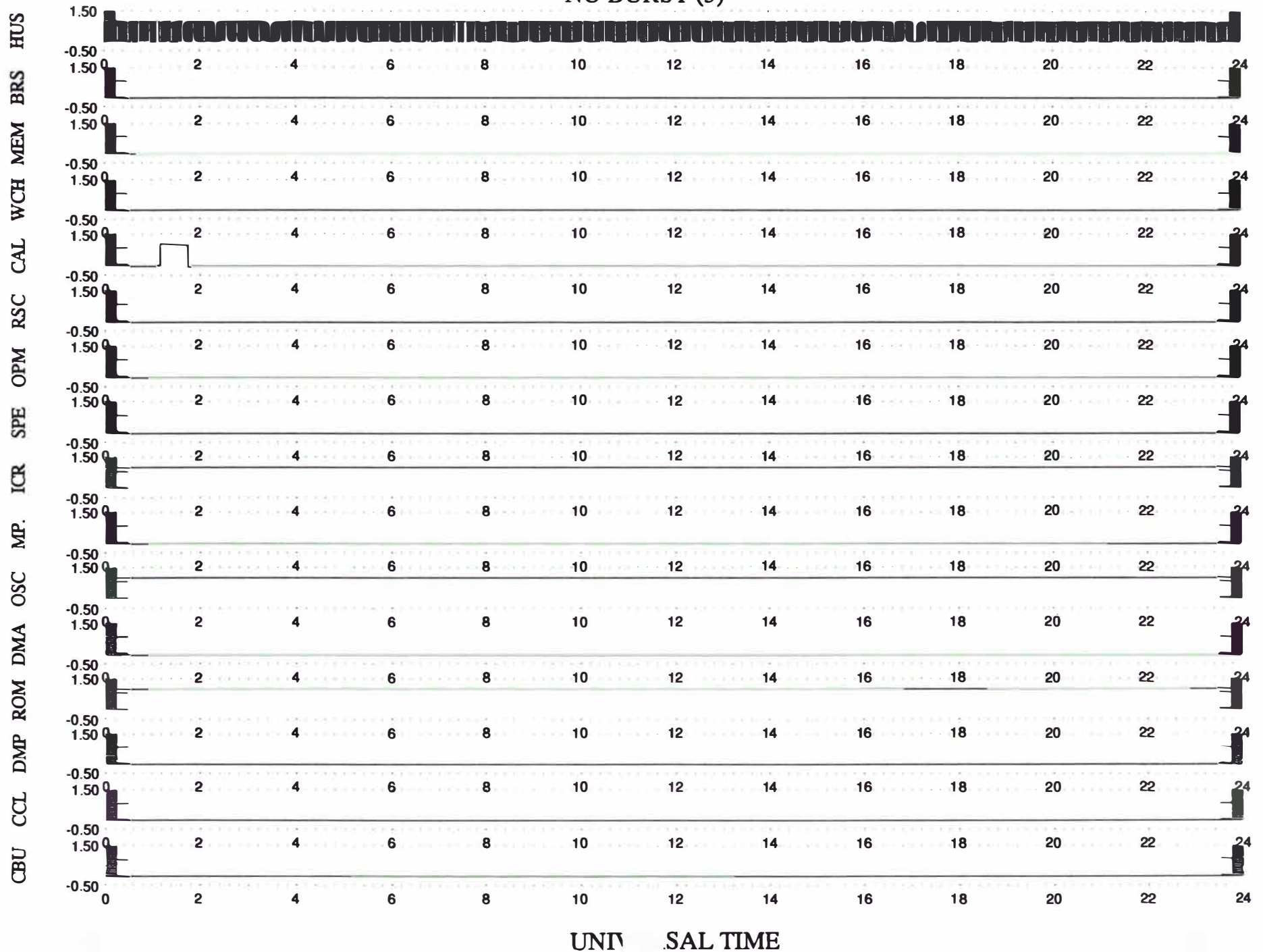
Data Start: 93/01/02, 0000:00

Plot created: 95/05/31, 2135

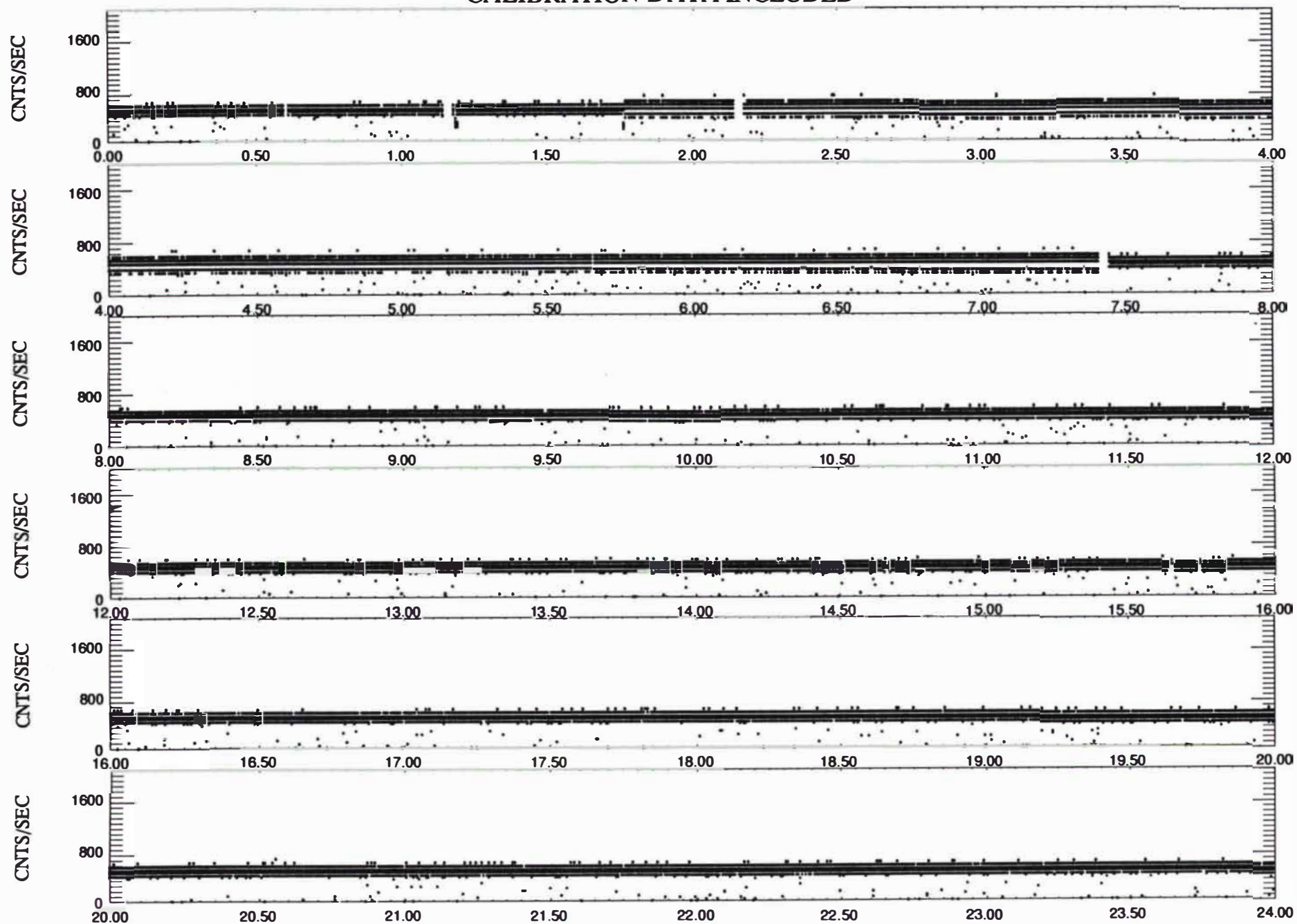
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

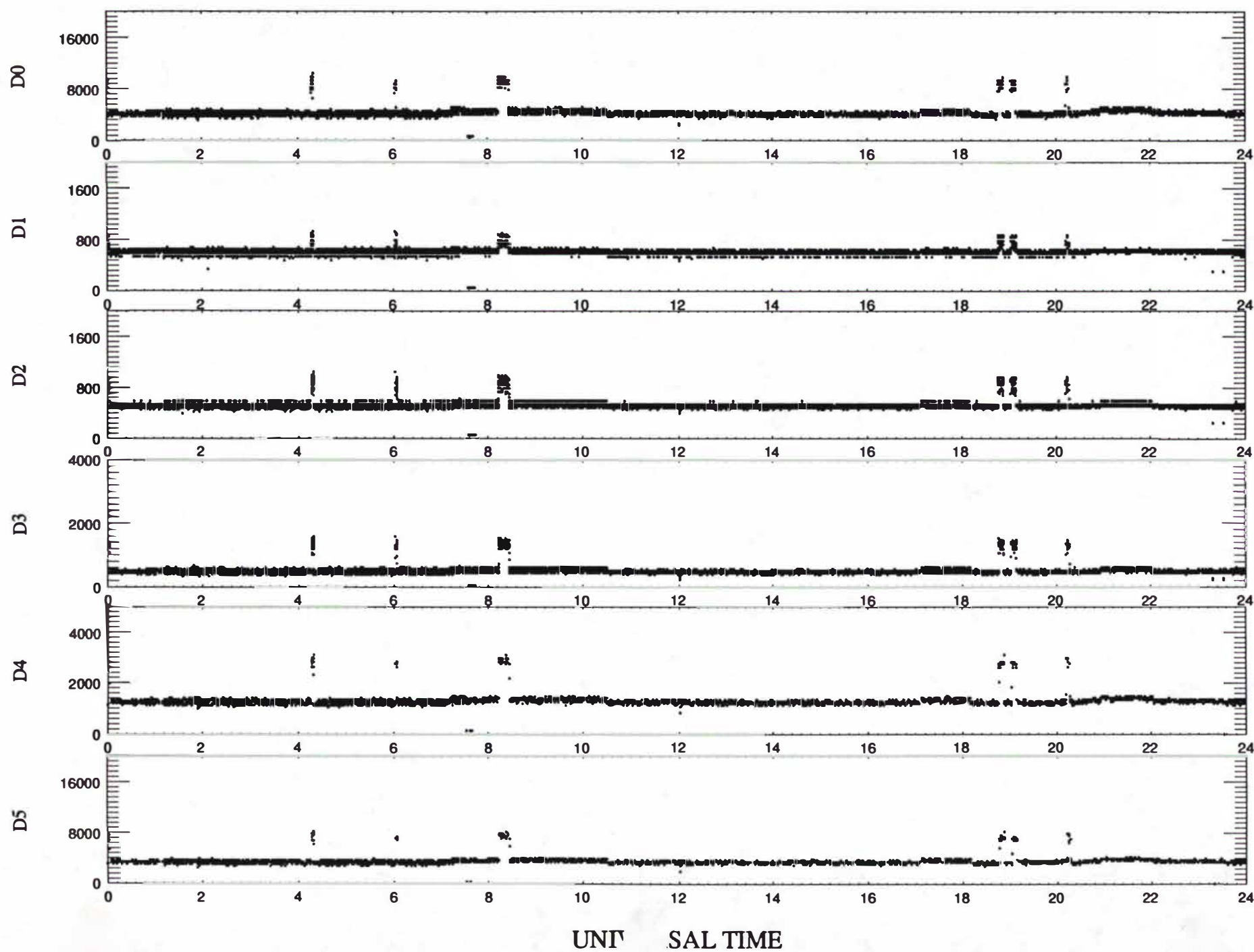
NO BURST (3)



CALIBRATION DATA INCLUDED



UNIV AL TIME



CATSEARCH PROGRAM

BATSE BURST # 2115

EVENT OF 1993 JAN 3 DAY OF YEAR= 3

EVENT CROSSING TIME AT BATSE : 4530. S. OR 01:15:30.0

COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)

BURST ARRIVAL DIRECTION: 203.600 2.000

BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND

POSITION OF ULYSSES ON 3/ 1/ 93 IS:

RA= 165.331 DEC= -12.404 DIST= 4.647 AU

BATSE-ULYSSES DISTANCE = 695251040. KM.

ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=139.36 DEG.

LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1759.78 SECS.

CROSSING TIME AT ULYSSES IS 2770. S. OR 00:46:10.2 +/- 285.51 SECONDS

100

From BHAT@ssl.msfc.nasa.gov Tue Jan 5 08:19:23 1993

Date: Tue, 5 Jan 1993 10:23:51 -0600 (CST)

From: BHAT@ssl.msfc.nasa.gov

Subject: Burst Trigger Message

To: igse@unhrcc.unh.edu, jryan@unhrcc.unh.edu, GROBAD@ESTEC.BITNET,
khurley@space6.ssl.berkeley.edu

X-Vmsmail-To: @mops\$send_msg:BURST_SPAN.DIS

Content-Length: 1377

BATSE BURST TRIGGER

NO.: 2115

TIME: TJD=8990 SECONDS=04529

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= 15.2 AZIMUTH= 18.3 ERROR= DEGREES

COMMENTS:

THIS IS SHORT BURST LASTING 0.45 S. THE LIGHT CURVE CONSISTS OF 2 NARROW PEAKS
SEPARATED BY 0.15 S WITH NO SIGNAL IN BETWEEN. THERE IS MARGINAL EVIDENCE FOR
SIGNAL BEING SEEN ABOVE 300 KEV UNDER THE SECOND PEAK.

From BHAT@ssl.msfc.nasa.gov Tue Jan 5 09:31:04 1993

Date: Tue, 5 Jan 1993 11:35:45 -0600 (CST)

From: BHAT@ssl.msfc.nasa.gov

Subject: BATSE burst

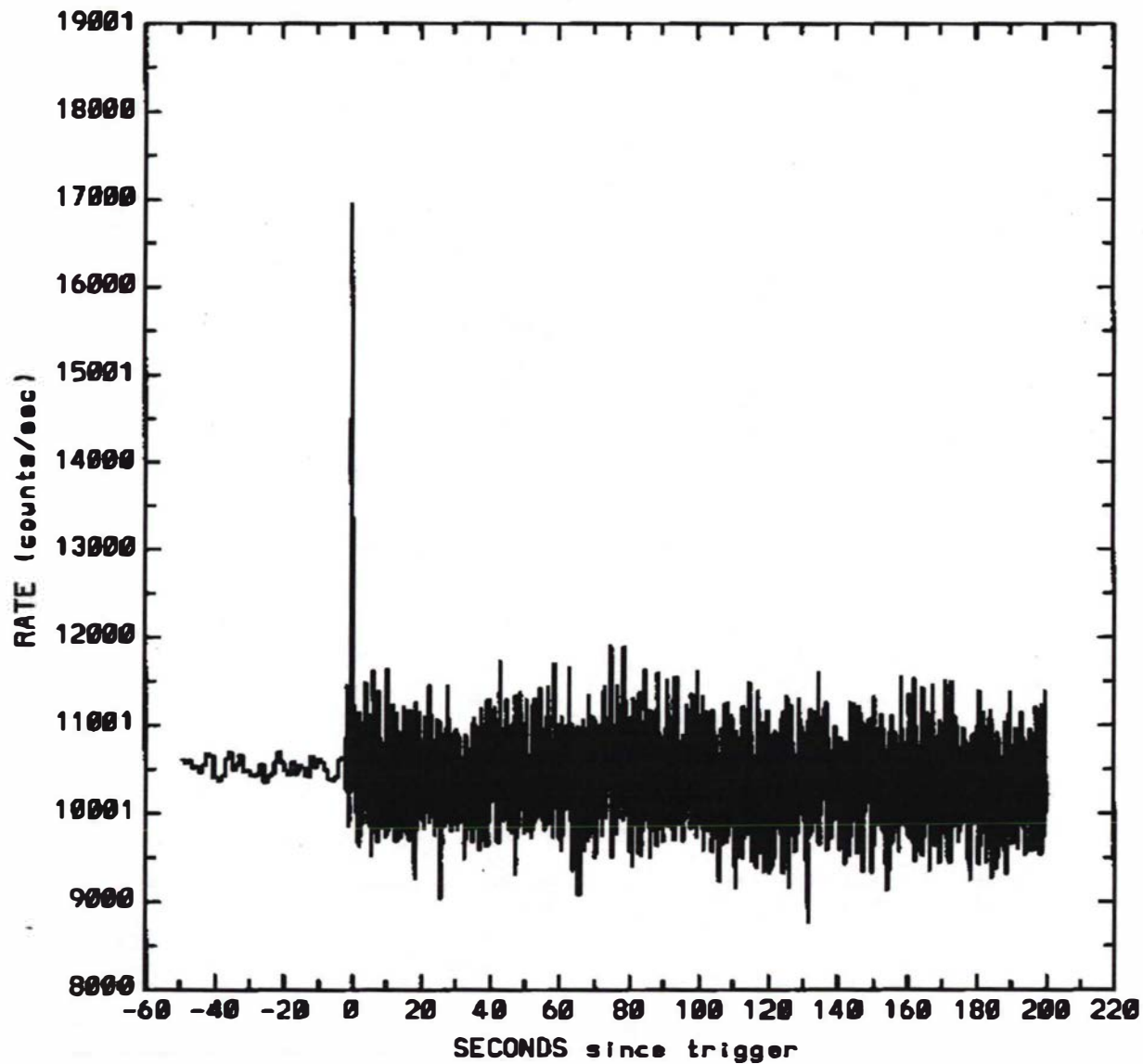
To: khurley@sunspot.ssl.berkeley.edu

X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU

Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2115	930103	8990	04529	12500	204	-03

Data for K. Hurley



23-MAR-1993 14.58.22

Created by MOPS 80
(Burst Display)
Version 2.18

Trigger # : 2115

Trigger Time:
8998 / 4529.986

Burst Data Type:
DISCSC

Deadtime
Corrected: N

Background Data
Type: PREB + DISCLA

Minimum Integ. Time:
0.064 seconds)

Detectors (7..0):
01010101

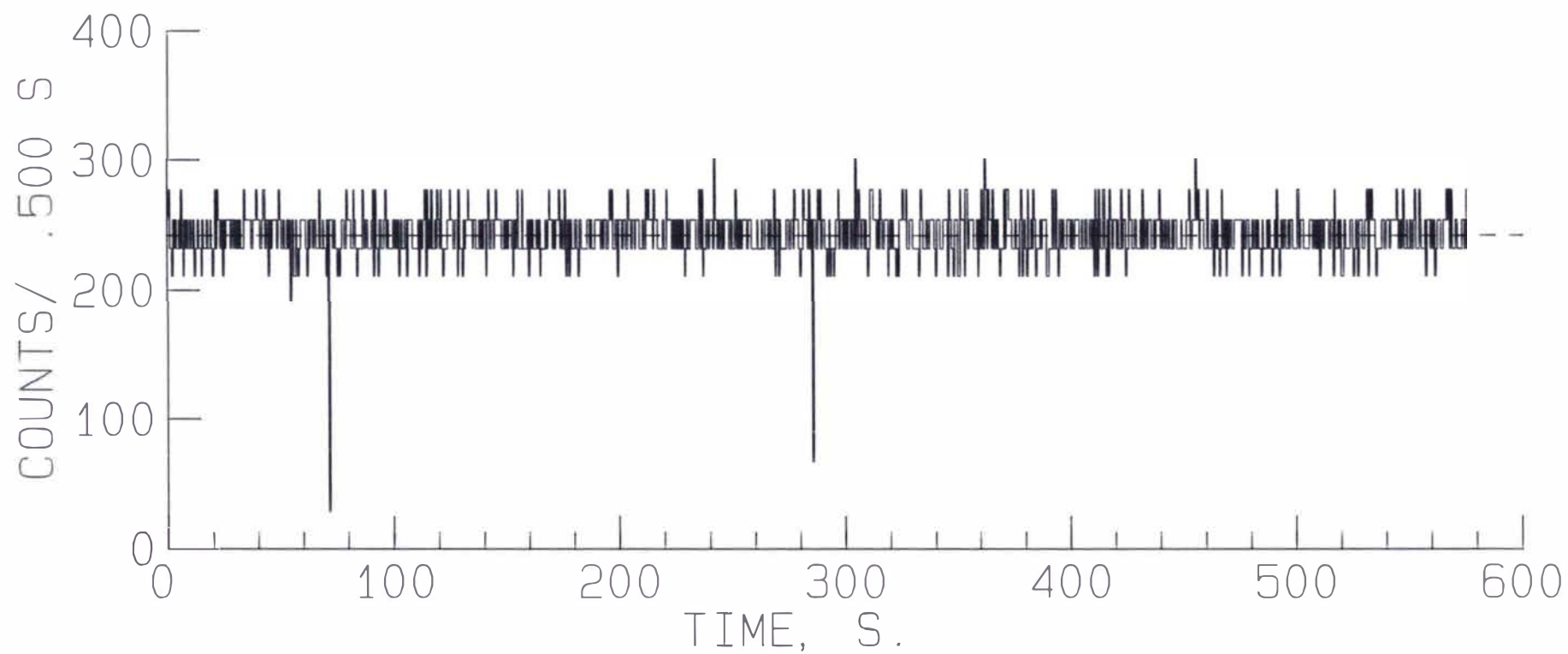
Discriminators:
1 1. 2)

Quality Mask:
BDISP1

11 / 1 / 93

ULYSSES RT
3/ 1/93 2448.341 s
0- 0 keV

N= 10 M= 1
>4.0 SIGMA FLUCTUATIONS



CATSEARCH PROGRAM

BATSE BURST # 2116
EVENT OF 1993 JAN 3 DAY OF YEAR= 3
EVENT CROSSING TIME AT BATSE : 13813. S. OR 03:50:13.1
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 195.800 22.000
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 3/ 1/ 93 IS:
RA= 165.331 DEC= -12.404 DIST= 4.647 AU
BATSE-ULYSSES DISTANCE = 695251040. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=134.43 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1623.42 SECS.
CROSSING TIME AT ULYSSES IS 12190. S. OR 03:23:09.7 +/- 312.88 SECONDS

NO

From BHAT@ssl.msfc.nasa.gov Tue Jan 5 08:27:10 1993
Date: Tue, 5 Jan 1993 10:31:33 -0600 (CST)
From: BHAT@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.unh.edu, GROBAD@ESTEC.BITNET,
khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops\$send_msg:BURST_SPAN.DIS
Content-Length: 1375

BATSE BURST TRIGGER

NO.: 2116

TIME: TJD=8990 SECONDS=13813

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=024.0 AZIMUTH=098.9 ERROR= DEGREES

COMMENTS:

A WEAK BURST LASTING FOR ABOUT 10 S. THE LIGHT CURVE CONSISTS OF TWO CLOSELY
SPECED PEAKS WHILE THE FIRST IS NARROWER THAN THE SECOND. SIGNAL IS SEEN ABOVE
300 KEV. THERE COULD BE A WEAK EMISSION AT ABOUT 30 S AFTER THE MAIN TRIGGER.

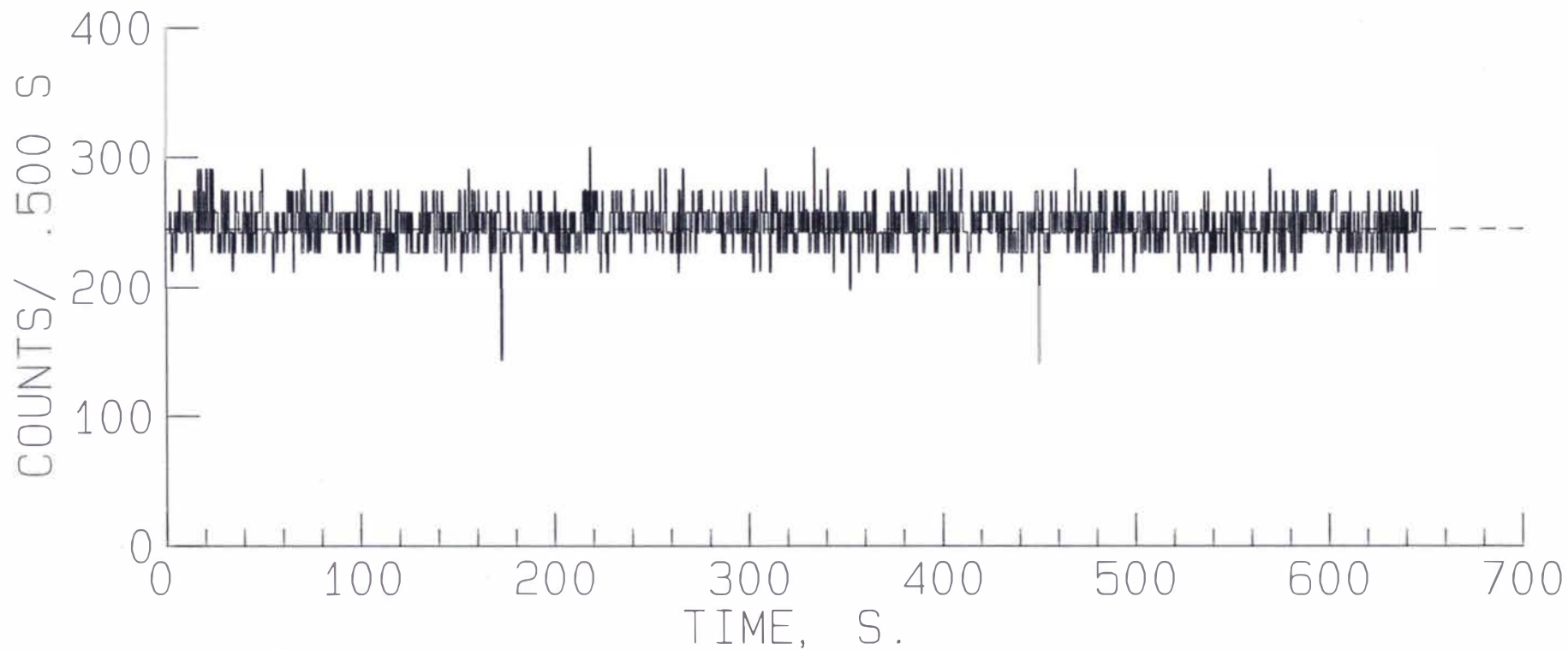
From BHAT@ssl.msfc.nasa.gov Tue Jan 5 09:36:54 1993
Date: Tue, 5 Jan 1993 11:41:37 -0600 (CST)
From: BHAT@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2116	930103	8990	13813	1800	196	+22

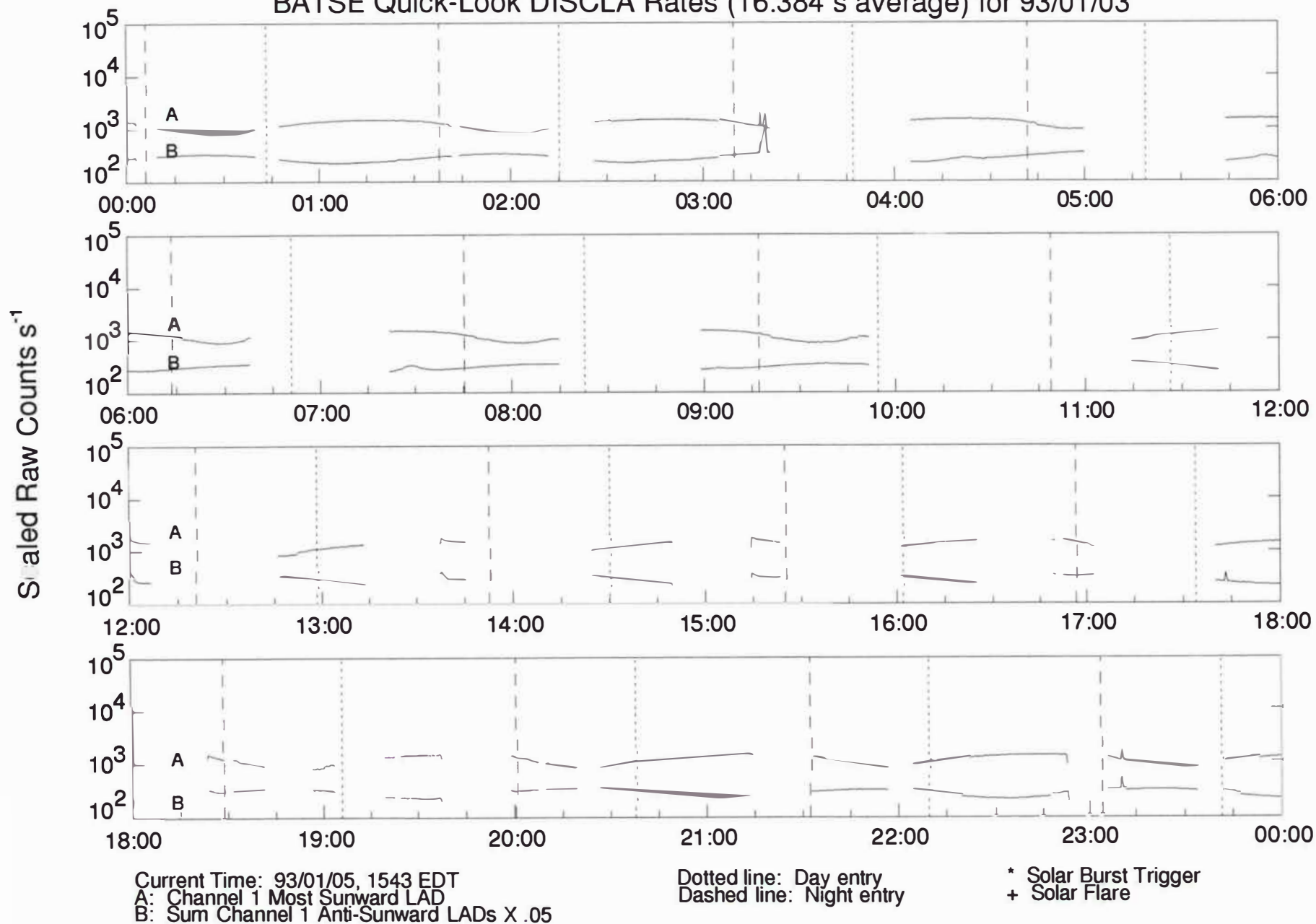
11 / 1 / 93

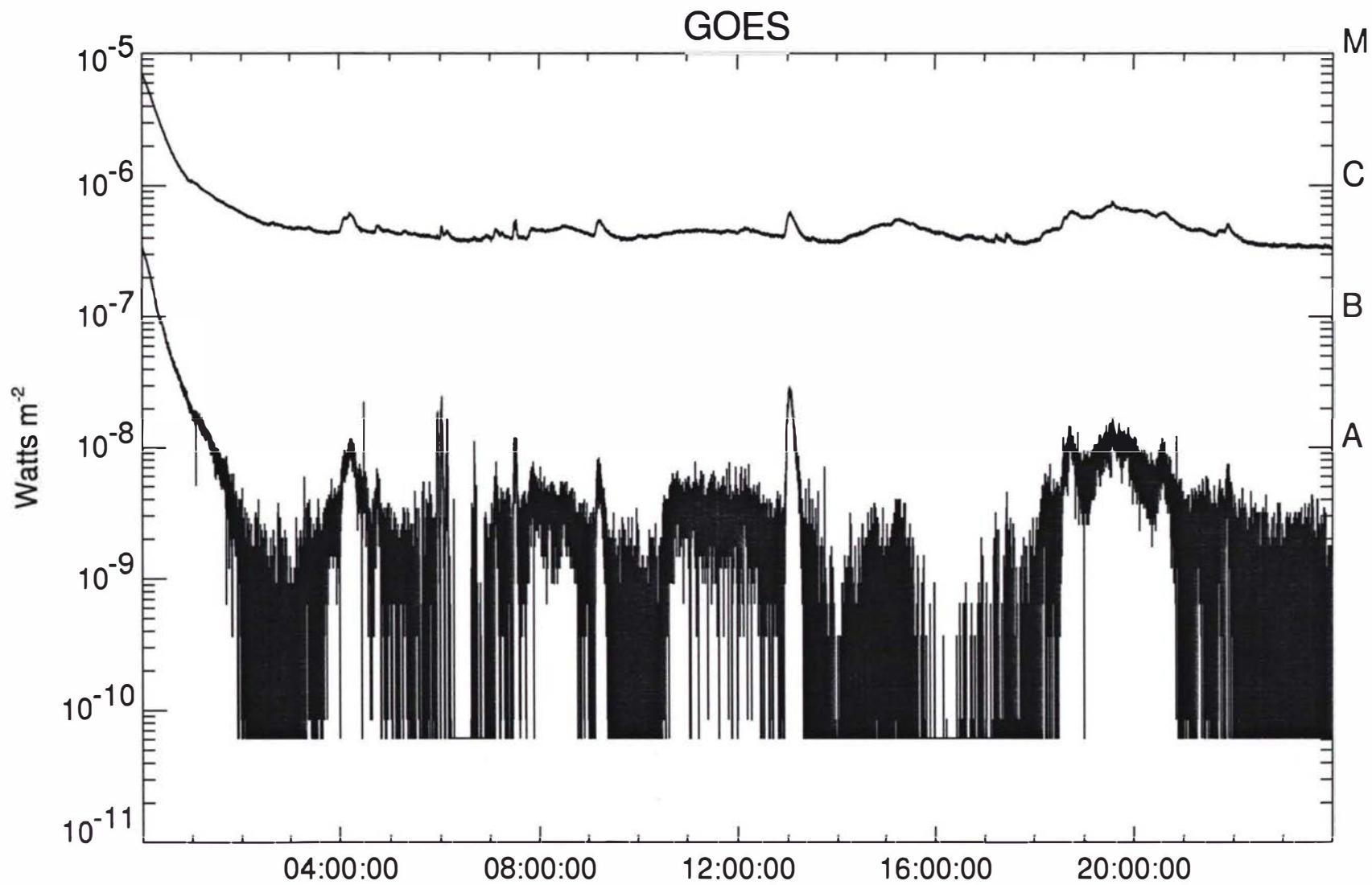
ULYSSES RT
3/ 1/93 11844.239 s
.250 S INTERVALS REGROUPED BY 2
0- 0 keV

N= 10 M=40
>4.0 SIGMA FLUCTUATIONS



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/03





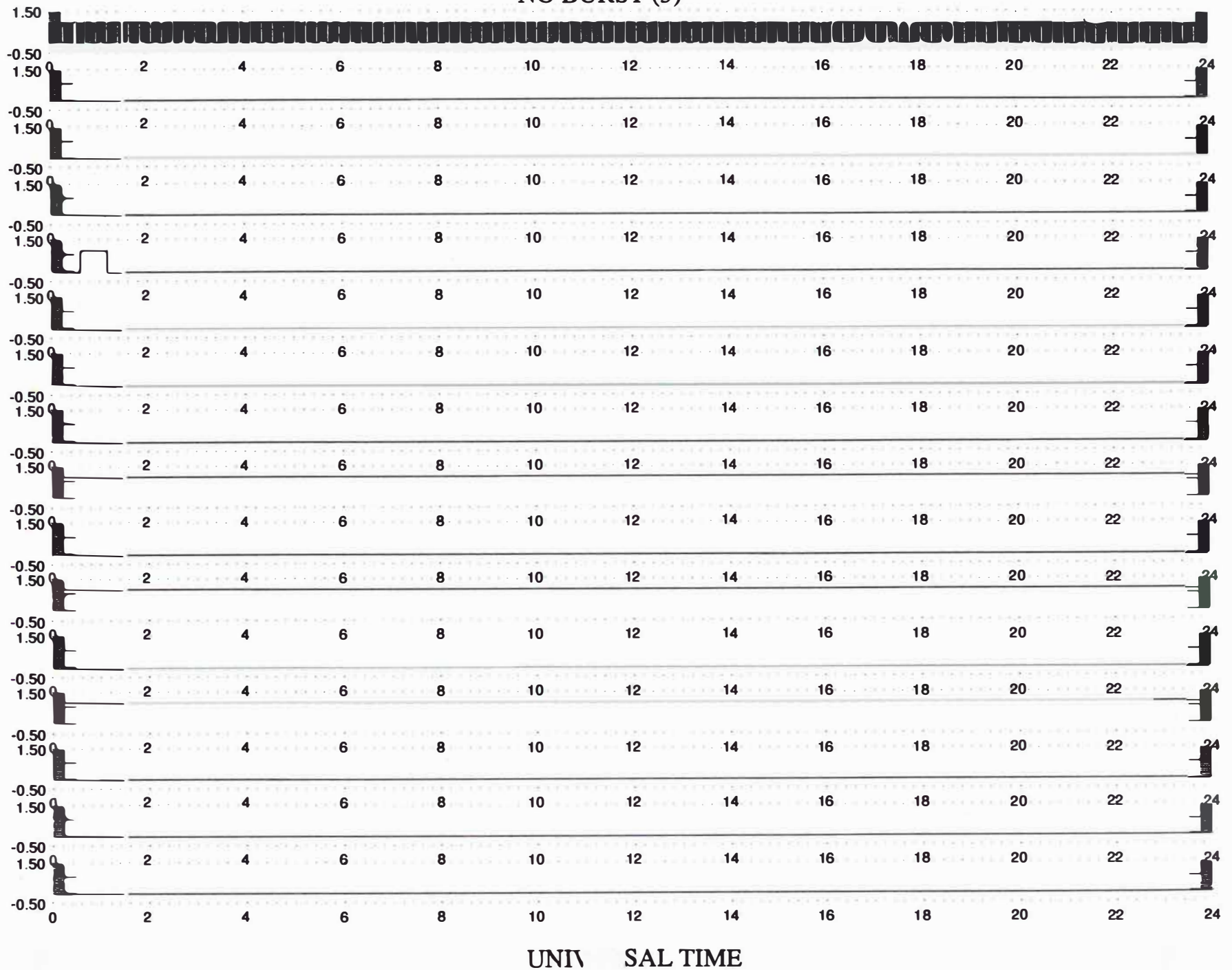
Data Start: 93/01/03, 0000:00

Plot created: 95/05/31, 2138

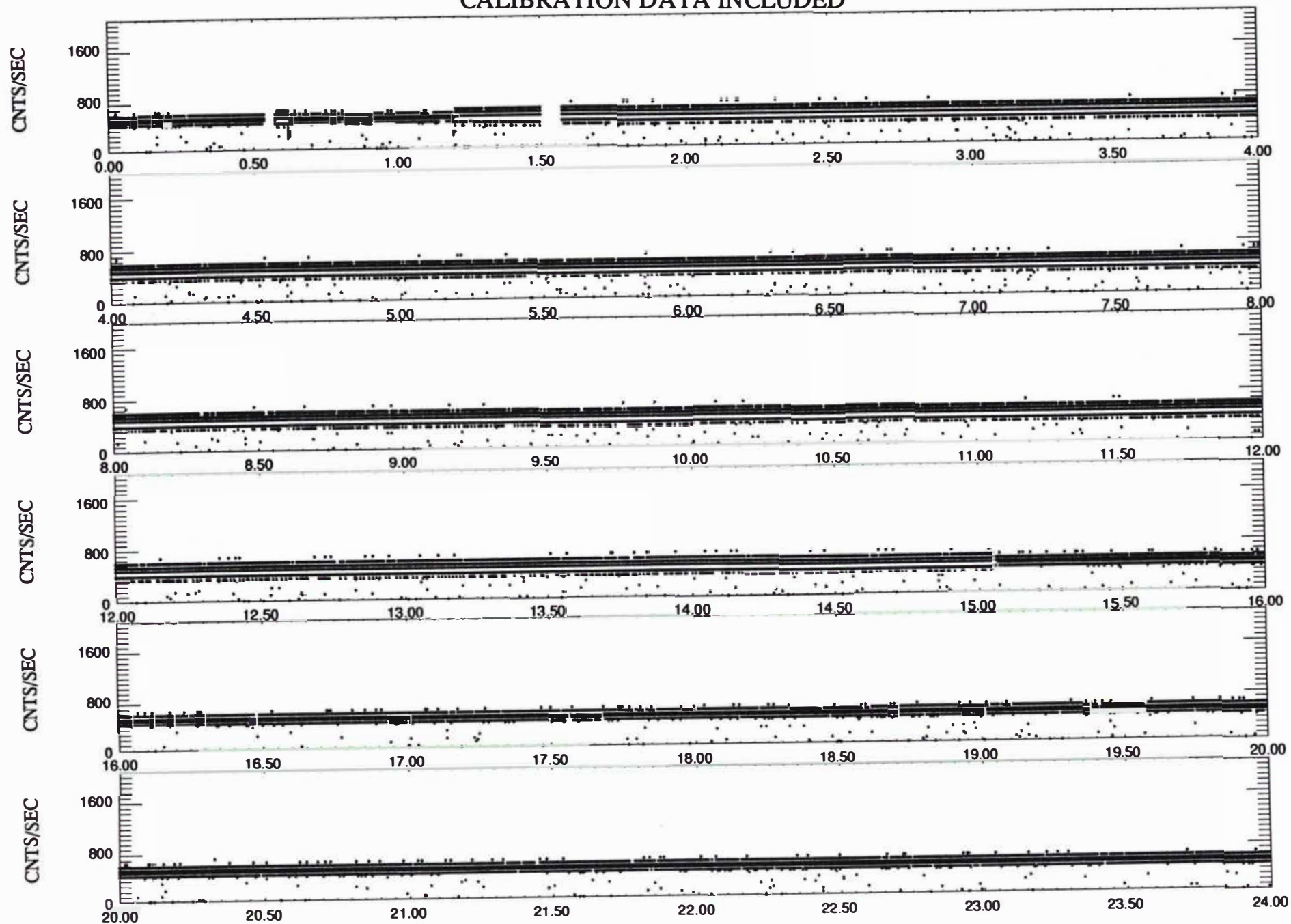
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

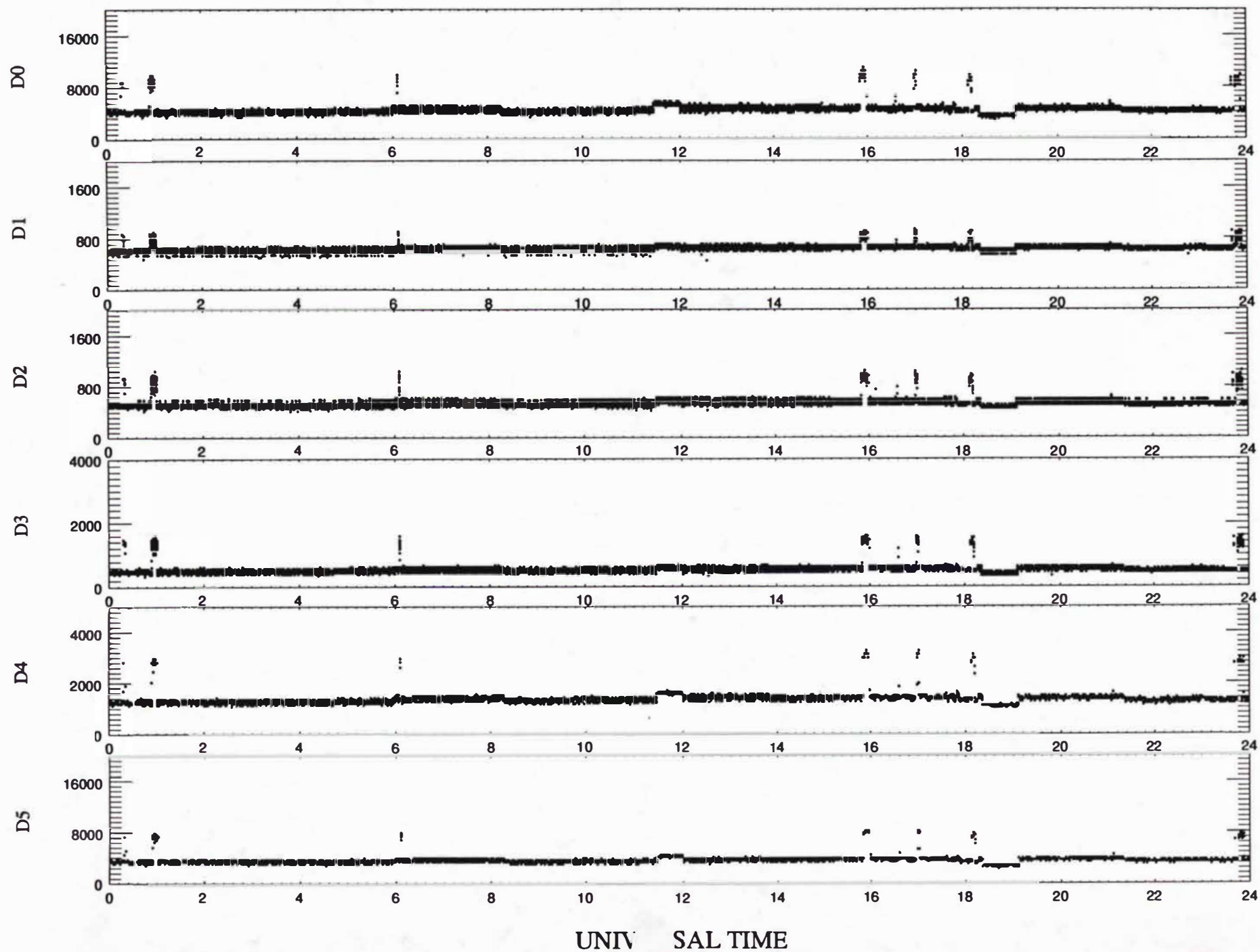
CBU CCL DMP ROM DMA OSC MP. ICR SPE OPM RSC CAL WCH MEM BRS HUS



CALIBRATION DATA INCLUDED



UNIV AL TIME



CATSEARCH PROGRAM

BATSE BURST # 2117
EVENT OF 1993 JAN 4 DAY OF YEAR= 4
EVENT CROSSING TIME AT BATSE : 3602. S. OR 01:00:01.8
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 8.300 8.600
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 4/ 1/ 93 IS:
RA= 165.227 DEC= -12.491 DIST= 4.630 AU
BATSE-ULYSSES DISTANCE = 692662960. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 23.00 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2126.73 SECS.
CROSSING TIME AT ULYSSES IS 5729. S. OR 01:35:28.5 +/- 239.06 SECONDS

No

From HAGEDON@fender.msfc.nasa.gov Wed Jan 6 09:54:32 1993
Date: Wed, 6 Jan 1993 11:57:56 -0600 (CST)
From: HAGEDON@fender.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02117

Jan 4
TIME: TJD=8991 SECONDS=03601

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=172. AZIMUTH=136. ERROR= DEGREES

COMMENTS:

BURST. WEAK SPIKE. DUR.~1S. POSSIBLE 2ND SPIKE AT ~T+190S.
FIRST SPIKE BARELY VISIBLE ABOVE 300KEV.

From HAGEDON@ssl.msfc.nasa.gov Wed Jan 6 10:05:40 1993
Date: Wed, 6 Jan 1993 12:10:25 -0600 (CST)
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
2117	930104	8991	03601	2500	012	+09

CATSEARCH PROGRAM

.TSE BURST # 2117
EVENT OF 1993 JAN 4 DAY OF YEAR= 4
EVENT CROSSING TIME AT BATSE : 3602. S. OR 01:00:01.7
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 85.840 37.260
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 4/ 1/ 93 IS:
RA= 165.227 DEC= -12.491 DIST= 4.630 AU
BATSE-ULYSSES DISTANCE = 692671936. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 90.70 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -28.11 SECS.
CROSSING TIME AT ULYSSES IS 3574. S. OR 00:59:33.6 +/- 450.68 SECONDS

9 / 11 / 95

ULYSSES RT

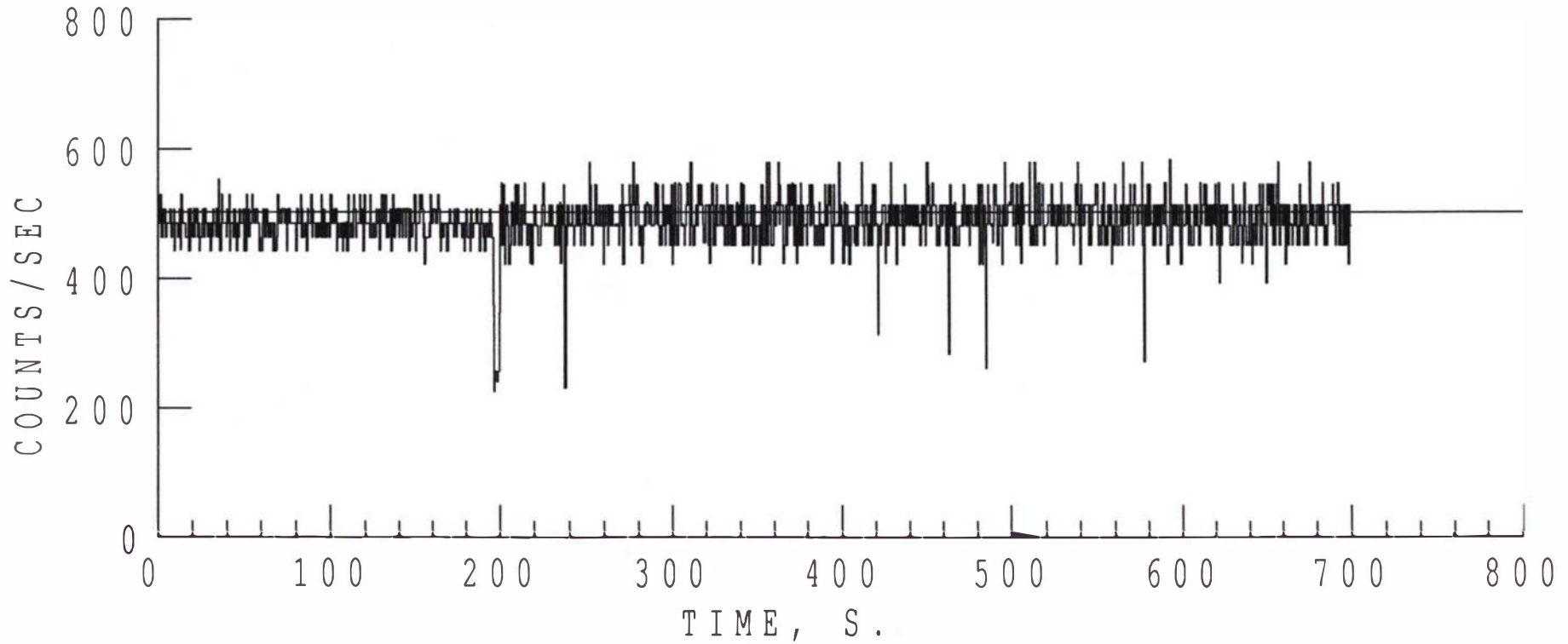
4 / 1 / 93 3132.205 s

0.250 S INTERVALS REGROUPED BY 2

0 - 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



 CATSEARCH PROGRAM

BATSE BURST # 2118
 EVENT OF 1993 JAN 4 DAY OF YEAR= 4
 EVENT CROSSING TIME AT BATSE : 39827. S. OR 11:03:47.1
 COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 310.100 32.400
 BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
 POSITION OF ULYSSES ON 4/ 1/ 93 IS:
 RA= 165.227 DEC= -12.491 DIST= 4.630 AU
 BATSE-ULYSSES DISTANCE = 692662960. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 37.80 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1825.52 SECS.
 CROSSING TIME AT ULYSSES IS 41653. S. OR 11:34:12.6 +/- 323.61 SECONDS

100

From HAGEDON@fender.msfc.nasa.gov Wed Jan 6 09:56:51 1993
 Date: Wed, 6 Jan 1993 12:00:19 -0600 (CST)
 From: HAGEDON@fender.msfc.nasa.gov
 Subject: Burst Trigger Message
 To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02118

Jan 4
 TIME: TJD=8991 SECONDS=39827

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=116. AZIMUTH=61. ERROR= DEGREES

COMMENTS:

BURST. SINGLE PULSE. DUR.~10S. NOT VISIBLE ABOVE 300KEV.

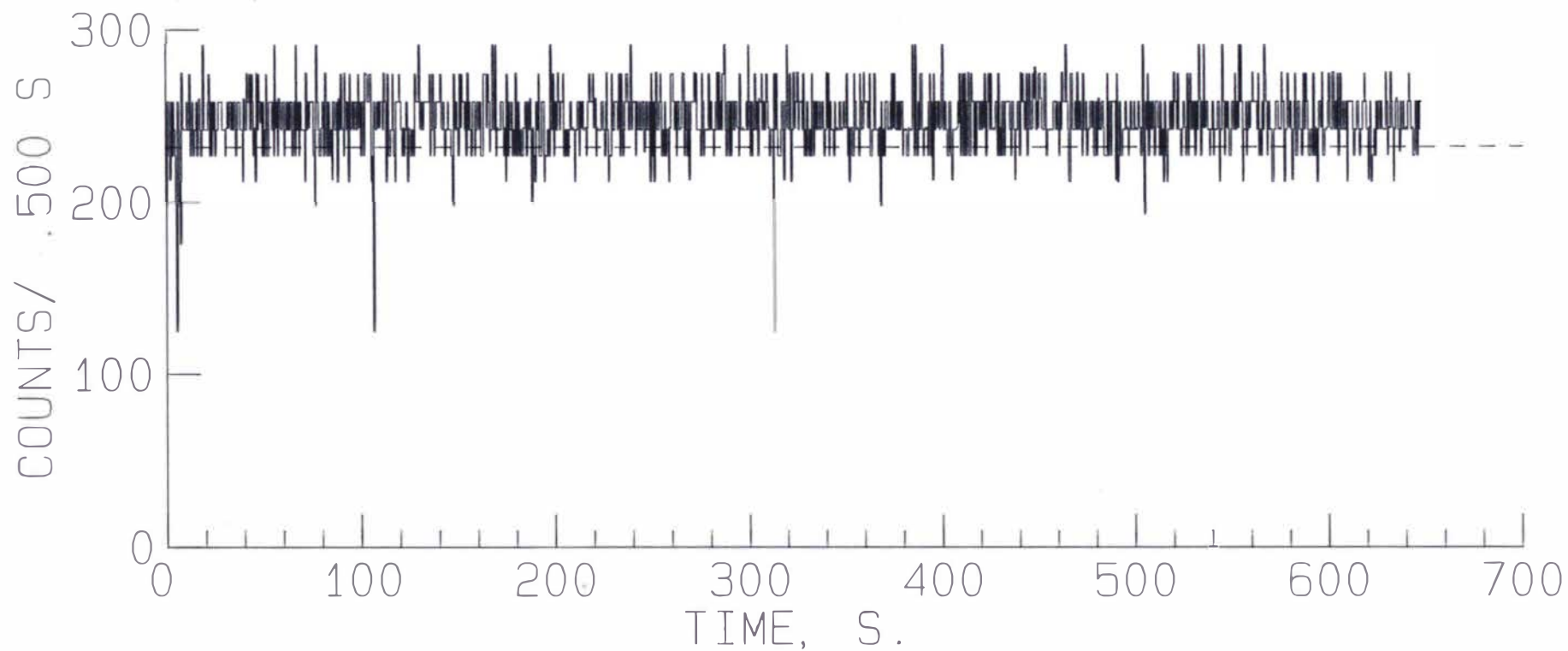
From HAGEDON@ssl.msfc.nasa.gov Wed Jan 6 10:09:30 1993
 Date: Wed, 6 Jan 1993 12:14:17 -0600 (CST)
 From: HAGEDON@ssl.msfc.nasa.gov
 Subject: BATSE burst
 To: khurley@sunspot.ssl.berkeley.edu
 X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
 Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2118	930104	8991	39827	1700	310	+32

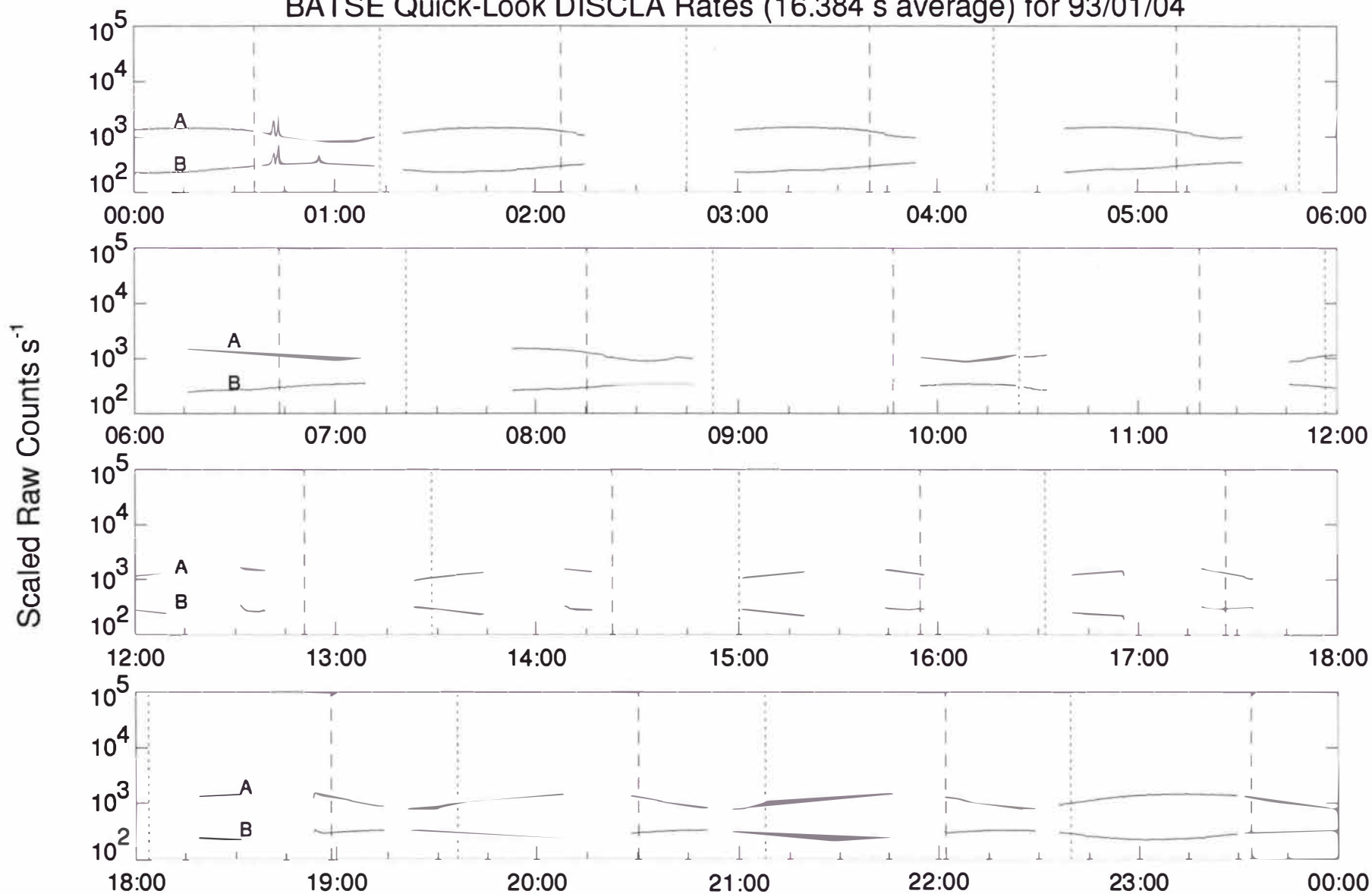
11 / 1 / 93

ULYSSES RT
4 / 1 / 93 41328.055 s
.250 S INTERVALS REGROUPED BY 2
0 - 0 keV

N= 10 M=40
>4.0 SIGMA FLUCTUATIONS



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/04

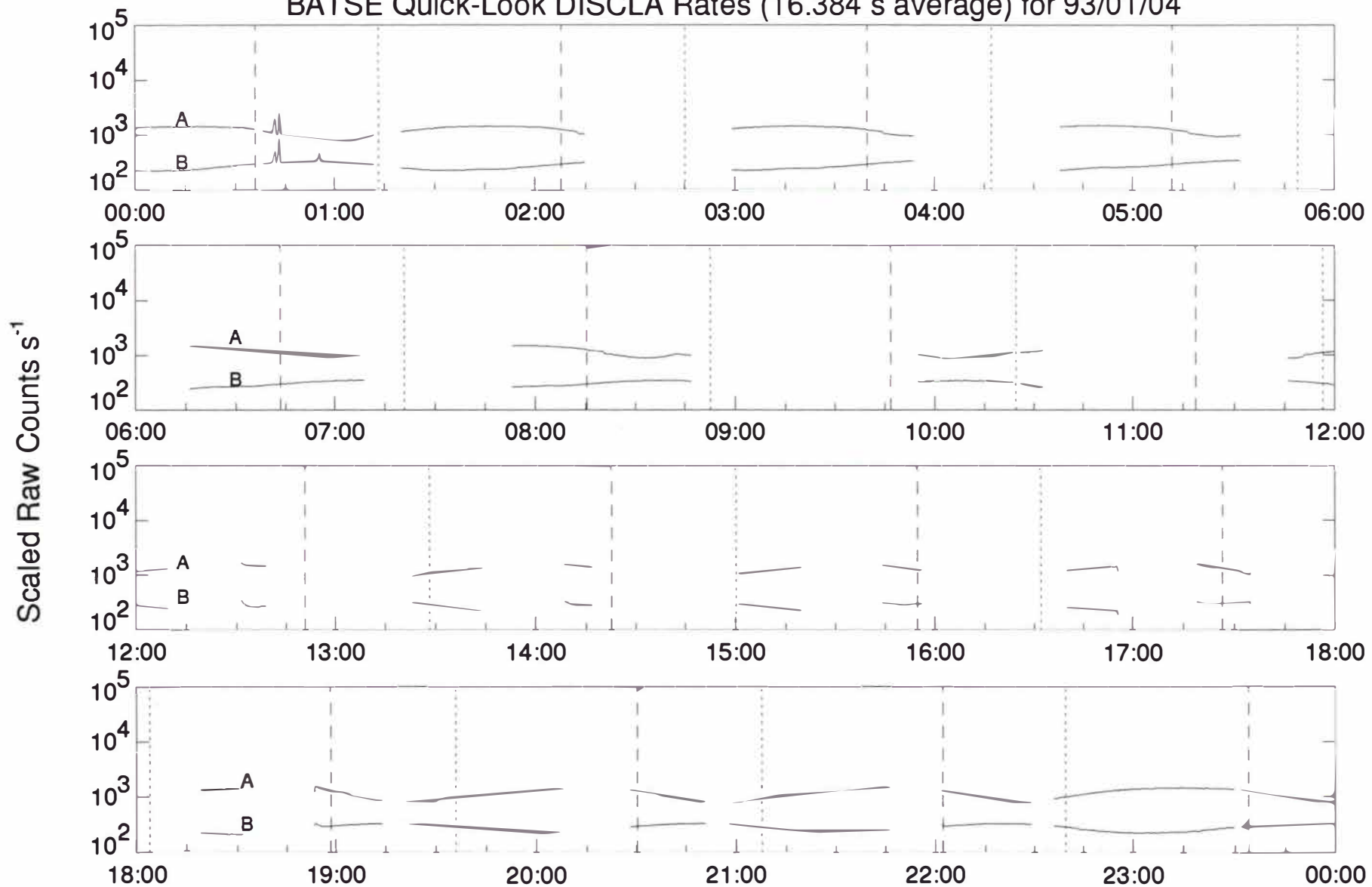


Current Time: 93/01/11, 1551 EDT
 A: Channel 1 Most Sunward LAD
 B: Sum Channel 1 Anti-Sunward LADs X .05

Dotted line: Day entry
 Dashed line: Night entry

* Solar Burst Trigger
 + Solar Flare

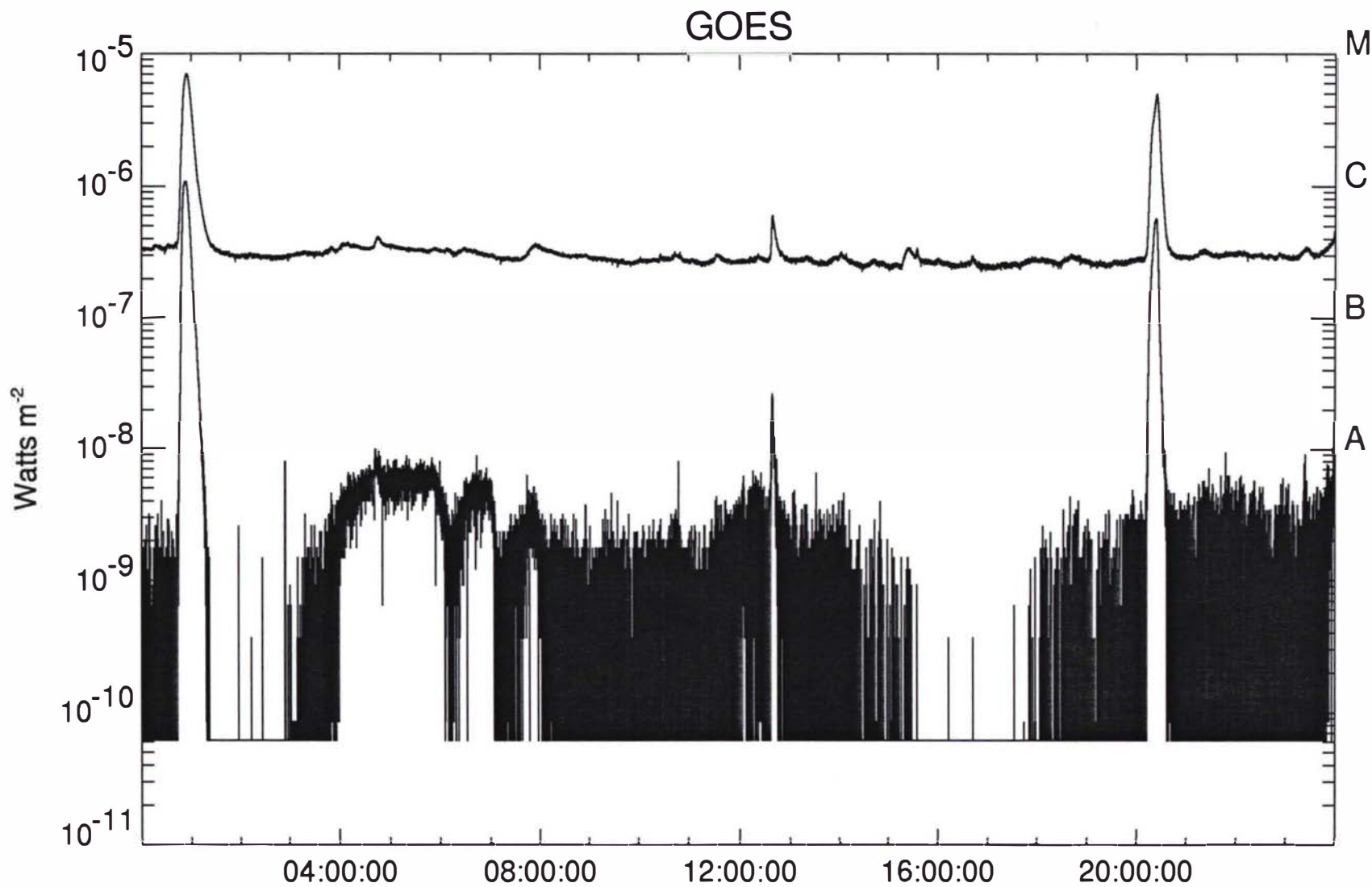
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/04



Current Time: 93/01/11, 1551 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



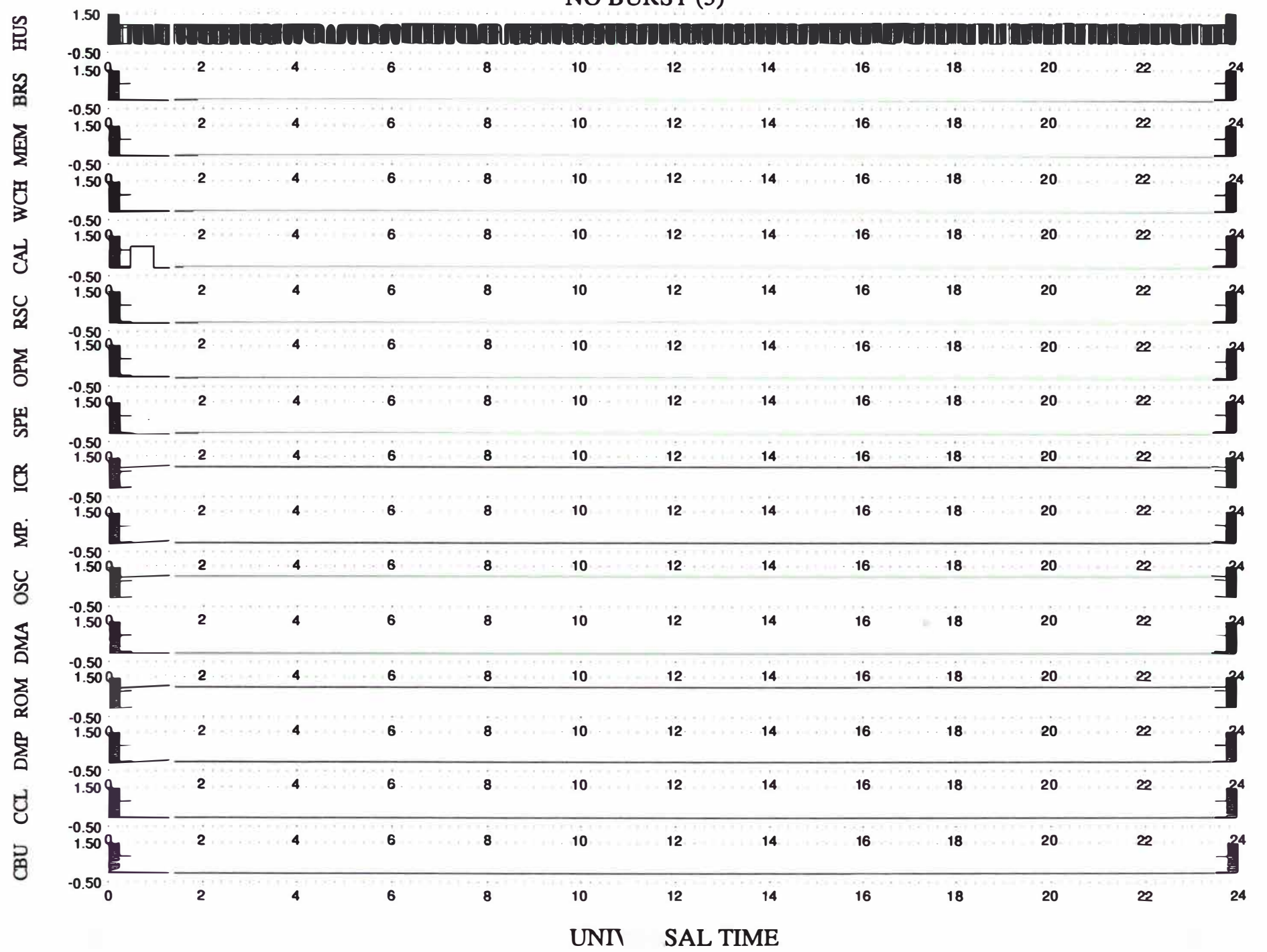
Data Start: 93/01/04, 0000:00

Plot created: 95/05/31, 2140

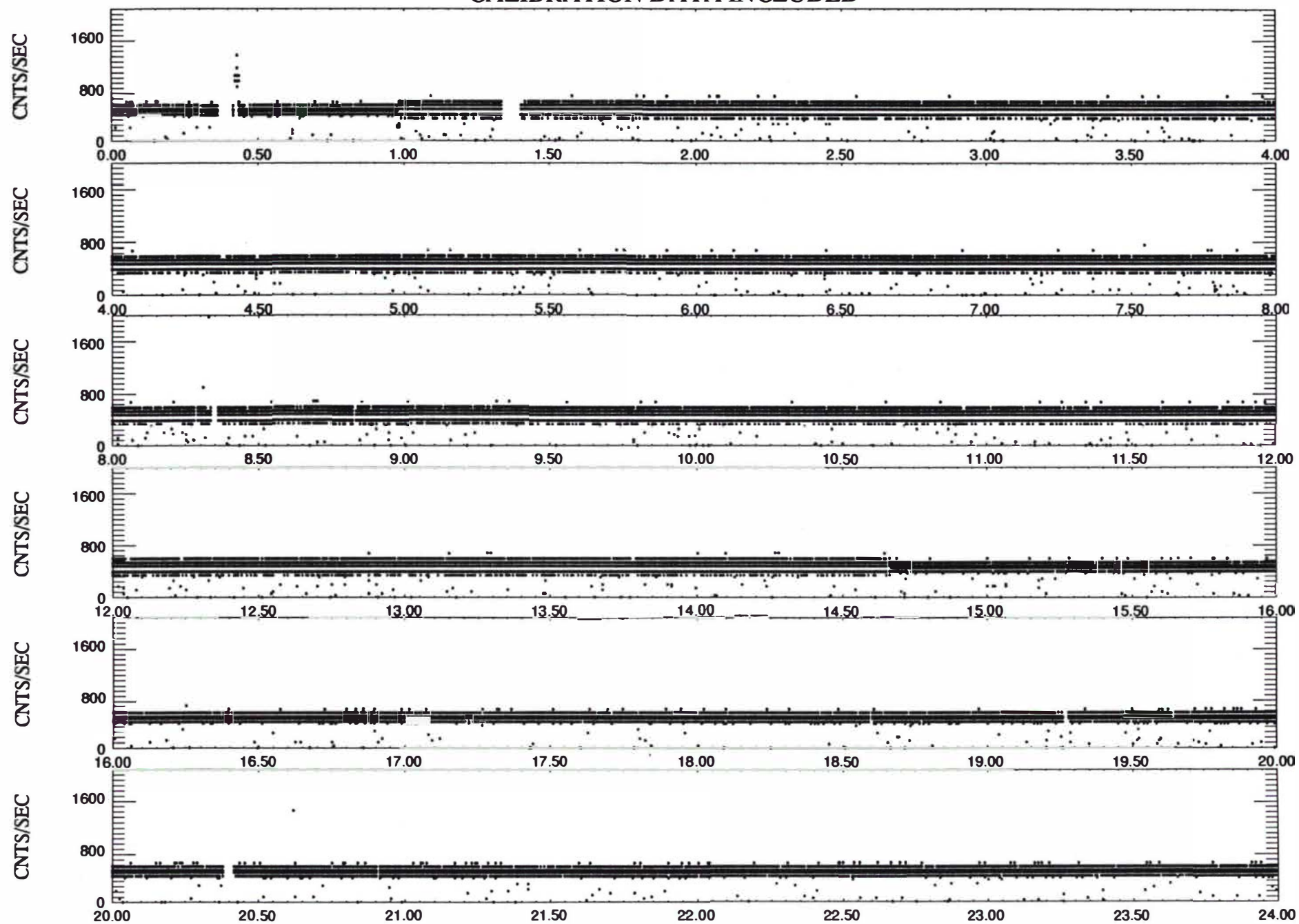
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

NO BURST (3)

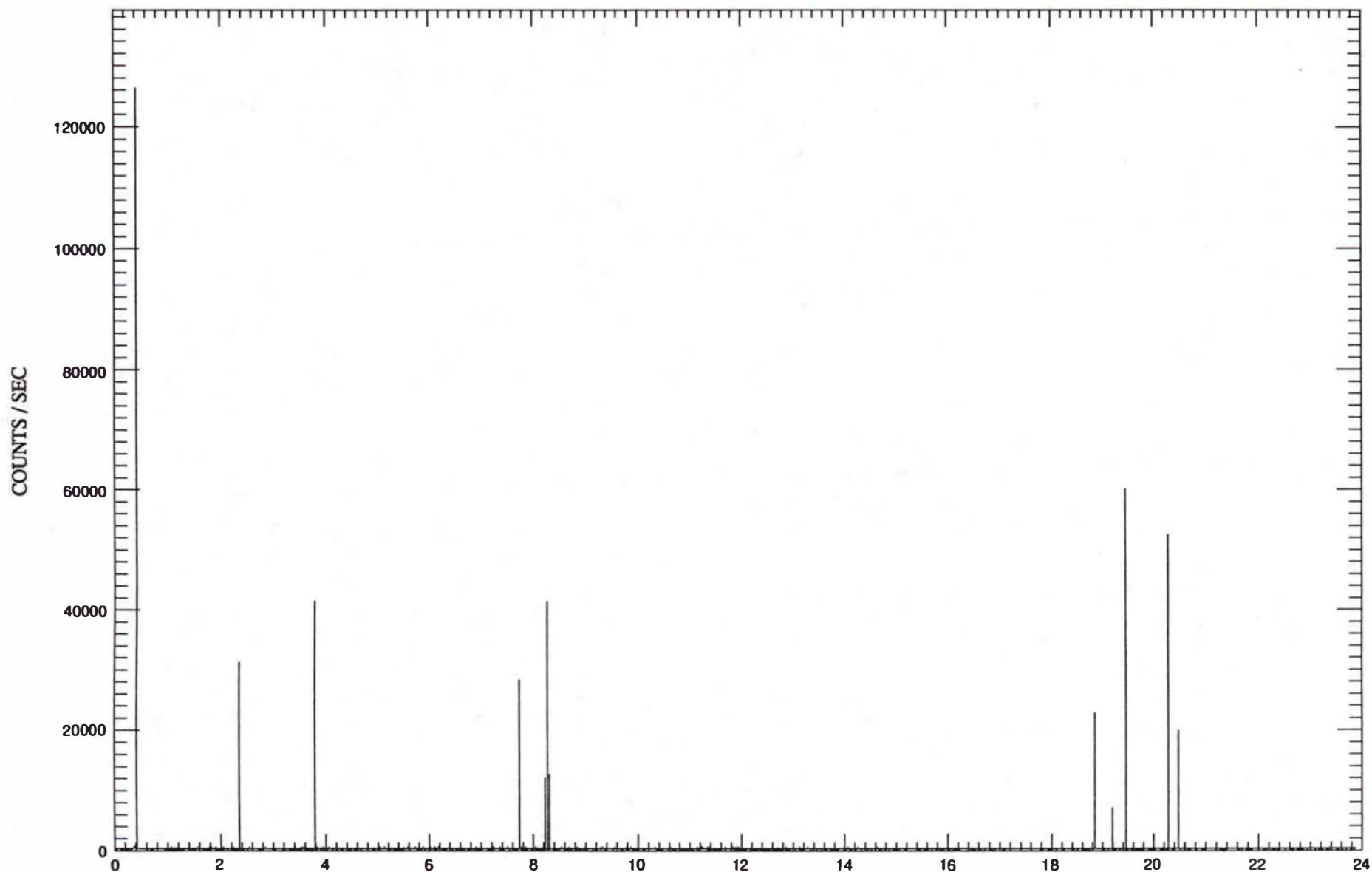


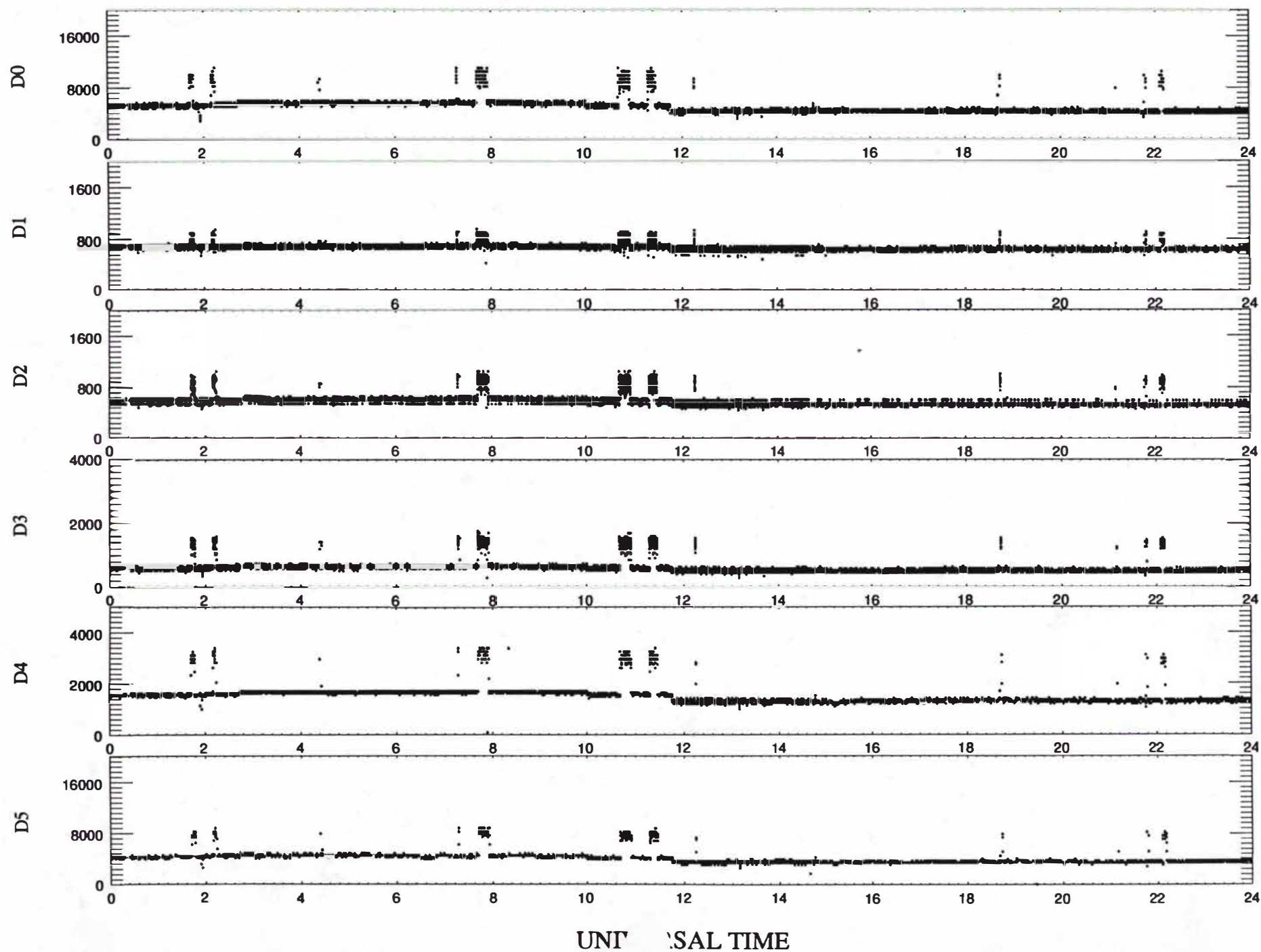
CALIBRATION DATA INCLUDED

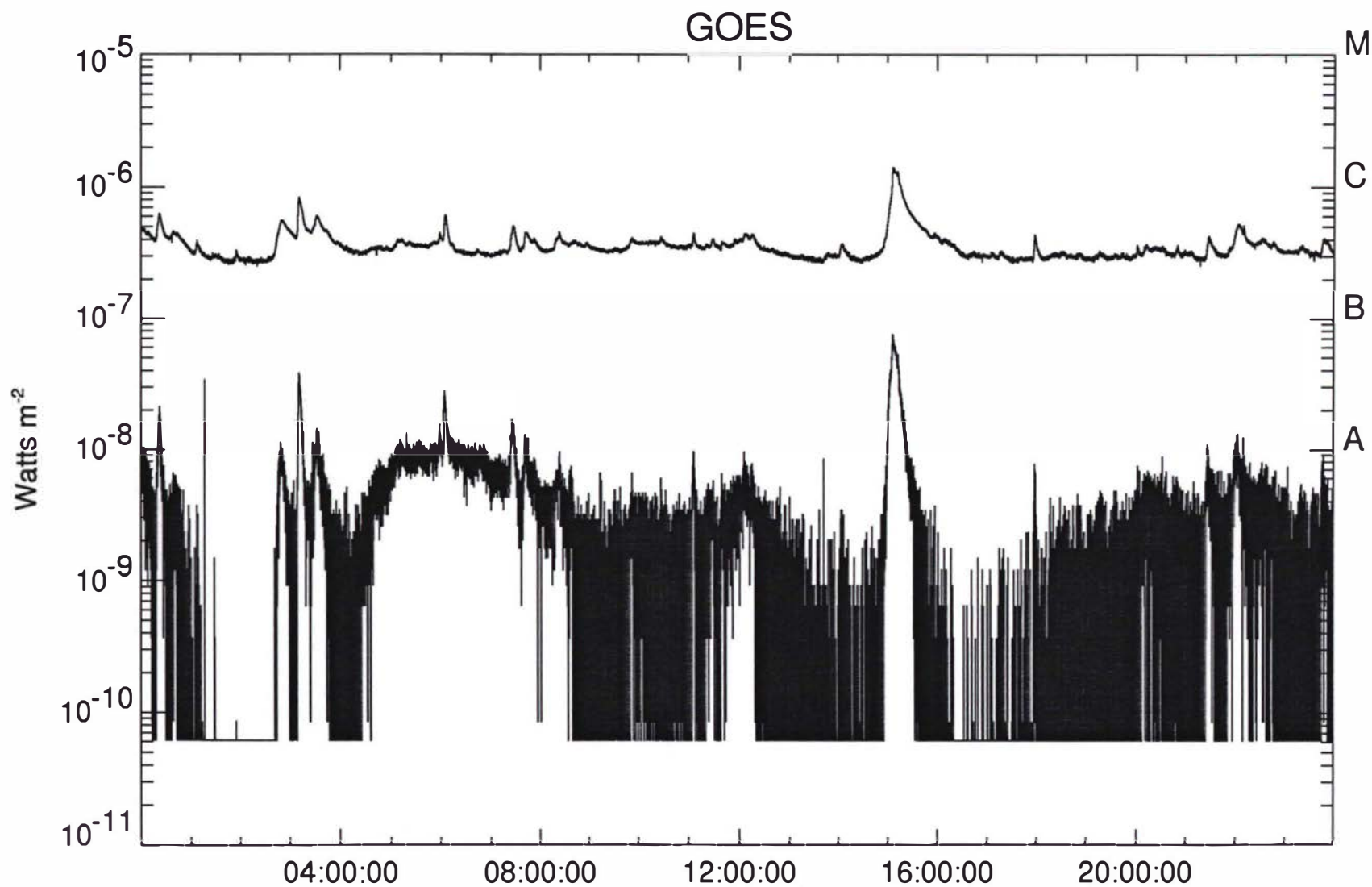


UNIV 'AL TIME

CALIBRATION DATA INCLUDED







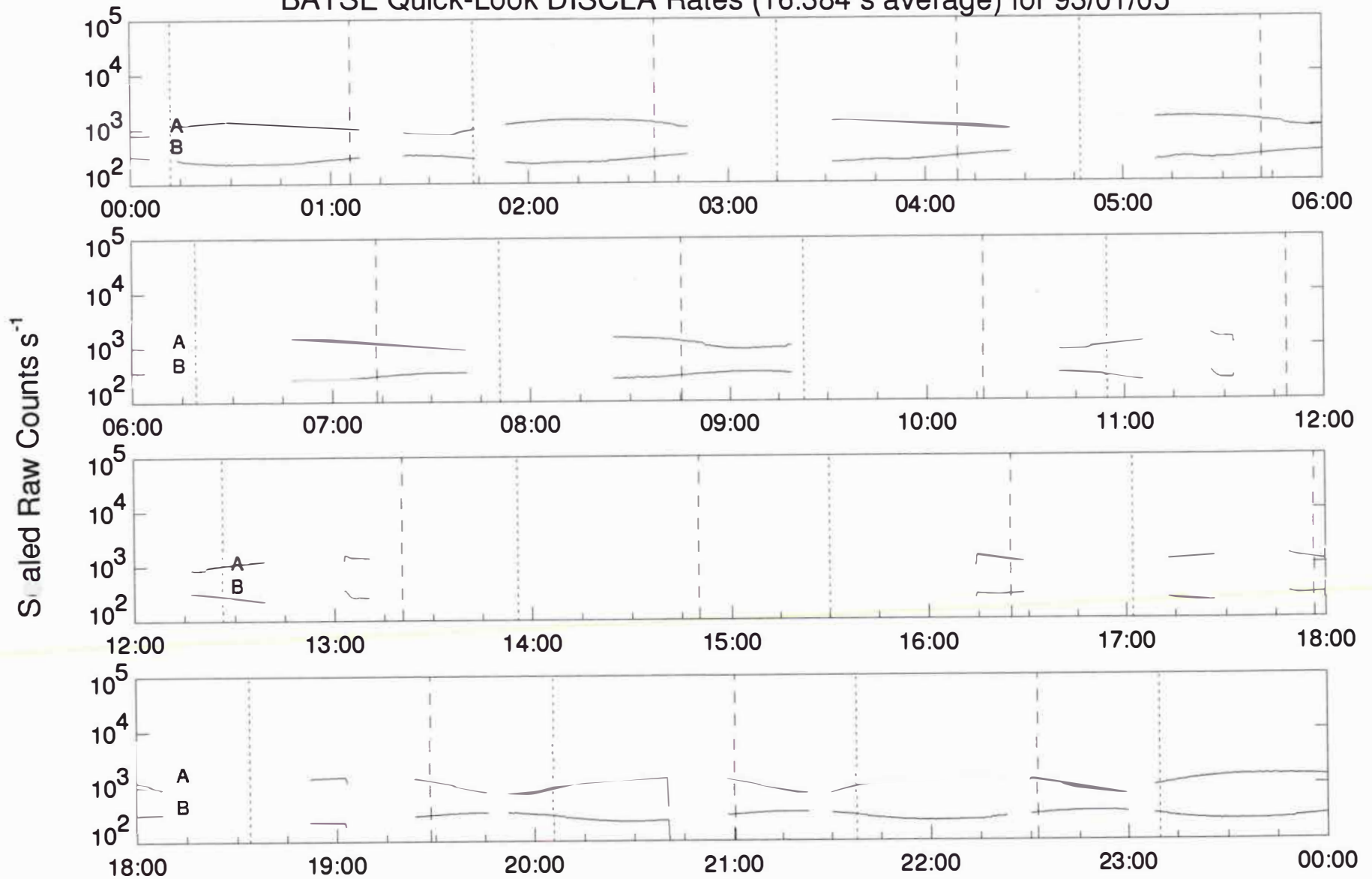
Data Start: 93/01/05, 0000:00

Plot created: 95/05/31, 2143

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 93/01/05

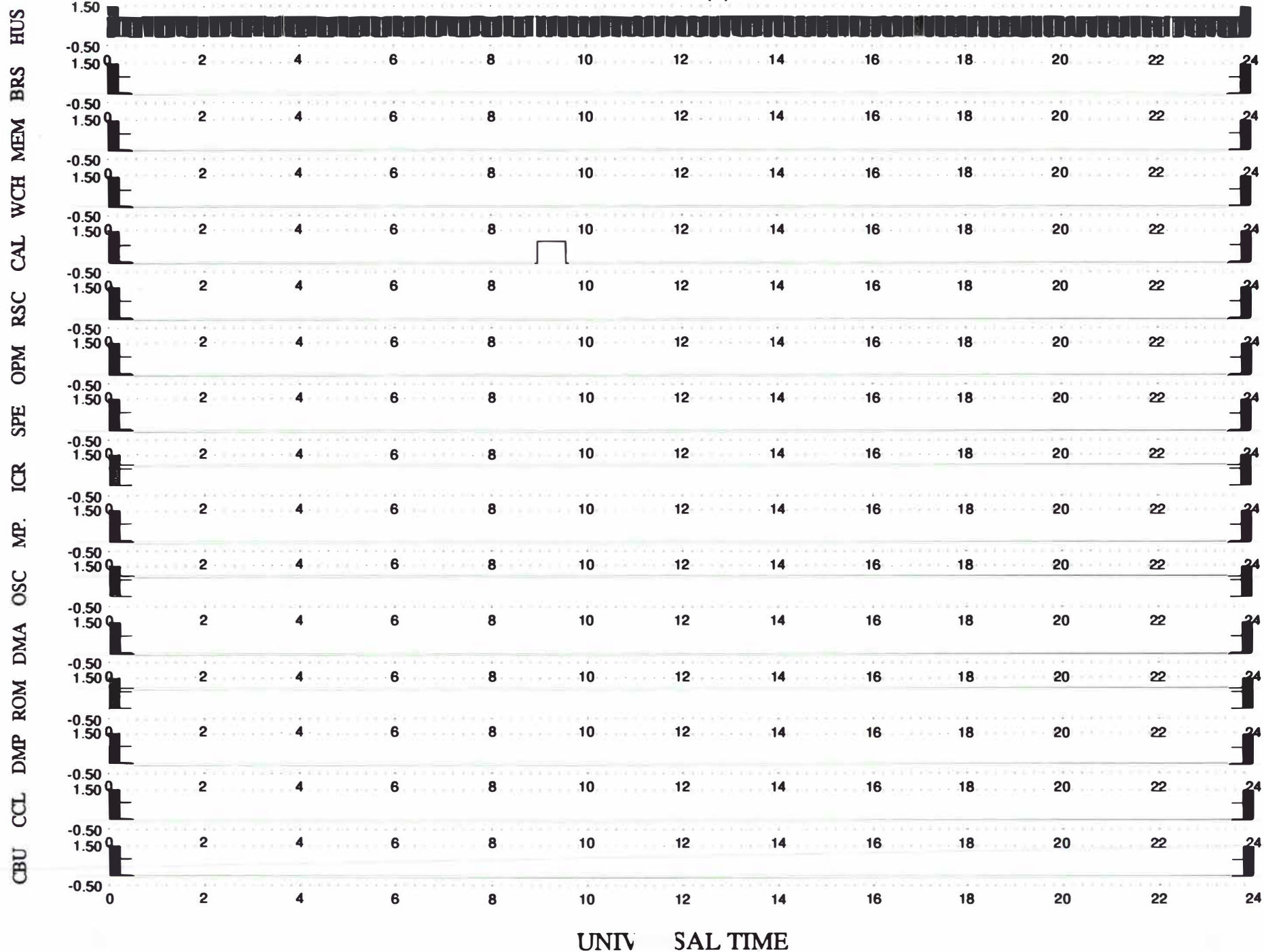


Current Time: 93/01/11, 1552 EDT
 A: Channel 1 Most Sunward LAD
 B: Sum Channel 1 Anti-Sunward LADs X .05

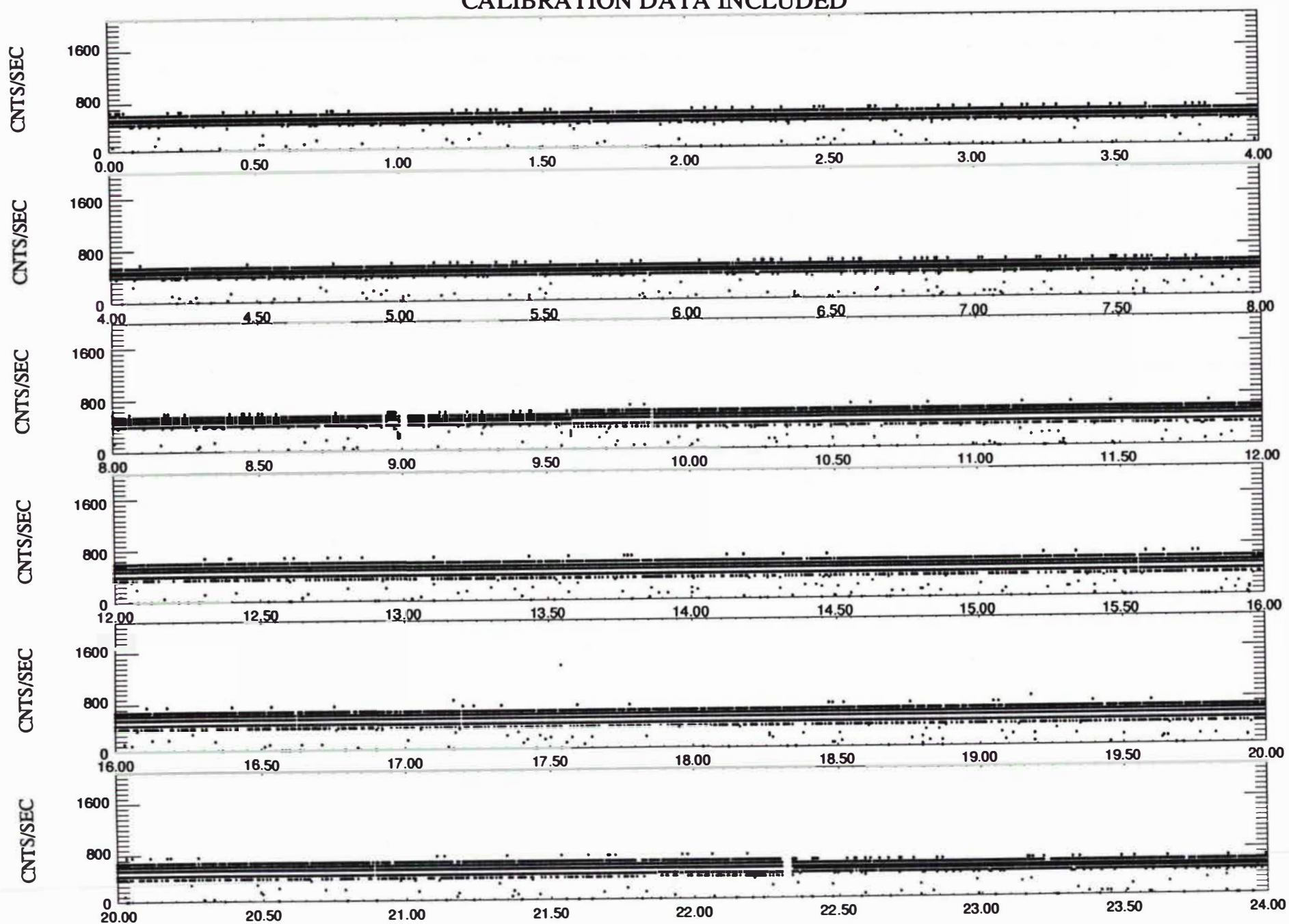
Dotted line: Day entry
 Dashed line: Night entry

* Solar Burst Trigger
 + Solar Flare

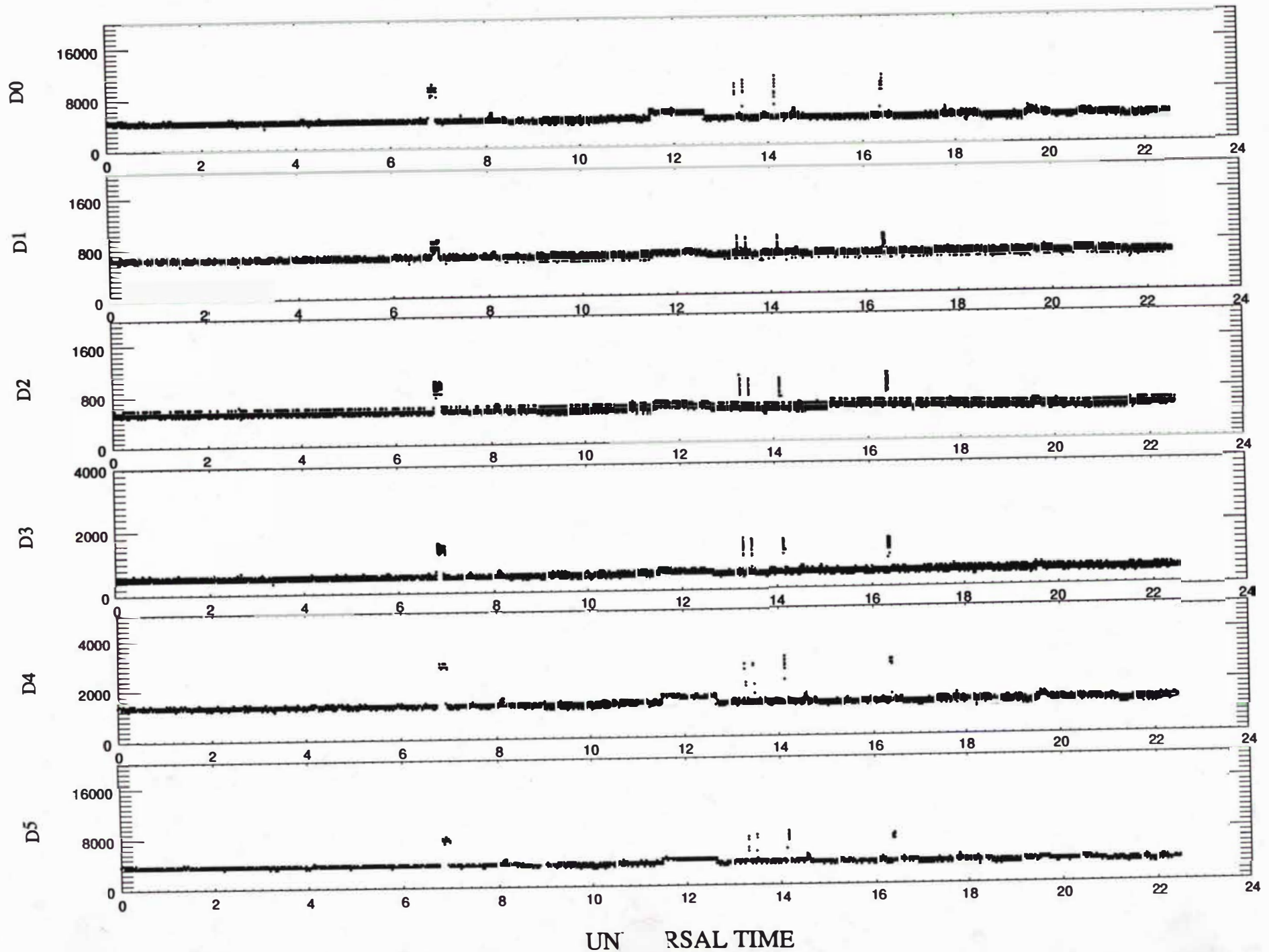
NO BURST (3)



CALIBRATION DATA INCLUDED



UNIV. AL TIME



CATSEARCH PROGRAM

BATSE BURST # 2119
EVENT OF 1993 JAN 6 DAY OF YEAR= 6
EVENT CROSSING TIME AT BATSE : 35145. S. OR 09:45:45.1
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 199.700 -15.100
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 6/ 1/ 93 IS:
RA= 165.007 DEC= -12.659 DIST= 4.596 AU
BATSE-ULYSSES DISTANCE = 687546640. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=146.27 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1907.24 SECS.
CROSSING TIME AT ULYSSES IS 33238. S. OR 09:13:57.8 +/- 242.16 SECONDS

NO

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 8 07:43:30 1993
Date: Fri, 8 Jan 1993 9:46:54 -0600 (CST)
From: BRAINERD@ssl.msfc.nasa.gov (Jim Brainerd, (205) 544-4970)
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02119

TIME: TJD=8993 SECONDS=35145

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=020.1 AZIMUTH=340.6 ERROR= DEGREES

COMMENTS:

GAMMA-RAY BURST OF 15 SECONDS DURATION. FAST RISE AND EXPONENTIAL DECAY
WITH LITTLE SUBSTRUCTURE. NOT SEEN ABOVE 300 KEV.

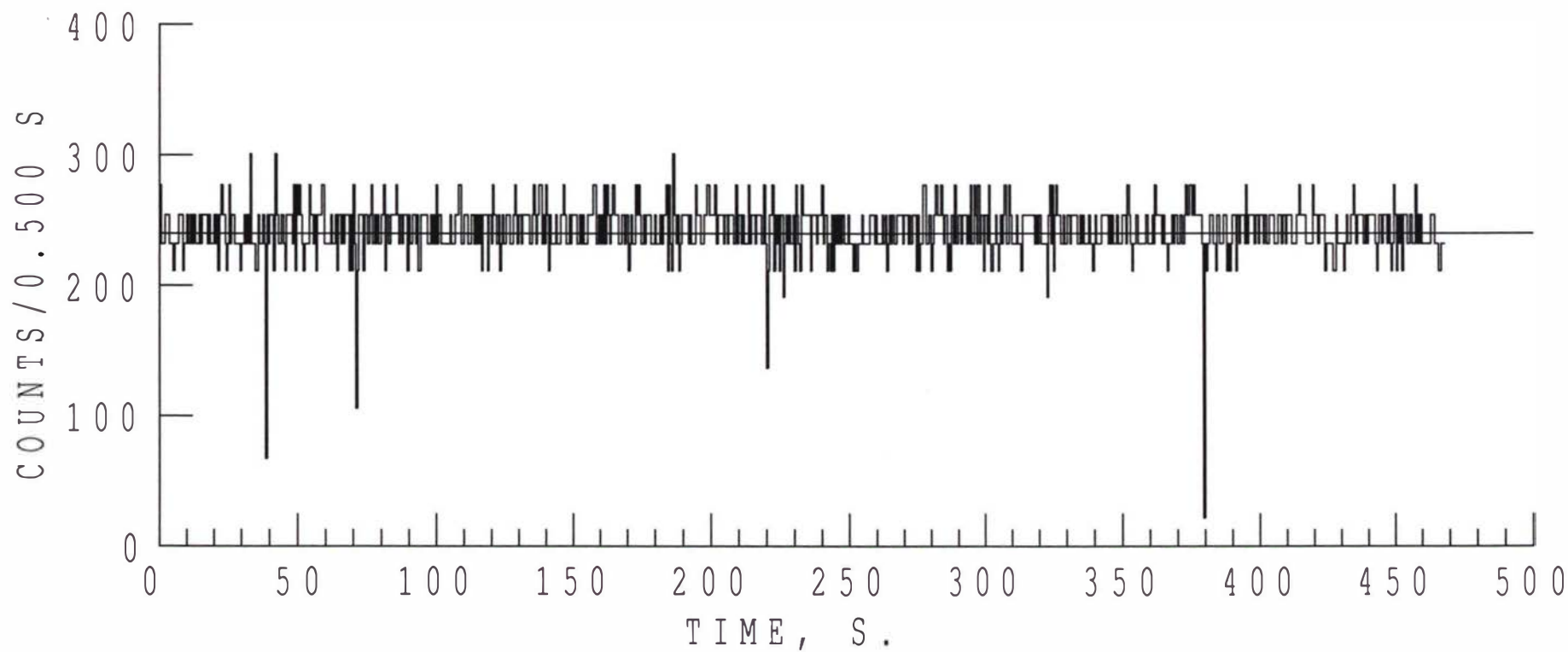
From BRAINERD@ssl.msfc.nasa.gov Thu Jan 7 15:47:25 1993
Date: Thu, 7 Jan 1993 17:52:13 -0600 (CST)
From: BRAINERD@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2119	930106	8993	35145	3000	201	-17

9 / 6 / 94

ULYSSES RT
6 / 1 / 93 33012.379 s
0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



CATSEARCH PROGRAM

BATSE BURST # 2120
EVENT OF 1993 JAN 6 DAY OF YEAR= 6
EVENT CROSSING TIME AT BATSE : 50185. S. OR 13:56:24.8
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 245.600 70.600
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 6/ 1/ 93 IS:
RA= 165.007 DEC= -12.659 DIST= 4.596 AU
BATSE-ULYSSES DISTANCE = 687546640. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 81.16 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 352.58 SECS.
CROSSING TIME AT ULYSSES IS 50537. S. OR 14:02:17.4 +/- 448.79 SECONDS

100

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 8 07:48:02 1993
Date: Fri, 8 Jan 1993 9:51:27 -0600 (CST)
From: BRAINERD@ssl.msfc.nasa.gov (Jim Brainerd, (205) 544-4970)
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02120

TIME: TJD=8993 SECONDS=50184

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=080.2 AZIMUTH=107.9 ERROR= DEGREES

COMMENTS:

WEAK BURST OF 40 SECONDS DURATION THAT APPEARS ABOVE 300 KEV.

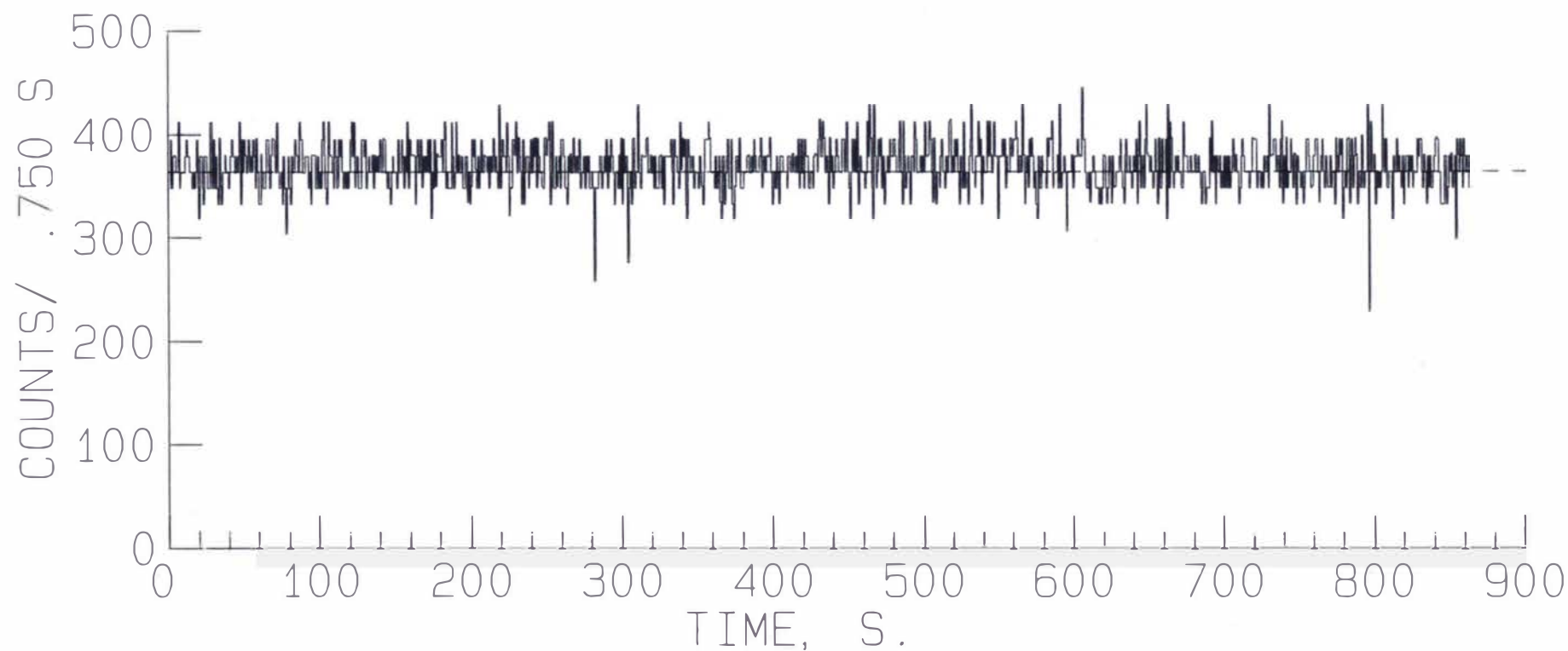
From BRAINERD@ssl.msfc.nasa.gov Fri Jan 8 07:36:00 1993
Date: Fri, 8 Jan 1993 9:40:54 -0600 (CST)
From: BRAINERD@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2120	930106	8993	50184	1200	246	+71

11 / 1 / 93

ULYSSES RT
6/ 1/93 50112.148 s
.250 S INTERVALS REGROUPED BY 3
0- 0 keV

N= 10 M=80
>4.0 SIGMA FLUCTUATIONS



CATSEARCH PROGRAM

BATSE BURST # 2121
EVENT OF 1993 JAN 6 DAY OF YEAR= 6
EVENT CROSSING TIME AT BATSE : 56259. S. OR 15:37:39.4
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 4.600 3.000
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 6/ 1/ 93 IS:
RA= 165.007 DEC= -12.659 DIST= 4.596 AU
BATSE-ULYSSES DISTANCE = 687546640. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 21.66 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2131.51 SECS.
CROSSING TIME AT ULYSSES IS 58391. S. OR 16:13:10.9 +/- 229.32 SECONDS

Trigger

From BRAINERD@ssl.msfc.nasa.gov Thu Jan 7 15:51:04 1993
Date: Thu, 7 Jan 1993 17:55:53 -0600 (CST)
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
2121	930106	8993	56259	140000	005	+03

time
Same as 2122

Trigger

Date:

Dec 15 '97

Helio corr removed

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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

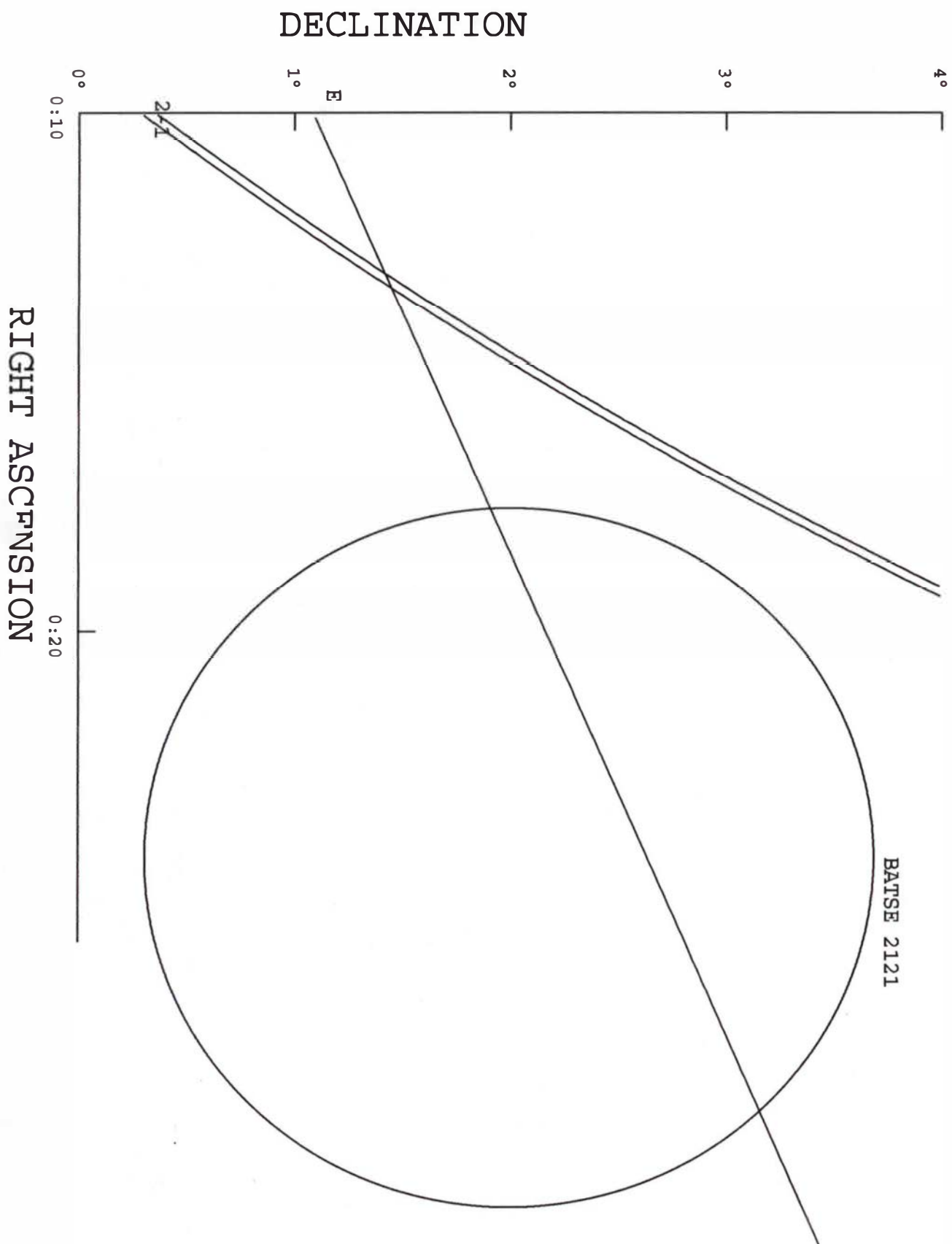
G=GALACTIC EQUATOR

1 ULYSSES

2 BATSE

EVENT OF JAN 6, 1993 16:13

15/12/97



BATSE

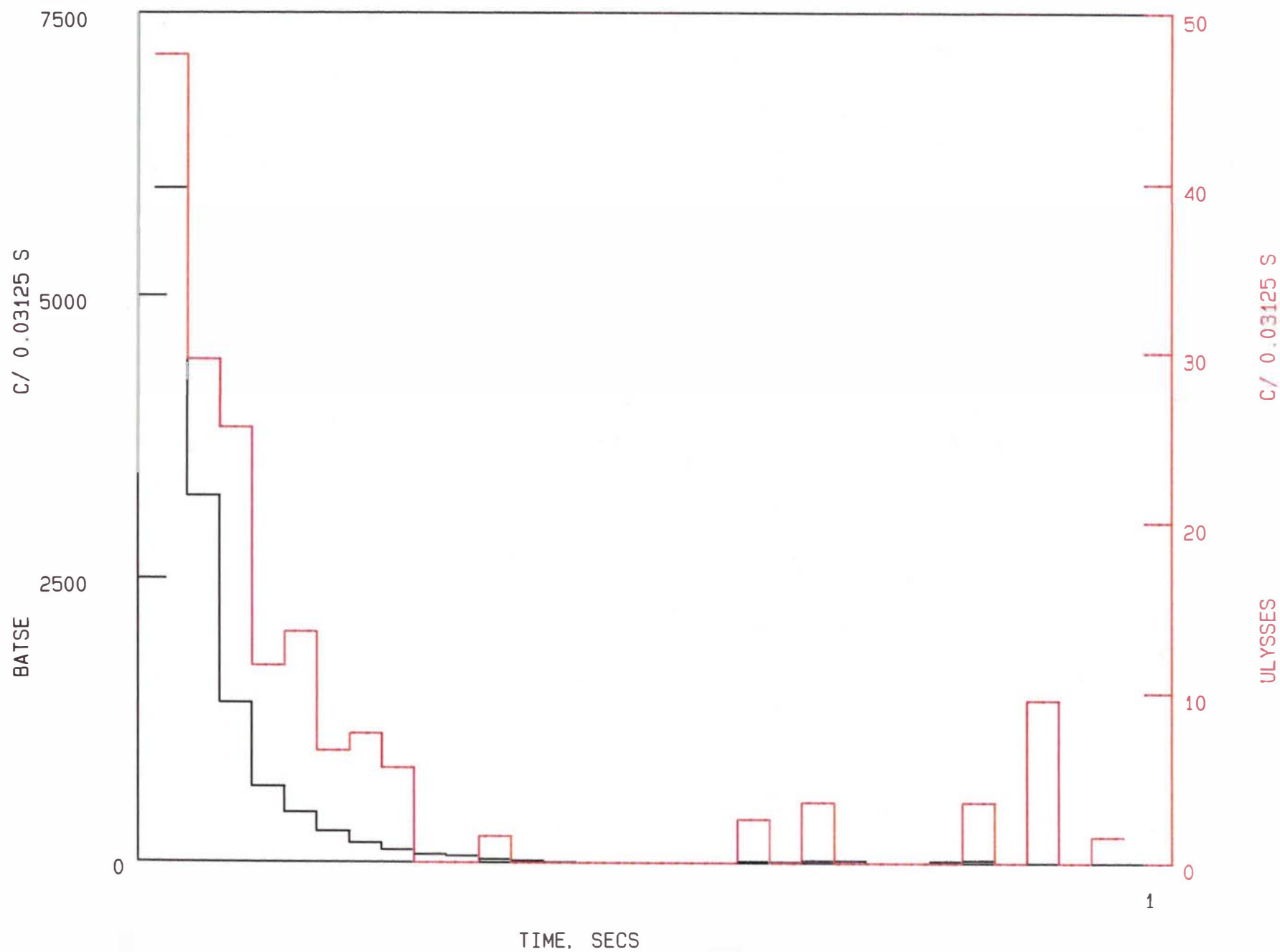
-ULYSSES

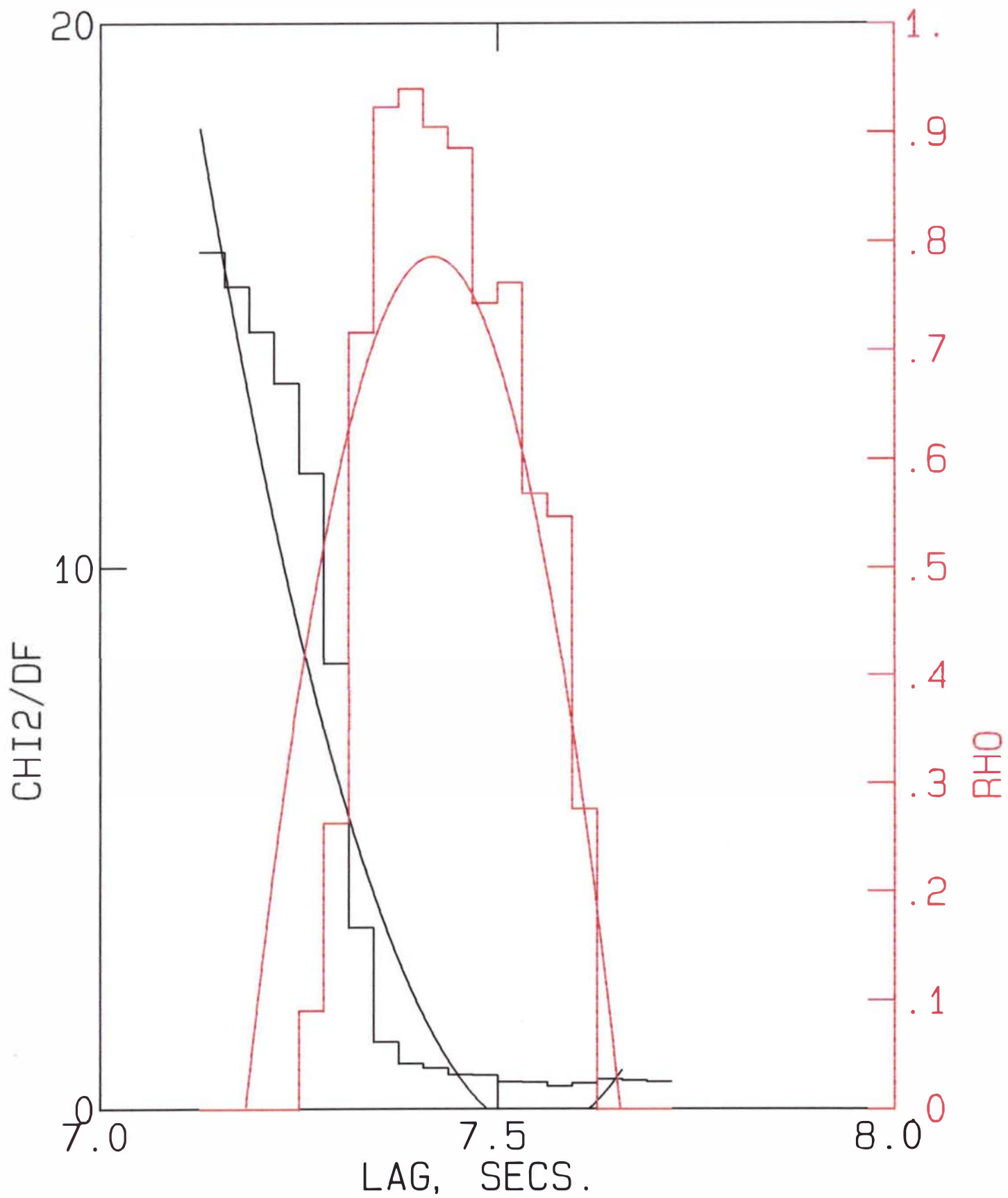
CORRELATION

6/ 1/93

56259.418

15/12/97





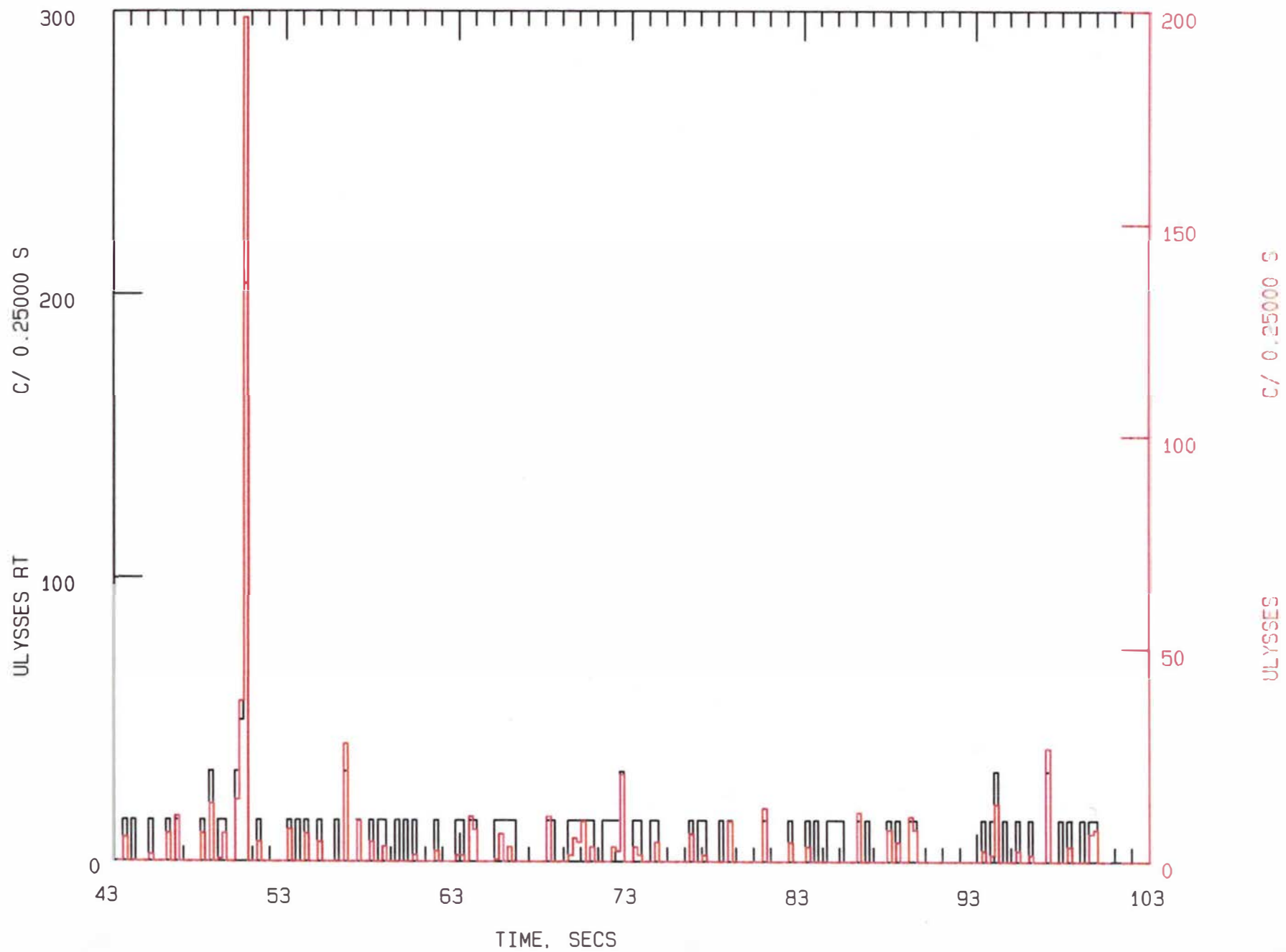
ULYSSES RT-ULYSSES

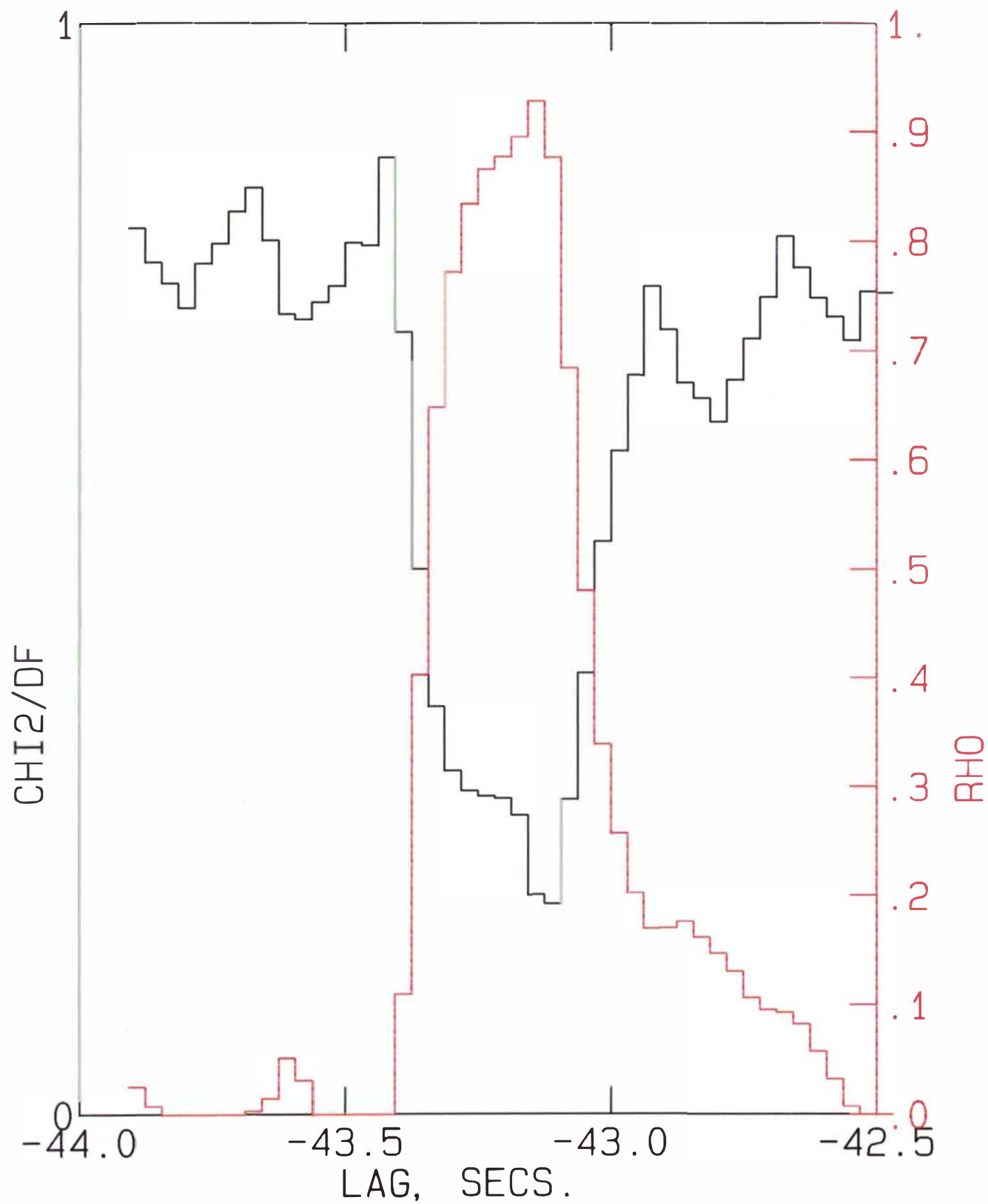
CORRELATION

6/ 1/93

58344.192

15/12/97

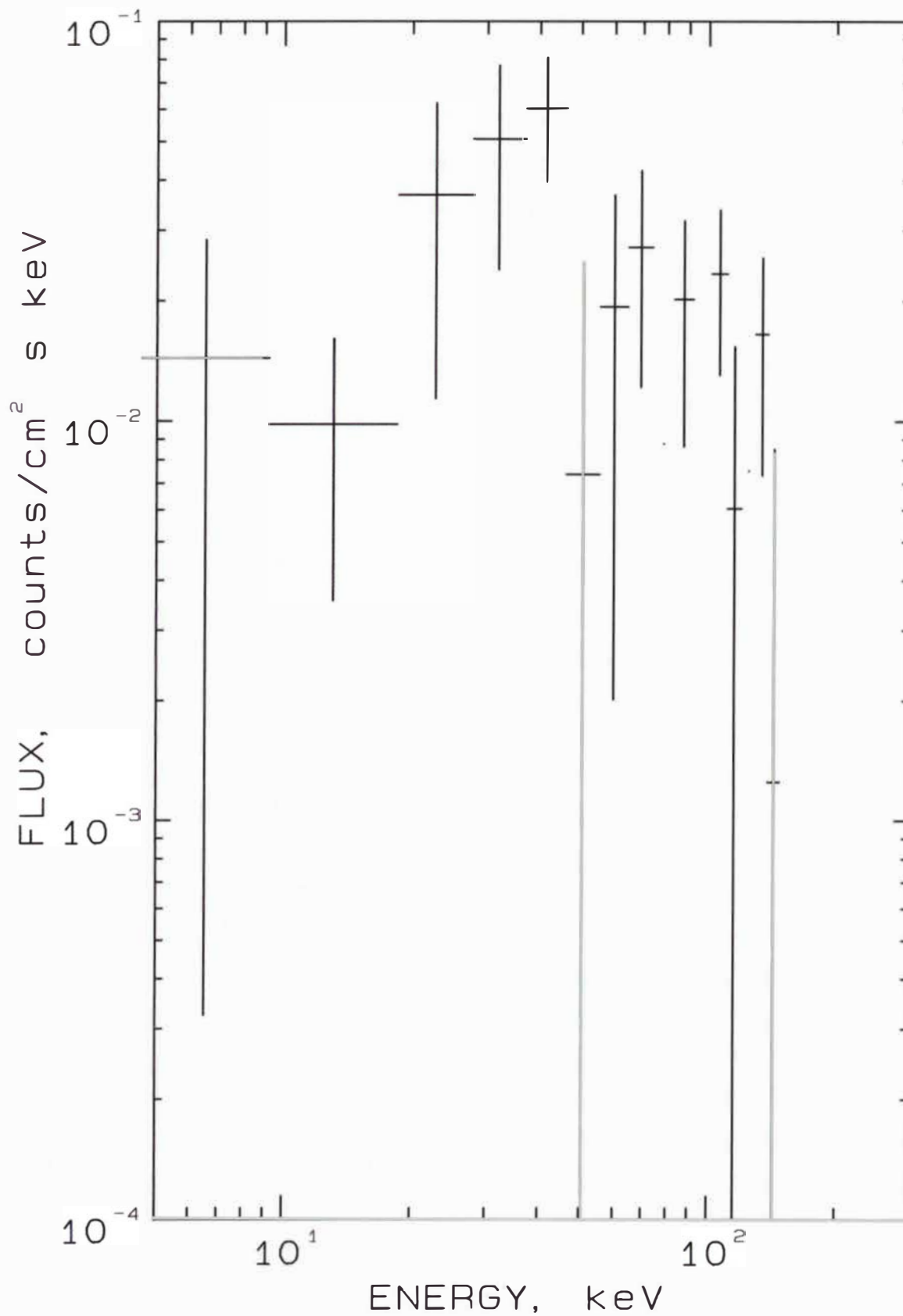




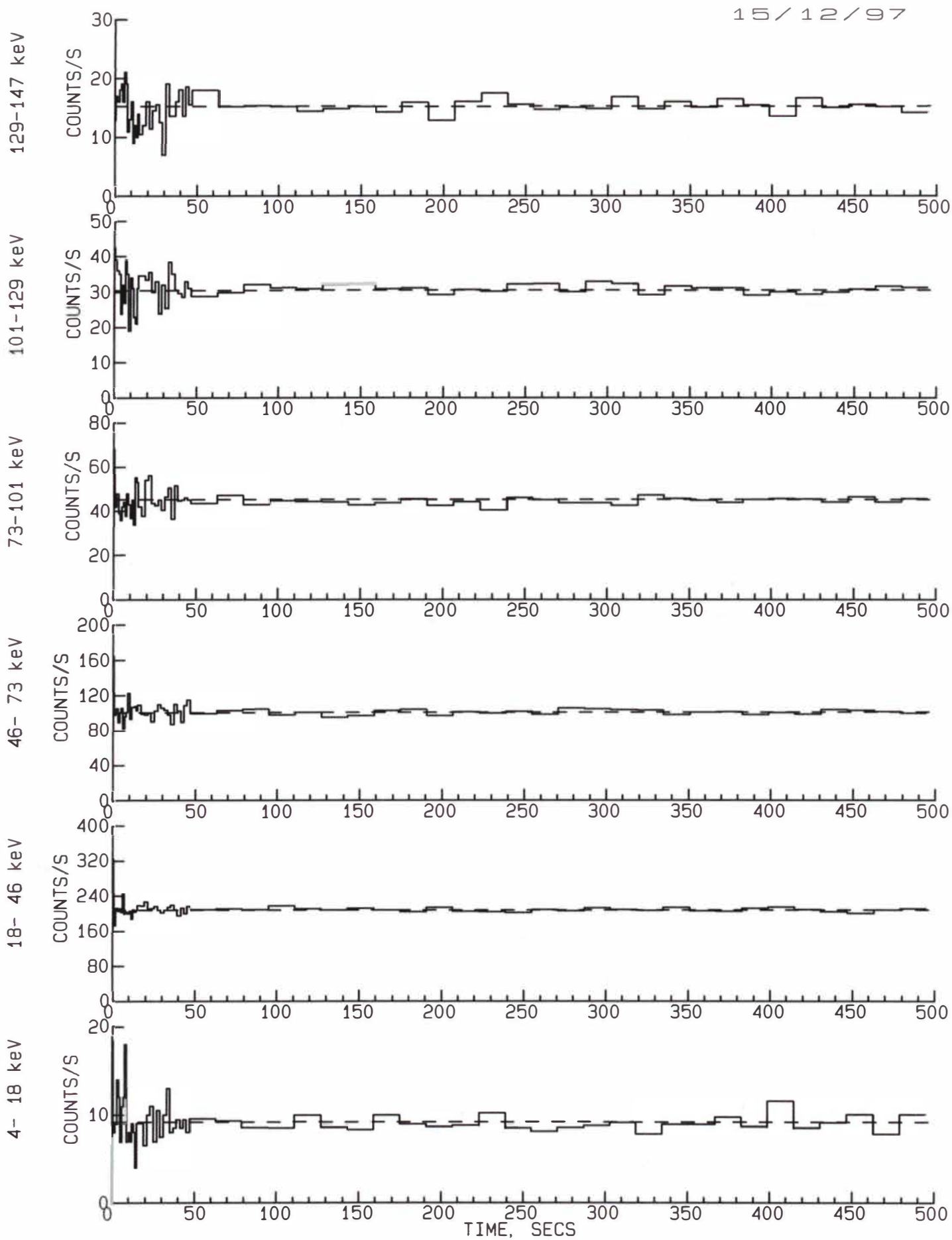
ULYSSES 06/01/93 58394.567

15/12/97

SPECTRUM INTEGRATED OVER 5.7 SECONDS, INTERVALS 2 TO 8



ULYSSES 06/01/93 58394.567 BURST SPECTRAL COUNT RATES



ULYSSES

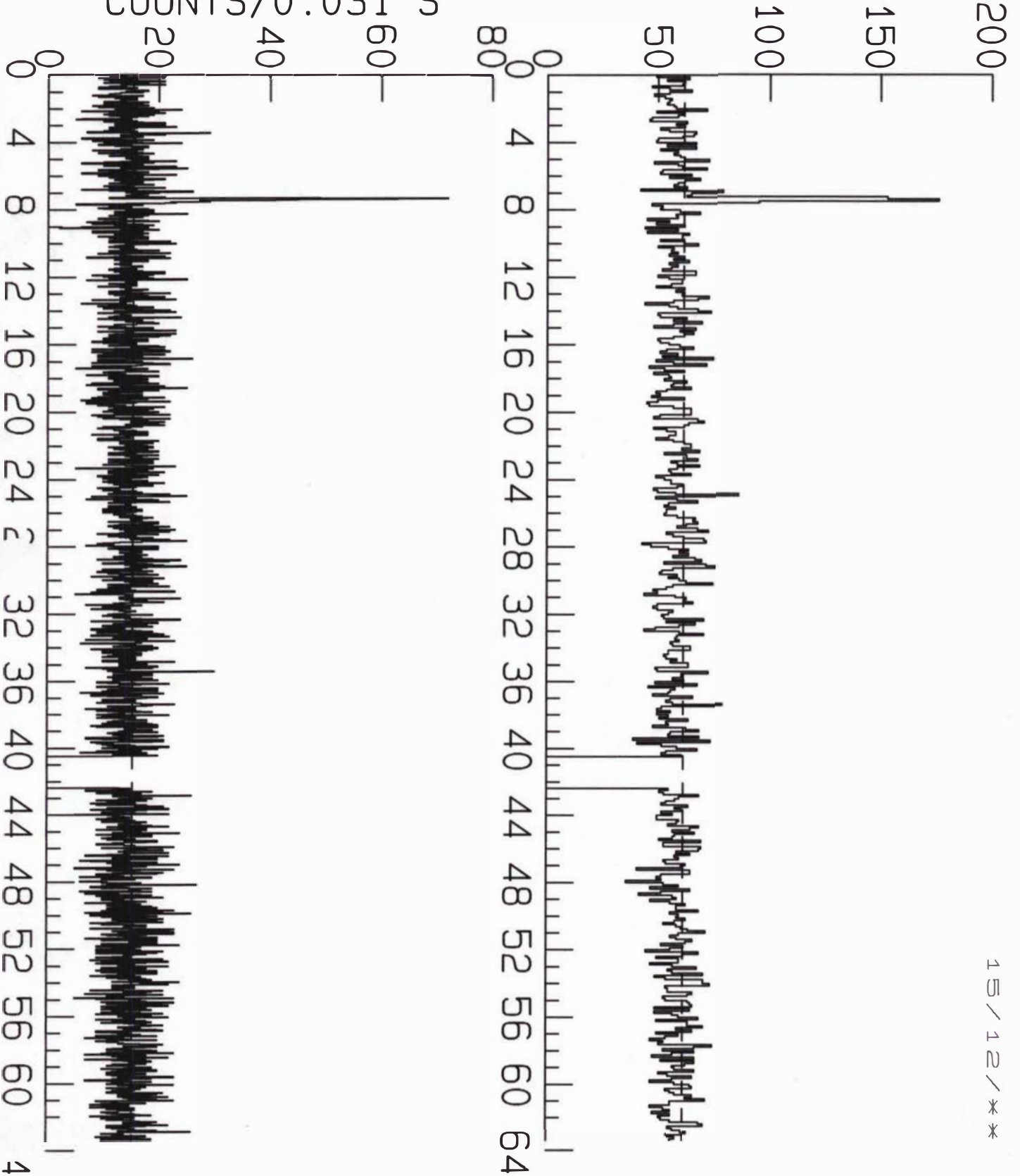
06/01/93

Ttrig=58394.738

22- 148 keV

15 / 12 / **

COUNTS/0.125 S



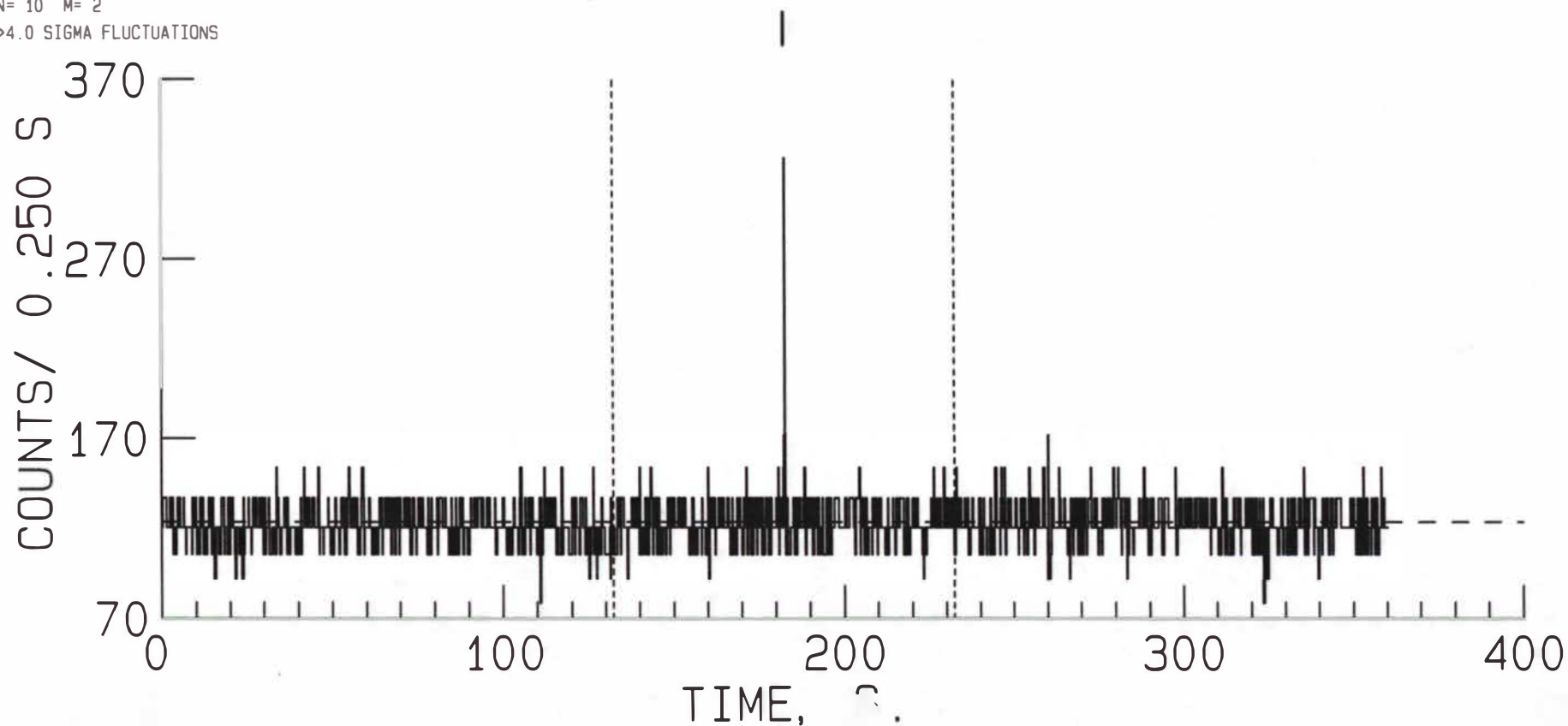
ULYSSES RT

15/12/97

6/ 1/93 58212.023 s

22- 148 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



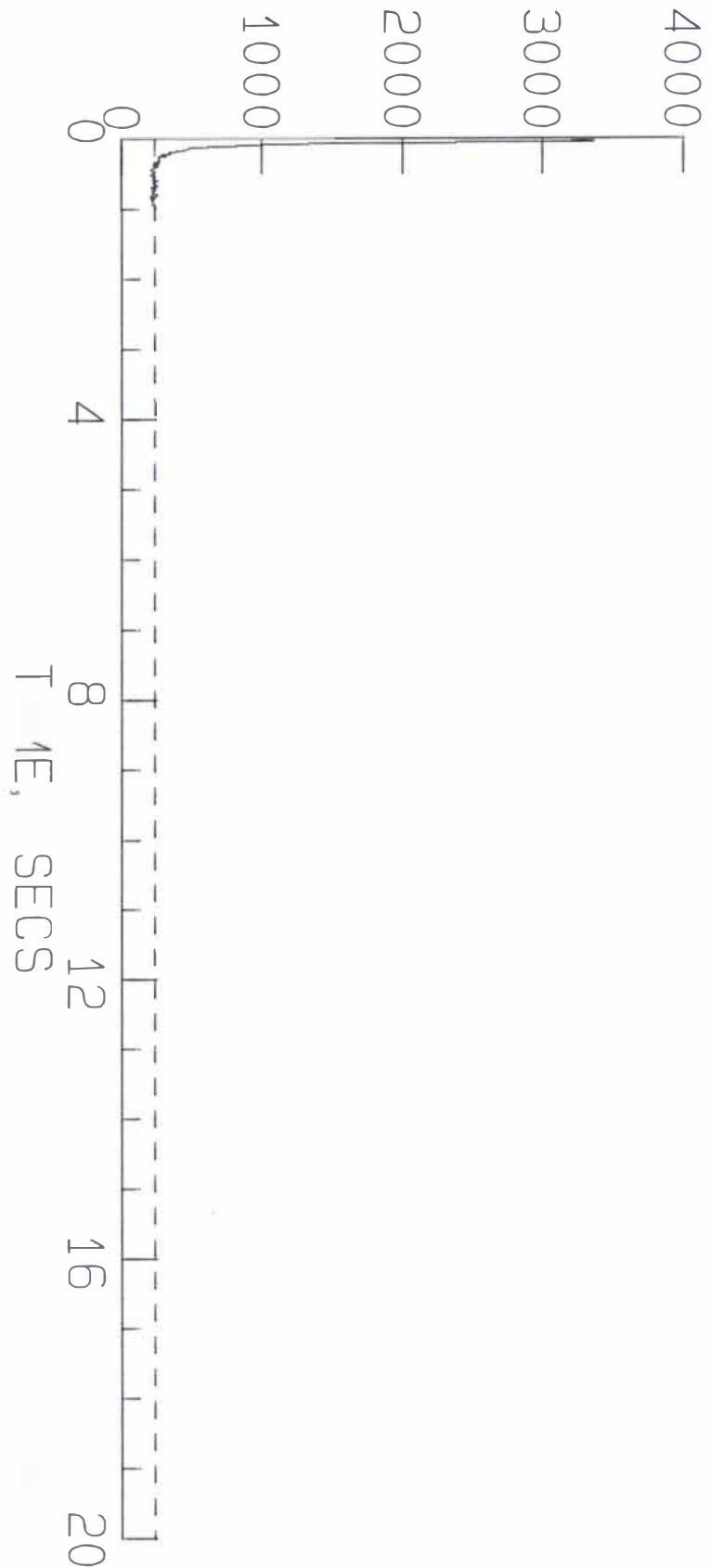
BATSE

6
~~07~~/01/93

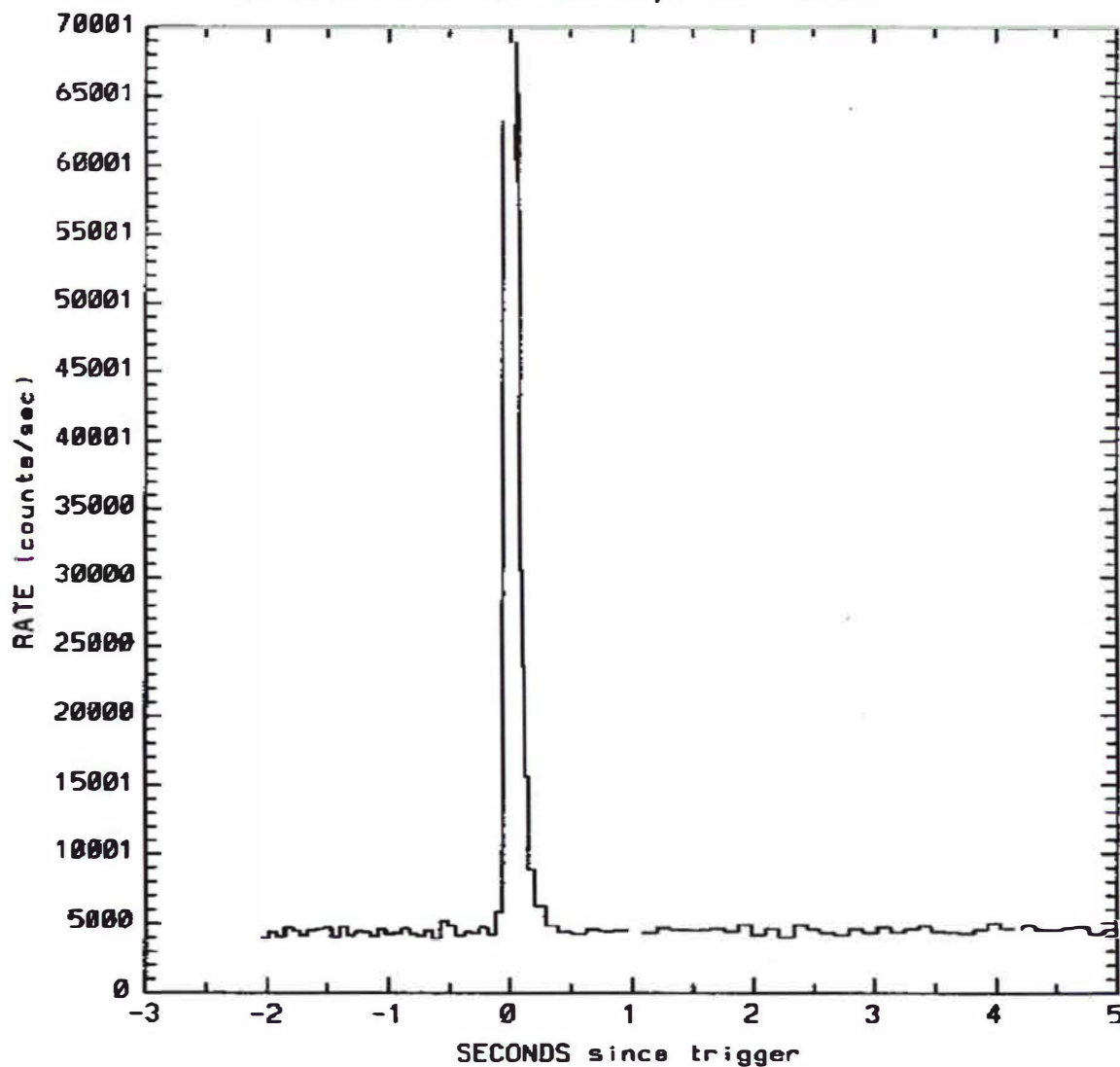
56259.418

30- 100 keV

COUNTS/ .016 S



TTS Data for K. Hurley, No. 2121



15-DEC-1994 16:01:36

Created by MOPS BD
(Burst Display)
Version 12.23

Trigger # : 2121

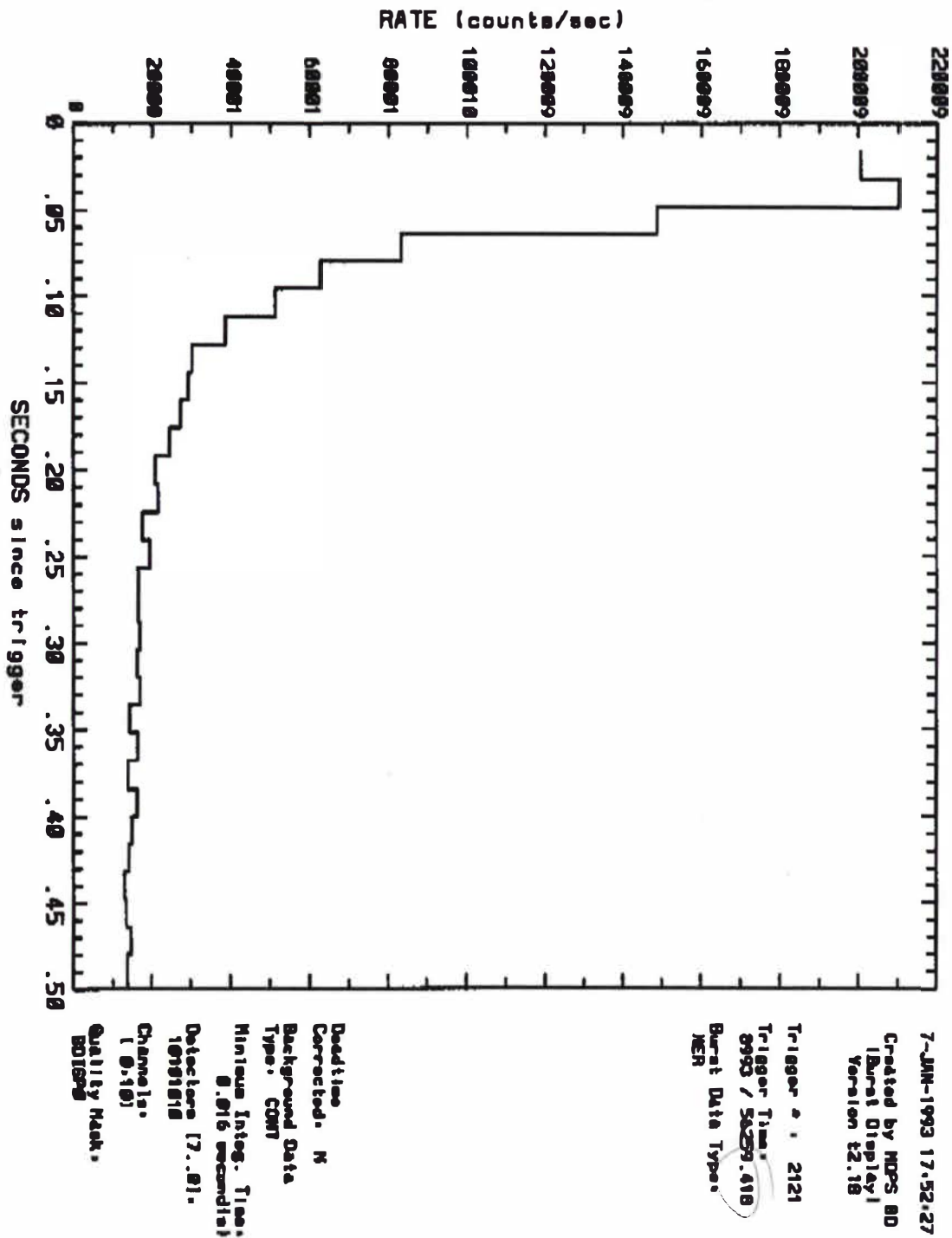
Trigger Time:
8993 / 56259.394Burst Data Type:
TTS

Time Corrected: Y

Maximum Time Error:
0.00006 second(s)Deadtime
Corrected: NBackground Data
Type: PREB + DISCLA

Bin Count: 8

Detectors (7..8).
7-5-3-1-Discriminators:
(2..2)Quality Mask:
BDISP1



From root Fri Dec 2 01:06 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA08685; Fri, 2 Dec 94 01:06:01
Received: from ax252.rikkyo.ac.jp by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
id AA01032; Fri, 2 Dec 1994 01:04:42 +0800
Received: by ax252.rikkyo.ac.jp (5.67+1.6W/6.4JAIN-rky-MX9407011)
id AA14094; Fri, 2 Dec 94 18:04:59 JST
Received: from ax251.rikkyo.ac.jp by ax252.rikkyo.ac.jp (5.67+1.6W/6.4JAIN-rky-M
id AA14087; Fri, 2 Dec 94 18:04:51 JST
Received: by ax251.rikkyo.ac.jp (5.67+1.6W/6.4JAIN-rky-NoMX940525)
id AA07502; Fri, 2 Dec 94 18:04:50 JST
Date: Fri, 2 Dec 94 18:04:50 JST
From: M. Yoshimori <yosimori@rikkyo.ac.jp>
Return-Path: <yosimori@rikkyo.ac.jp>
Message-Id: <9412020904.AA07502@ax251.rikkyo.ac.jp>
To: khurley@space6.ssl.berkeley.edu
Subject: Burst positions
Cc: suga@flare2.solar.isas.ac.jp
Content-Length: 297
Status: R

Dear Dr.Hurley,

In addition to the previous three events, we found the following five events:

1992.Oct.04	14:00:21 UT	✓
1992.Dec.07	16:00:48	✓
1993.Jan.06	15:37:39	✓
94.Aug.09	12:00:06	NO POSITION AVAILABLE
94.Aug.26	20:55:20	✓

We would appreciate receiving their positions.

Thank you.

Regards,

M.Yoshimori

From root Wed Nov 30 03:00 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA07664; Wed, 30 Nov 94 03:00:48
Received: from ax252.rikkyo.ac.jp by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
id AA11098; Wed, 30 Nov 1994 02:59:29 +0800
Received: by ax252.rikkyo.ac.jp (5.67+1.6W/6.4JAIN-rky-MX9407011)
id AA22039; Wed, 30 Nov 94 19:59:42 JST
Received: from ax251.rikkyo.ac.jp by ax252.rikkyo.ac.jp (5.67+1.6W/6.4JAIN-rky-M
id AA22032; Wed, 30 Nov 94 19:59:27 JST
Received: by ax251.rikkyo.ac.jp (5.67+1.6W/6.4JAIN-rky-NoMX940525)
id AA18391; Wed, 30 Nov 94 19:59:27 JST
Date: Wed, 30 Nov 94 19:59:27 JST
From: M. Yoshimori <yosimori@rikkyo.ac.jp>
Return-Path: <yosimori@rikkyo.ac.jp>
Message-Id: <9411301059.AA18391@ax251.rikkyo.ac.jp>
To: khurley@space6.ssl.berkeley.edu
Cc: suga@flare2.solar.isas.ac.jp, morimoto@flare2.solar.isas.ac.jp
Subject: Yohkoh GBD events
Content-Length: 362
Status: R

Dear Dr.Hurley,

Yohkoh observed the following four events.

1. 1994 Feb.06 00:08:37 UT
2. 1994 Feb.18 19:32:28 UT
3. 1994 Mar.02 05:08:31 UT
4. 1994 Jul.03 04:40:46 UT

We like to know the locations of the following three events,

1. 1994 Feb.06 00:08:37 UT ✓
2. 1994 Feb.18 19:32:28 UT ✓
3. 1994 Mar.02 05:08:31 UT *(rough location only)* ✓

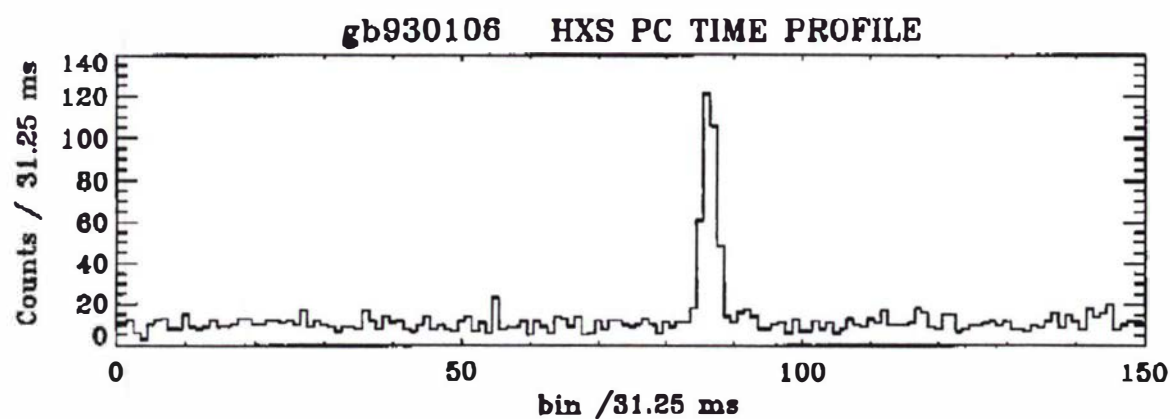
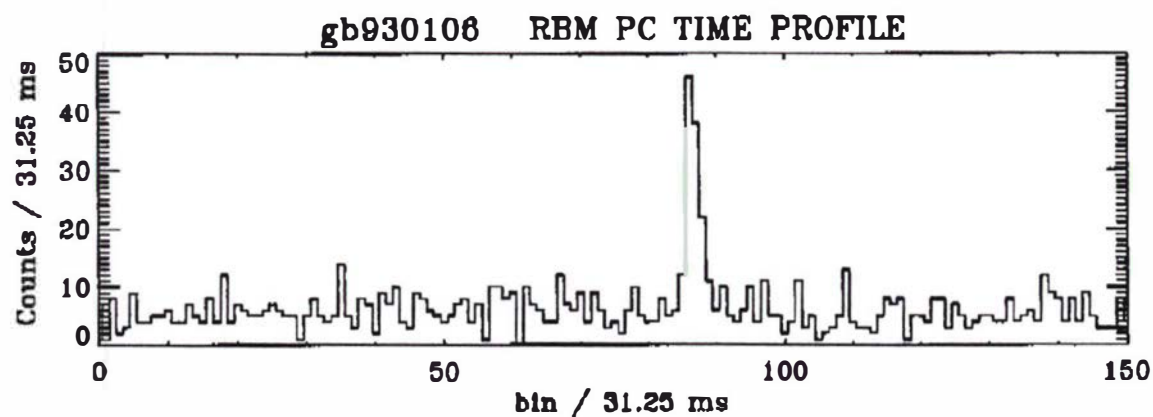
Thank you.

Regards,

M.Yoshimori

13/19

Vohkoh



From khurley@space6.ssl.berkeley.edu Fri Jan 8 08:44:51 1993
Date: Fri, 8 Jan 93 08:40:08
From: khurley@space6.ssl.berkeley.edu
Content-Length: 269

Dear Chryssa,

John Laros tells me that MO was off on the 6th (and will stay off for another couple of weeks). I got the MER data, but the event is now slipping down on my list of priorities, unless you can think of a reason to get an annulus location quickly.

Kevin

From khurley@space6.ssl.berkeley.edu Tue Nov 23 08:45:15 1993
Date: Tue, 23 Nov 93 09:41:35
From: khurley@space6.ssl.berkeley.edu
Content-Length: 4895

Jim,

I've finally managed to get back to the DMSP localizations. I'm e-mailing you files for the following events: July 31 1992 and October 4 1992

I have not sent data for the following events:

May 19, 1992: I think that you have everything already. Let me know if that is not the case.

June 28, 1992: No Ulysses data due to the earthquake, which knocked out the tracking station.

June 29, 1992: There is no trace of this event in the Ulysses data. I would have said that it is solar, but the GOES data show no activity at this time. Also, there is a BATSE data gap around this time. This one is a mystery to me.

July 16, 1992: I'm pretty sure this one is solar; there was a strong GOES event at just this time. There is a BATSE data gap at the time, and Ulysses did not observe it.

Aug 5, 1992: Ulysses did not observe this event. Both BATSE and GOES report a strong solar flare at this time, so I think that is the explanation for this event.

Jan 6 1993: This is a nice-looking candidate in the DMSP data, but I haven't found anything corresponding to it in the Ulysses data. We had coverage at 0.5 s resolution, and I searched a window +/- 2100 seconds long around the DMSP time. No other spacecraft reported an event at this time, either.

*Time was
wrong
56260,
not 26260*

And, on another subject, you mentioned a possible burst on Oct 24, 1991. Ulysses did not observe it, but the WATCH experiment aboard GRANAT observed solar particles at the time of this event.

SATELLITE POSITIONAL INFORMATION AND BURST ARRIVAL TIME

NO	NAME	DIST. FROM EARTH, KM.	ALPHA, DEG.	DELTA, DEG.
1	ULYSSES	926718236.0000+/-	23.8000000 154.29600+/-	.00003 3.69480+/-
2	DMSP	6800.0000+/-	50.0000000 .00000+/-	180.00000 .00000+/-

JULIAN DAY NUMBER IS 33815.22 DAYS SINCE 1900 JAN 0.5

20.00 BY 15.00 CM MAP FOR RA= .00 TO 360.00, DEC= -70.00 TO 70.00

INTERSATELLITE CORRELATIONS

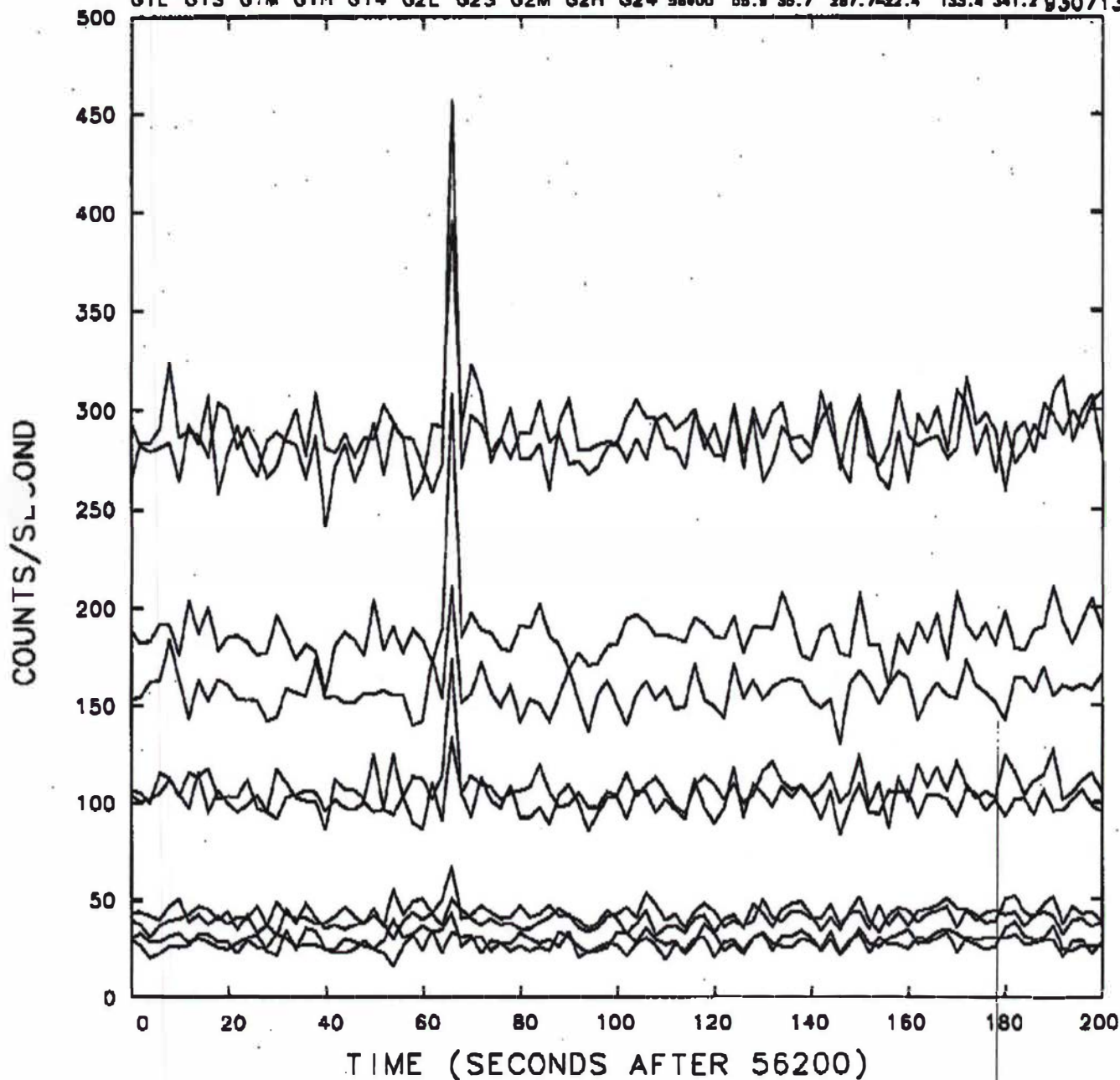
SEPARATION BETWEEN SATELLITES 1 AND 2 IS 3091.21926 LIGHT SECONDS. TIME DELAY IS
CORRELATION BETWEEN SATELLITE 1 (ULYSSES)) AND SATELLITE 2 (DMSP)

DMSP10 1993 JAN 6 93006

UT SCRA DEC SUNRA DEC ANOSUN GHAA

56202 88.3 24.1 287.7-22.4 134.8 340.4 830106B

G1L G1S G1M G1H G14 G2L G2S G2M G2H G24 56400 55.8 36.7 287.7-22.4 133.4 341.2 930713



51
26200.4 PEAK (2 ONLY)
07:17:40

WATCH-EURECA Gamma Ray Bursts. Niels Lund, Soren Brandt & Alberto Castro-Tirado
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	562205				-----	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

From root Fri Jul 16 15:29 1993
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA07838; Fri, 16 Jul 93 15:29:21
Received: from UCBSP.SSL.BERKELEY.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA21891; Fri, 16 Jul 93 15:30:05 PDT
Message-Id: <9307162230.AA21891@sunspot.ssl.berkeley.edu>
Date: Fri 16 Jul 93 15:31:54-PST
From: \$C <046369@essdp2.span.nasa.gov>
To: KHURLEY@sunspot.ssl.berkeley.edu
Subject: [Resent-MM Mail] DMSP GAMMA-RAY BURST DATA
Status: R

Received: from ESSDP2 by UCBSP.SSL.BERKELEY.EDU via MAIL-11 with
DECnet; Fri, 16 Jul 93 15:31:29-PST
Date: Fri 16 Jul 93 15:31:29-PST
From: 046369@ESSDP2.SPAN.NASA.GOV
Subject: DMSP GAMMA-RAY BURST DATA
To: "UCBSP::HURLEY"@ESSDP2.SPAN.NASA.GOV

FROM: ESSDP2::TERRELL (JAMES TERRELL, LOS ALAMOS NATL LAB)
TO: UCBSP::HURLEY (KEVIN HURLEY)
CC:
SUBJ: DMSP GAMMA-RAY BURST DATA, AS OF 16 JULY 1993

HERE ARE SOME NOTES CORRECTING DMSP PEAKTIMES FOR YOUR MASTER BURST LIST.
I HAVE MORE GRAPHS AND INFO TO SEND, BUT HAVE RUN OUT OF TIME.
I WILL SEND MORE INFO AFTER RETURNING 28 JULY--JIM.

27SEP91 84415 YES (8SAA,9YES,10SAA)
16OCT91 36696 YES (8SAA,9YES,10NR)
4NOV91 54286 YES (8SR,9YES,10YES)
27NOV91 15739 YES (8NO,9NO,10YES)
2DEC91 73733 YES (8YES,9NO@144DEG,10NR)
9DEC91 66959 N/O (8SR,9SR,10NR,11ND)
21DEC91 22686 YES (8ND,9NO,10NO,11YES)
10JAN92 33478 NA (BLANK) (8ND,9NA,10SAA,11NA)
10FEB92 35633 YES (8NO,9WEAK,10SAA,11SAA)
6APR92 9855 N/O (OBSCURED) (8NO@141,10SR,11NO@137DEG)
1MAY92 76696 N/O (OBSCURED) (8NO@127,10NO@157,11NO@147DEG)
22JUN92 25506 N/O (8SAA,10NR,11SA)
28JUN92 76452 YES (8ND,10YES,11NO)
29JUN92 75897 YES (ALL YES, SOFT)
14JUL92 47069 NA (BLANK) (8NA,10SAA,11SR)
16JUL92 60933 YES (9NO,10YES,11YES)
20JUL92 11524 N/O (OBSCURED) (8NA@130,10NA@145,11SR)
23JUL92 72188 N/O (OBSCURED) (8ND,10NA@148,11NR)
10AUG92 79599 YES? (8YES?,10NA,11NA) (LONG SOFT PEAK)
4OCT92 50421 YES (8YES,10YES,11SR)
23NOV92 22727 YES (8YES,10YES,1SR) (NOT AT 22712)
23NOV92 46542 YES (8NR,10SR,11YES) (NOT AT 46584, BATSE GRB)
7DEC92 57649 YES (8YES,10YES,11YES)
6JAN93 55260 YES (8SAA,10YES,11SR)
12JAN93 55082 YES (8YES,10NO@138,11VERYWEAK) (8:BIG PEAK AT 55202)
20JAN93 84779 YES (8YES,10,YES,11YES) (NO, AT 84700!)

 CATSEARCH PROGRAM

BATSE BURST # 2122
 EVENT OF 1993 JAN 6 DAY-OF-YEAR= 6
 EVENT CROSSING TIME AT BATSE : 71835. S. OR 19:57:15.2
 COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 125.600 -32.200
 BATSE PEAK COUNTING RATE: 0000 C/S

 EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
 POSITION OF ULYSSES ON 6/ 1/ 93 IS:
 RA= 165.007 DEC= -12.659 DIST= 4.596 AU
 BATSE-ULYSSES DISTANCE = 687546640. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=139.00 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1730.84 SECS.
 CROSSING TIME AT ULYSSES IS 70104. S. OR 19:28:24.4 +/- 284.94 SECONDS

RI

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 8 08:04:45 1993
 Date: Fri, 8 Jan 1993 10:07:56 -0600 (CST)
 From: BRAINERD@ssl.msfc.nasa.gov (Jim Brainerd, (205) 544-4970)
 Subject: Burst Trigger Message
 To: igse@unhrcc.unh.edu, jryan@unhrcc.unh.edu, GROBAD@ESTEC.BITNET,
 khurley@space6.ssl.berkeley.edu
 X-Vmsmail-To: @mops\$send_msg:BURST_SPAN.DIS
 Content-Length: 1377

BATSE BURST TRIGGER

NO.: 02122

TIME: TJD=8993 SECONDS=71835

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=65.7 AZIMUTH=249.4 ERROR= DEGREES

COMMENTS:
 GAMMA-RAY BURST OF 150 SECONDS DURATION WITH A FAST RISE AND AN EXPONENTIAL
 DECAY. SPIKES OF SEVERAL SECONDS DURATION OCCUR BEFORE THE EXPONENTIAL
 DECAY OF THE BURST. SEEN ABOVE 300 KEV.

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 8 12:57:50 1993
 Date: Fri, 8 Jan 1993 14:32:38 -0600 (CST)
 From: BRAINERD@ssl.msfc.nasa.gov (Jim Brainerd, (205) 544-4970)
 Subject: BATSE Trigger 2122
 To: khurley@sunspot.ssl.berkeley.edu
 X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu"
 Content-Length: 244

Kevin,

As you noticed, the time I gave for trigger 2122 in the
 first message yesterday is incorrect. The correct time
 of the trigger is 71835, which is given in the second message
 for this trigger. Sorry for the inconvenience.

Jim Brainerd

From BRAINERD@ssl.msfc.nasa.gov Thu Jan 7 15:58:42 1993
 Date: Thu, 7 Jan 1993 18:03:33 -0600 (CST)
 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
2122	930106	8993	71835	6000	127	-32

Helio corr removed

Date: Dec 15 '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 starts*

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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

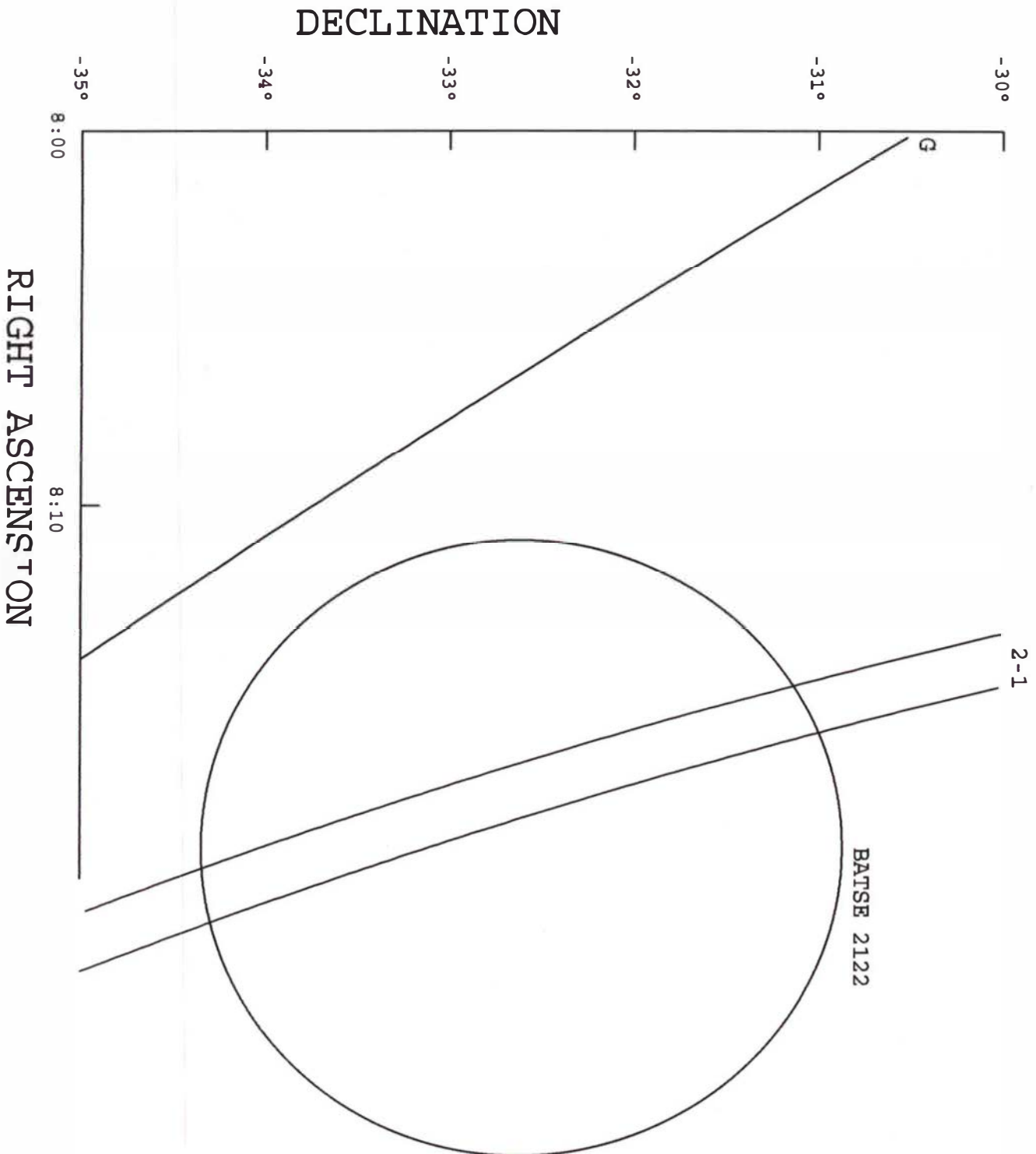
G=GALACTIC EQUATOR

1 ULYSSES

2 BATSE

EVENT OF JAN 6, 1993 19:28

15/12/97



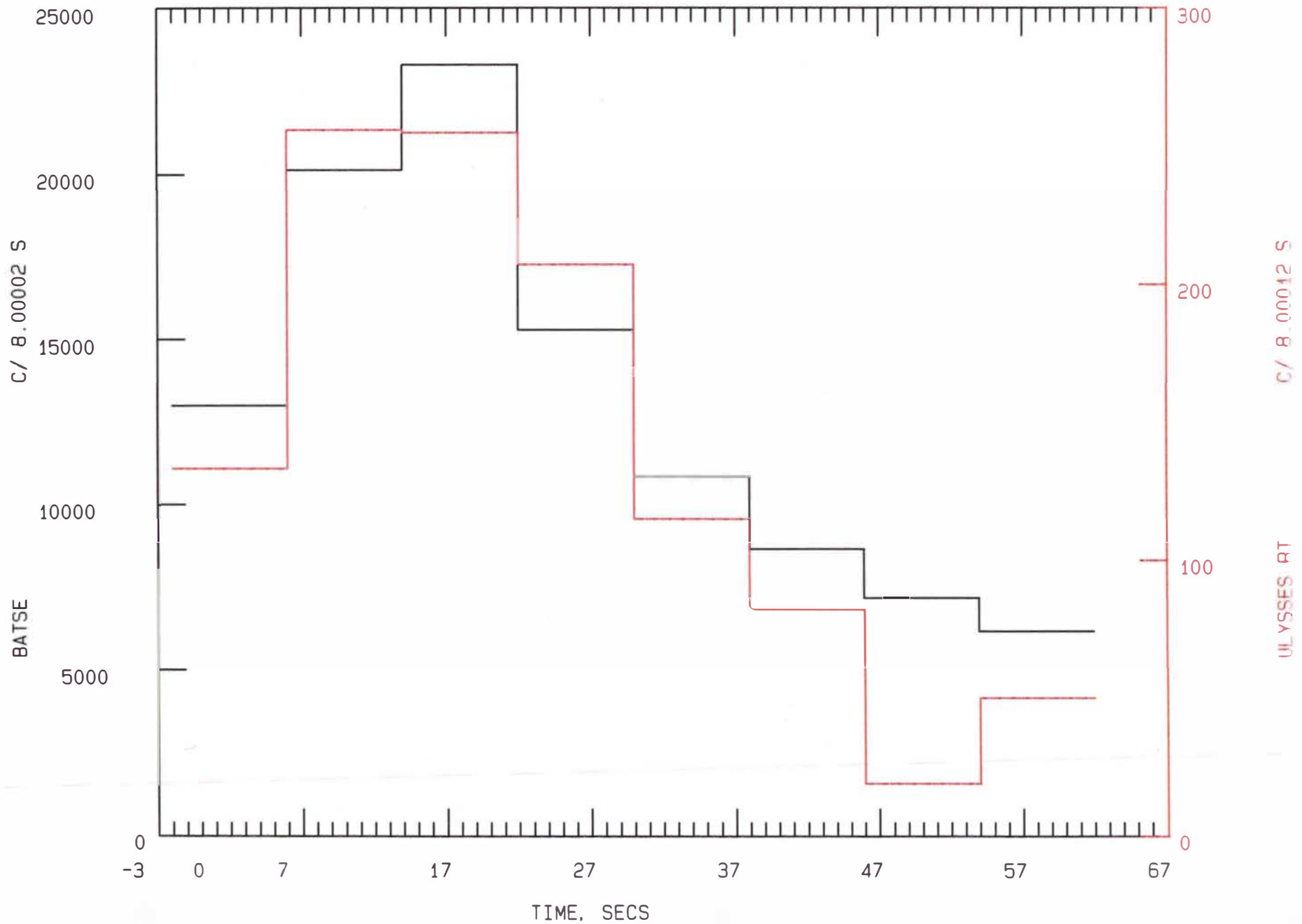
BATSE

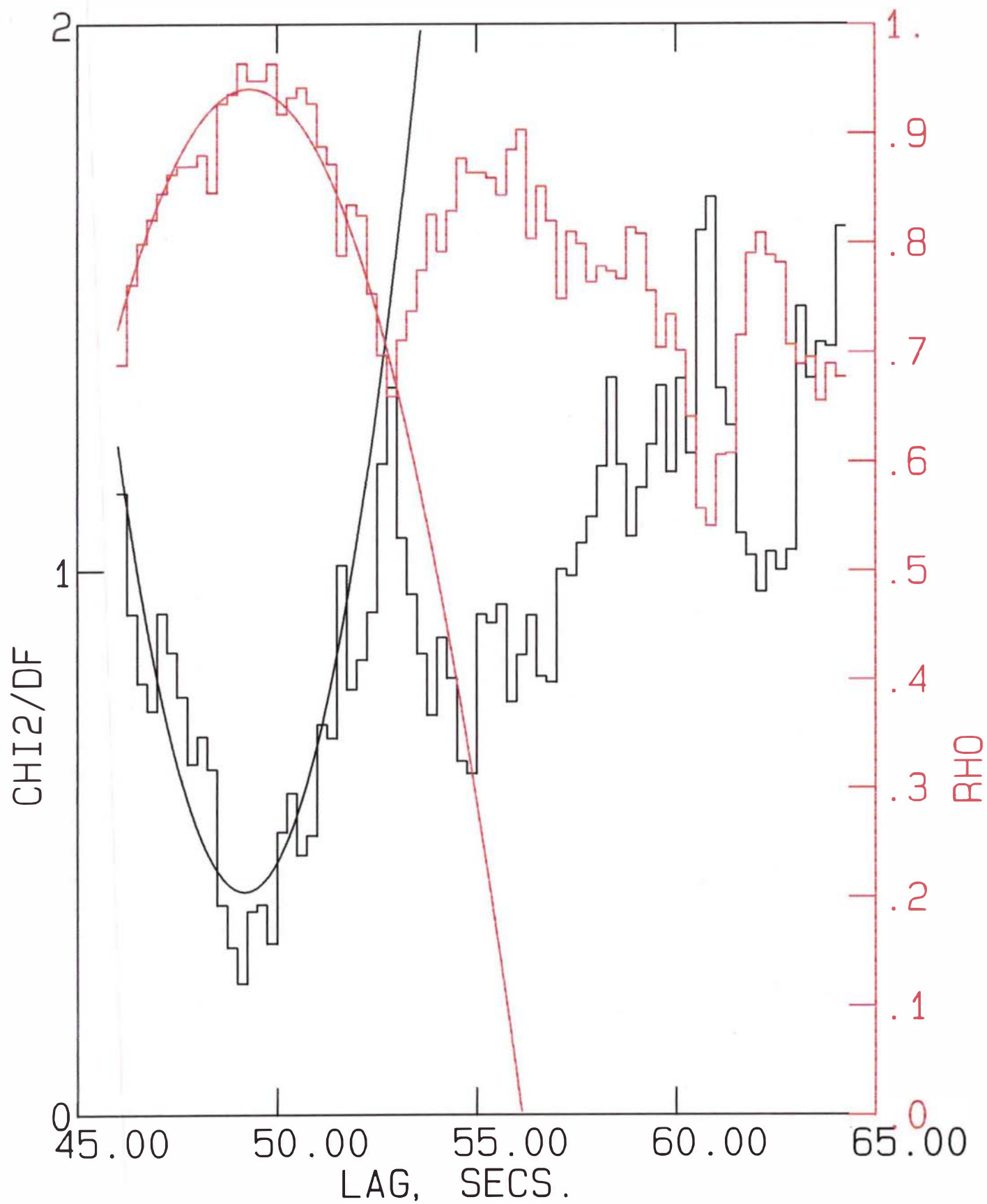
-ULYSSES RT CORRELATION

6/ 1/93

71835.266

15/12/97





ULYSSES RT

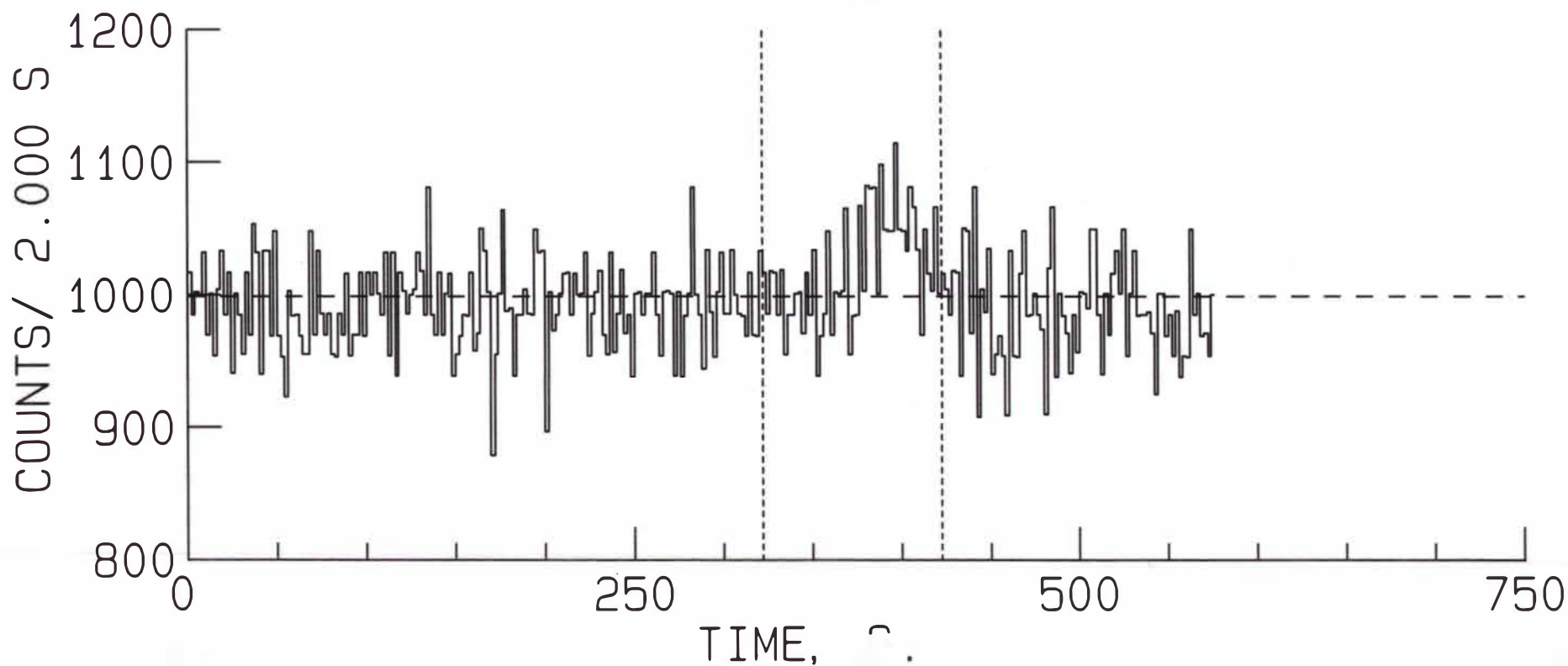
15 / 12 / 97

6 / 1 / 93 69768.208 s

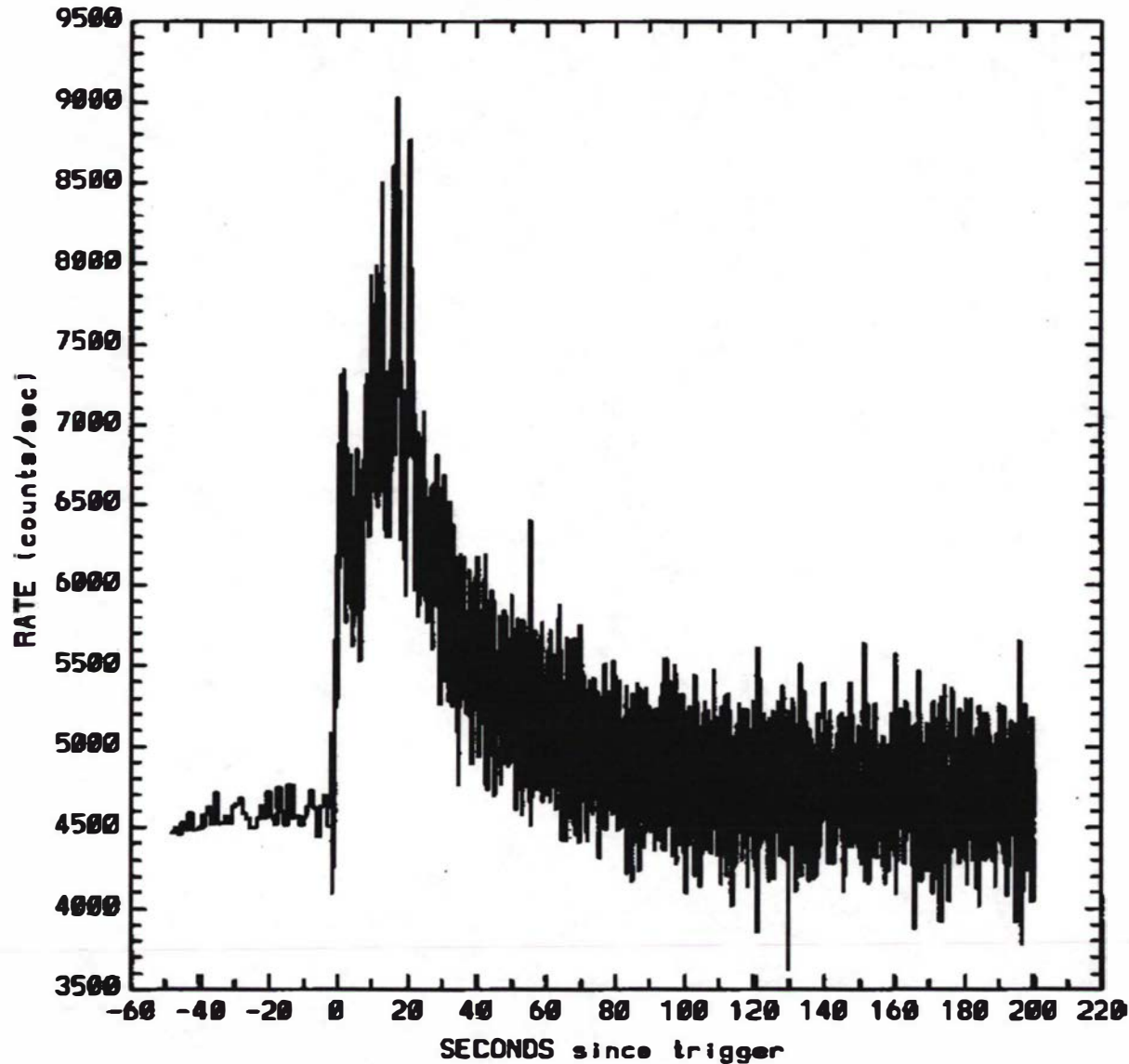
0.250 S INTERVALS REGROUPED BY 8

22- 148 keV

N= 10 M=10
>3.5 SIGMA FLUCTUATIONS



Data for K. Hurley



23-MAR-1993 15.05.37

Created by NOPS 80
(Burst Display)
Version 2.10

Trigger = 2122

Trigger Time:
8993 / 71835.266

Burst Data Type:
DISCSC

Deadtime
Corrected: M

Background Data
Type: PREB + DISCLA

Minimum Integ. Time:
0.064 seconds

Detectors [7..0]:
01000100

Discriminators:
(1, 2)

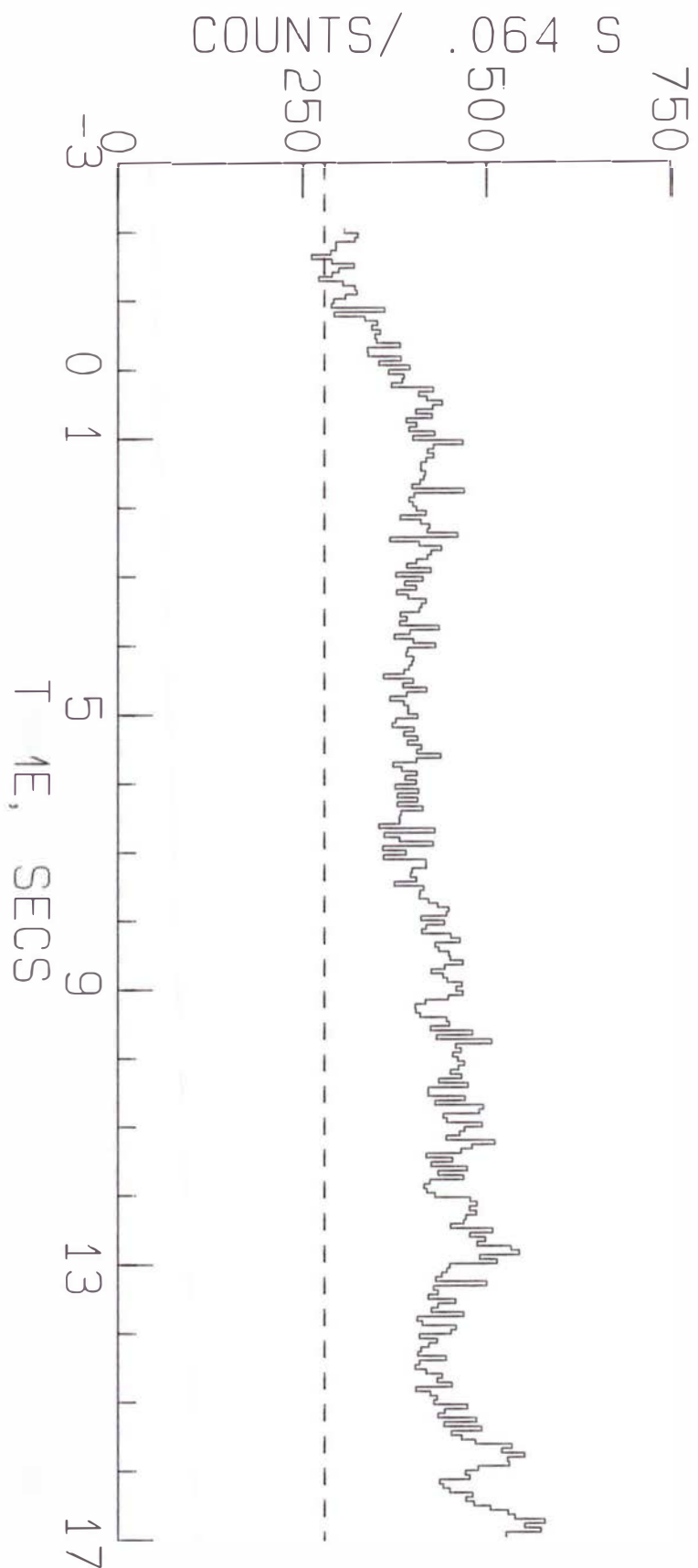
Quality Mask:
001SP1

BATSE

06/01/93

71835.266

25- 100 keV

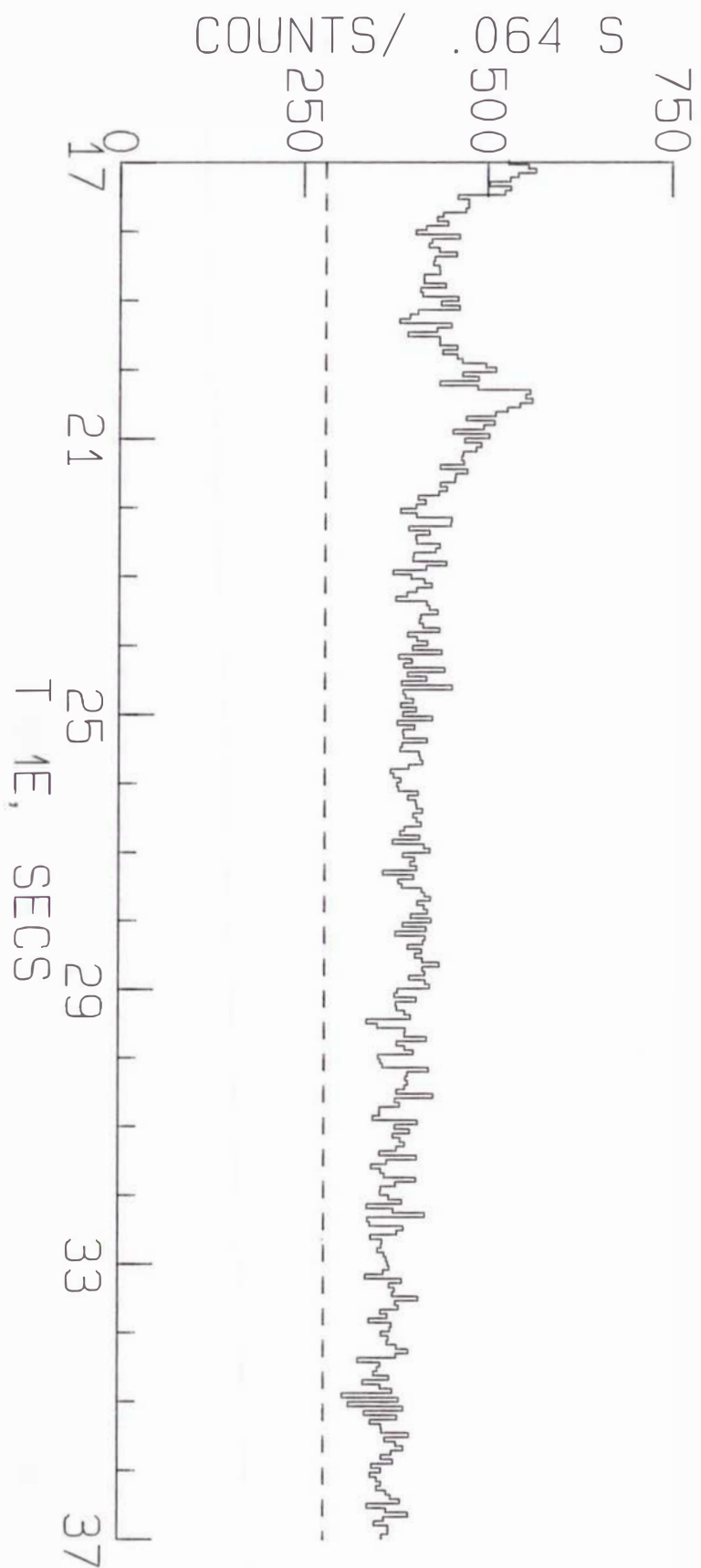


BATSE

06/01/93

71835.266

25- 100 keV



BATSE

06/01/93

71835.266

25- 100 keV

COUNTS/ .064 S

750
500
250
0

37

41

45

49

53

57

T IE, SECS



BATSE

06/01/93

71835.266

25- 100 keV

COUNTS/ .064 S

750
500
250
0

57

61

65

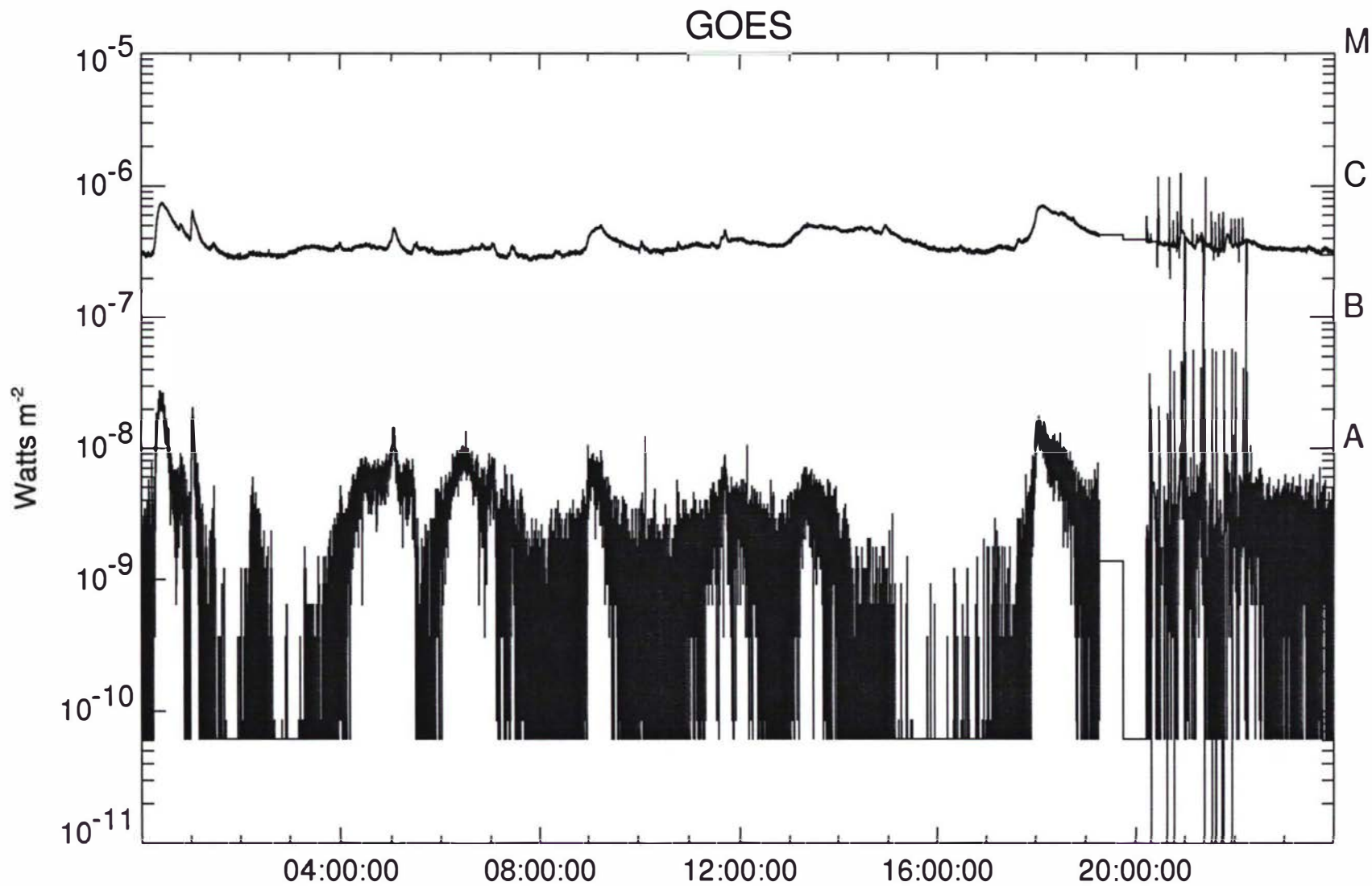
69

73

77

T 1E, SECS





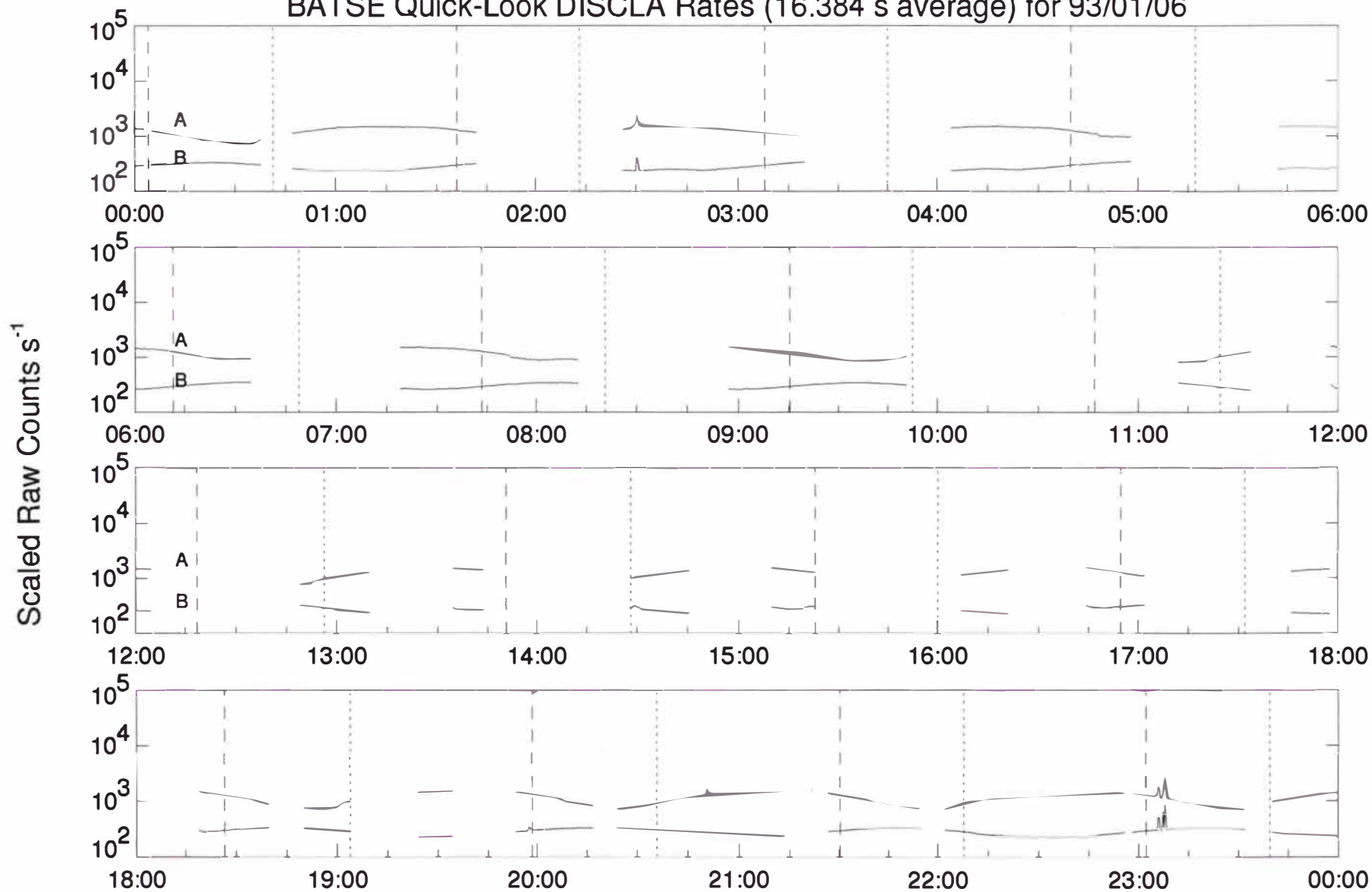
Data Start: 93/01/06, 0000:02

Plot created: 95/05/31, 2146

Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/06

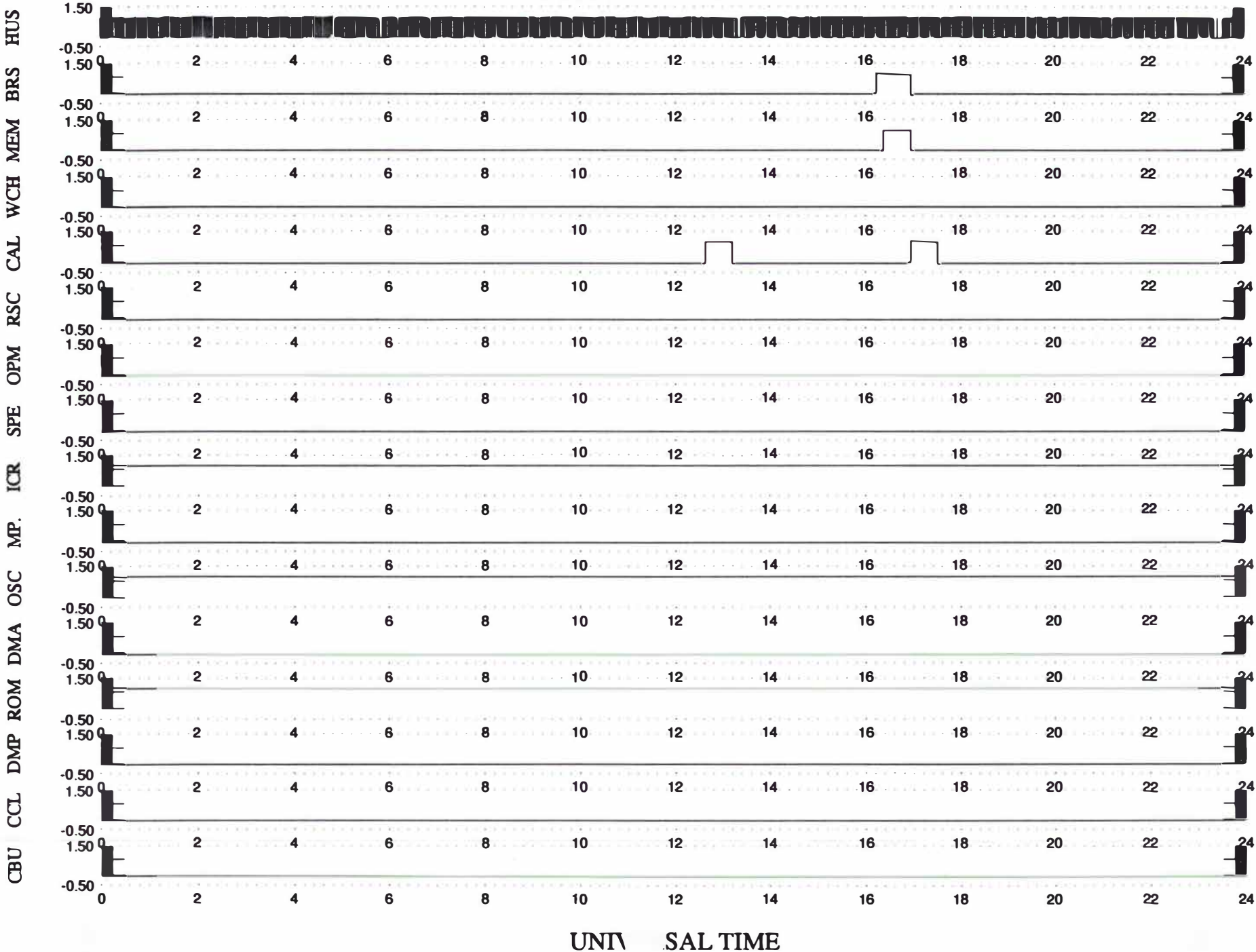


Current Time: 93/01/11, 1553 EDT
 A: Channel 1 Most Sunward LAD
 B: Sum Channel 1 Anti-Sunward LADs X .05

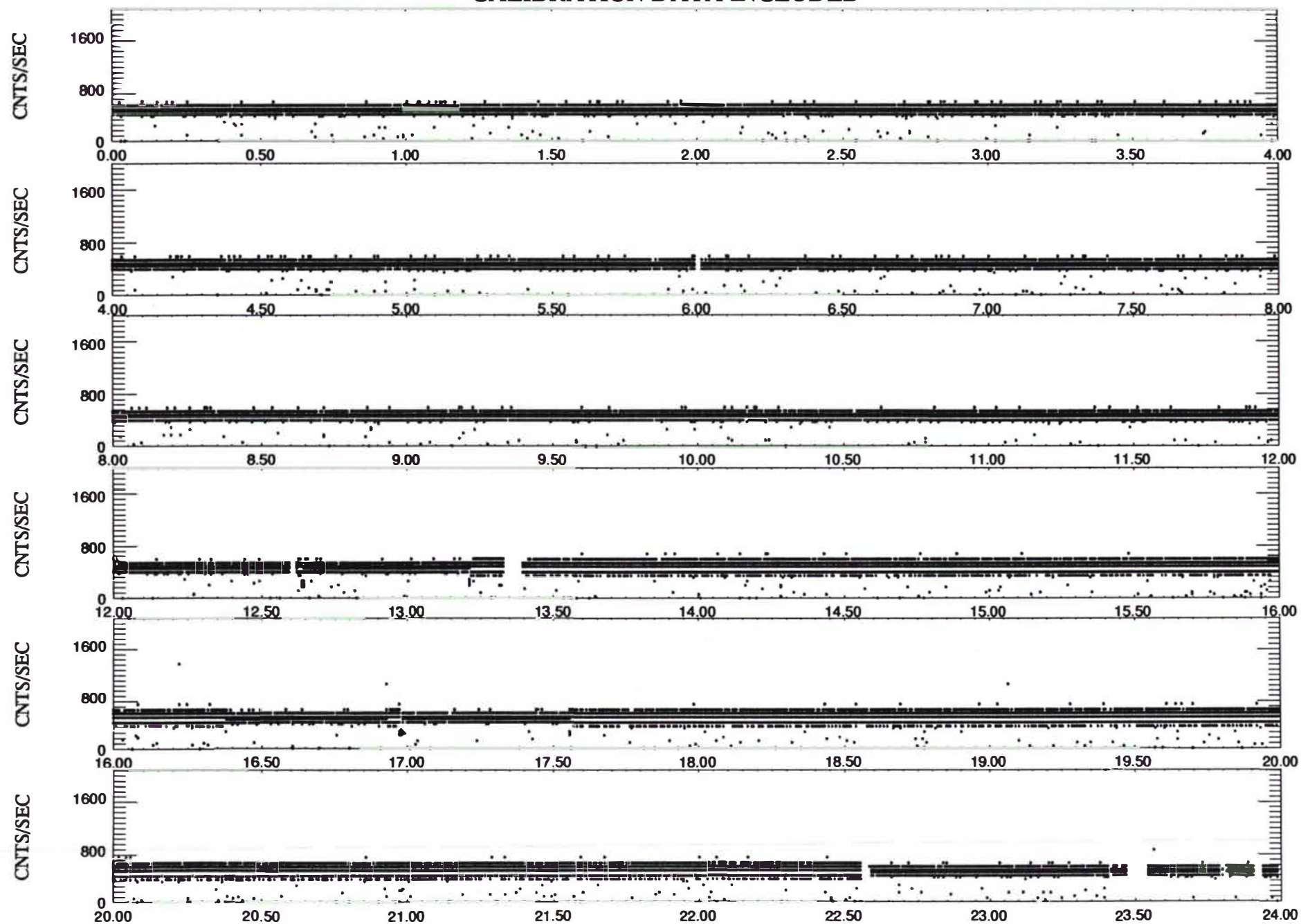
Dotted line: Day entry
 Dashed line: Night entry

* Solar Burst Trigger
 + Solar Flare

BURST NUMBER 4

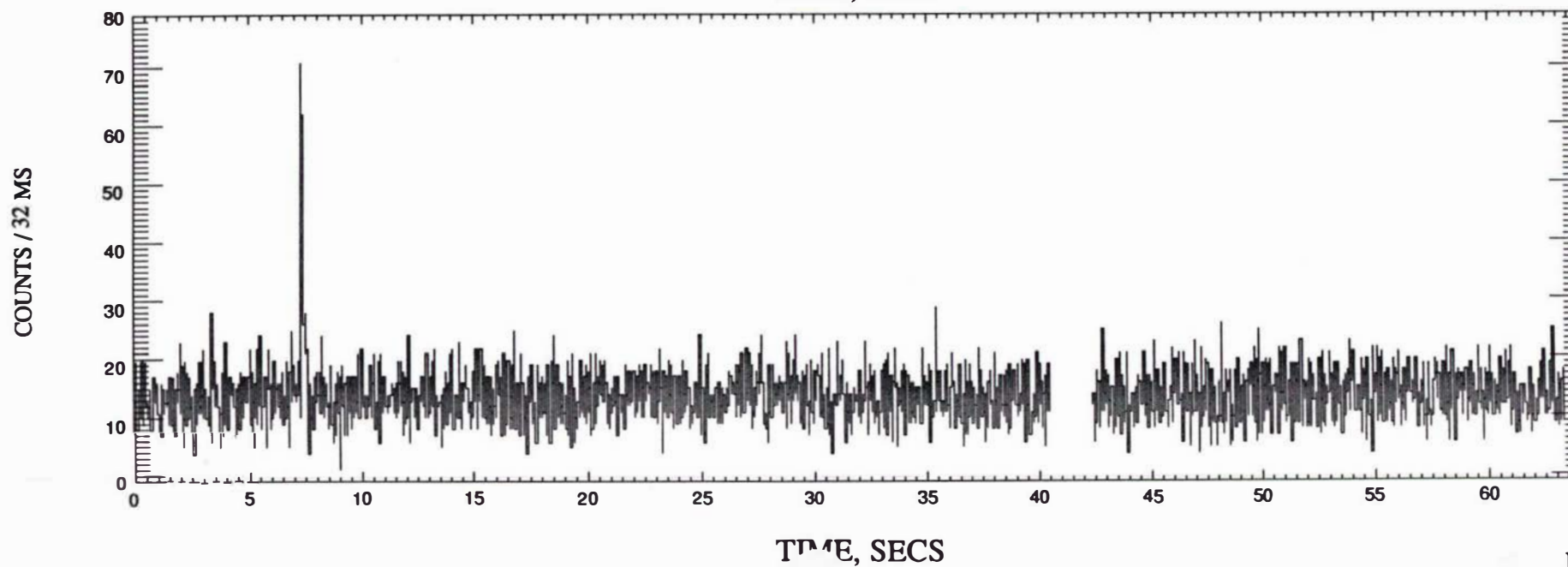
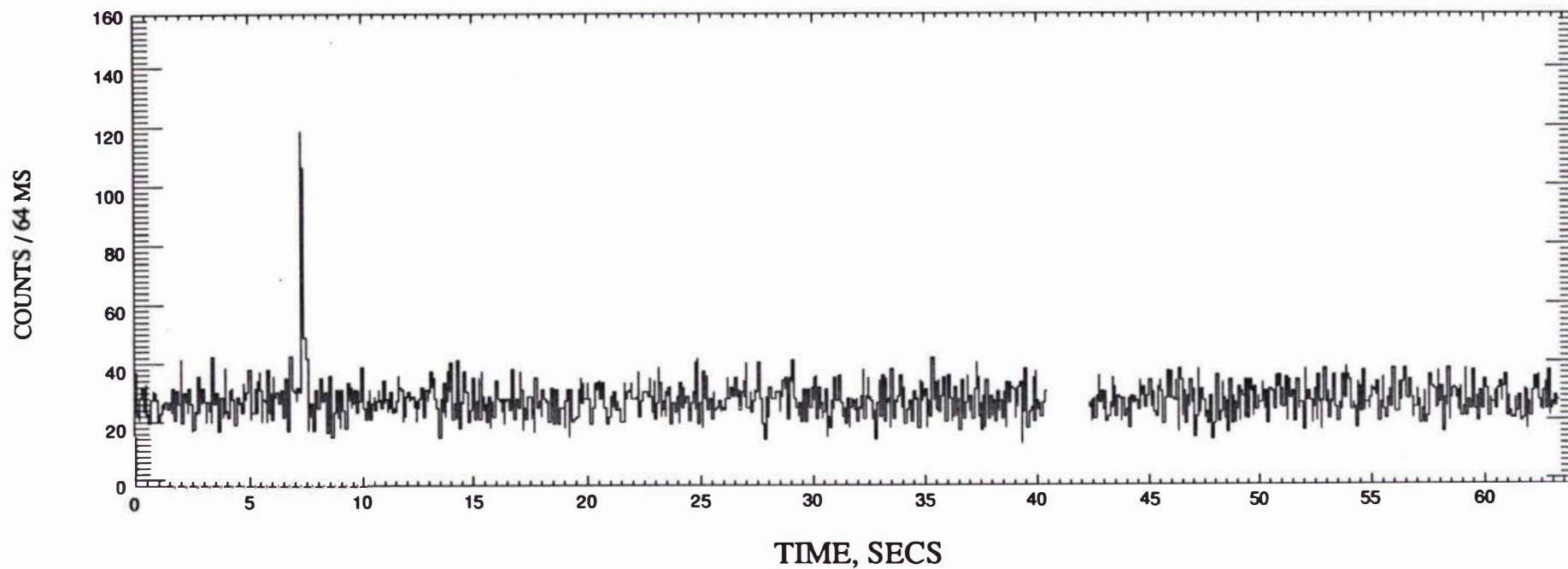


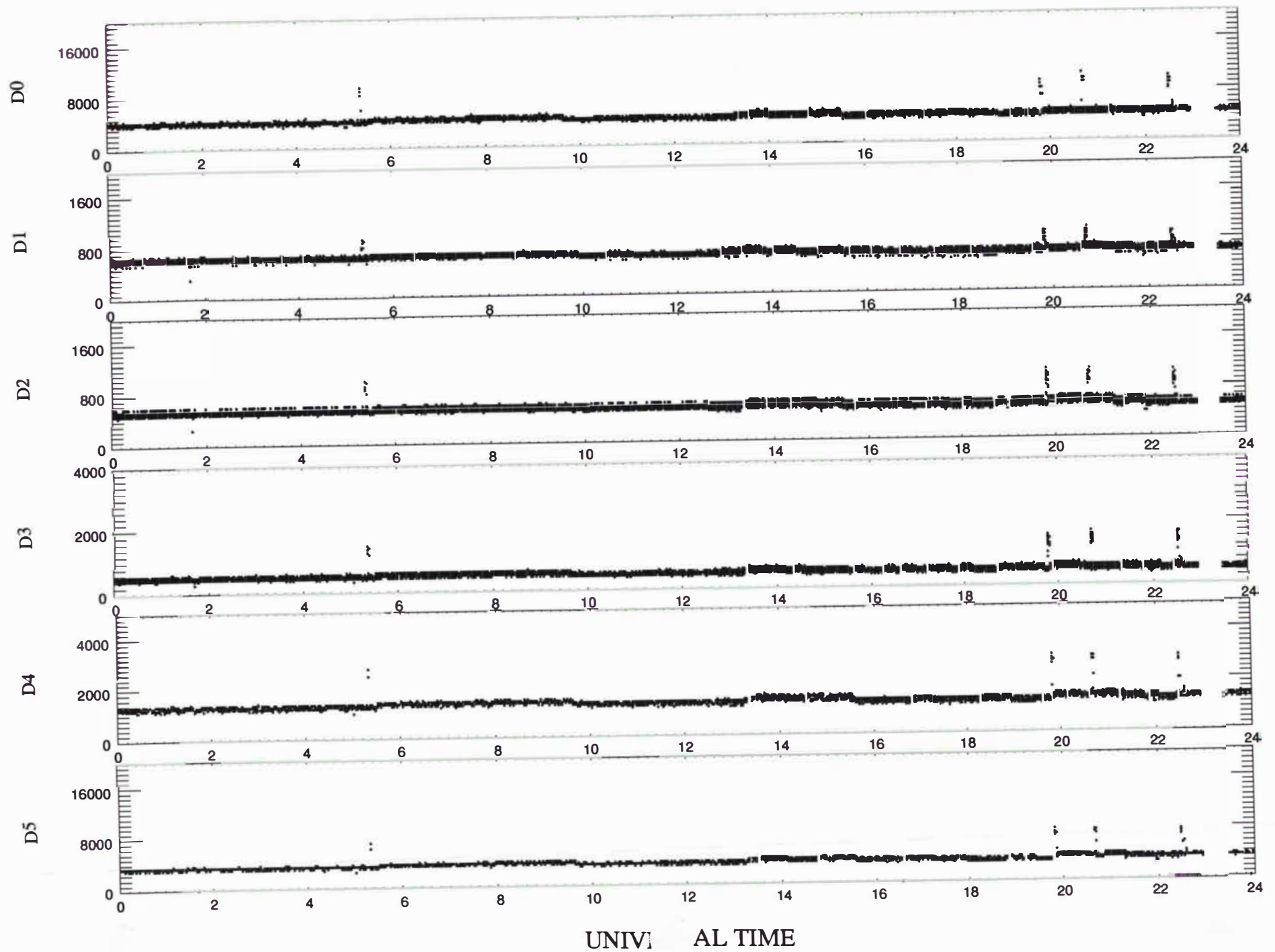
CALIBRATION DATA INCLUDED

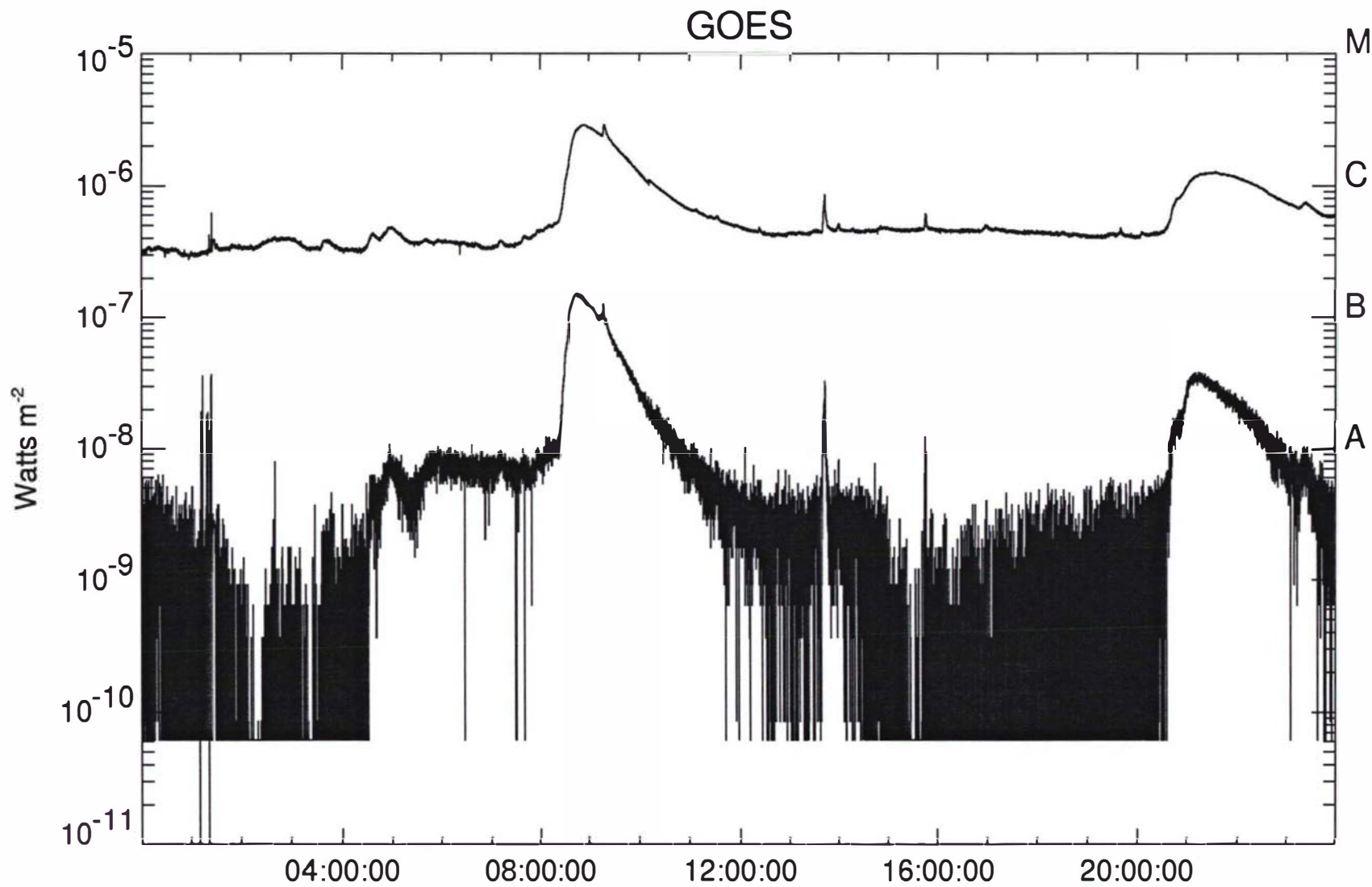


UNIV. TIME

Burst Counter 4 at UT=16.220713009304 h=58394.567 s 16:13:14.567







Data Start: 93/01/07, 0000:02

Plot created: 95/05/31, 2149

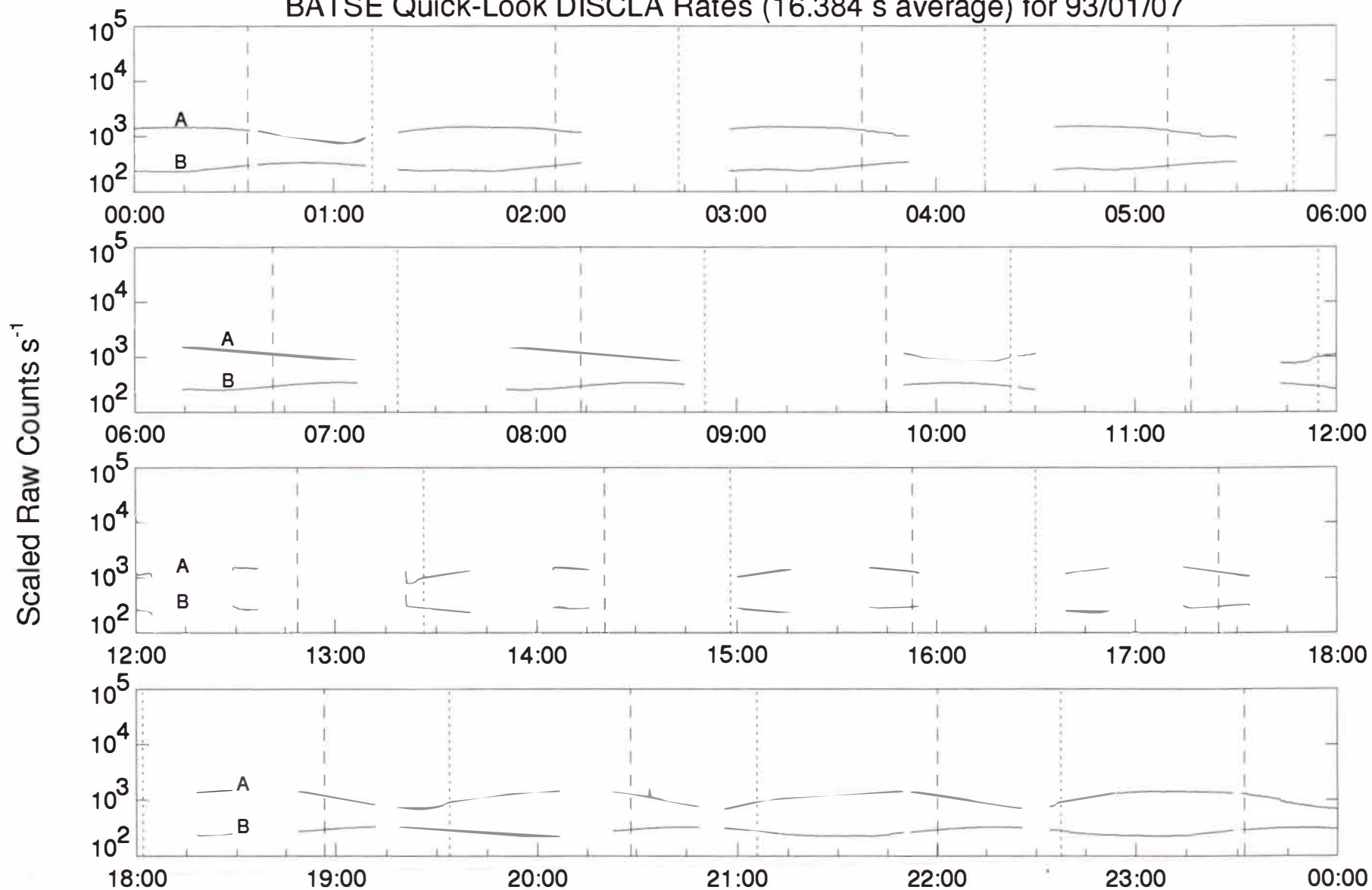
Channel 1 (1.0 - 8.0 Angstroms)

Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms)

Background not subtracted

BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/07

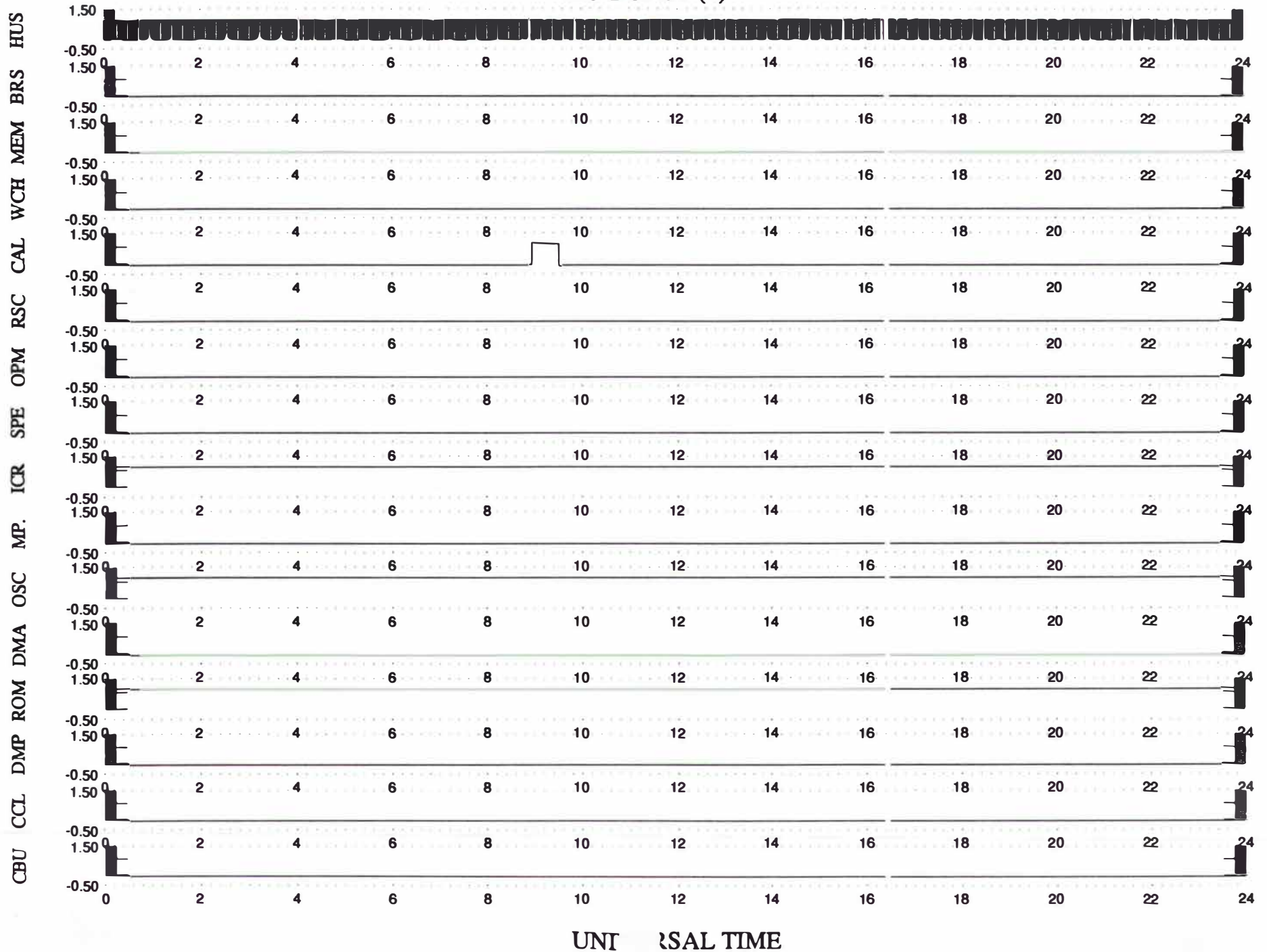


Current Time: 93/01/11, 1555 EDT
 A: Channel 1 Most Sunward LAD
 B: Sum Channel 1 Anti-Sunward LADs X .05

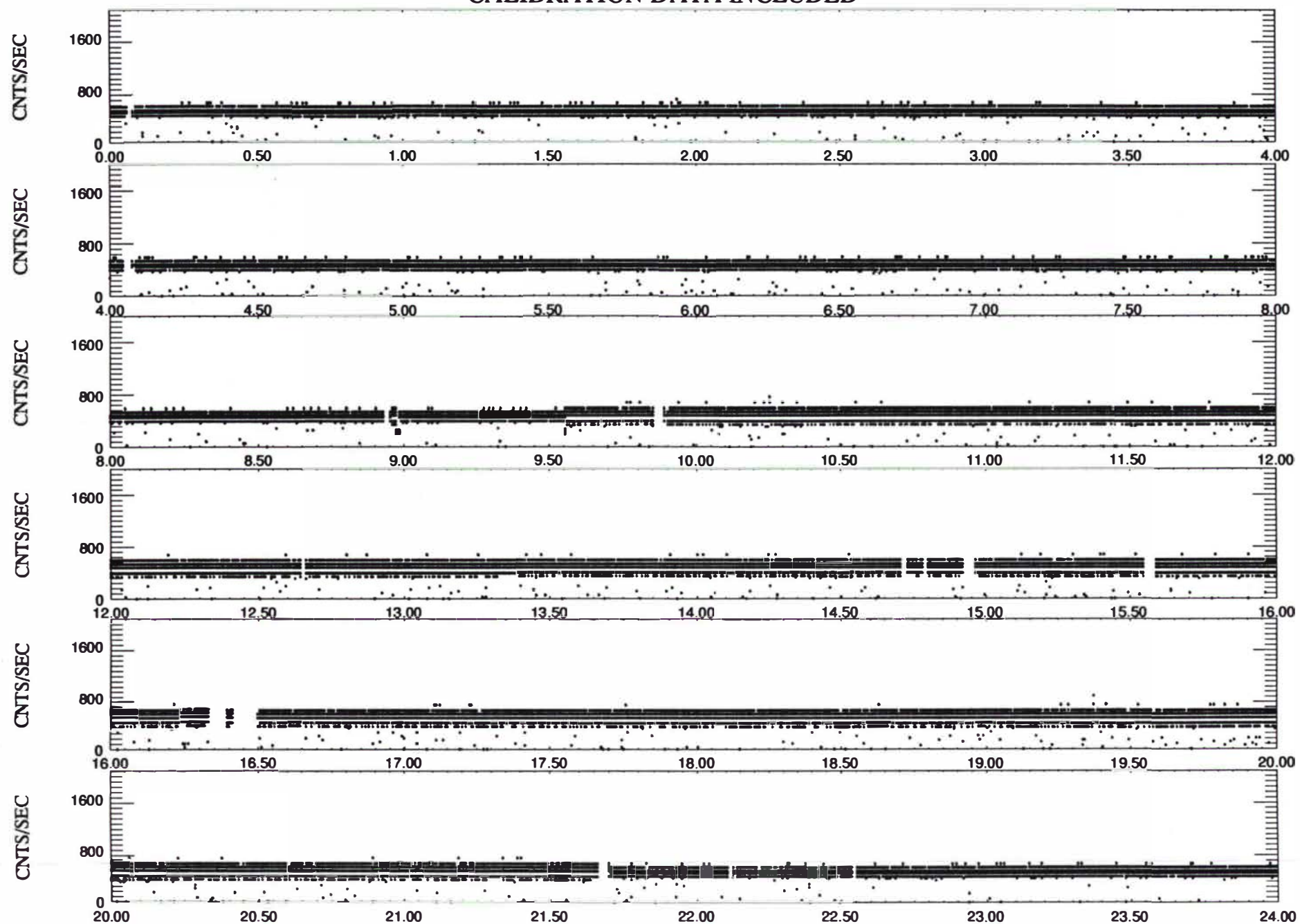
Dotted line: Day entry
 Dashed line: Night entry

* Solar Burst Trigger
 + Solar Flare

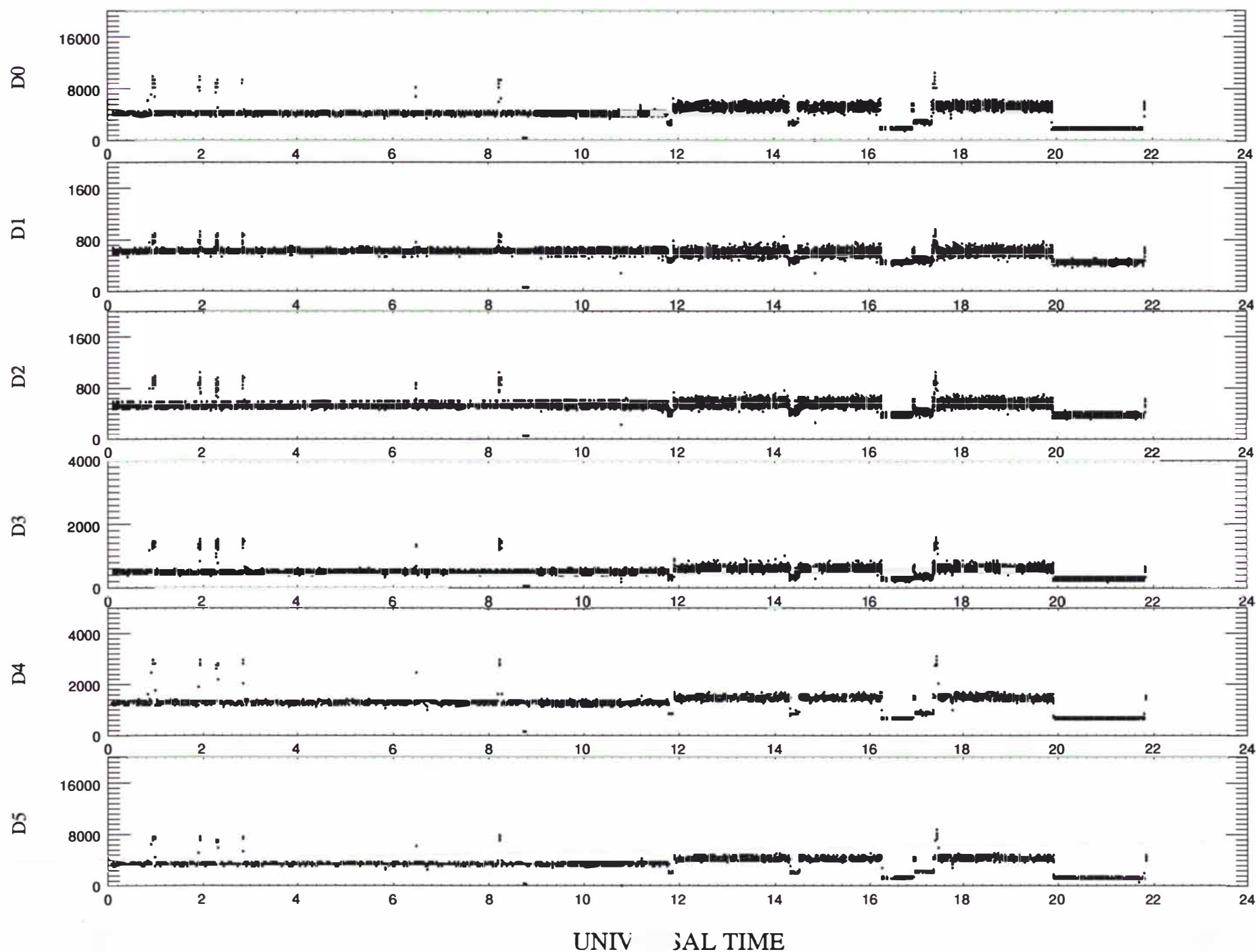
NO BURST (4)



CALIBRATION DATA INCLUDED



UNIV JAL TIME



CATSEARCH PROGRAM

BATSE BURST # 2123
EVENT OF 1993 JAN 8 DAY OF YEAR= 8
EVENT CROSSING TIME AT BATSE : 8935. S. OR 02:28:55.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 95.500 -29.900
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 8/ 1/ 93 IS:
RA= 164.771 DEC= -12.823 DIST= 4.562 AU
BATSE-ULYSSES DISTANCE = 682483231. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=114.19 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -932.97 SECS.
CROSSING TIME AT ULYSSES IS 8002. S. OR 02:13:22.1 +/- 396.36 SECONDS

RI

From BRIGGS@ssl.msfc.nasa.gov Sat Jan 9 16:13:49 1993
Date: Sat, 9 Jan 1993 18:18:47 -0600 (CST)
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
2123	930108	8995	08935	9000	096	-26

RI

Helio corr removed

Date: *Dec 15 '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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

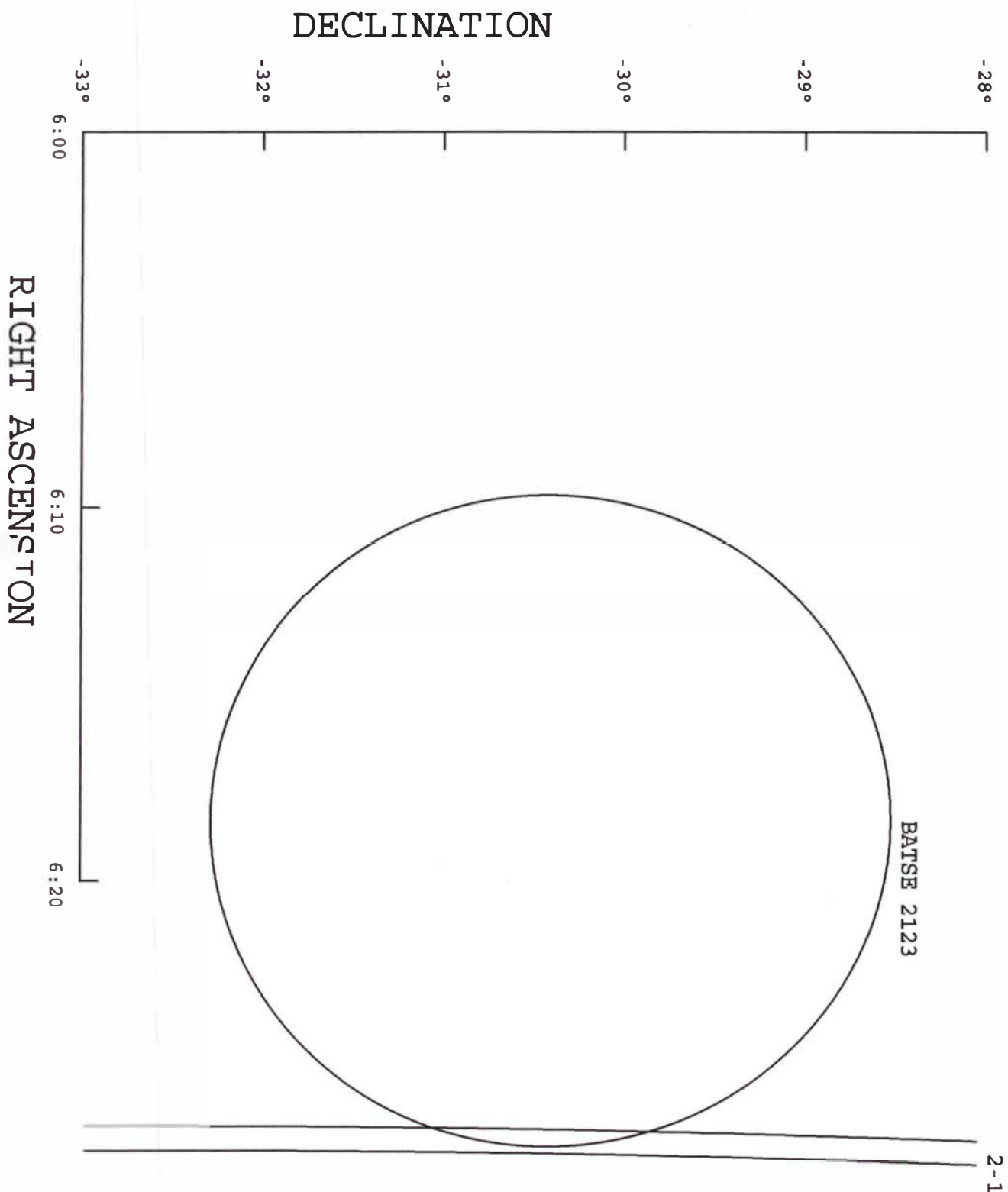
G=GALACTIC EQUATOR

1 ULYSSES

2 BATSE

EVENT OF JAN 8, 1993 2:12

15/12/97



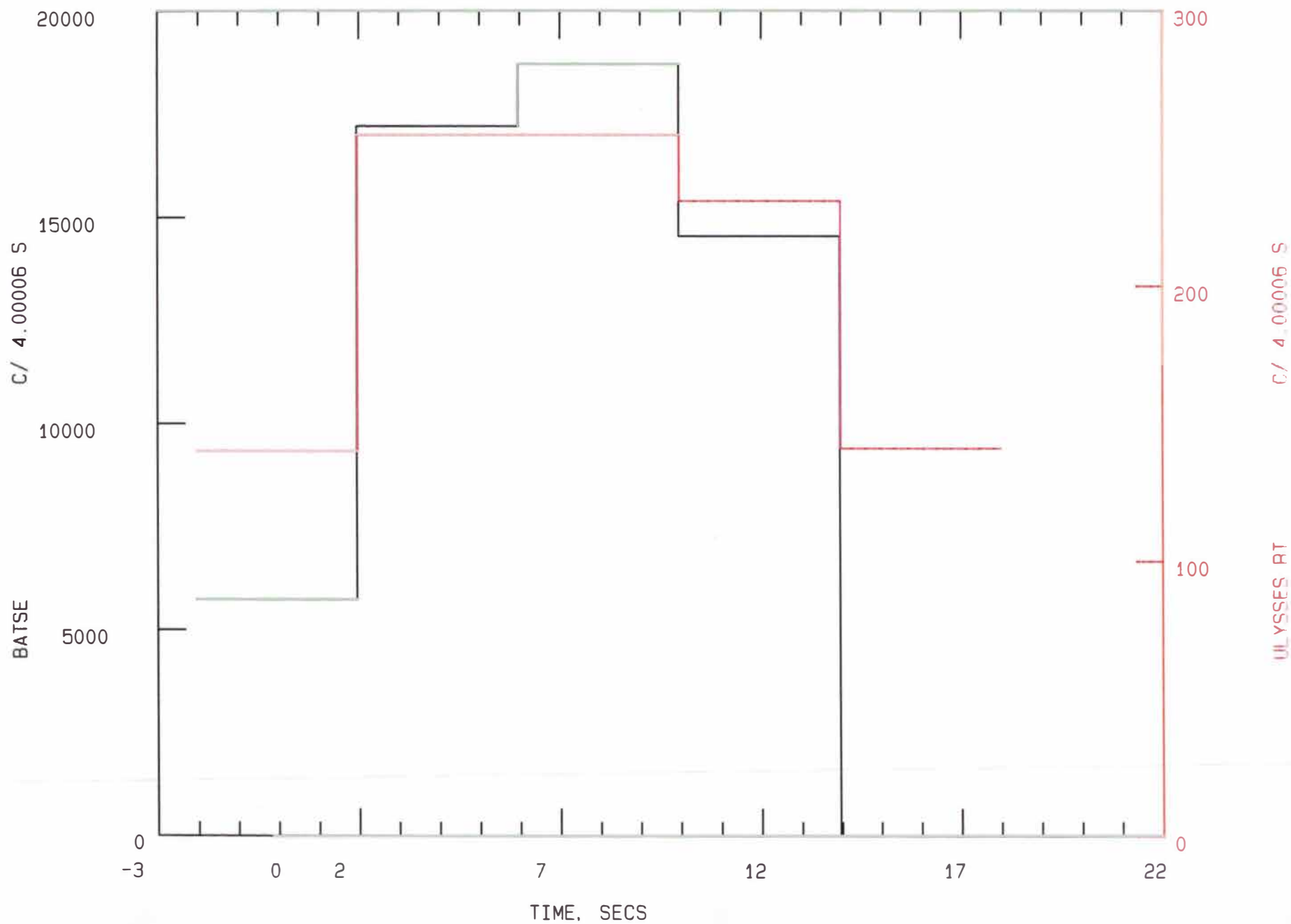
BATSE

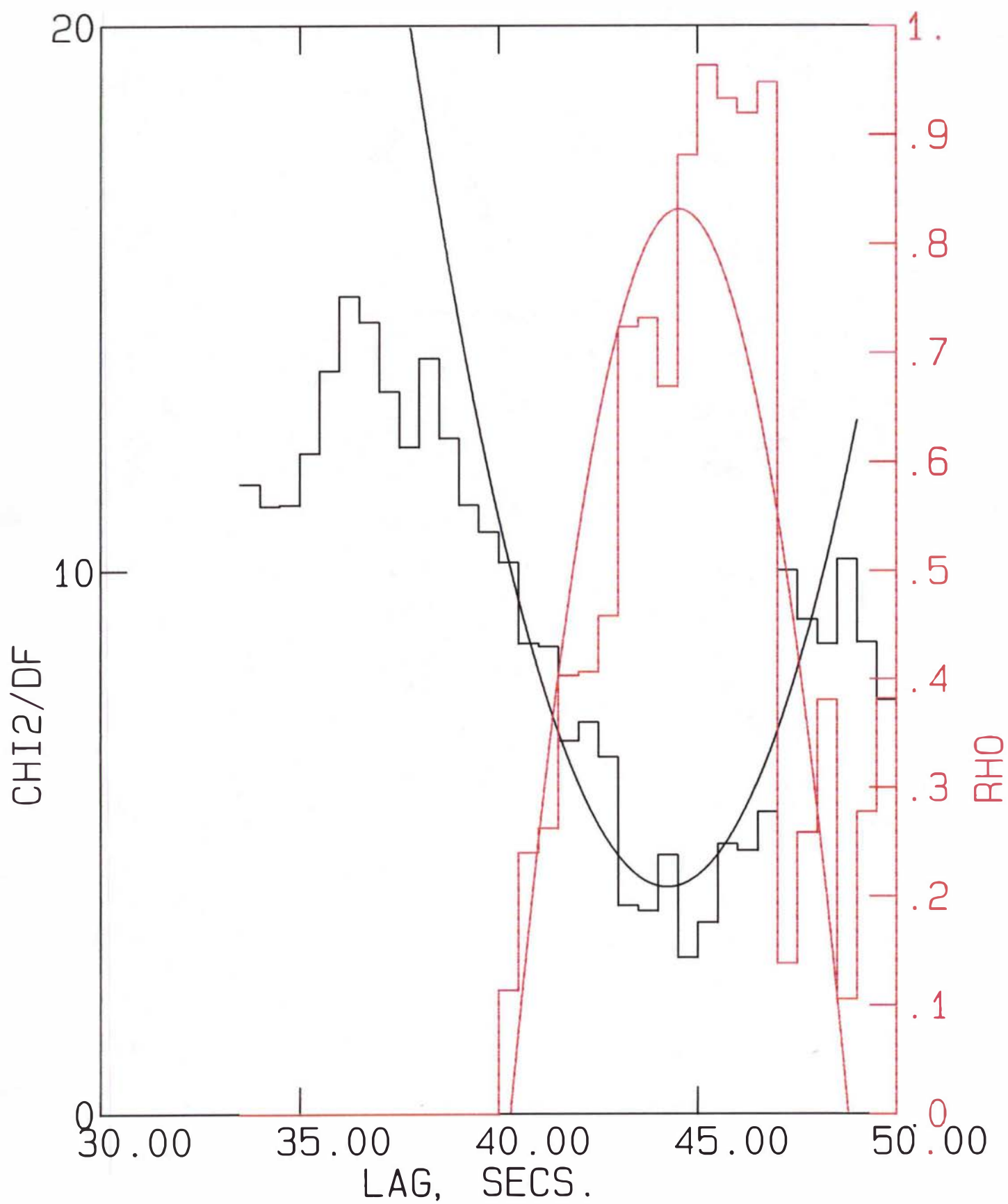
-ULYSSES RT CORRELATION

8/ 1/93

8935.042

15/12/97





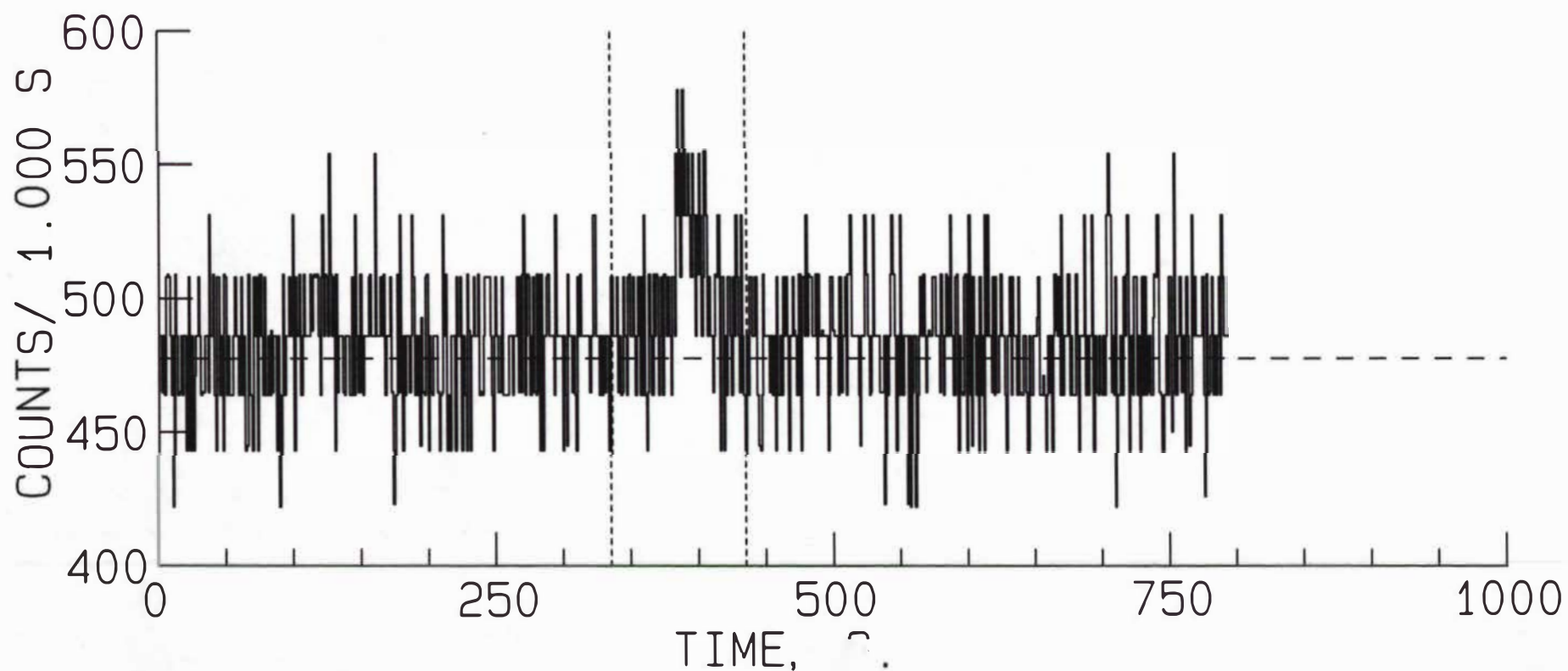
ULYSSES RT

15/12/97

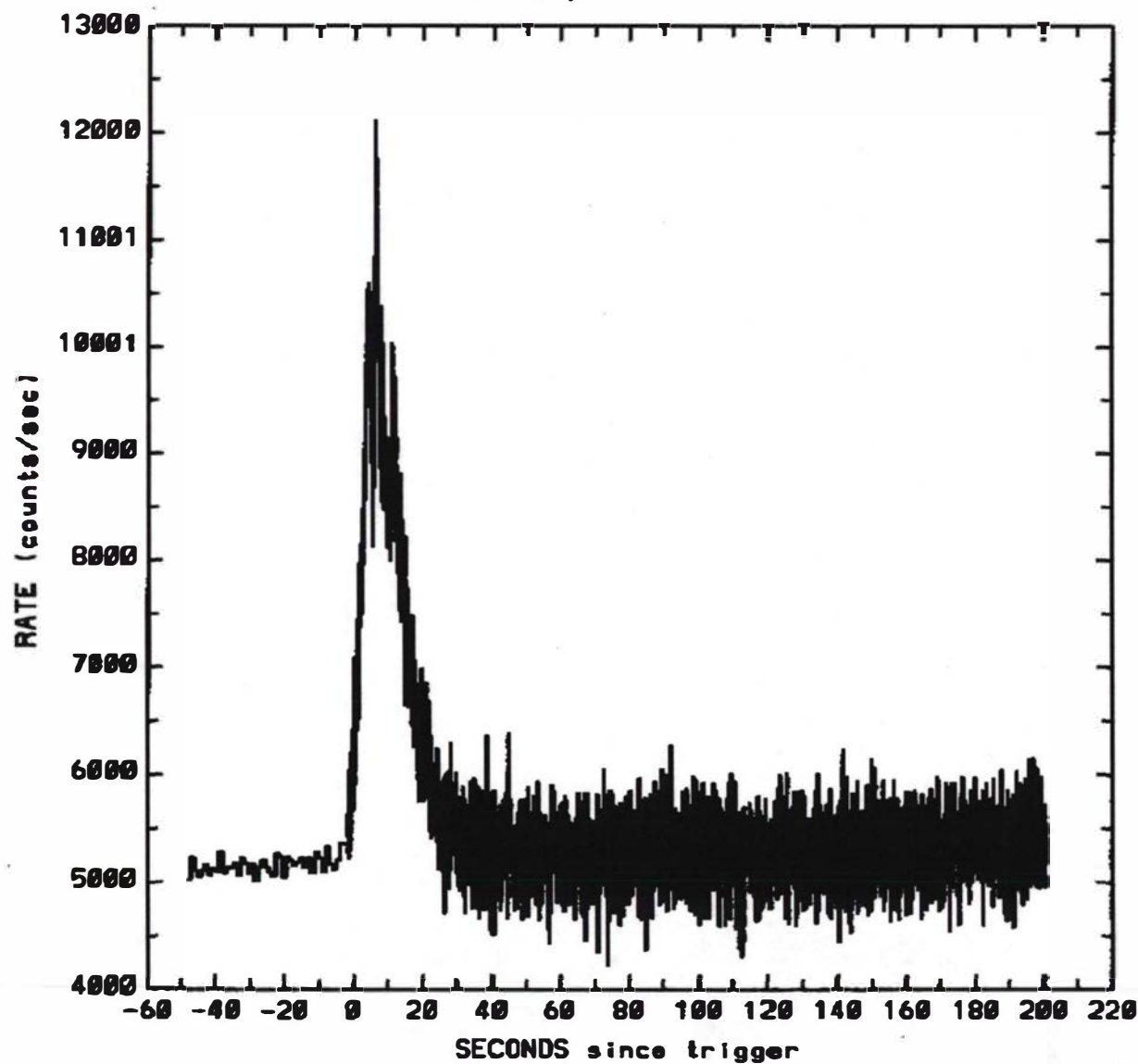
8/ 1/93 7596.190 s

0.500 S INTERVALS REGROUPED BY 2

22- 147 keV



Data for K. Hurley



23-MAR-1993 15:00:51

Created by ROPS 80
(Burst Display)
Version 2.10

Trigger # : 2123

Trigger Time:
8995 / 8935.842

Burst Data Type:
DISCSC

Deadtime
Corrected: N

Background Data
Type: PRED + DISCLA

Minimum Integ. Time:
0.004 seconds

Detectors (7..8):
11000000

Discriminators:
(1..2)

Quality Mask:
80ISP1

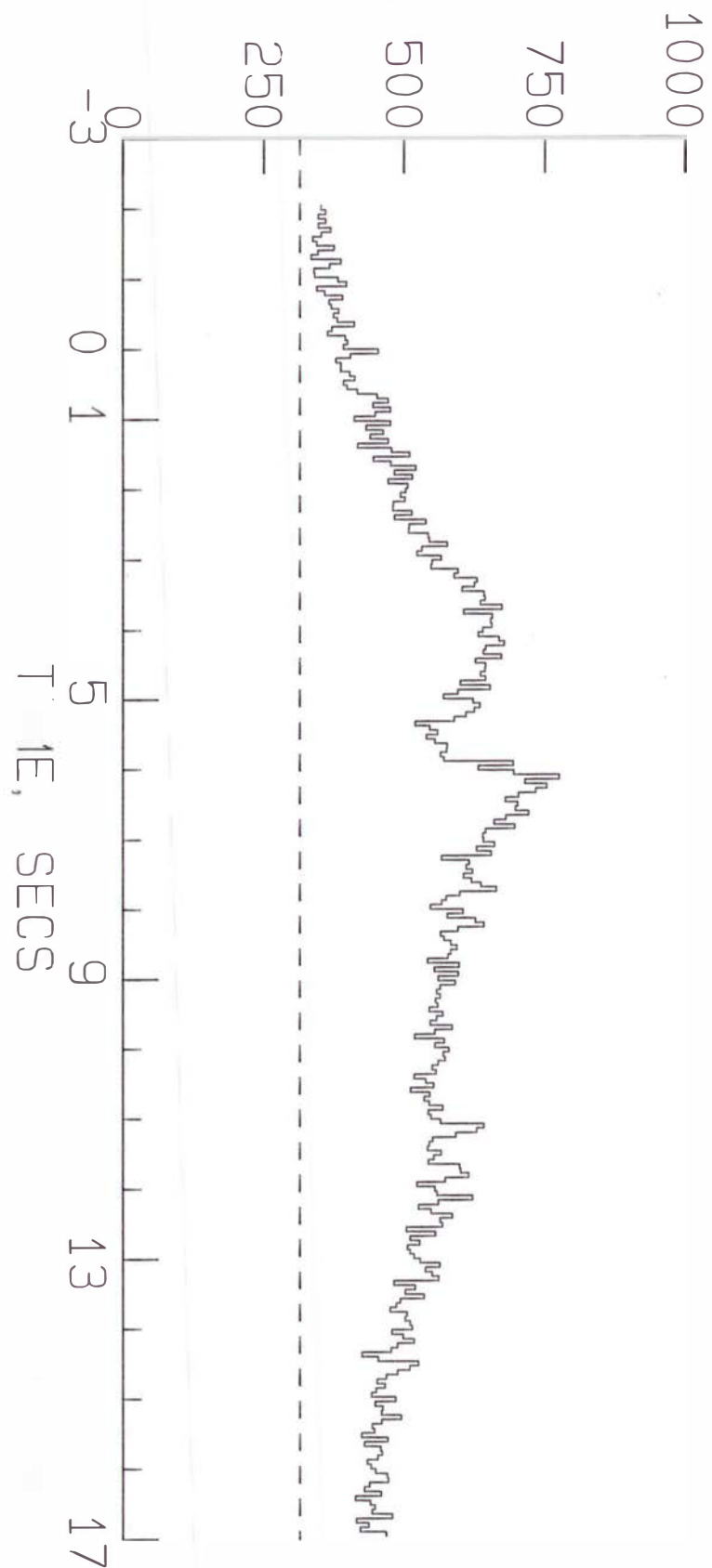
BATSE

08/01/93

8935.042

25- 100 keV

COUNTS/ .064 S



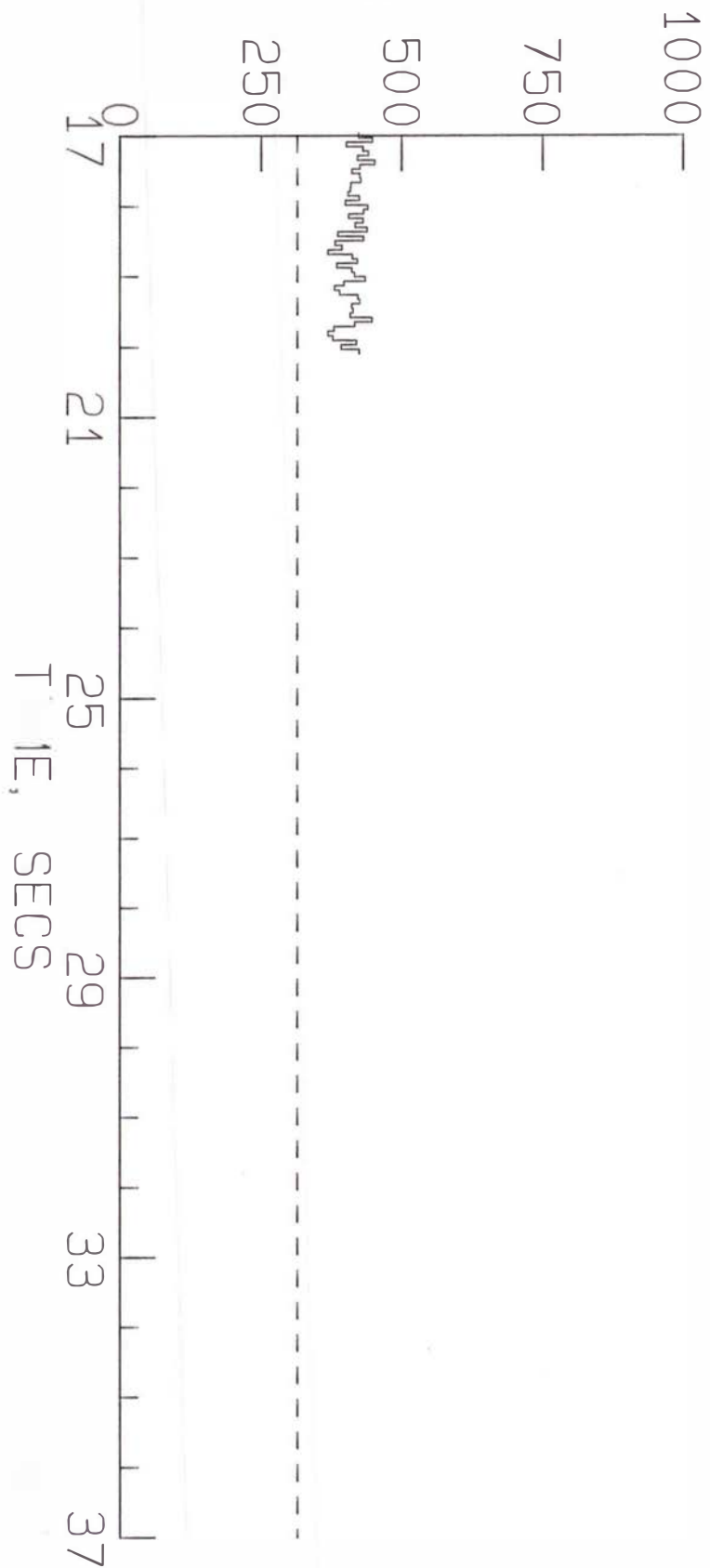
BATSE

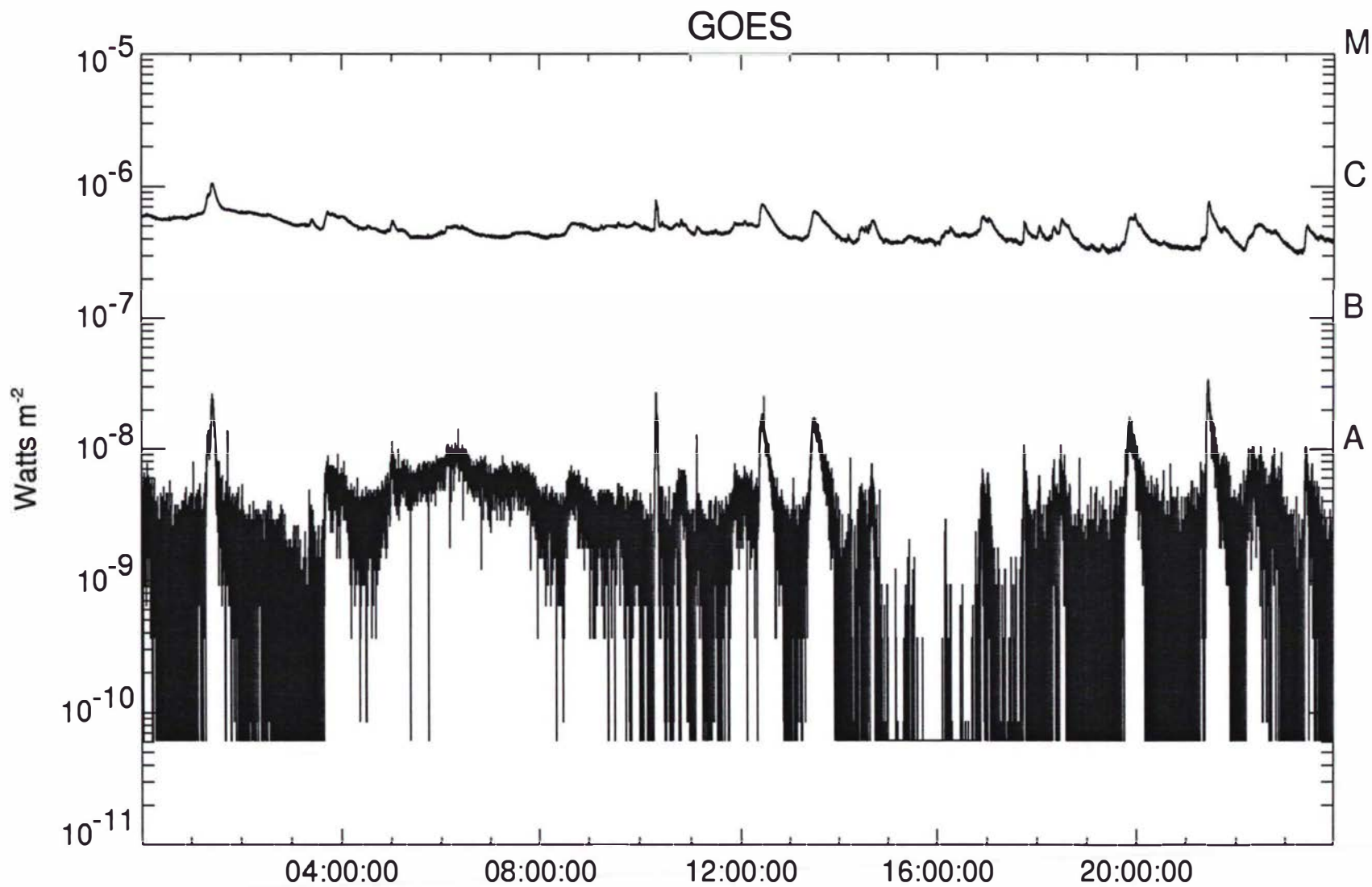
08/01/93

8935.042

25- 100 keV

COUNTS/ .064 S





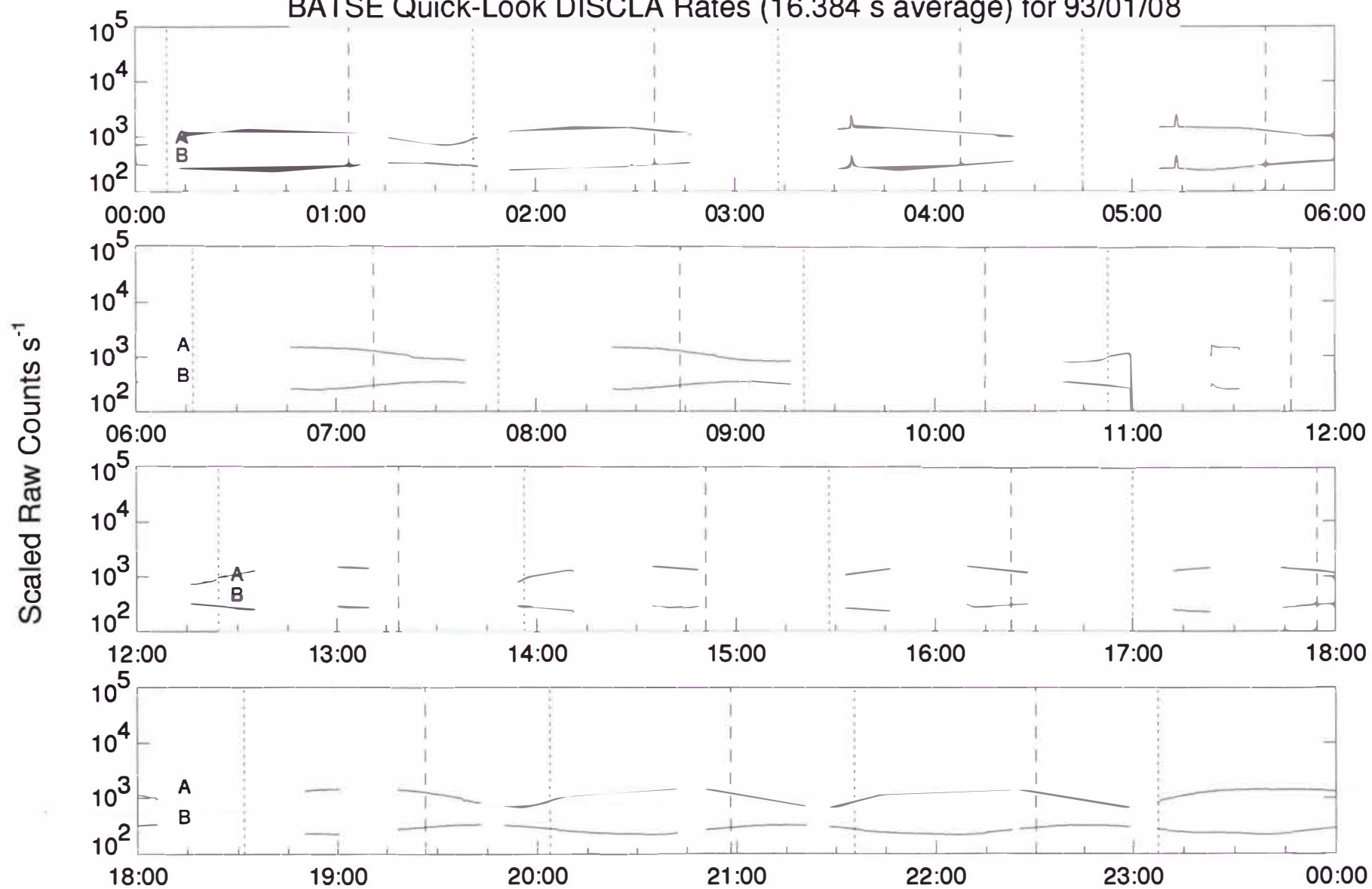
Data Start: 93/01/08, 0000:02

Plot created: 95/05/31, 2151

Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/08

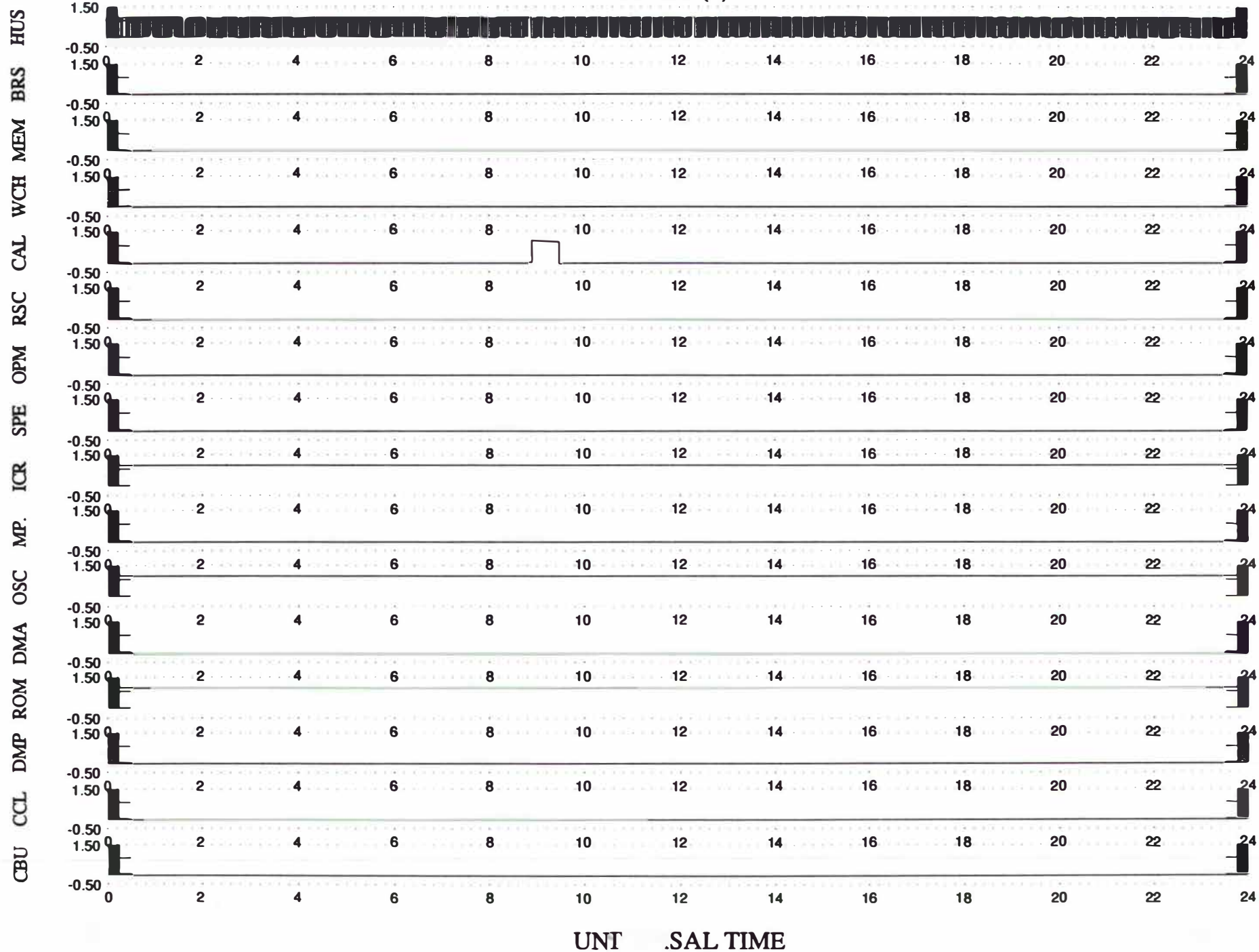


Current Time: 93/01/11, 1556 EDT
 A: Channel 1 Most Sunward LAD
 B: Sum Channel 1 Anti-Sunward LADs X .05

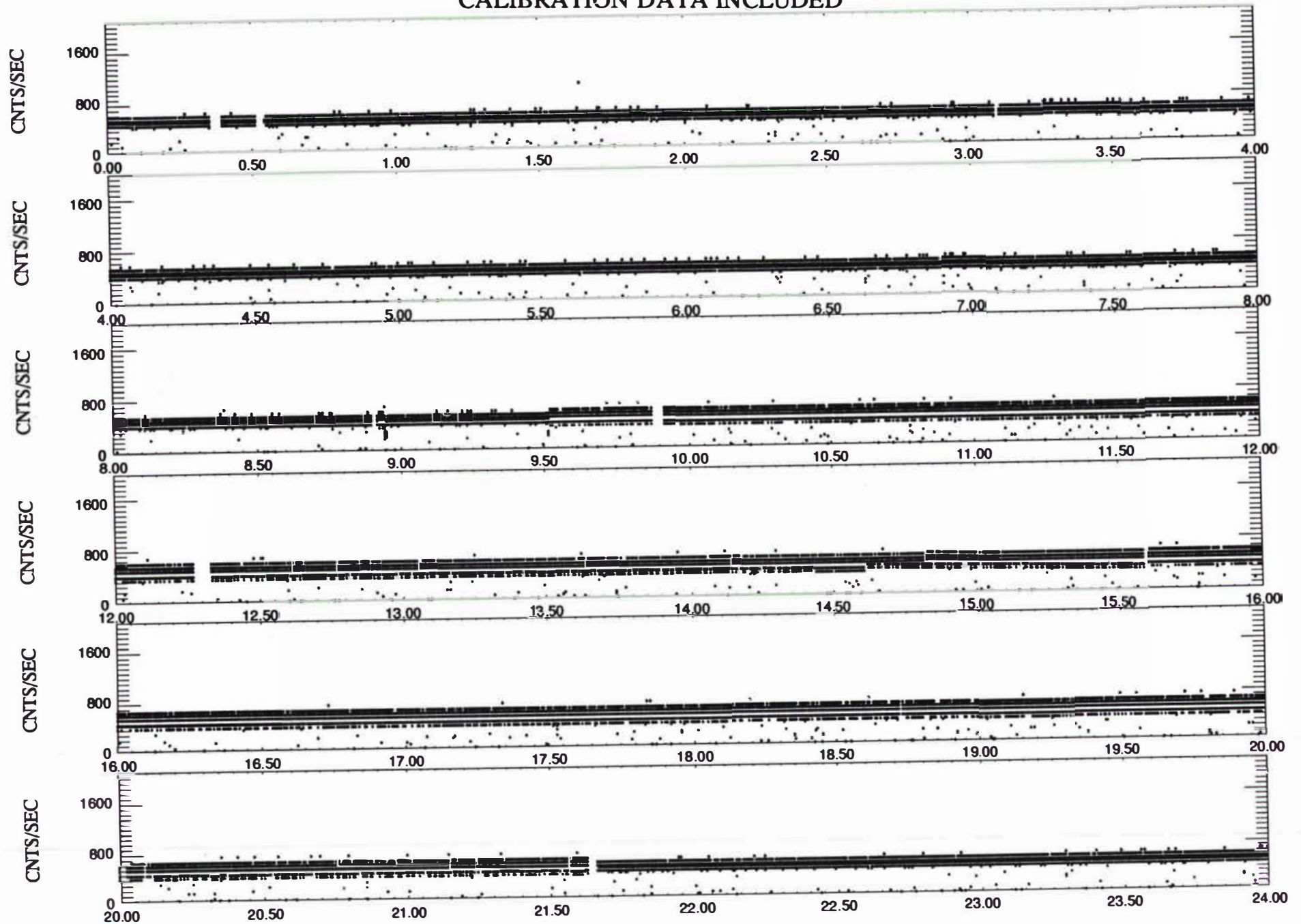
Dotted line: Day entry
 Dashed line: Night entry

* Solar Burst Trigger
 + Solar Flare

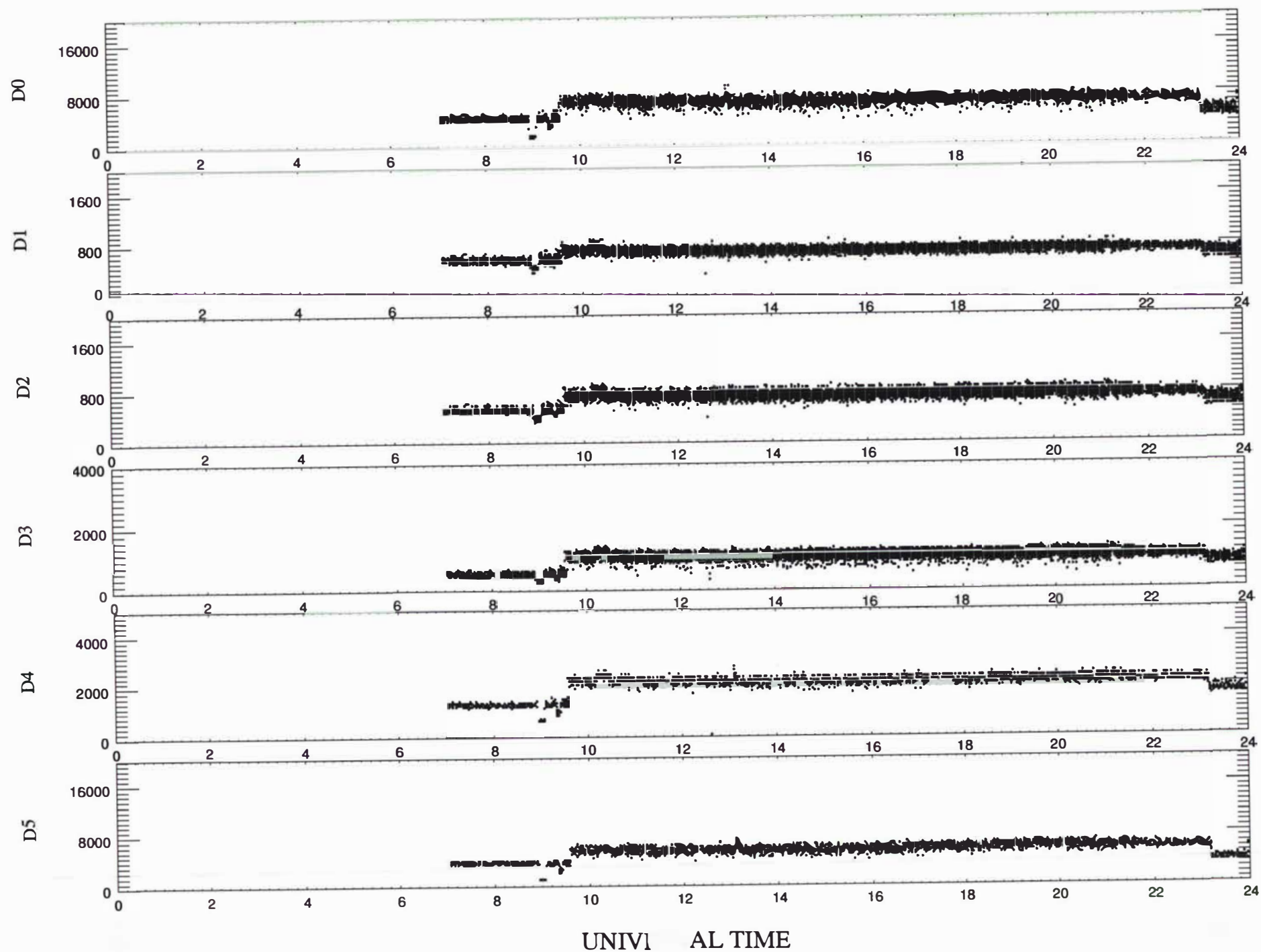
NO BURST (4)



CALIBRATION DATA INCLUDED



UNIV SAL TIME



CATSEARCH PROGRAM

BATSE BURST # 2124
EVENT OF 1993 JAN 9 DAY OF YEAR= 9
EVENT CROSSING TIME AT BATSE : 37782. S. OR 10:29:41.6
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 81.800 27.400
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 9/ 1/ 93 IS:
RA= 164.647 DEC= -12.903 DIST= 4.545 AU
BATSE-ULYSSES DISTANCE = 680006800. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 90.29 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -11.33 SECS.
CROSSING TIME AT ULYSSES IS 37770. S. OR 10:29:30.3 +/- 443.63 SECONDS

NO

From MALLOZZI@ssl.msfc.nasa.gov Sun Jan 10 10:41:43 1993
Date: Sun, 10 Jan 1993 12:46:45 -0600 (CST)
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

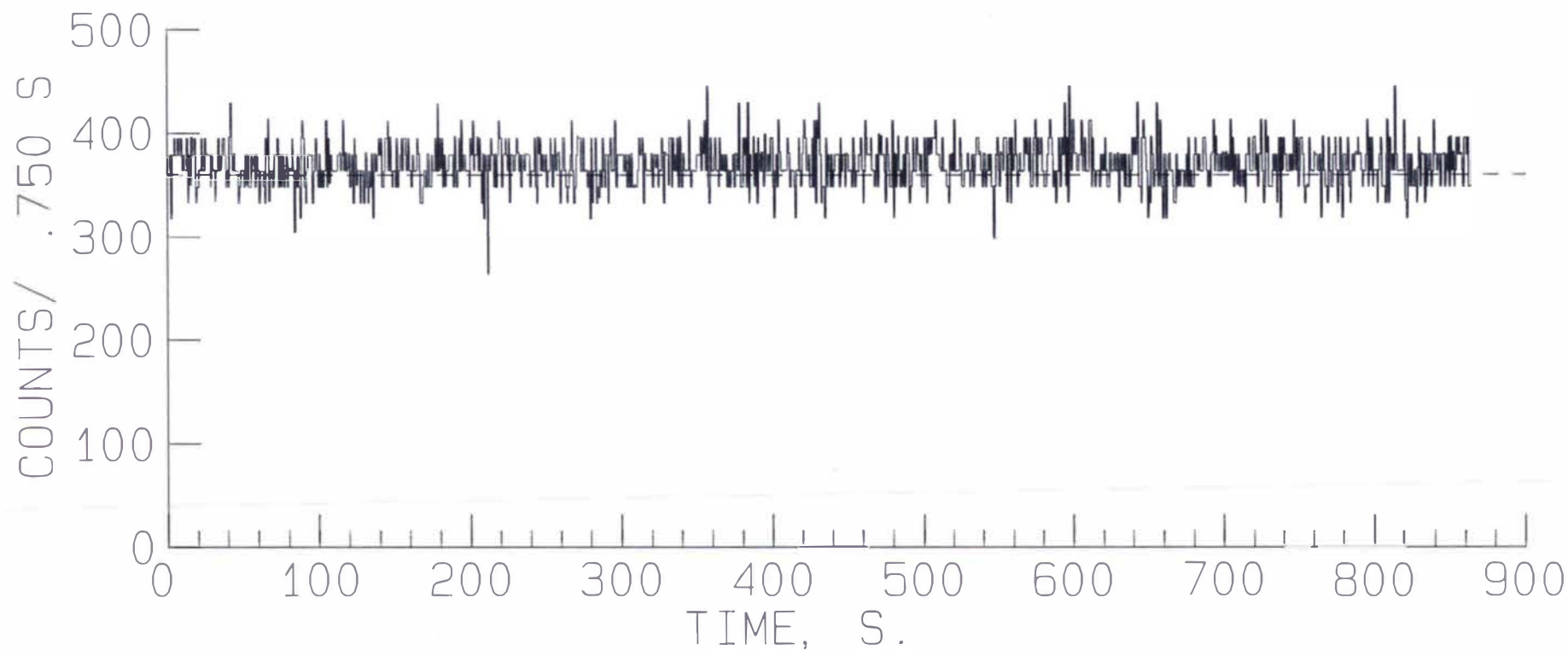
BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2124	930109	8996	37781	1900	080	+25

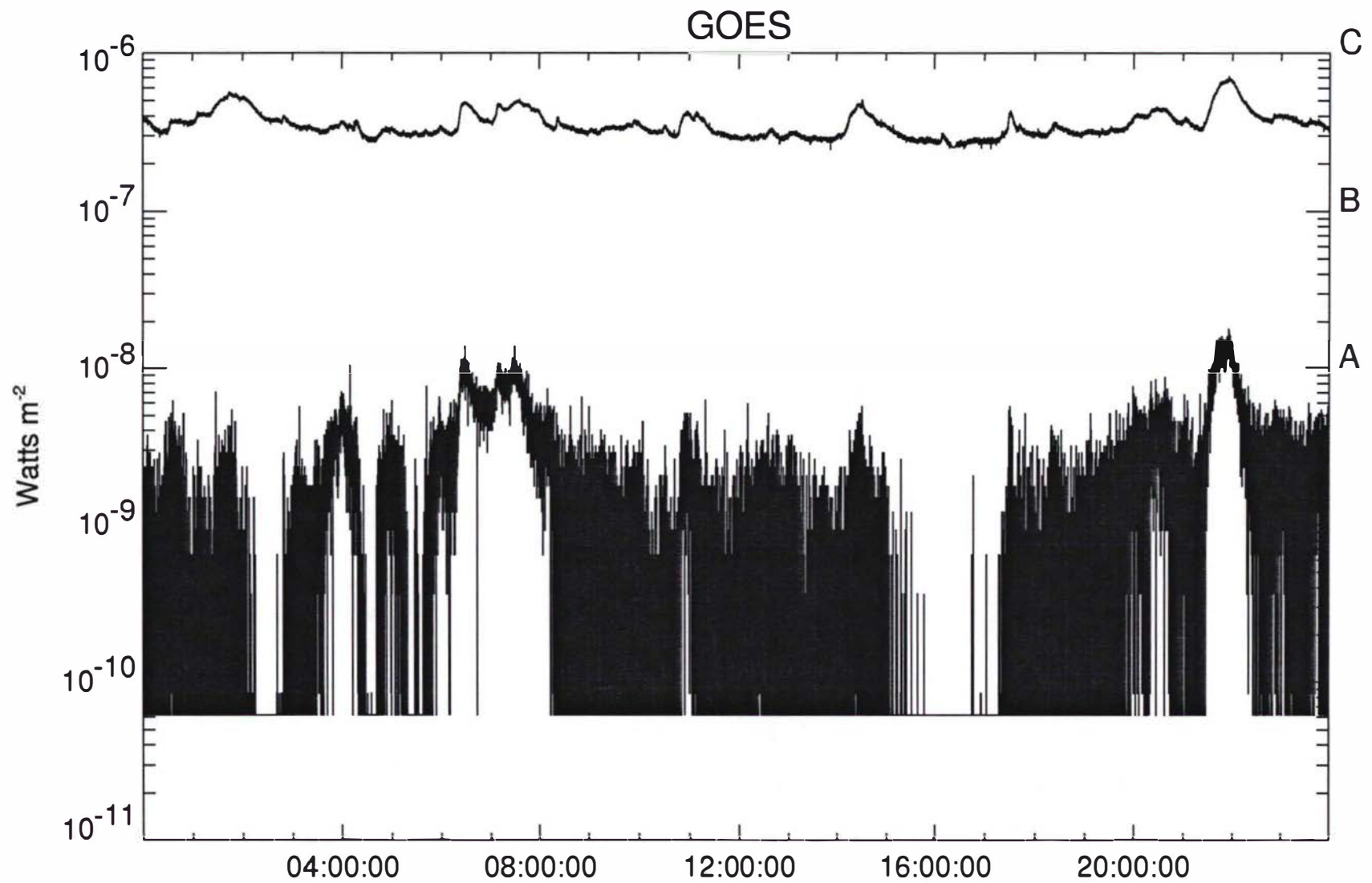
NO

11 / 1 / 93

ULYSSES RT
9/ 1/93 37368.223 s
.250 S INTERVALS REGROUPED BY 3
0- 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS





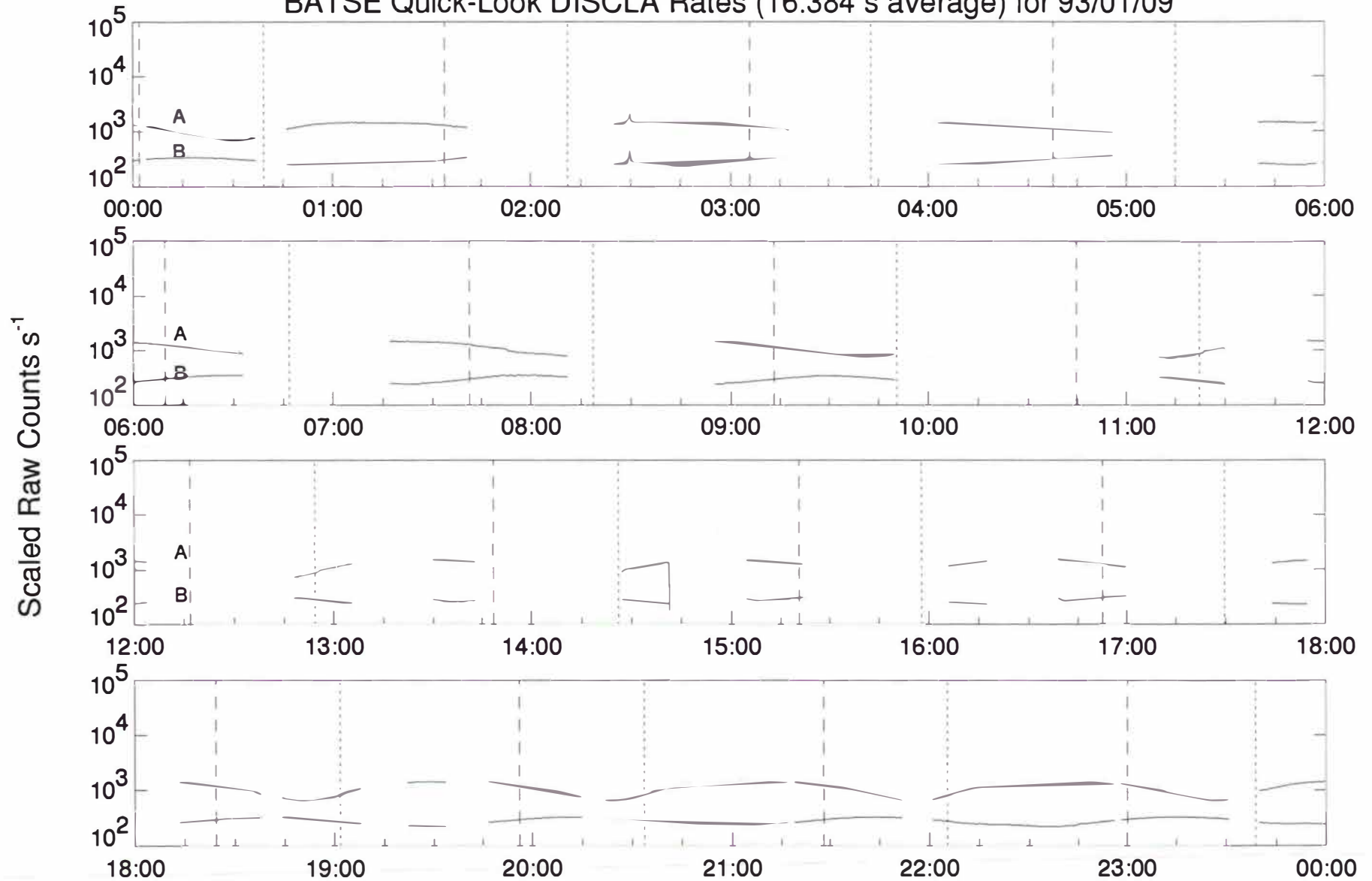
Data Start: 93/01/09, 0000:02

Plot created: 95/05/31, 2154

Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/09

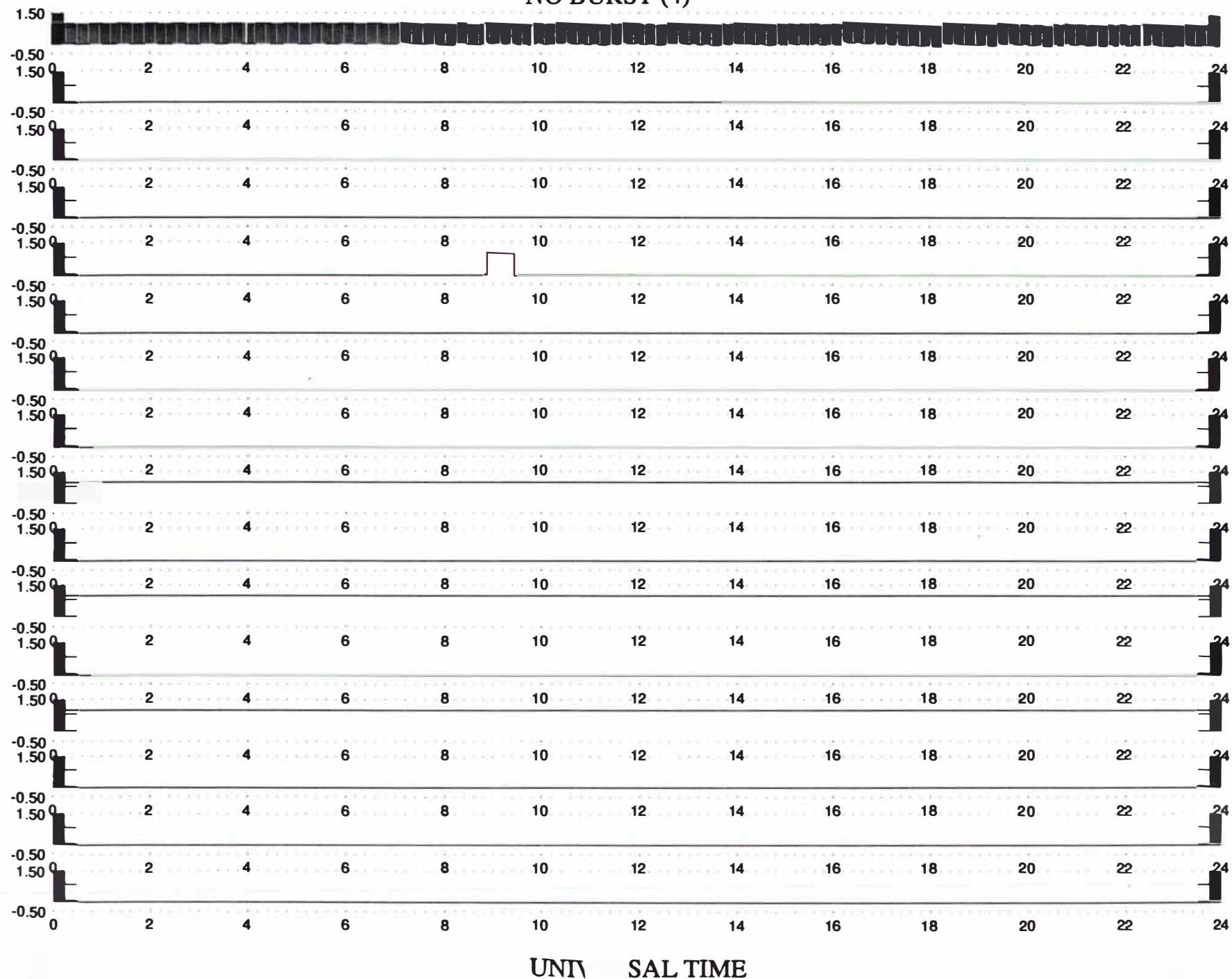


Current Time: 93/01/11, 1557 EDT
 A: Channel 1 Most Sunward LAD
 B: Sum Channel 1 Anti-Sunward LADs X .05

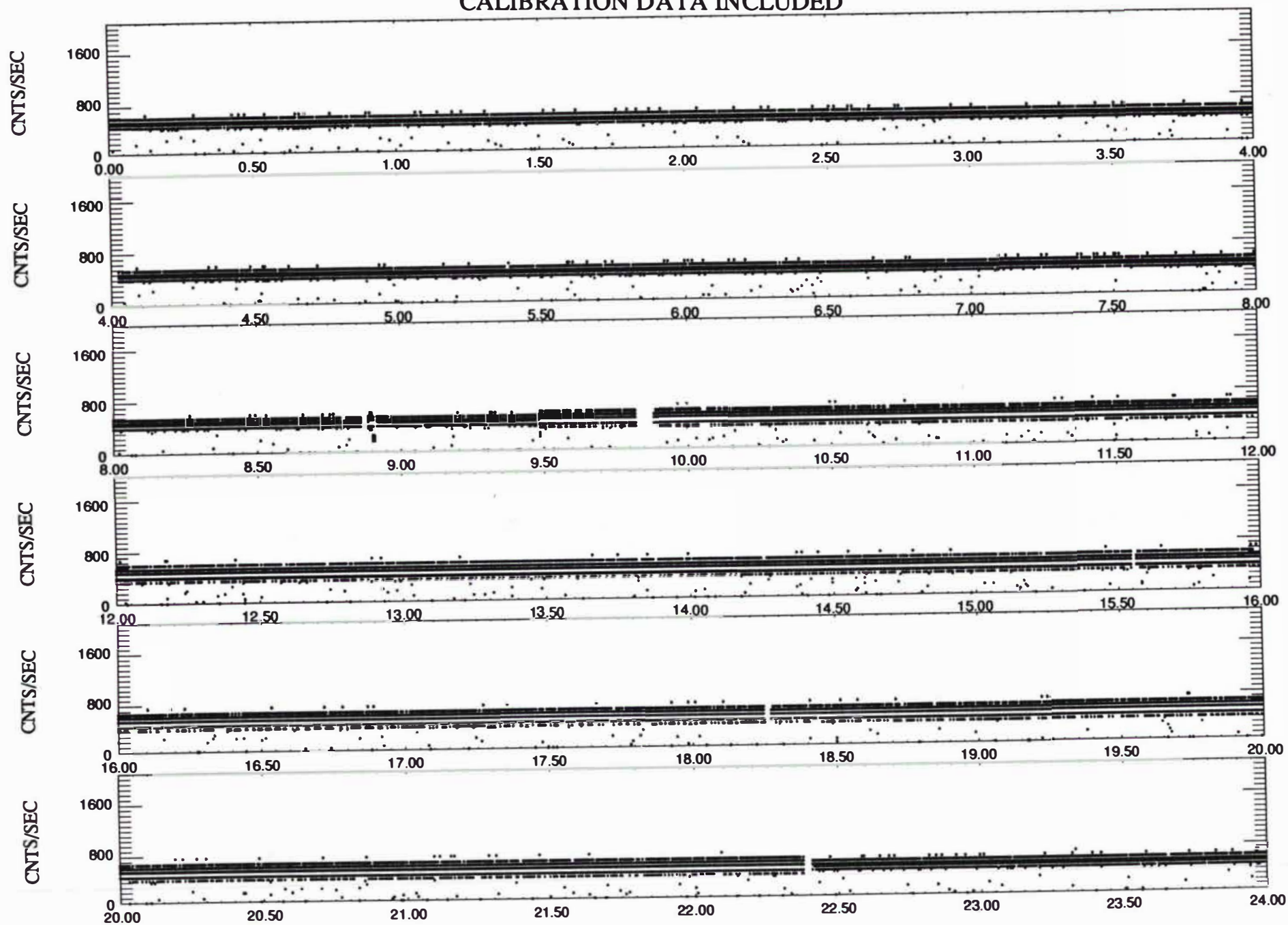
Dotted line: Day entry
 Dashed line: Night entry

* Solar Burst Trigger
 + Solar Flare

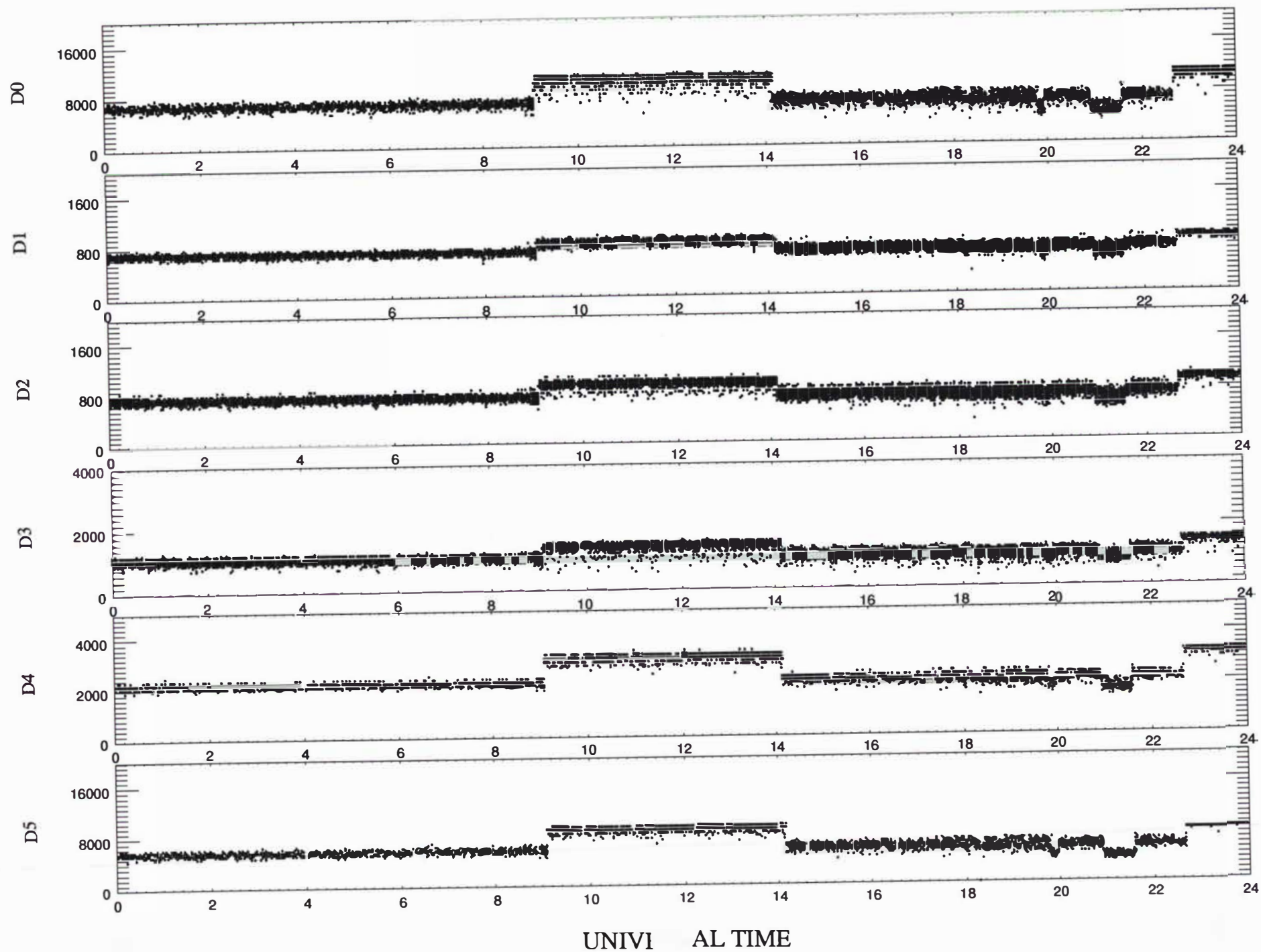
CBU	CCL	DMP	ROM	DMA	OSC	MP.	ICR	SPE	OPM	RSC	CAL	WCH	MEM	BRS	HUS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



CALIBRATION DATA INCLUDED



UNIV SAL TIME



 CATSEARCH PROGRAM

BATSE BURST # 2125
 EVENT OF 1993 JAN 10 DAY OF YEAR= 10
 EVENT CROSSING TIME AT BATSE : 6699. S. OR 01:51:38.7
 COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 100.700 -1.100
 BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
 POSITION OF ULYSSES ON 10/ 1/ 93 IS:
 RA= 164.520 DEC= -12.982 DIST= 4.529 AU
 BATSE-ULYSSES DISTANCE = 677538400. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=115.73 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH= -981.18 SECS.
 CROSSING TIME AT ULYSSES IS 5718. S. OR 01:35:17.5 +/- 388.57 SECONDS

100

From MEEGAN@ssl.msfc.nasa.gov Mon Jan 11 14:22:32 1993
 Date: Mon, 11 Jan 1993 16:26:00 -0600 (CST)
 From: MEEGAN@ssl.msfc.nasa.gov
 Subject: Burst Trigger Message
 To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02125

TIME: TJD=8997 SECONDS=06698

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= 90. AZIMUTH=220. ERROR= DEGREES

COMMENTS:

INTENSE BURST LASTING ABOUT 1/4 SECOND. SEEN ABOVE 300 KEV.

From MEEGAN@ssl.msfc.nasa.gov Mon Jan 11 14:24:28 1993
 Date: Mon, 11 Jan 1993 16:29:33 -0600 (CST)
 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
2125	930110	8997	06698	55000	099	-06

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:

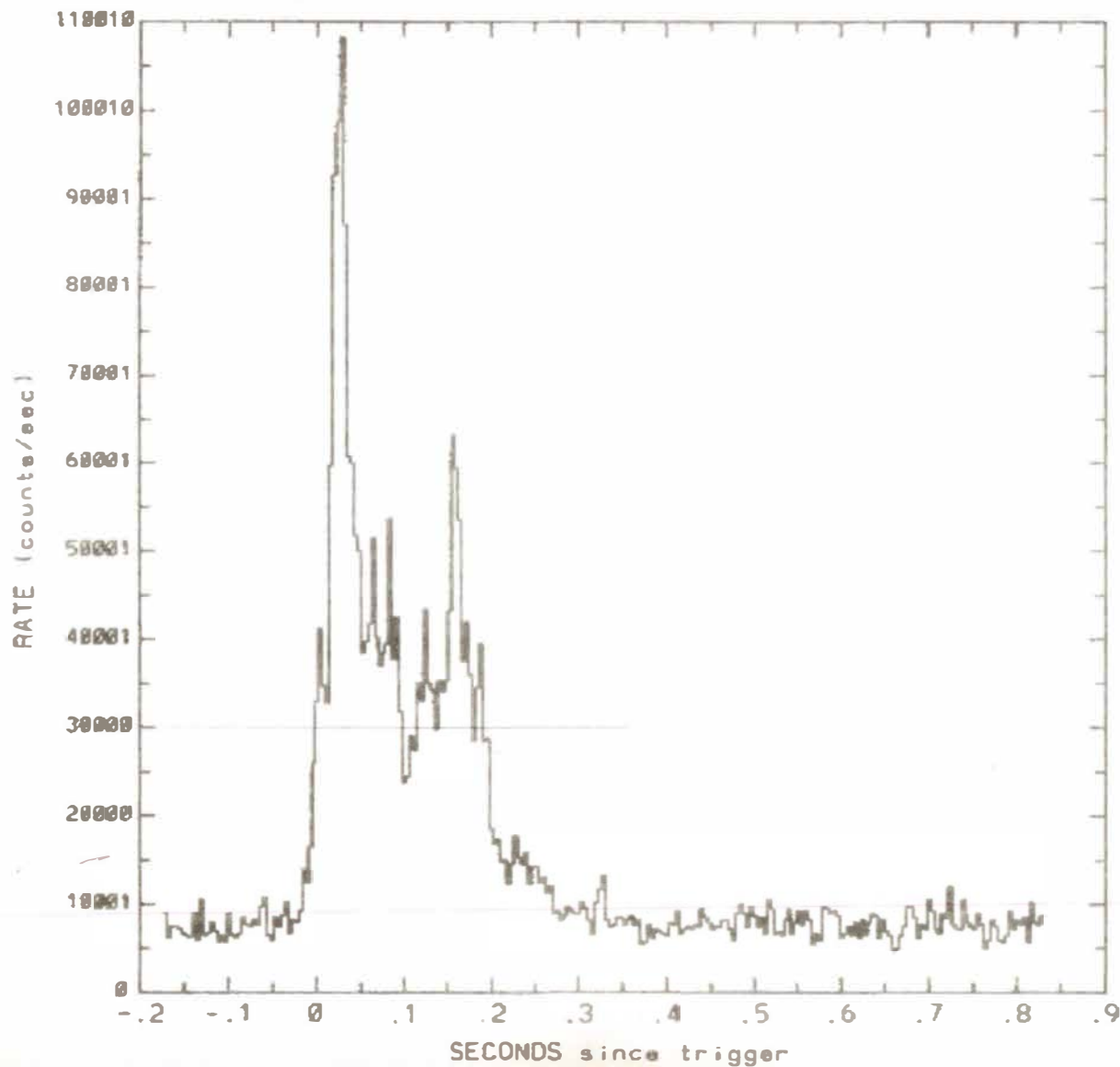
Thanks very much for the listing of strong Batse bursts sent to me 11/1/93.
 I have now managed to check all of them against DMSP data, and find that
 many of them were also detected by DMSP8,9,10, or 11. Probably the higher percent
 of detections in recent data is due to more extraction of full data. 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

Trigger # 2125



11-JAN-1993 16:00.19

Created by MOPS 8D
 (Burst Display)
 Version t2.18

Trigger # . 2125

Trigger Time:
 8997 / 6698.713

Burst Data Type:
 RTE

Multiple Events
 Ignored: 33

If average is ~ 30000 c/s
 over .25 s, net rate is
 20000 c/s $\rightarrow$ 200 c in
 Ulysses

Deadtime
 Corrected: N

Background Data
 Type: DISCLA

Minimum Integ. Time:
 0.004000 seconds

Detectors [7..8].
 11000000

Discriminators:
 (1..4)

Quality Mask:
 001SP8

15 / 1 / 93

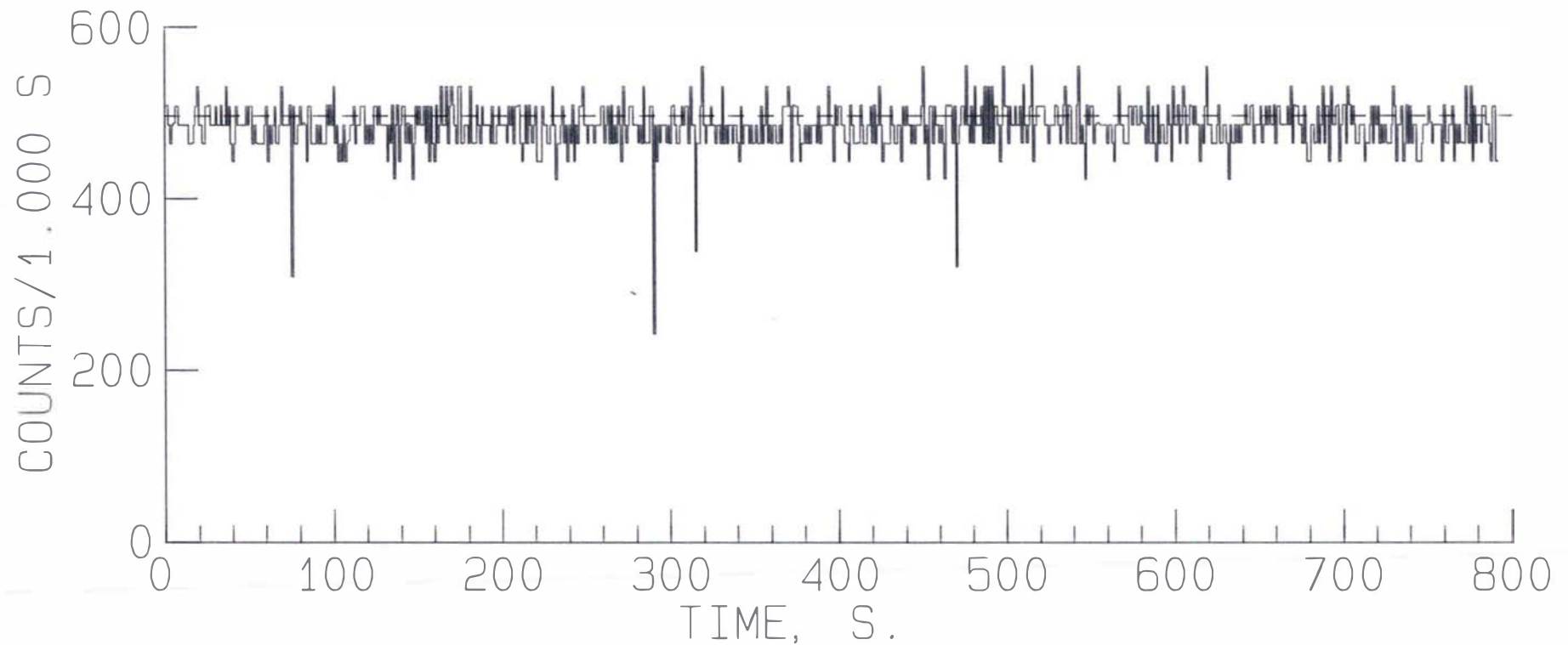
ULYSSES RT

10 / 1 / 93 5328.321 s

.500 S INTERVALS REGROUPED BY 2

0 - 0 keV

N= 10 M= 1
>3.0 SIGMA FLUCTUATIONS



13 / 1 / 93

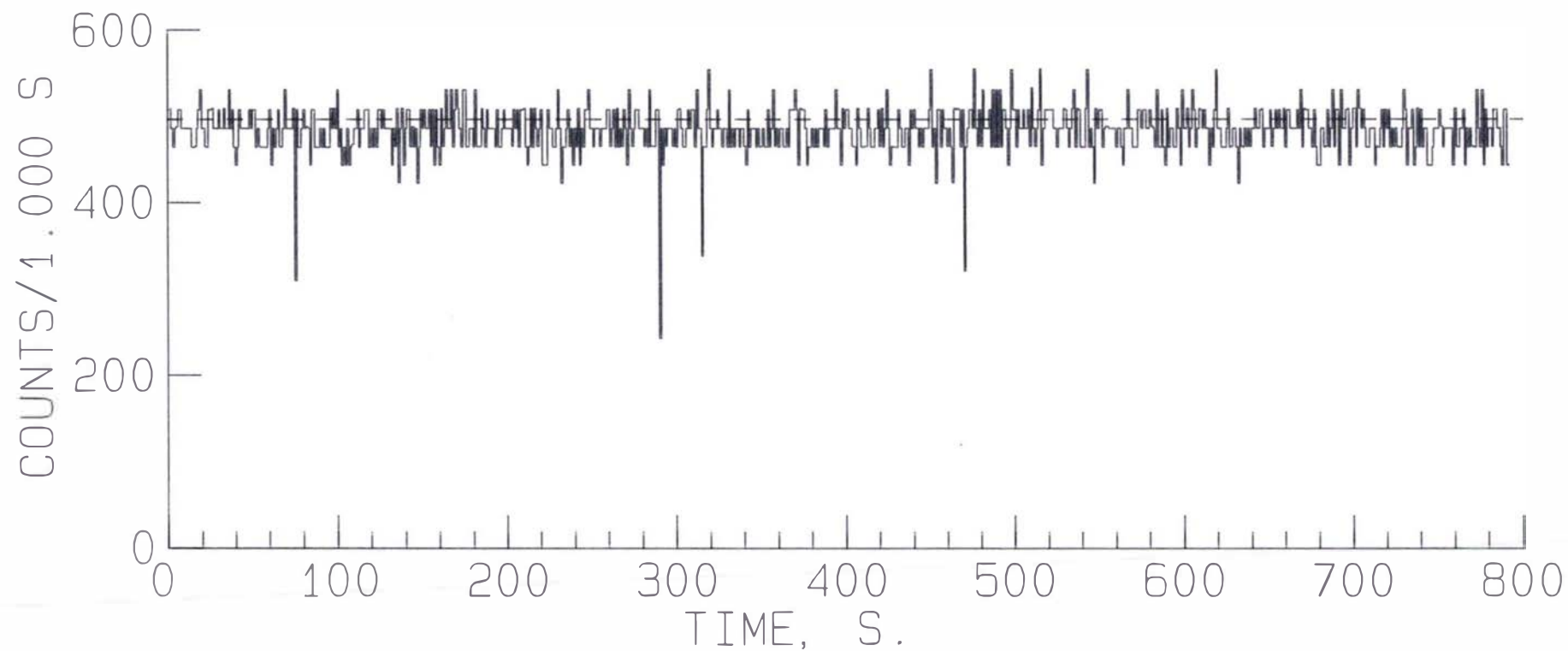
ULYSSES RT

10 / 1 / 93 5328.321 s

.500 S INTERVALS REGROUPED BY 2

0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



CATSEARCH PROGRAM

BATSE BURST # 2126
EVENT OF 1993 JAN 10 DAY OF YEAR= 10
EVENT CROSSING TIME AT BATSE : 22954. S. OR 06:22:34.4
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 236.800 31.800
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 10/ 1/ 93 IS:
RA= 164.520 DEC= -12.982 DIST= 4.529 AU
BATSE-ULYSSES DISTANCE = 677538400. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 97.68 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -302.14 SECS.
CROSSING TIME AT ULYSSES IS 22652. S. OR 06:17:32.3 +/- 434.27 SECONDS

From MEEGAN@ssl.msfc.nasa.gov Mon Jan 11 14:52:49 1993
Date: Mon, 11 Jan 1993 16:55:56 -0600 (CST)
From: MEEGAN@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02126

TIME: TJD=8997 SECONDS=22954

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=053. AZIMUTH=071. ERROR= DEGREES

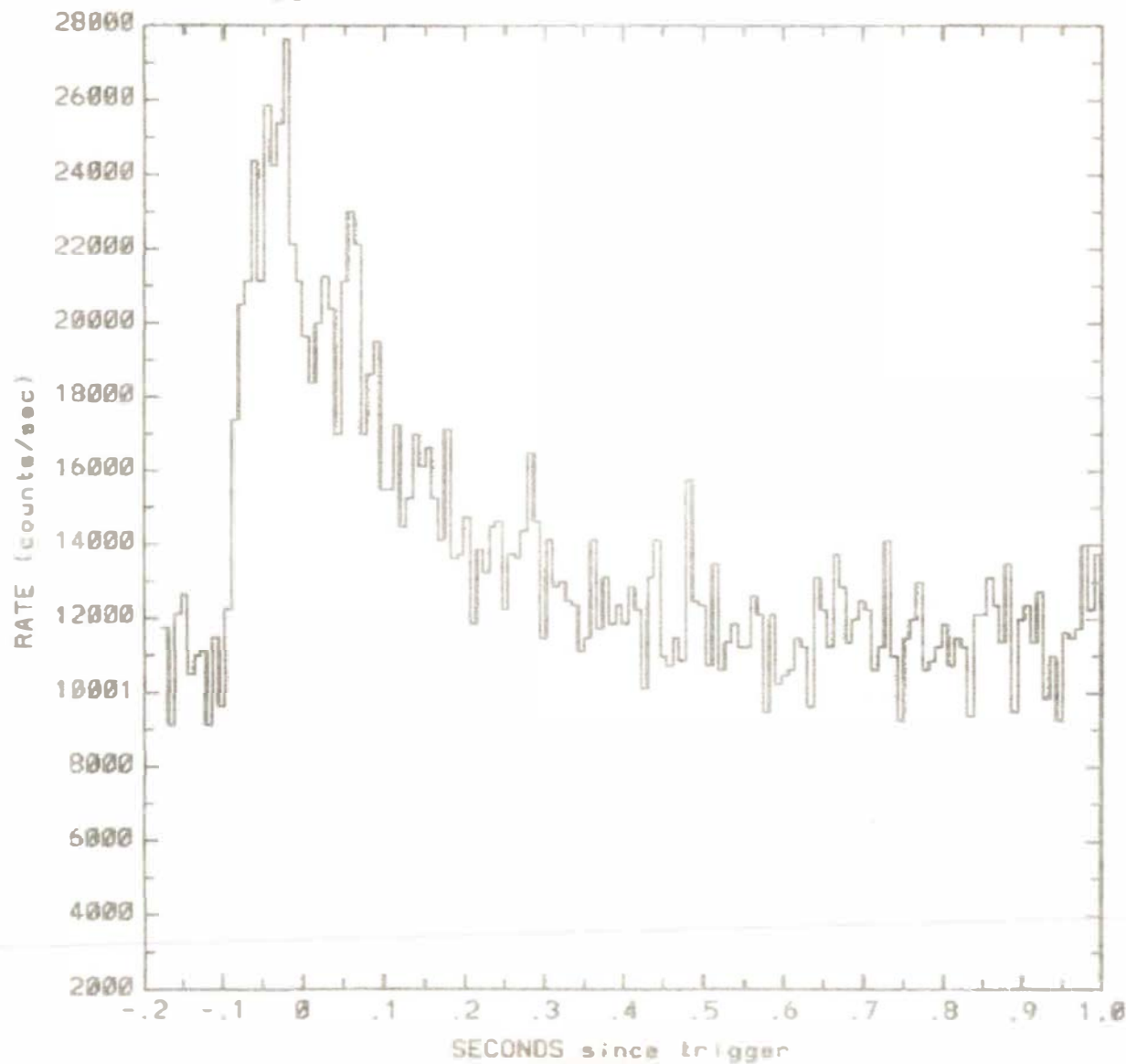
COMMENTS:

FAST RISE, 0.1 SECOND EXPONENTIAL DECAY. SEEN ABOVE 300 KEV.

From MEEGAN@ssl.msfc.nasa.gov Tue Jan 12 06:09:30 1993
Date: Tue, 12 Jan 1993 8:14:37 -0600 (CST)
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
2126	930110	8997	22954	13000	235	+28

Trigger 2126



11-JAN-1993 18:26:16

Created by MOPS BD
(Burst Display)
Version 2.17

Trigger #: 2126

Trigger Time:
8997 / 22954.457Burst Data Type:
TTEMultiple Events
Ignored: 27Deadtime
Corrected: NBackground Data
Type: DISCLAMinimum Integ. Time:
0.000000 secondsDetectors [7..8]:
00010011Discriminators:
[1..4]Quality Mask:
0DISP0

9 / 6 / 94

ULYSSES RT

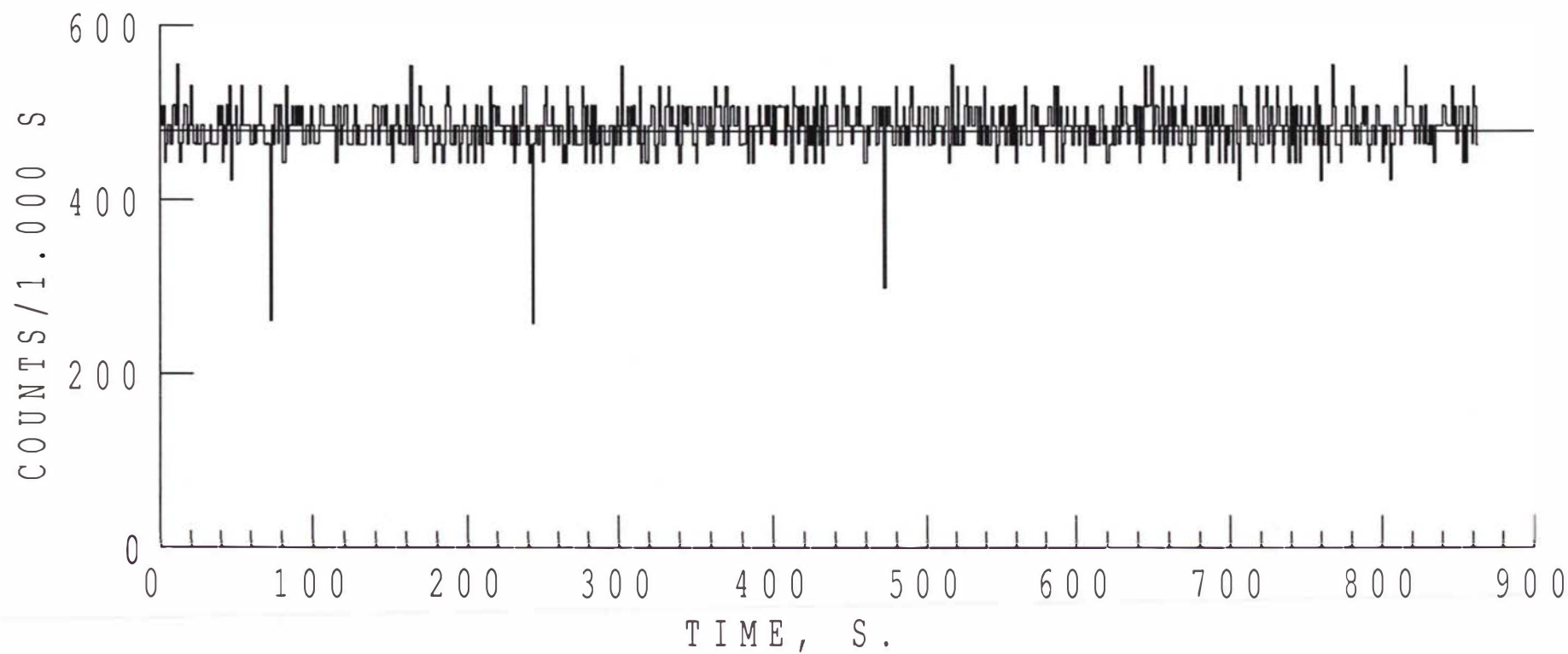
10 / 1 / 93 22212.084 s

0.500 S INTERVALS REGROUPED BY 2

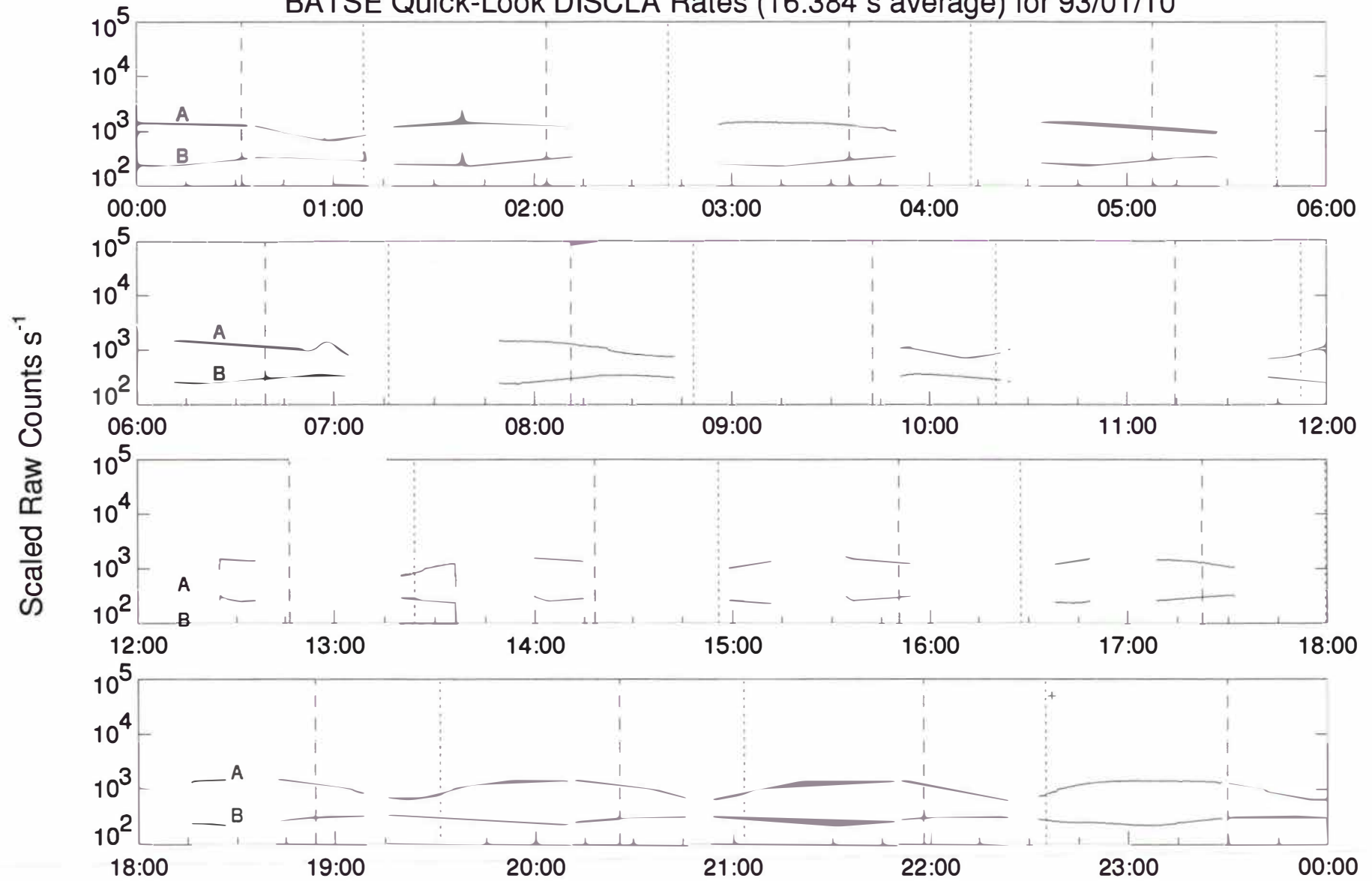
0 - 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



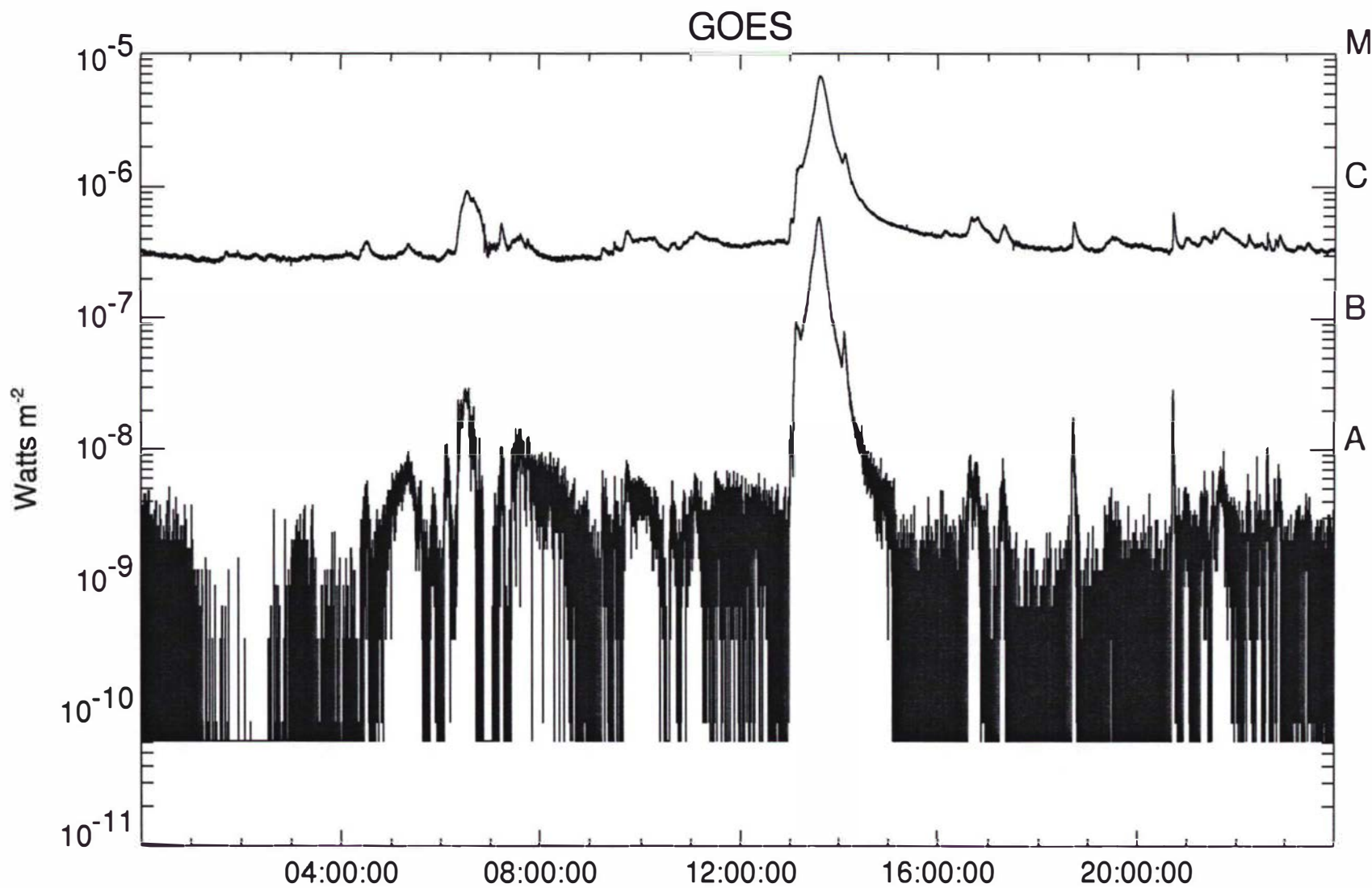
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/10



Current Time: 93/01/25, 1954 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



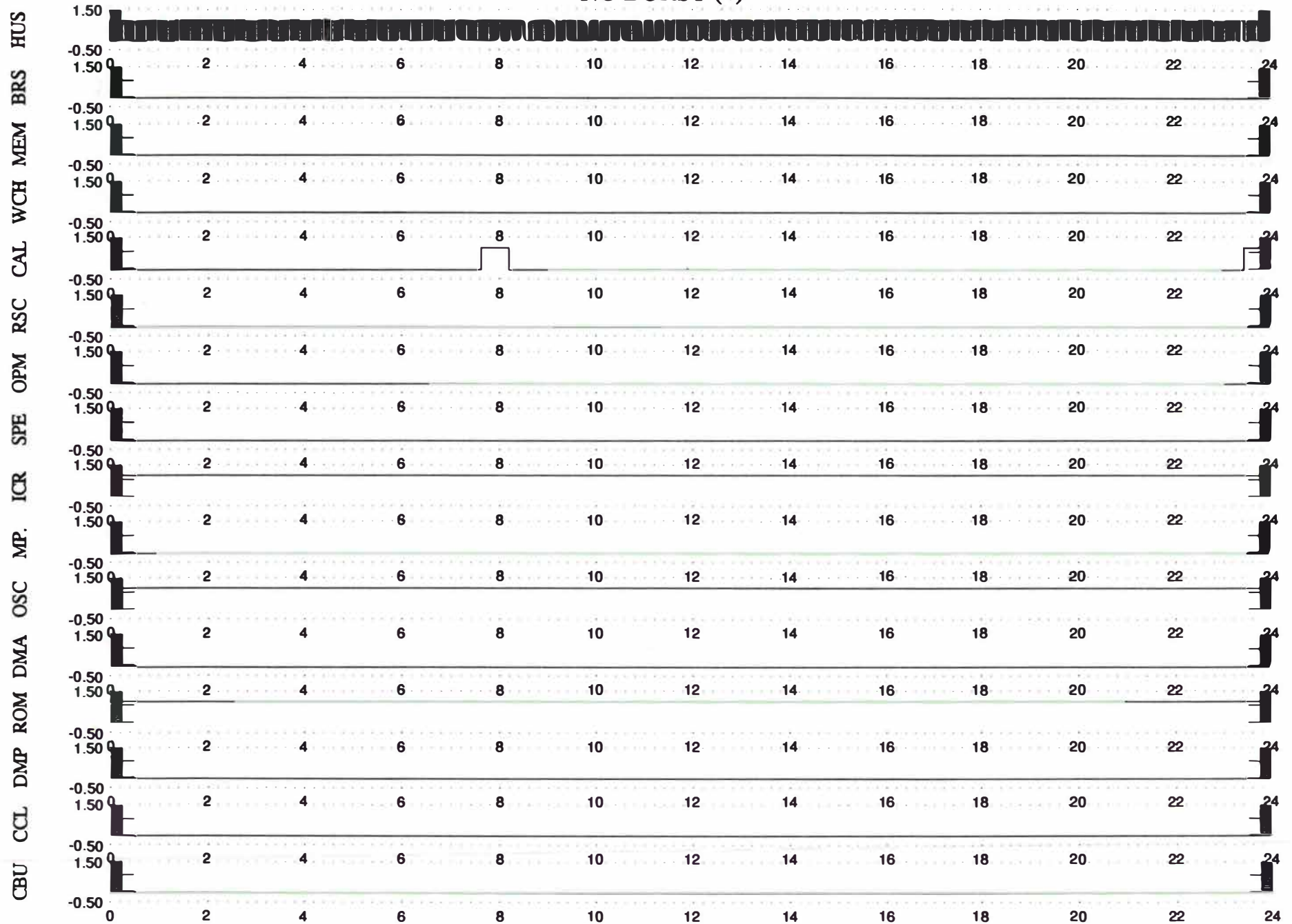
Data Start: 93/01/10, 0000:02

Plot created: 95/05/31, 2157

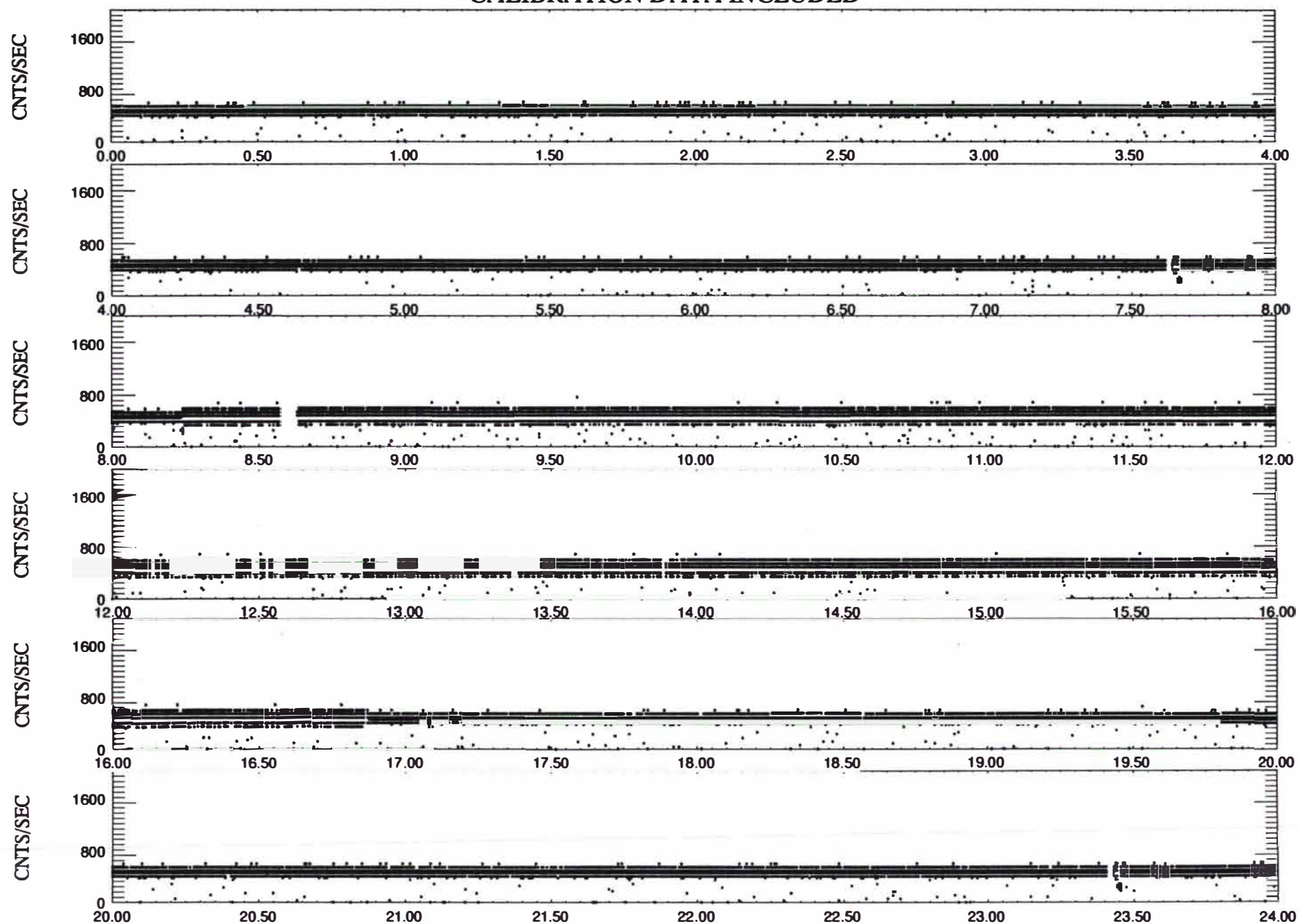
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

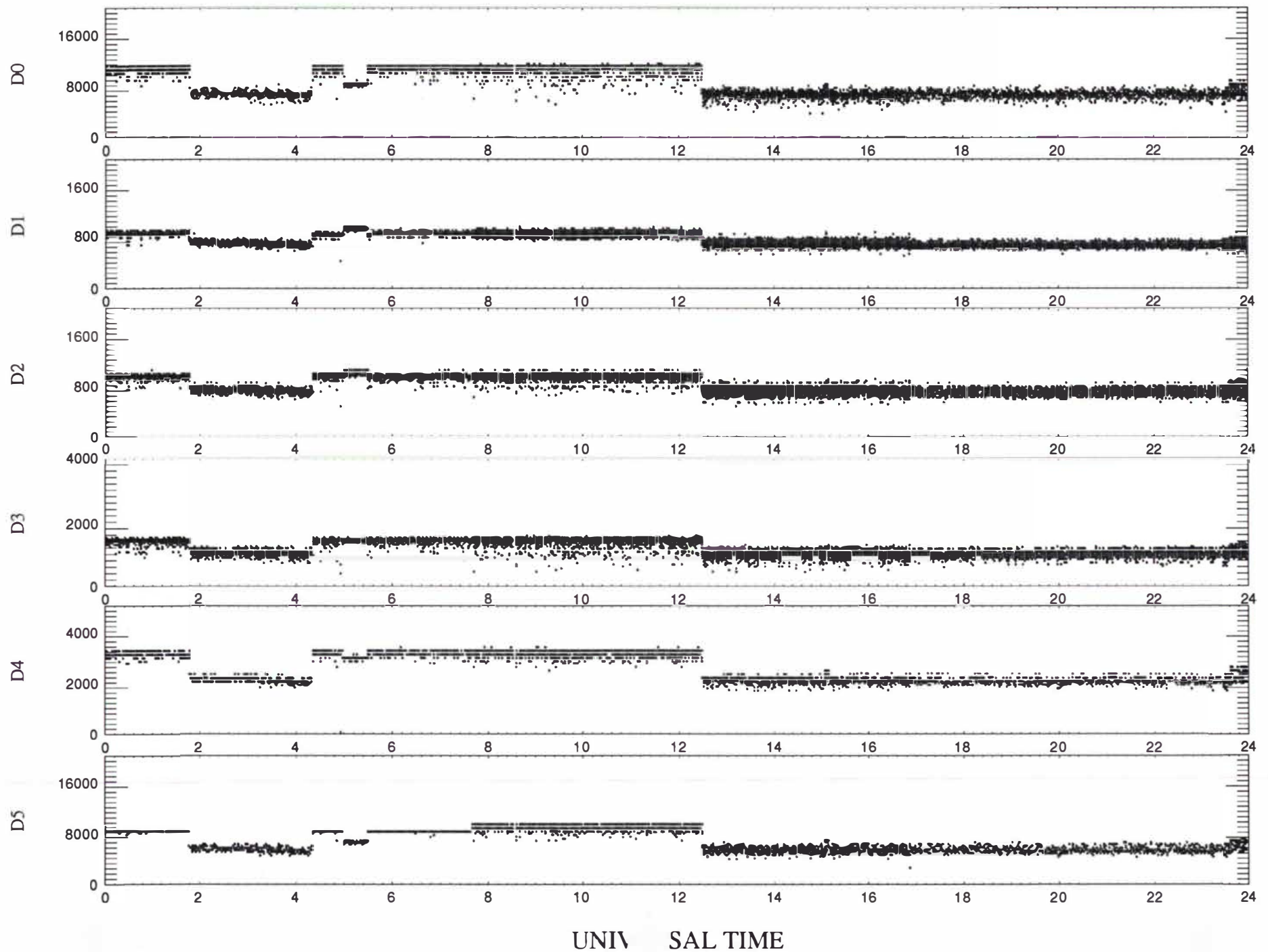
UNIV! AL TIME



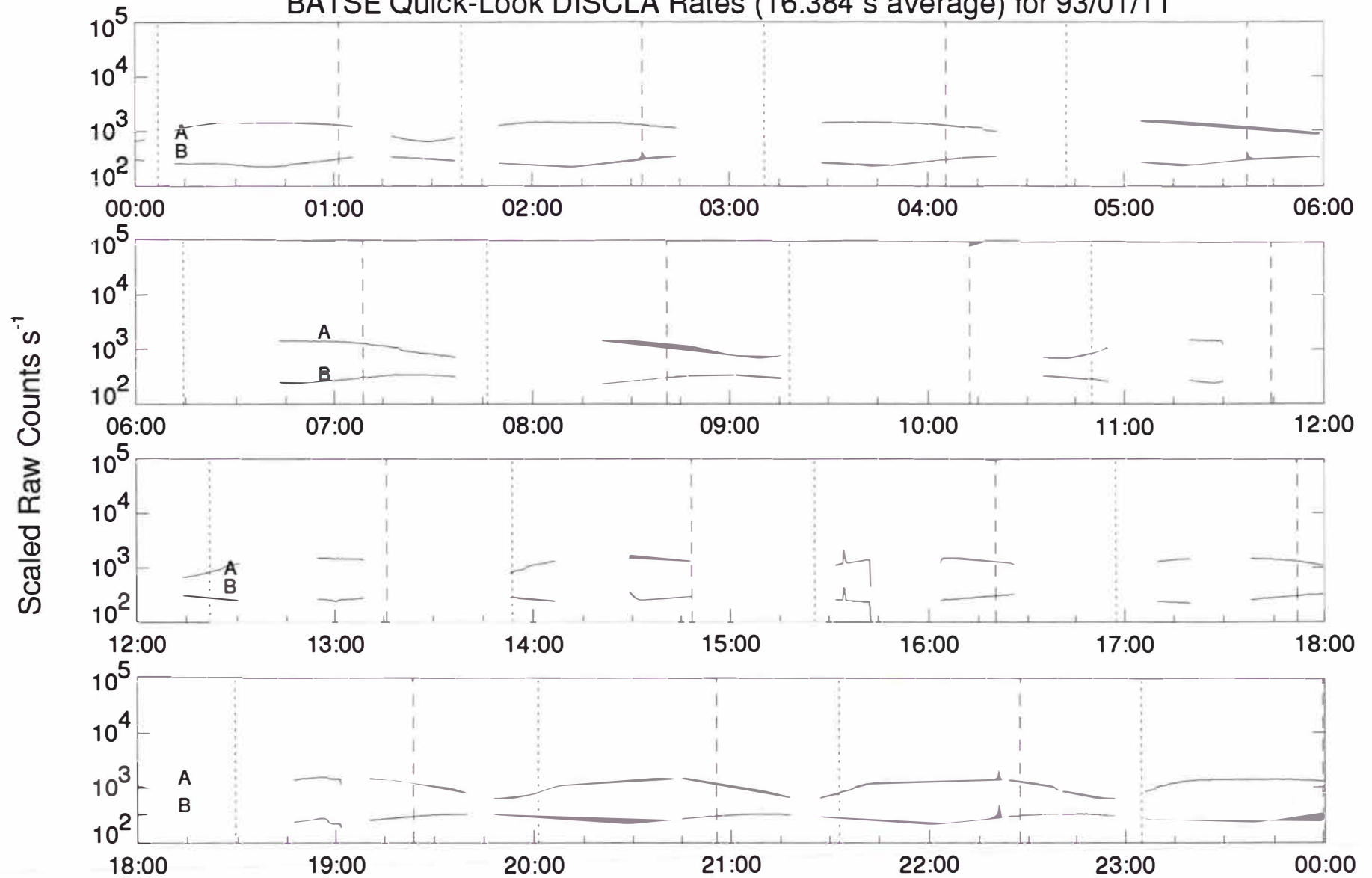
CALIBRATION DATA INCLUDED



UNIV AL TIME



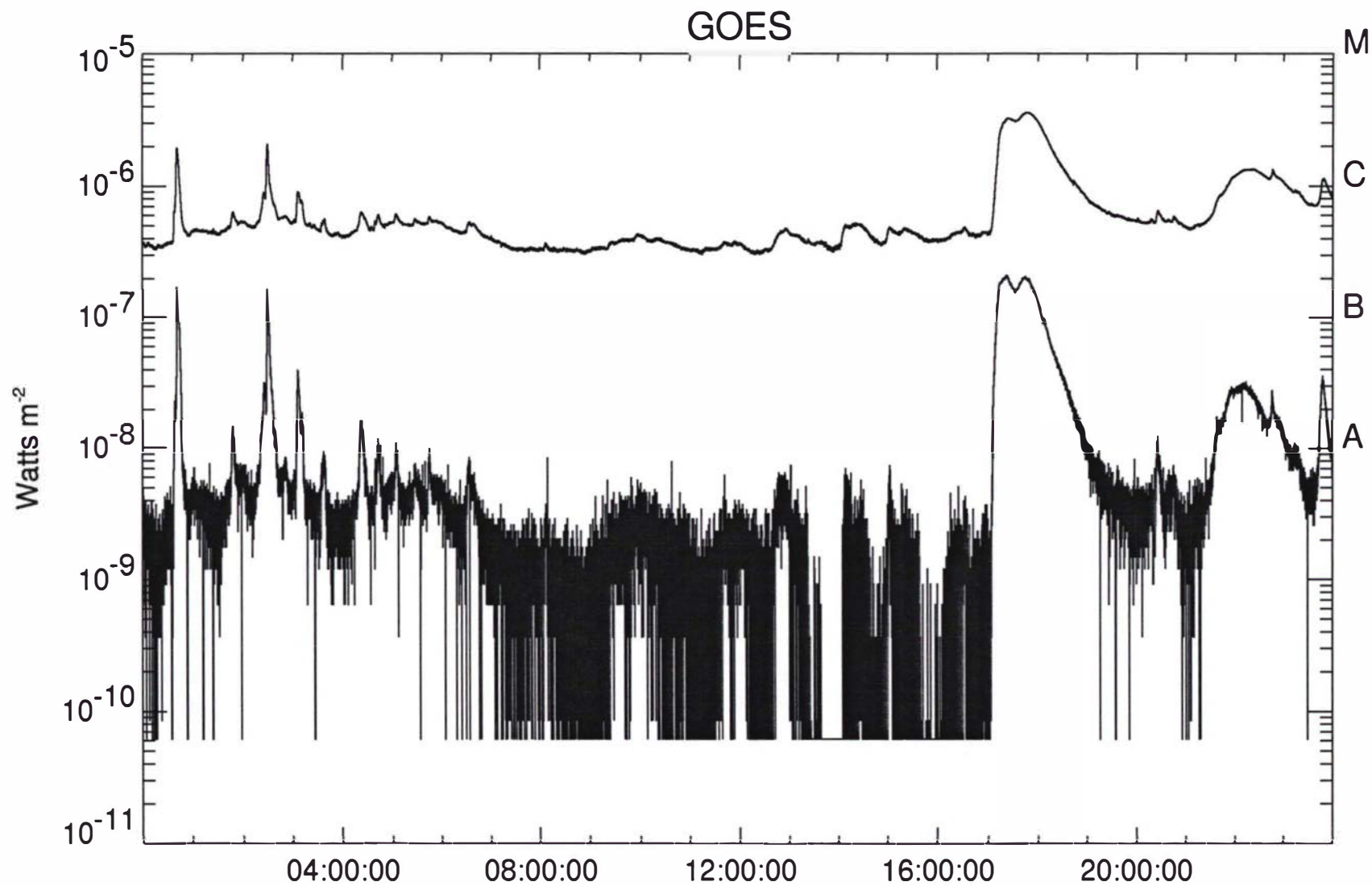
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/11



Current Time: 93/01/25, 1955 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



Data Start: 93/01/11, 0000:02

Plot created: 95/05/31, 2200

Channel

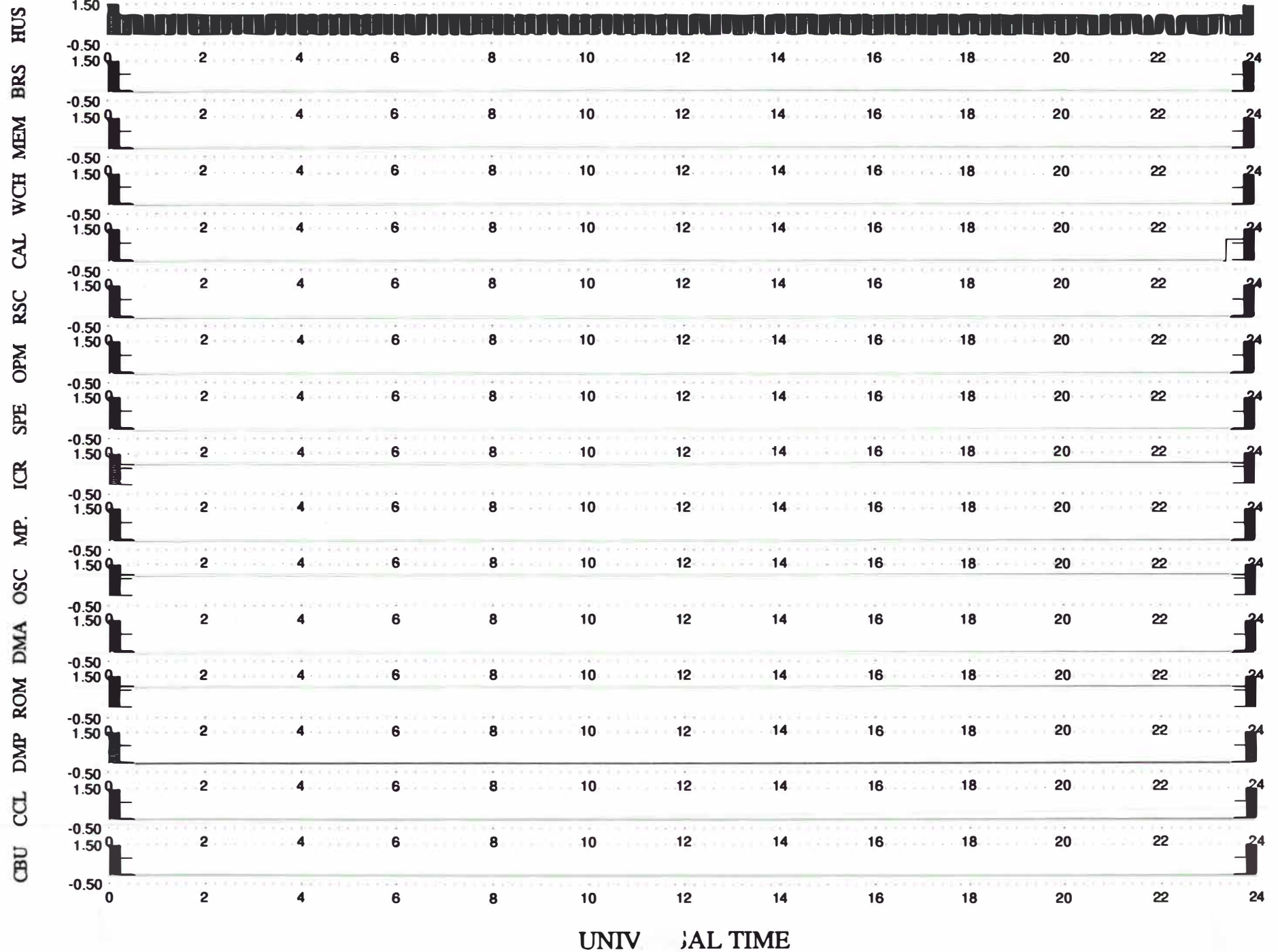
1 (1.0 - 8.0 Angstroms)

Background not subtracted

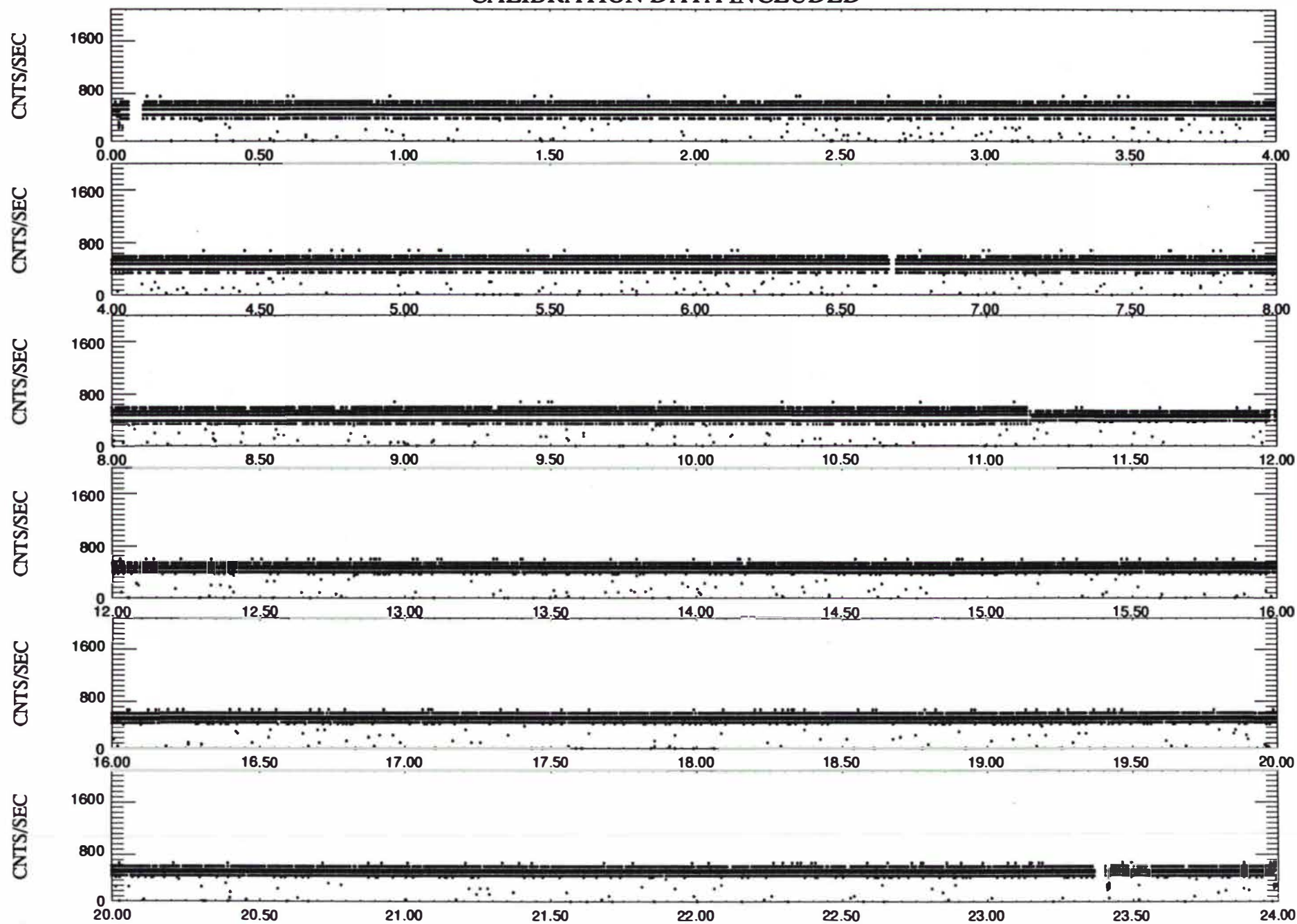
2 (0.5 - 4.0 Angstroms)

Background not subtracted

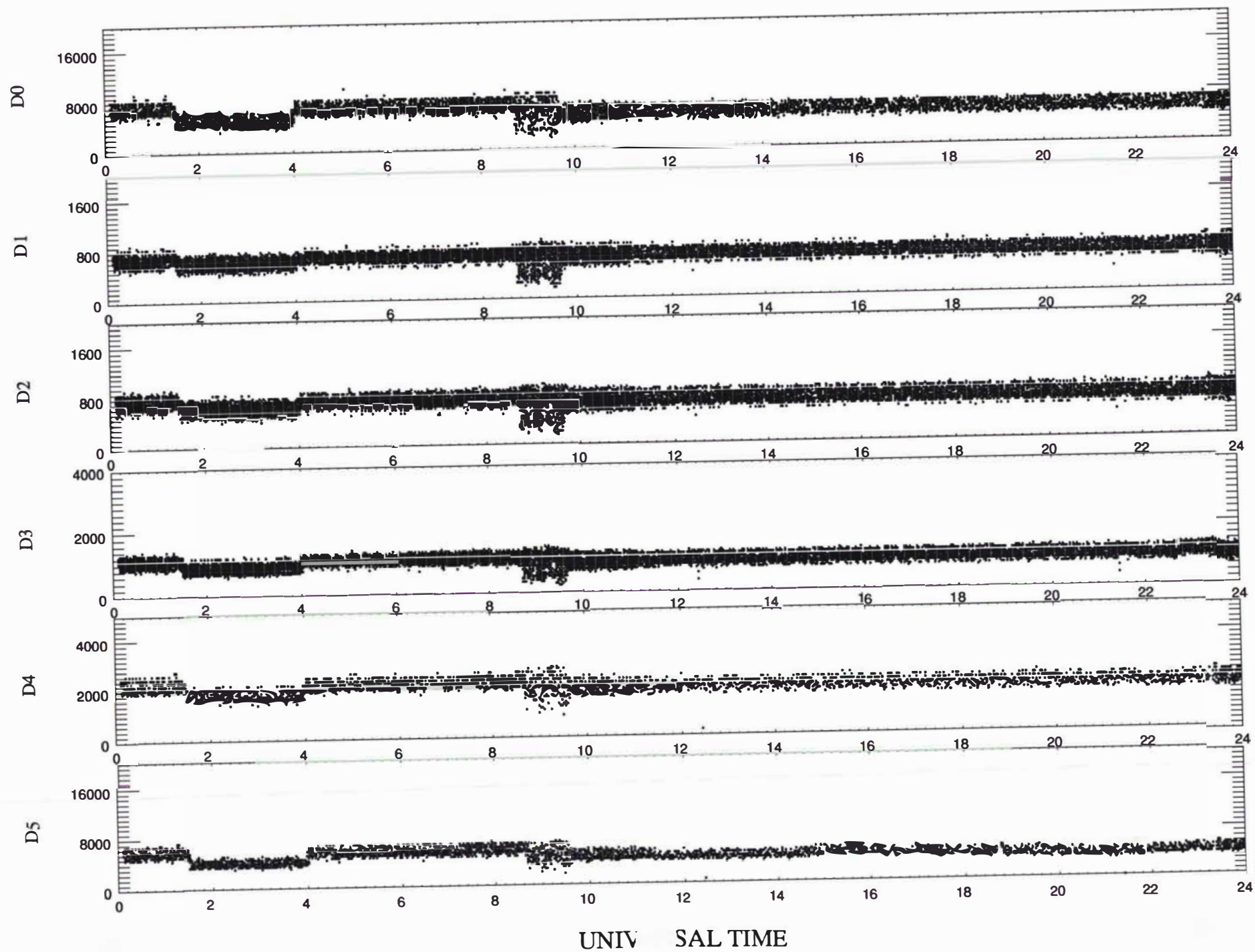
NO BURST (4)



CALIBRATION DATA INCLUDED



UNIV TIME



Date: Aug 1 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?

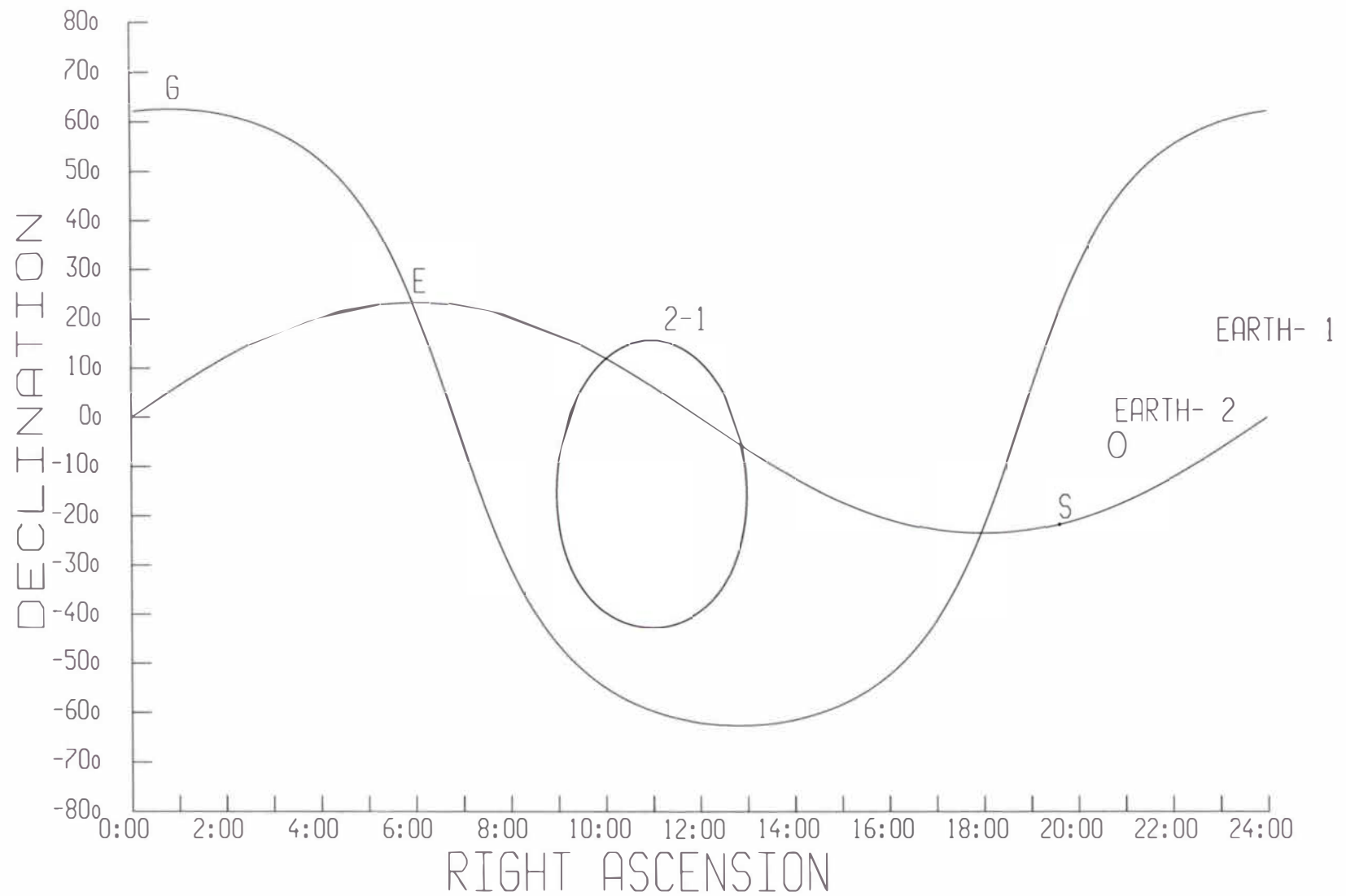
3. PVO Data

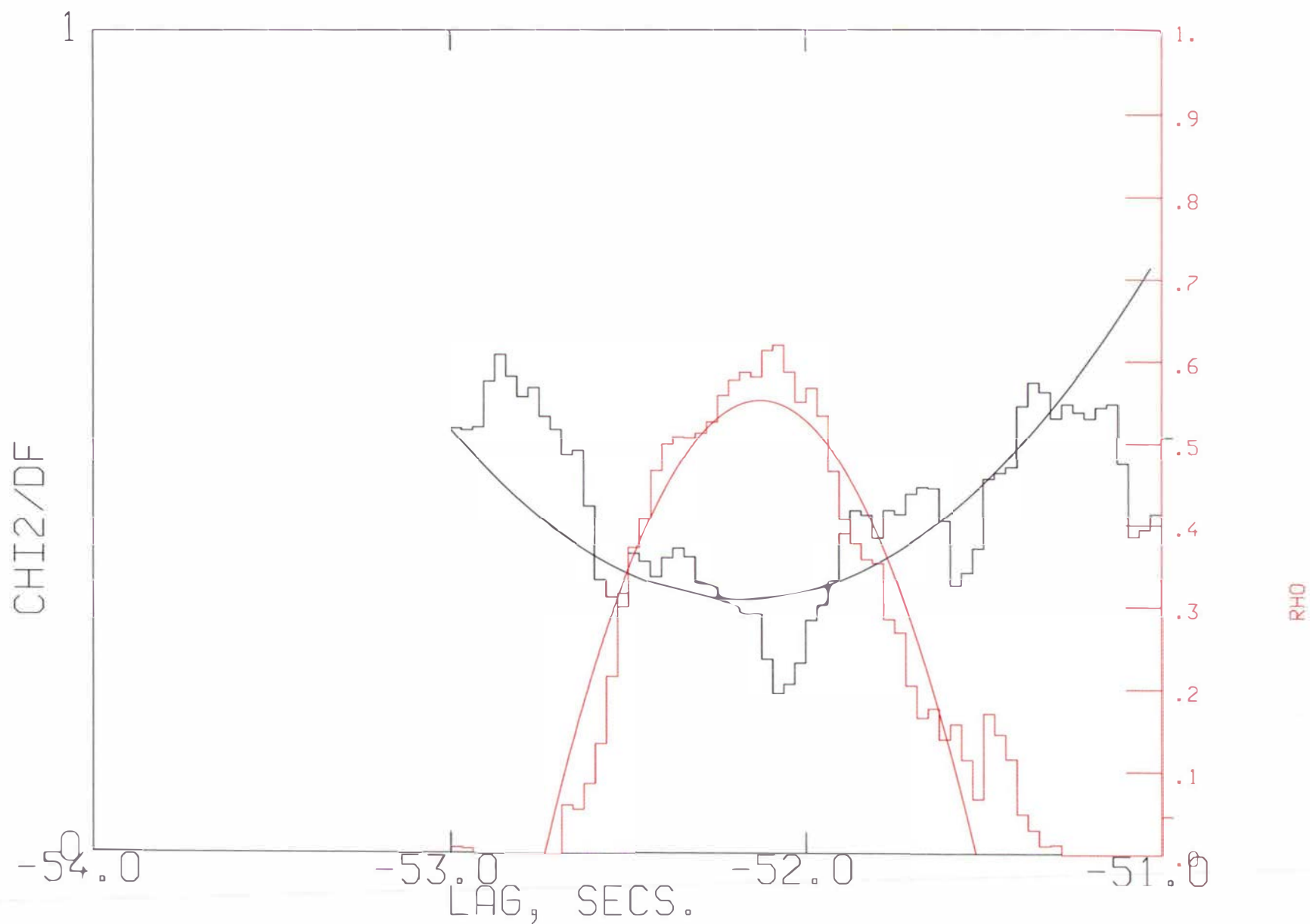
- ☐ Ephemeris of PVO used (not Venus)?
- ☐ 2000 coordinates used?
- ☐ Geocentric time used?
- ☒ ACCESS and MBL databases updated with identical times?

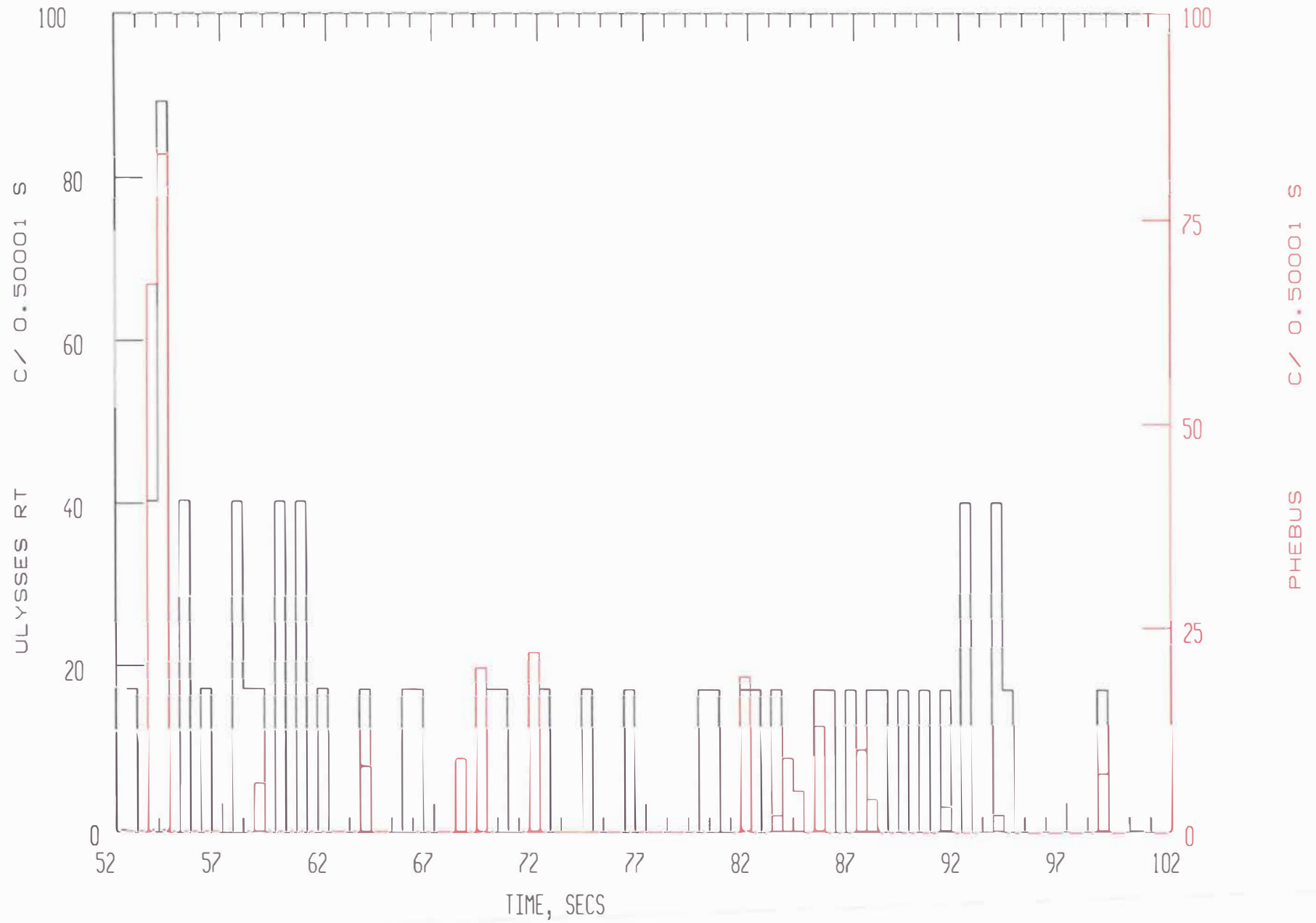
EVENT OF JAN 12, 1993 17:33

01/08/2011

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







PHEBUS

12/ 1/93 65201.742 s

100- 1600 keV

s

COUNTS/0.03125

40

30

20

10

0

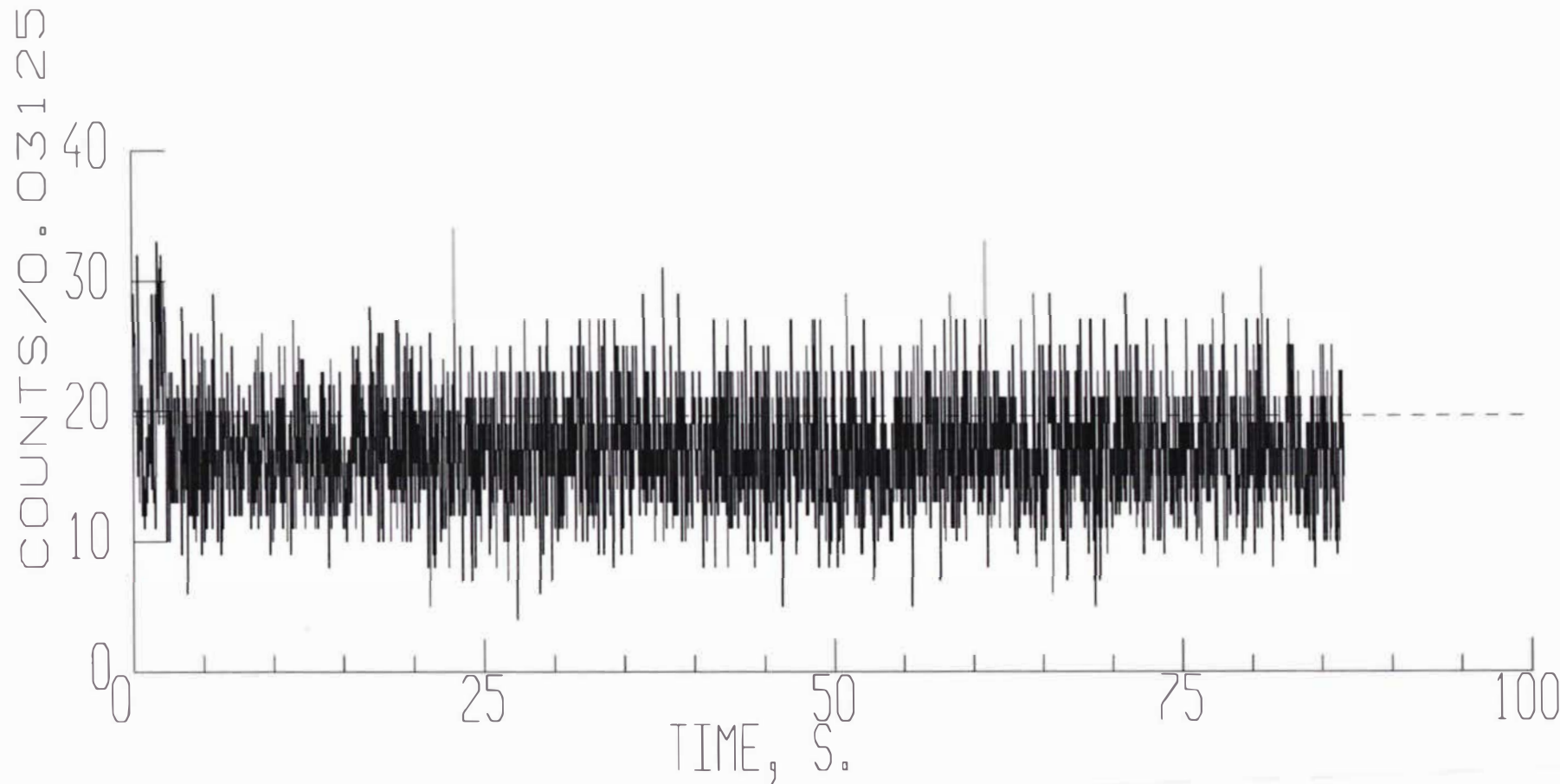
25

50

75

100

TIME, S.



PHEBUS 19930112 65201

ULYSSES RT

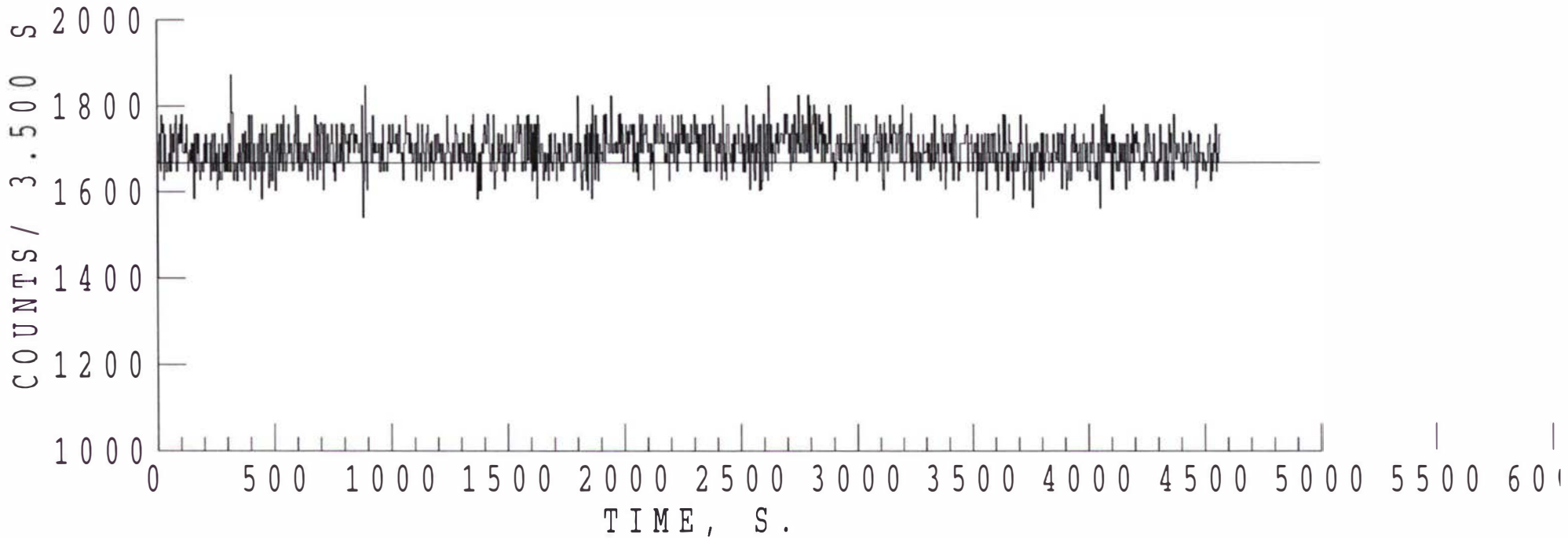
01/08/11

12/01/93 62928.426 s

0.500 S INTERVALS REGROUPED BY 7

0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS |



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
9:0932	extract	beg time:1025	e92010_2A1_10.42_10.48.ascii.Z	Y (TRIGGER)
1:0845	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 1300)
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)
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
1:1445	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
1:0144	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

No error in these files -
time resolution didn't change
from 0.5s

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
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

(GR 1744) - MAYBE USED FOR NETSYN?

"	"	"
"	"	"
"	"	"
"	"	"

CATSEARCH PROGRAM

BATSE BURST # 2127
EVENT OF 1993 JAN 12 DAY OF YEAR= 12
EVENT CROSSING TIME AT BATSE : 13651. S. OR 03:47:30.8
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 224.700 29.400
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 12/ 1/ 93 IS:
RA= 164.252 DEC= -13.135 DIST= 4.496 AU
BATSE-ULYSSES DISTANCE = 672676400. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=107.87 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -688.61 SECS.
CROSSING TIME AT ULYSSES IS 12962. S. OR 03:36:02.2 +/- 410.30 SECONDS

RI

From SHARIFF@ssl.msfc.nasa.gov Thu Jan 14 16:54:47 1993
Date: Thu, 14 Jan 1993 18:58:35 -0600 (CST)
From: SHARIFF@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02127

TIME: TJD=8999 SECONDS=13650

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=045.5 AZIMUTH=078.7 ERROR= DEGREES

COMMENTS:

BURST, COMPLEX, LASTING ~120S. VISIBLE ABOVE 300KEV. HARD SPECTRUM.

From SHARIFF@ssl.msfc.nasa.gov Thu Jan 14 17:10:25 1993
Date: Thu, 14 Jan 1993 19:15:32 -0600 (CST)
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
2127	930112	8999	13650	23000	225	+30

RI

From williams Fri Jul 12 18:37 PDT 1996
Date: Fri, 12 Jul 1996 18:37:40 -0700
From: williams (Roger Williams)
To: khurley@sunspot
Subject: LIST_OF_PROBS

Possible ~ 1/2 s timing error

1 hour time range from beginning of burst that extract falls in:

b03:0219 extract beg time:0244 e91270_2A1_02.73_02.84.ascii.Z
b09:0932 extract beg time:1025 e92010_2A1_10.42_10.48.ascii.Z
b01:0629 extract beg time:0634 e92174_2A1_06.57_06.87.ascii.Z
b01:0541 extract beg time:0549 e92190_2A1_5.76_5.90.ascii.Z
b02:2032 extract beg time:2058 e92205_2A1_20.97_22.66.ascii.Z
b01:1202 extract beg time:1240 e92209_2A1_12.67_12.85.ascii.Z
b15:1825 extract beg time:1905 q92314_2A1_19.08_19.30.ascii.Z
b03:0322 extract beg time:0344 e92315_2A1_3.10_3.36.ascii.Z
b06:0819 extract beg time:0844 e92315_2A1_8.71_8.85.ascii.Z
b02:0600 extract beg time:0644 e92316_2A1_6.76_7.04.ascii.Z
b04:0315 extract beg time:0329 e93012_2A1_3.50_3.72.ascii.Z
b01:1105 extract beg time:1150 q93077_2A1_11.83_12.05.ascii.Z
b01:0745 extract beg time:0756 q93096_2A1_7.71_7.85.ascii.Z
b01:1445 extract beg time:1530 e93126_2A1_15.50_15.65.ascii.Z
b01:0334 extract beg time:0434 e93265_2A1_04.56_04.64.ascii.Z
b01:0900 extract beg time:0943 e93272_2A1_09.71_09.98.ascii.Z
b01:1654 extract beg time:1707 e93287_2A1_17.11_17.37.ascii.Z
b01:2215 extract beg time:2240 e93294_2A1_22.67_22.85.ascii.Z
b01:0824 extract beg time:0840 e93303_2A1_08.66_08.81.ascii.Z
b05:1140 extract beg time:1240 e94044_2A1_12.66_12.76.ascii.Z
b01:0113 extract beg time:0124 e94049_2A1_01.40_02.50.ascii.Z
b01:0047 extract beg time:0128 e94062_2A1_01.47_01.63.ascii.Z
b01:2113 extract beg time:2142 e94202_2A1_21.70_21.98.ascii.Z
b01:2113 extract beg time:2144 e94202_2A1_21.74_22.14.ascii.Z
b01:1047 extract beg time:1143 e94242_2A1_11.71_11.86.ascii.Z
b01:0647 extract beg time:0728 e94298_2A1_07.47_07.51.ascii.Z
b11:1328 extract beg time:1348 e94321_2A1_13.80_14.47.ascii.Z
b01:1952 extract beg time:2040 e94326_2A1_20.66_20.78.ascii.Z
b01:0144 extract beg time:0158 e95216_2A1_01.96_02.09.ascii.Z
b02:1628 extract beg time:1718 e95339_2A1_17.30_17.45.ascii.Z
b03:1718 extract beg time:1718 e95339_2A1_17.30_17.45.ascii.Z
b01:1124 extract beg time:1205 e95362_2A1_12.09_12.87.ascii.Z
b05:1516 extract beg time:1540 e95362_2A1_15.67_15.84.ascii.Z
b05:1516 extract beg time:1541 e95362_2A1_15.69_15.85.ascii.Z
b02:0216 extract beg time:0251 e96002_2A1_02.85_03.62.ascii
b20:1956 extract beg time:2041 e96002_2A1_20.68_20.76.ascii
b20:1956 extract beg time:2041 e96002_2A1_20.69_20.76.ascii
b03:0235 extract beg time:0305 e96004_2A1_03.09_03.87.ascii.Z
b05:1621 extract beg time:1656 e96006_2A1_16.93_17.08.ascii.Z
b01:0116 extract beg time:0150 e96007_2A1_01.84_01.95.ascii
b01:0116 extract beg time:0152 e96007_2A1_01.87_01.99.ascii
b01:0208 extract beg time:0233 e96030_2A1_02.55_02.66.ascii.Z
b01:0208 extract beg time:0235 e96030_2A1_02.58_02.73.ascii.Z
b01:0208 extract beg time:0235 e96030_2A1_02.59_02.73.ascii.Z
b01:0849 extract beg time:0949 qp96032_2A1_09.81_09.94.ascii.Z

BATSE 825; not det.
BATSE 1289; not det.
BATSE 1662; not det.
S 4R 1900 - could have been used for
PVO/WATCH; trigger - this network sys.
BATSE 1726; not det. this data prob. not us
BATSE 2044; not det.
BATSE 2045; not det.
BATSE 2046; not det.
BATSE 2046; not det.
BATSE 2127; RT detec.

Apr 6 15:47 1993 standard input Page 6

From cole@gibson.span@Sdsc.Edu Tue Apr 6 13:15:24 1993
Date: Tue, 6 Apr 93 20:18:00 GMT
From: cole@gibson.span@Sdsc.Edu
Subject: EPHEMERIS/ARRIVAL INFO.
To: khurley@sunspot.ssl.berkeley.edu
X-St-Vmsmail-To: HURLEY
Content-Length: 1006

In all locations assume an error box of 7 degrees radius.

Please note that digital data for trigger #2127 is MER data.

DATE	UT	X	Y	Z	RA	DEC
920617	19611.2	-5682.8	2111.8	3008.5		
920714	47070.8	6362.3	805	2178.5	213.96	-31.57
920720	21173.9	-5428.0	3739.0	-1537.0		
920830	6318.7	-5710.0	-3143.8	-1802.3		
921003	23741.1	-951.8	-5876.3	-3217.3	145.42	-14.81
921015	5792.4	5926.3	383.8	3216.8		
921123	22711.9	6695.0	286.3	830.3		
921203	78263.9	-4560.0	-4259.5	-2583.8		
921206	66259.6	-4885.5	3488.0	-3101.3		
921209	9721.5	4330.5	5164.5	342.0		
921230	32271.0	2122.0	6367.0	-672.0		
921230	50746.0	-5740.5	-2050.3	2884.5		
930108	8935.0	6619.0	1172.5	581.8		
930112	14339.7	-1382.0	-5773.8	-3211.5	224.74	29.36
930120	84700.8	5523.3	-3023.3	2412.8	264.41	15.79
930127	58466.9	5896.3	-1171.3	3049.5		
930217	53079.7	-5919.5	-460.5	3181.3		

Wrong time

Helio corr removed

Date: *Dec 15 '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? *Possible 0.5 s error added to uncertainty*
- ☒ 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 ? *No - it's off*
- ☒ 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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

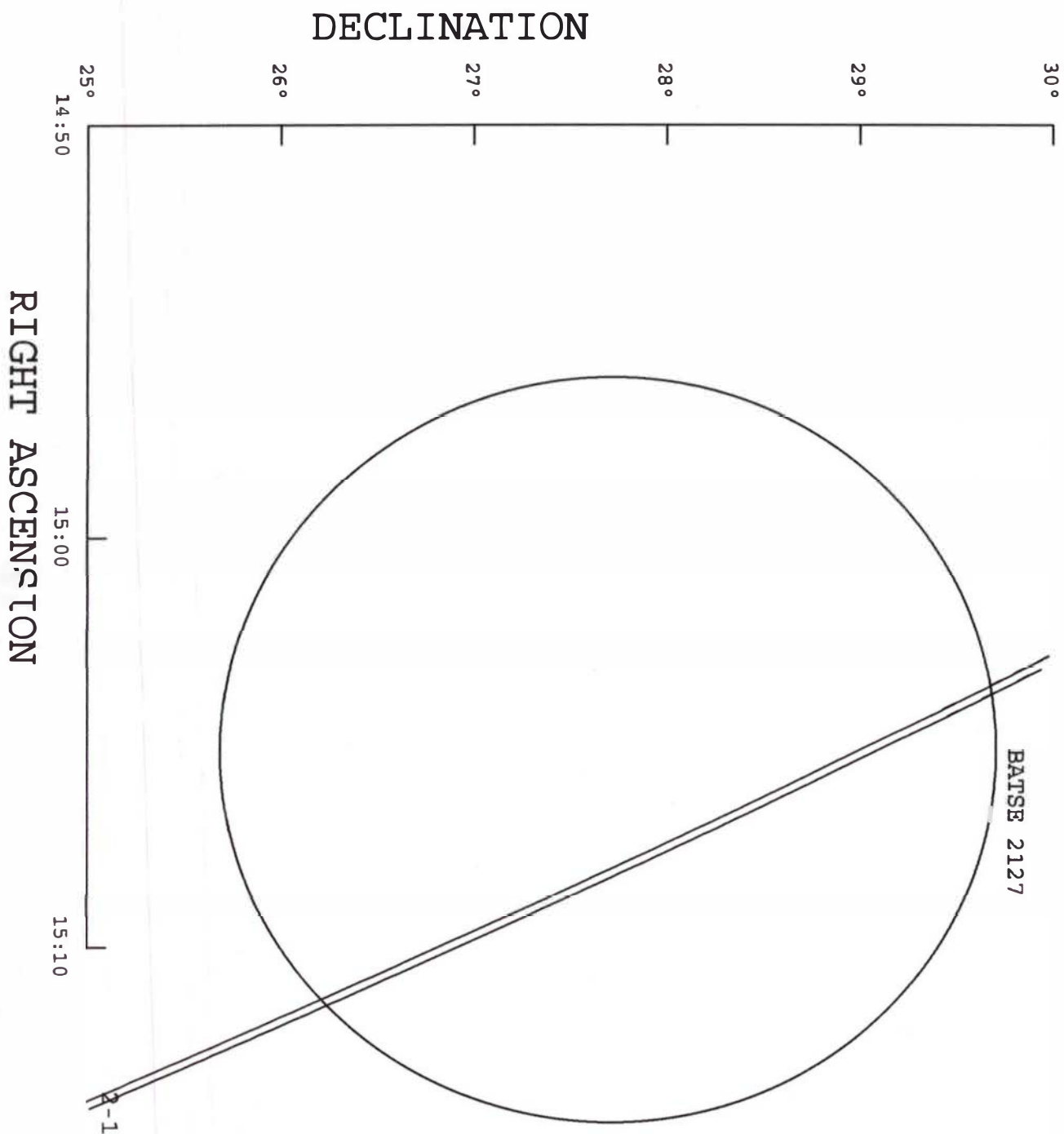
G=GALACTIC EQUATOR

1 ULYSSES

2 BATSE

EVENT OF JAN 12, 1993 3:35

15/12/97



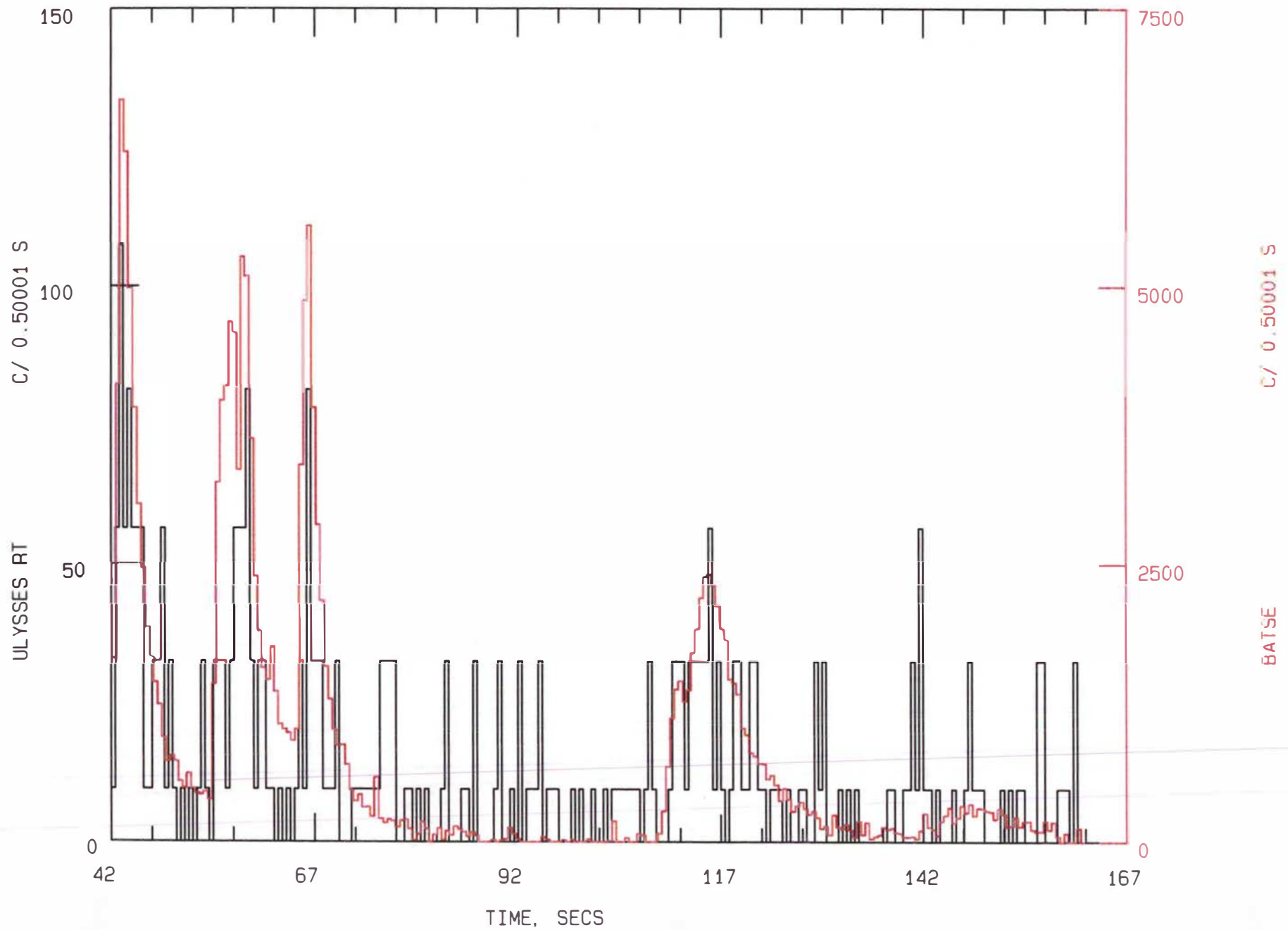
ULYSSES RT-BATSE

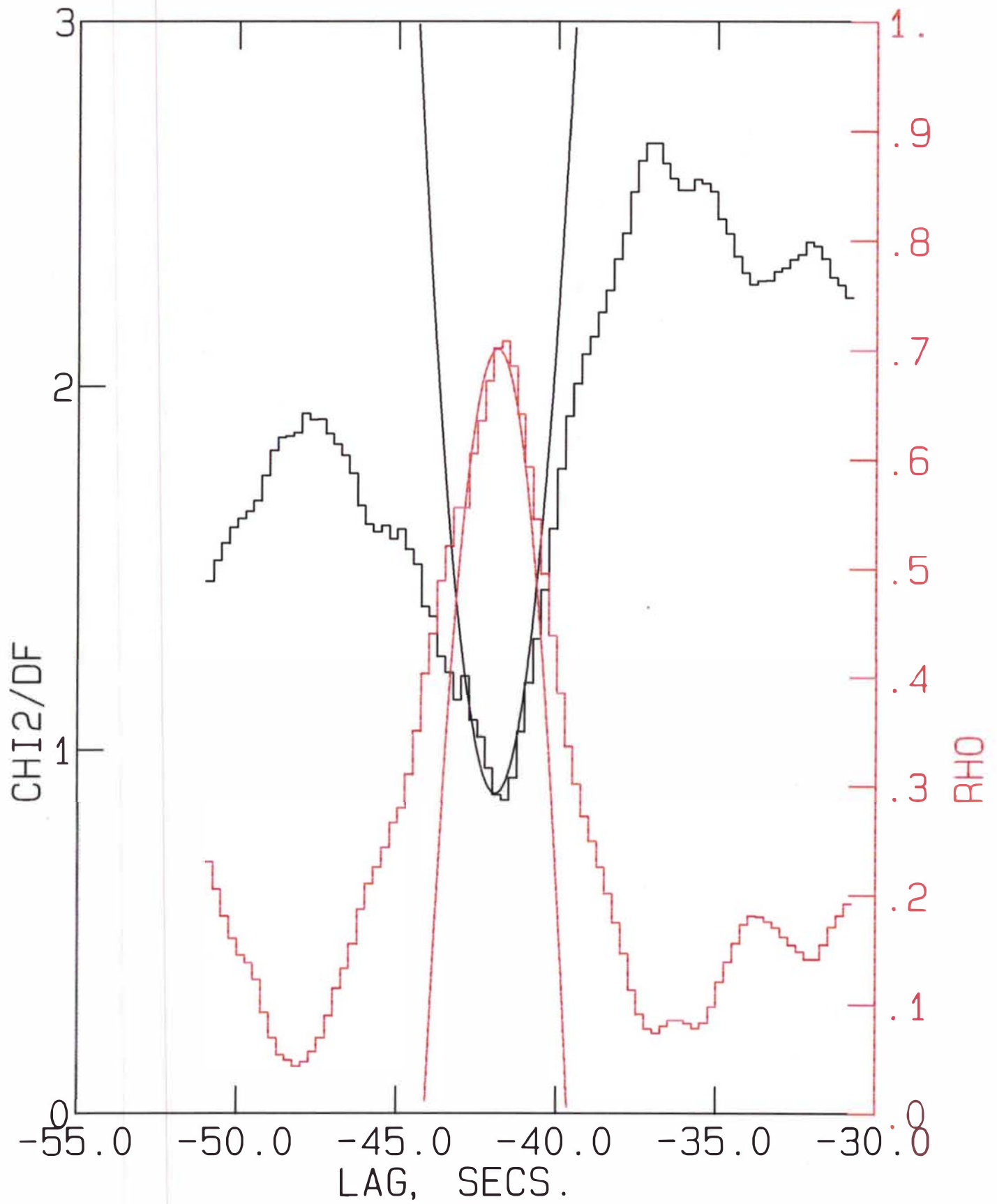
CORRELATION

12/ 1/93

12950.332

15/12/97





ULYSSES RT

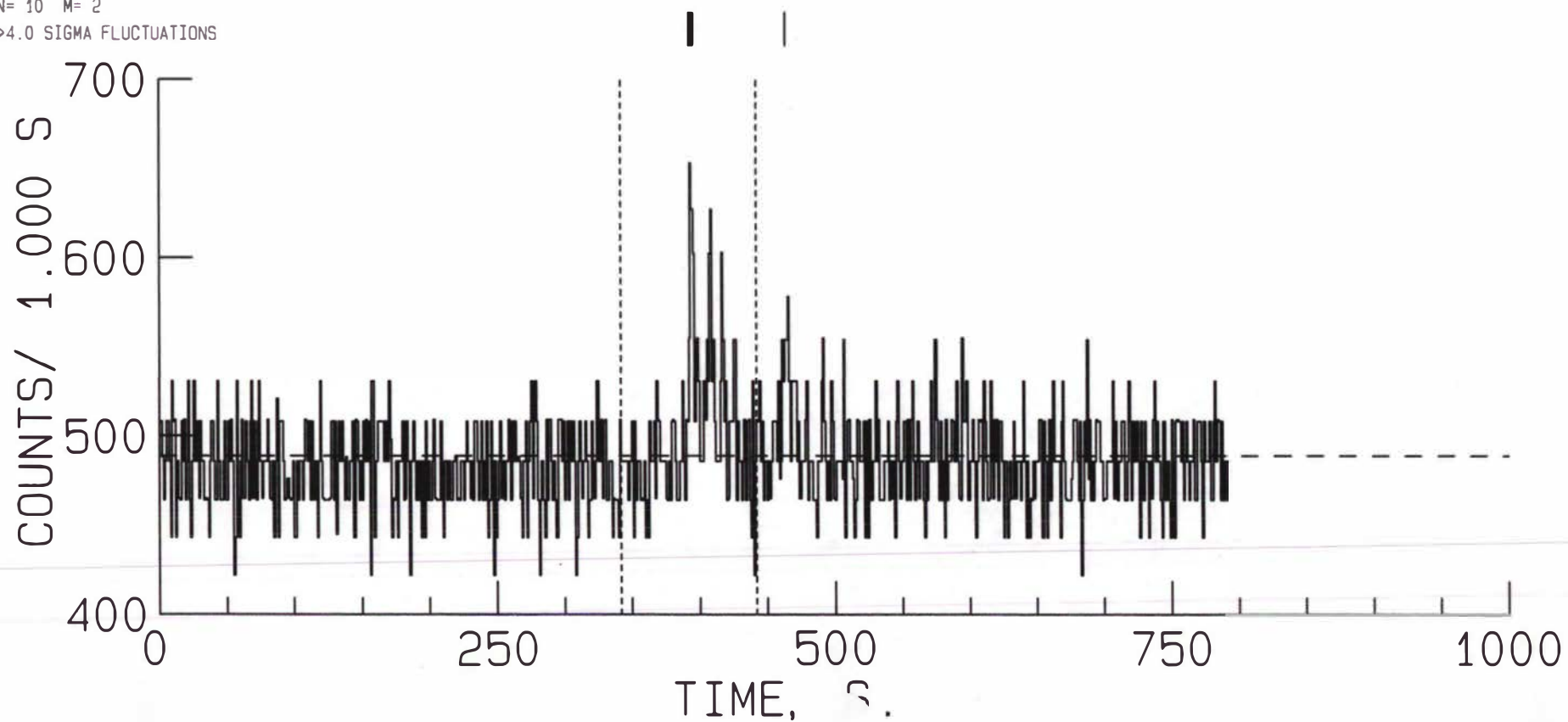
15 / 12 / 97

12/ 1/93 12600.141 s

0.500 S INTERVALS REGROUPED BY 2

22- 147 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



marshall

From khurley@space6.ssl.berkeley.edu Mon Oct 18 17:24:57 1993

Date: Mon, 18 Oct 93 17:20:02

From: khurley@space6.ssl.berkeley.edu

Content-Length: 365

I finally got a better location for the GRB of 9²⁰112.2. The Ulysses to BATSE annulus is centered at RA(2000)=164.854 degrees, dec(2000)=-13.414, radius=72.912 degrees, and width 4'. This goes through the BATSE error circle at RA(2000)=224.7, dec=29.4, radius approximately 4 degrees. Did EUVE scan this region in the survey? The burst was at 13619 seconds UT.

BATSE

12/01/93

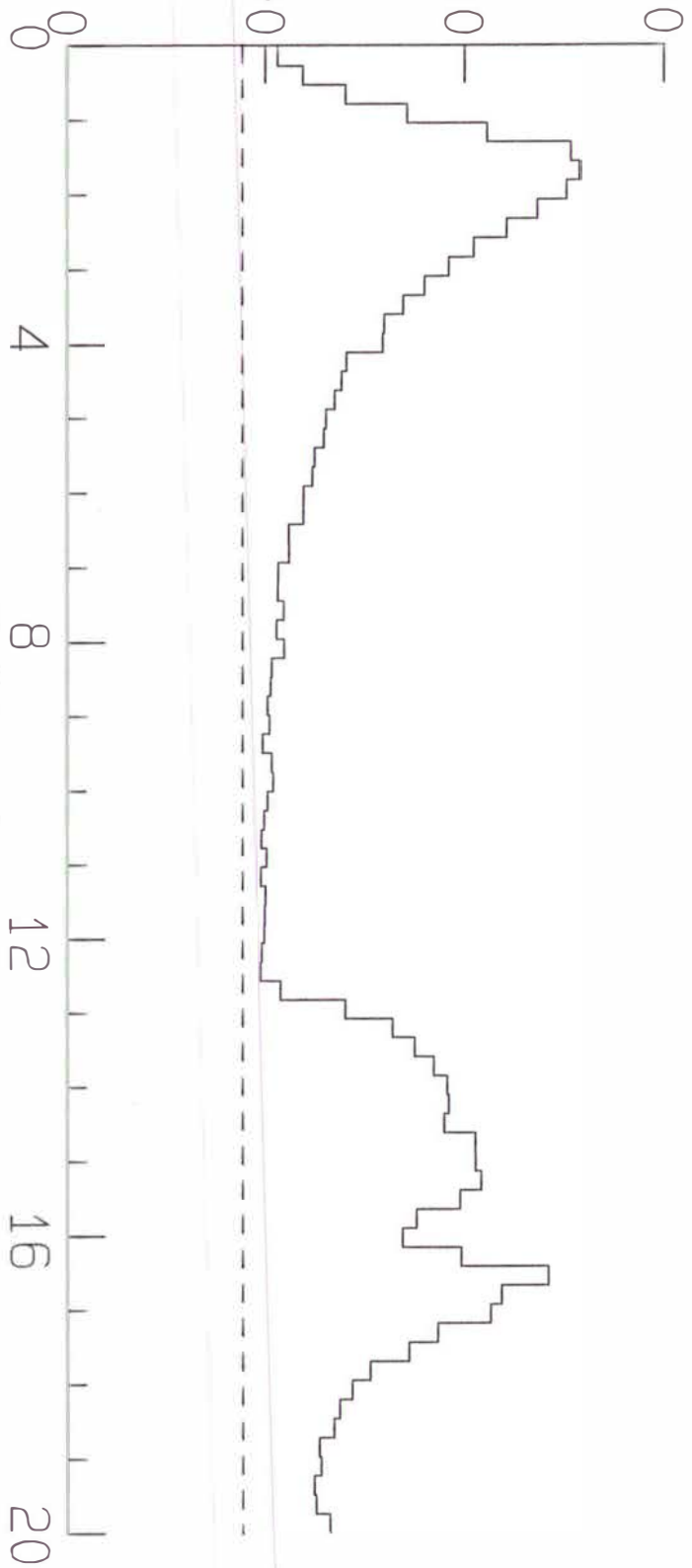
13650.844

25- 100 keV

COUNTS/ .256 S

6000
4000
2000
0

0 4 8 12 16 20
TIME, SECS



BATSE

12/01/93

13650.844

25- 100 keV

COUNTS/ .256 S

2000
4000
6000

20

24

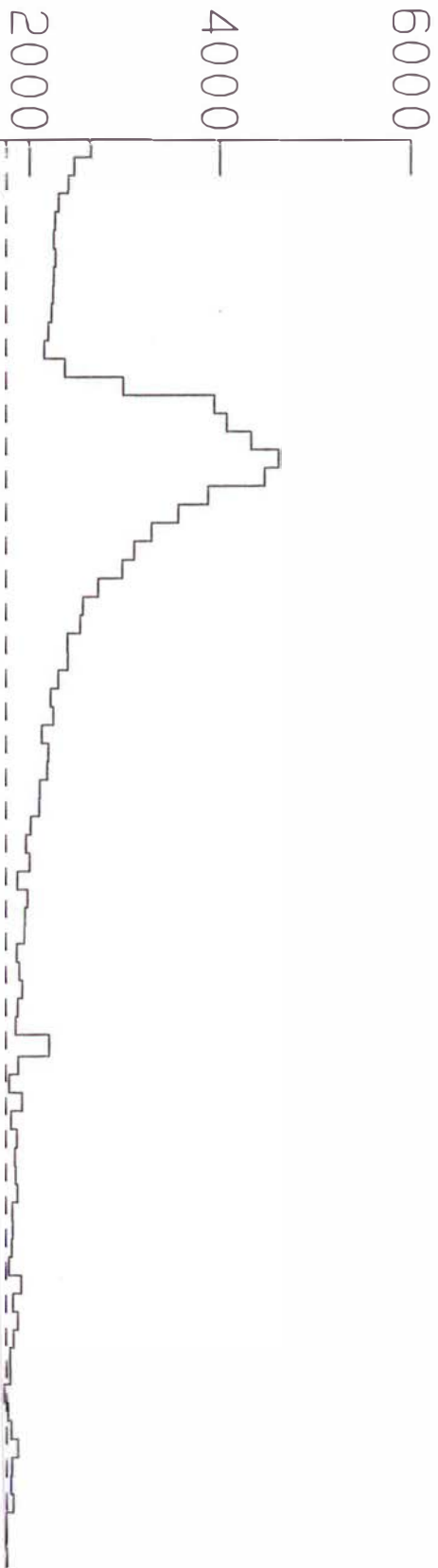
28

32

36

40

T ME, SECS



BATSE

12/01/93

13650.844

25- 100 keV

COUNTS/ .256 S

2000
4000
6000

0

44

48

52

56

60

TIME, SECS



BATSE

12/01/93

13650.844

25- 100 keV

COUNTS/ .256 S

2000
4000
6000

60

64

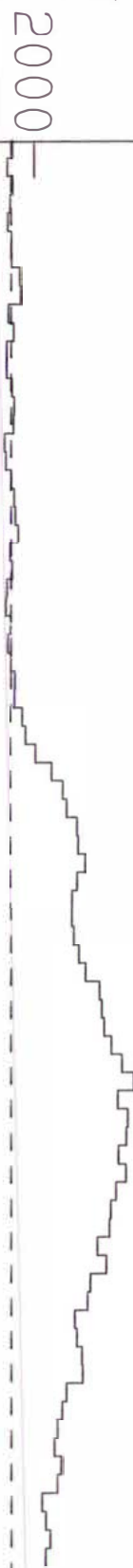
68

72

76

80

T ME, SECS



BATSE

12/01/93

13650.844

25- 100 keV

COUNTS/ .256 S

2000
4000
6000

80

84

88

92

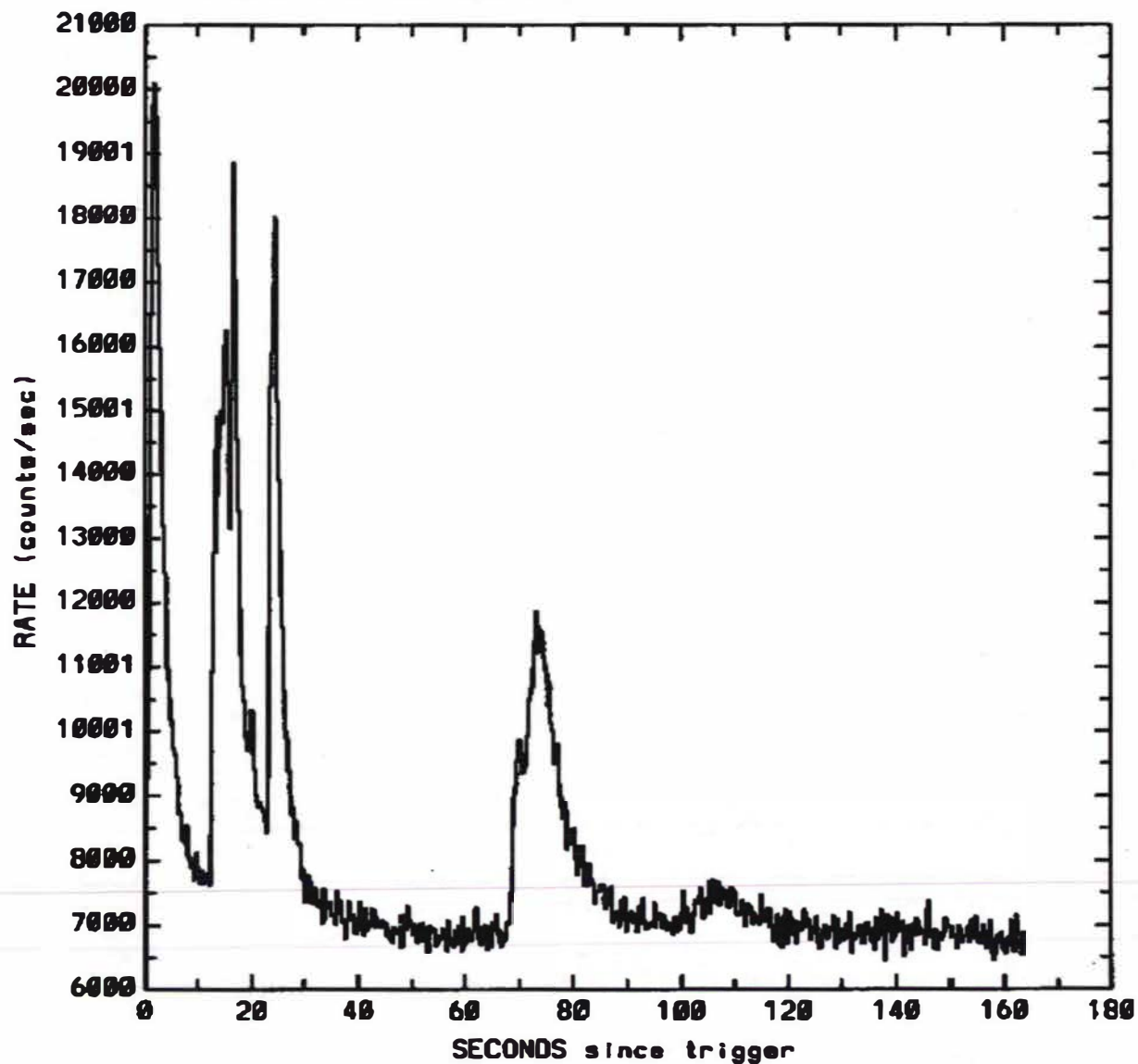
96

100

T
4E, SECS



Data for K. Hurley



23-MAR-1993 15:23:29

Created by MDPS BD
(Burst Display)
Version 2.18

Trigger # : 2127

Trigger Time:
8999 / 13658.844

Burst Data Type:
MER

Deadtime
Corrected: N
Background Data
Type: CONT
Minimum Integ. Time:
0.256 seconds

Detectors [7..8]:
00010001

Channels:
(0. 6)

Quality Mask:
8018P1

CATSEARCH PROGRAM

BATSE BURST # 2128
EVENT OF 1993 JAN 12 DAY OF YEAR= 12
EVENT CROSSING TIME AT BATSE : 55082. S. OR 15:18:02.1
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 210.700 51.300
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 12/ 1/ 93 IS:
RA= 164.252 DEC= -13.135 DIST= 4.496 AU
BATSE-ULYSSES DISTANCE = 672676400. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=104.02 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -543.40 SECS.
CROSSING TIME AT ULYSSES IS 54539. S. OR 15:08:58.7 +/- 419.71 SECONDS

21

From SHARIFF@ssl.msfc.nasa.gov Thu Jan 14 16:58:50 1993
Date: Thu, 14 Jan 1993 19:02:31 -0600 (CST)
From: SHARIFF@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02128

TIME: TJD=8999 SECONDS=55082

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=081.9 AZIMUTH=084.7 ERROR= DEGREES

COMMENTS:

BURST, MULTI-PEAKED, LASTING > 50S. VISIBLE ABOVE 300KEV. SPARSE DATA.

From SHARIFF@ssl.msfc.nasa.gov Thu Jan 14 17:11:34 1993
Date: Thu, 14 Jan 1993 19:16:47 -0600 (CST)
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
2128	930112	8999	55082	12250	211	+52

25

Helio corr removed

Date: *Dec 15 '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? *TTS data*

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 ? *No*
- ☒ 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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

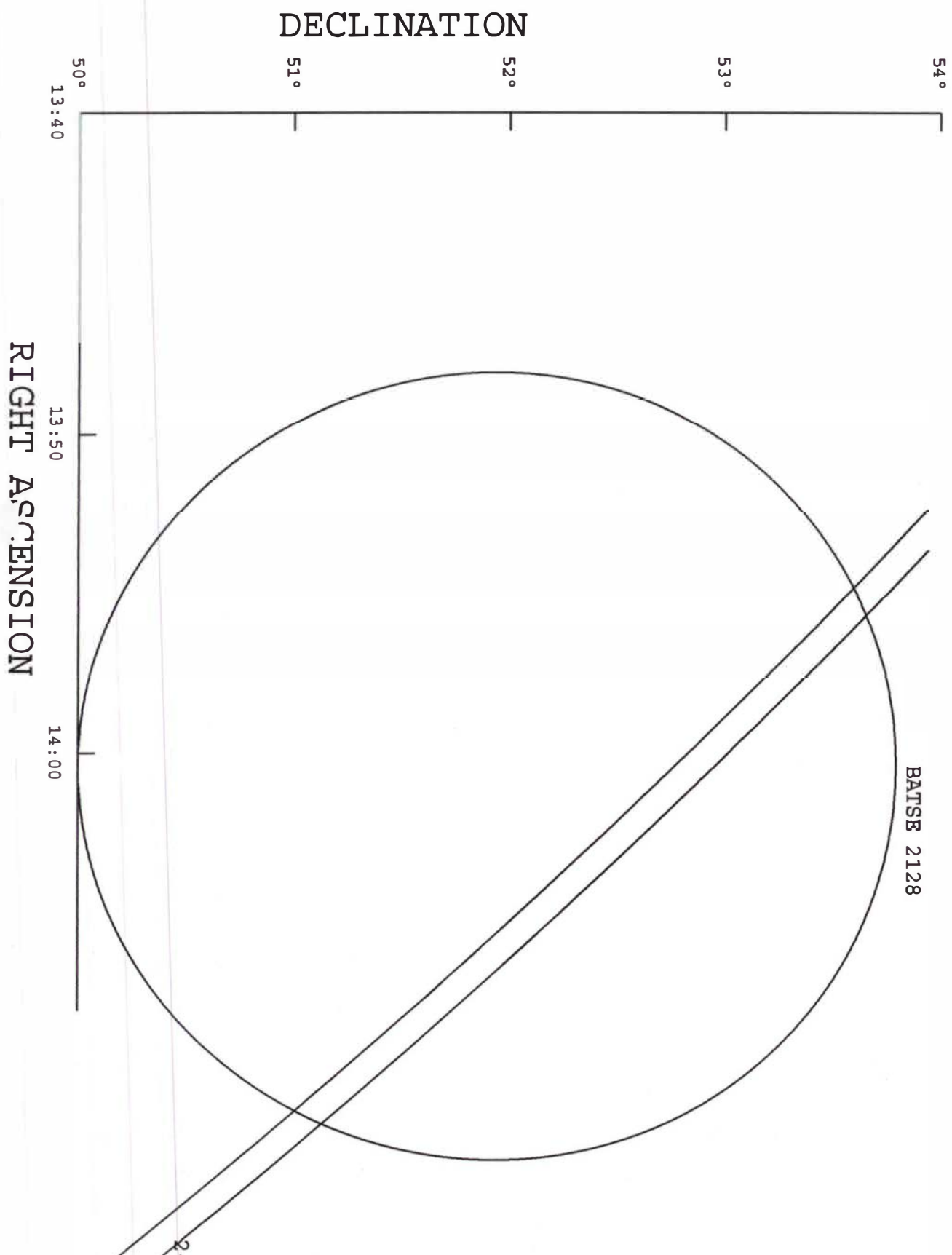
G=GALACTIC EQUATOR

1 ULYSSES

2 BATSE

EVENT OF JAN 12, 1993 15:08

15/12/97



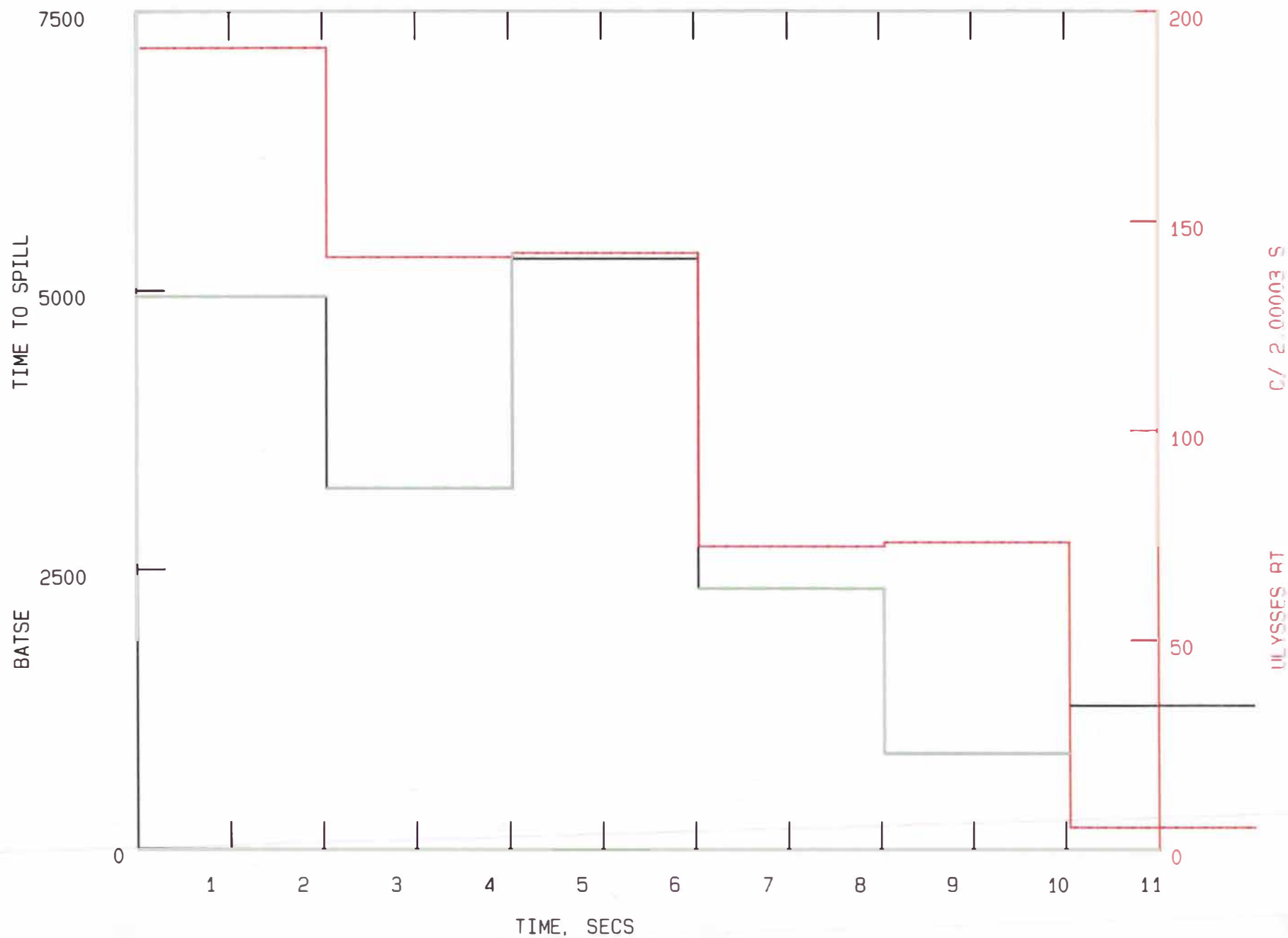
BATSE

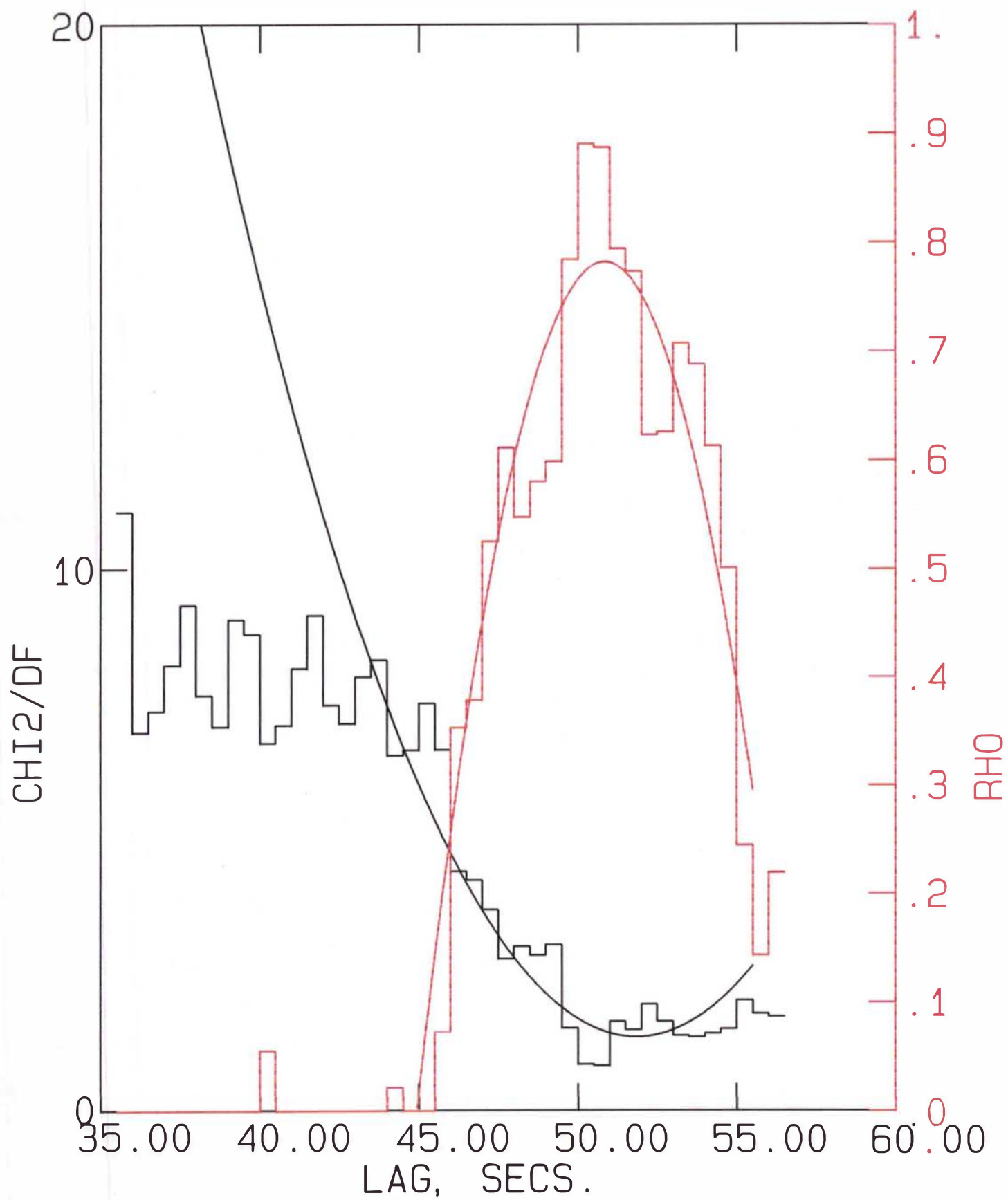
-ULYSSES RT CORRELATION

12/ 1/93

55082.114

15/12/97





ULYSSES RT

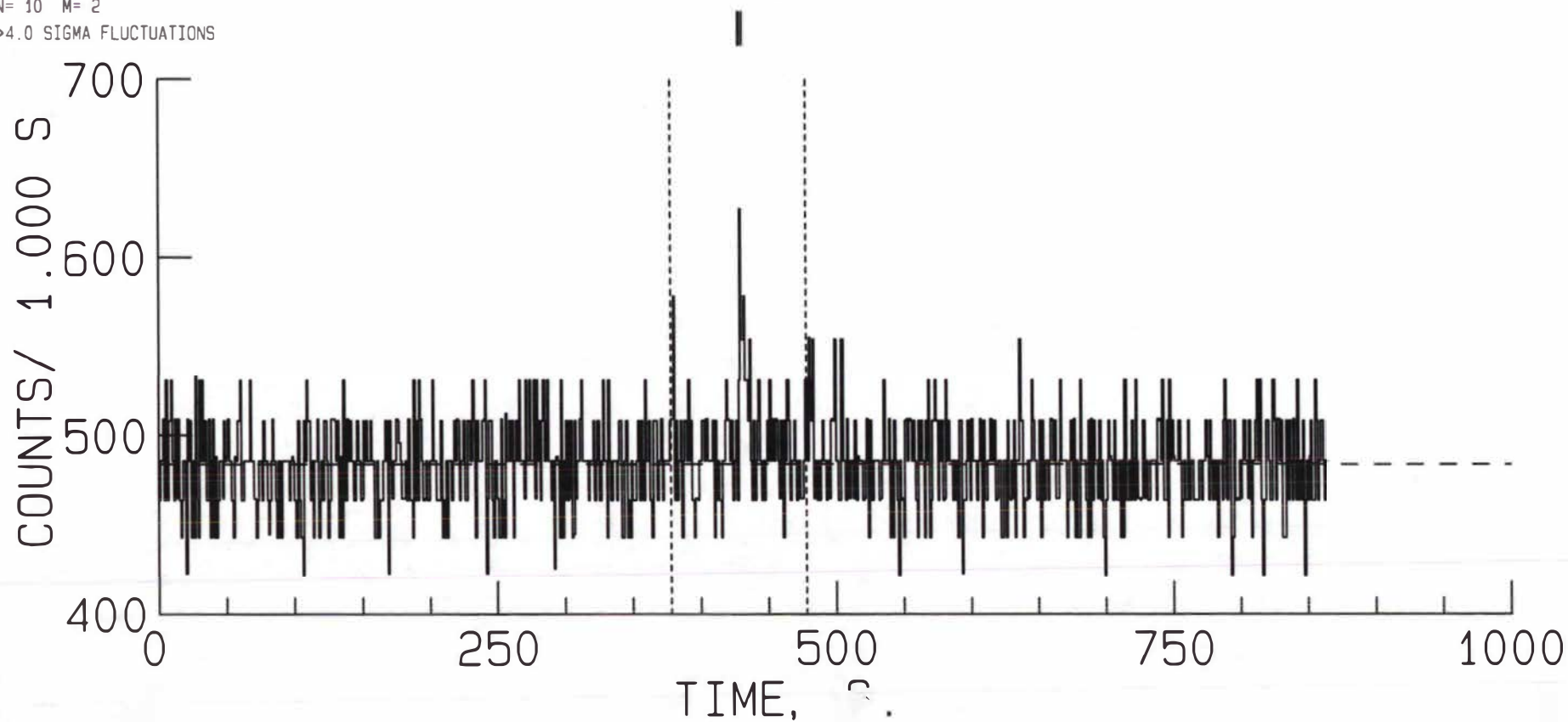
15/12/97

12/ 1/93 54144.290 s

0.500 S INTERVALS REGROUPED BY 2

22- 147 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

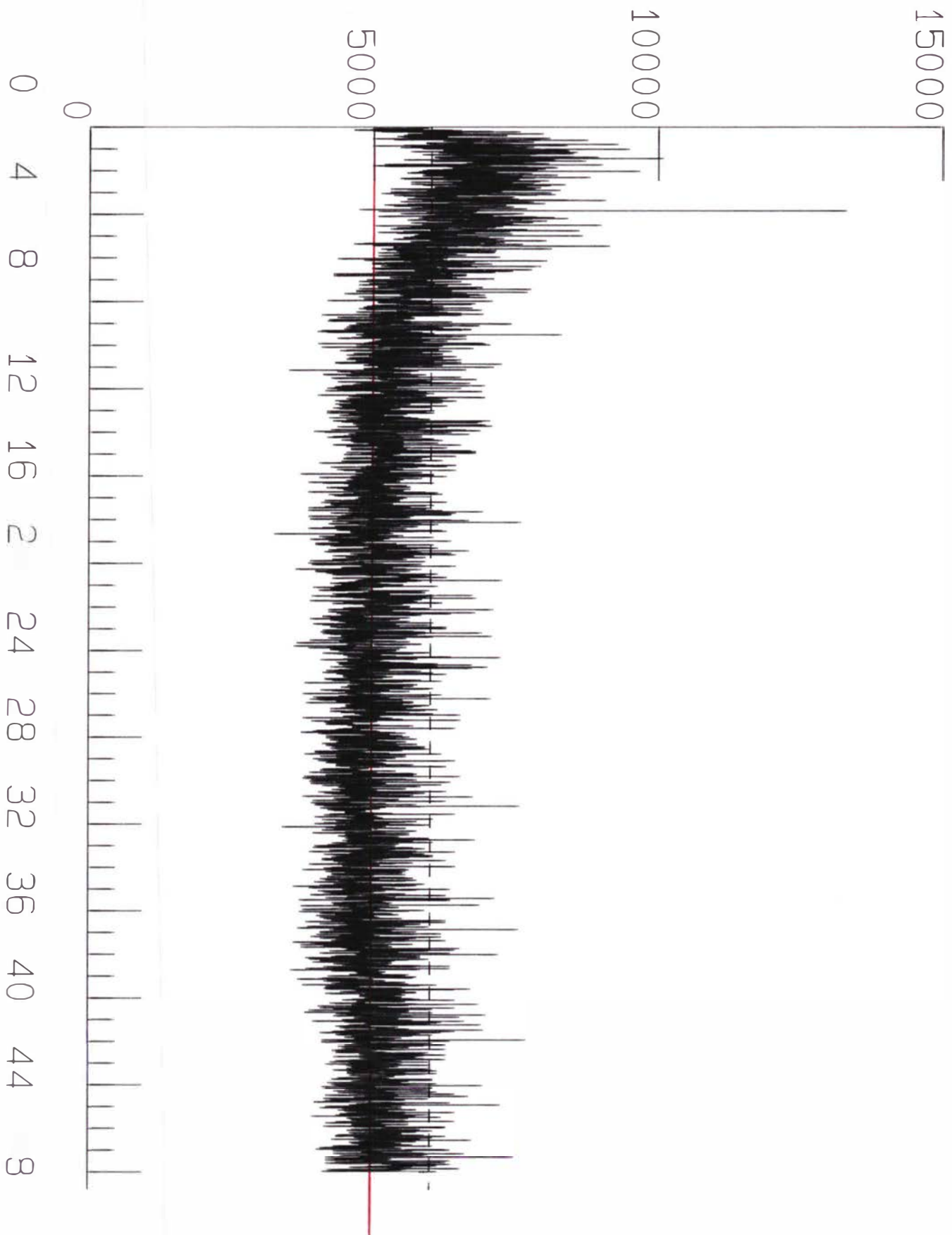


BATSE

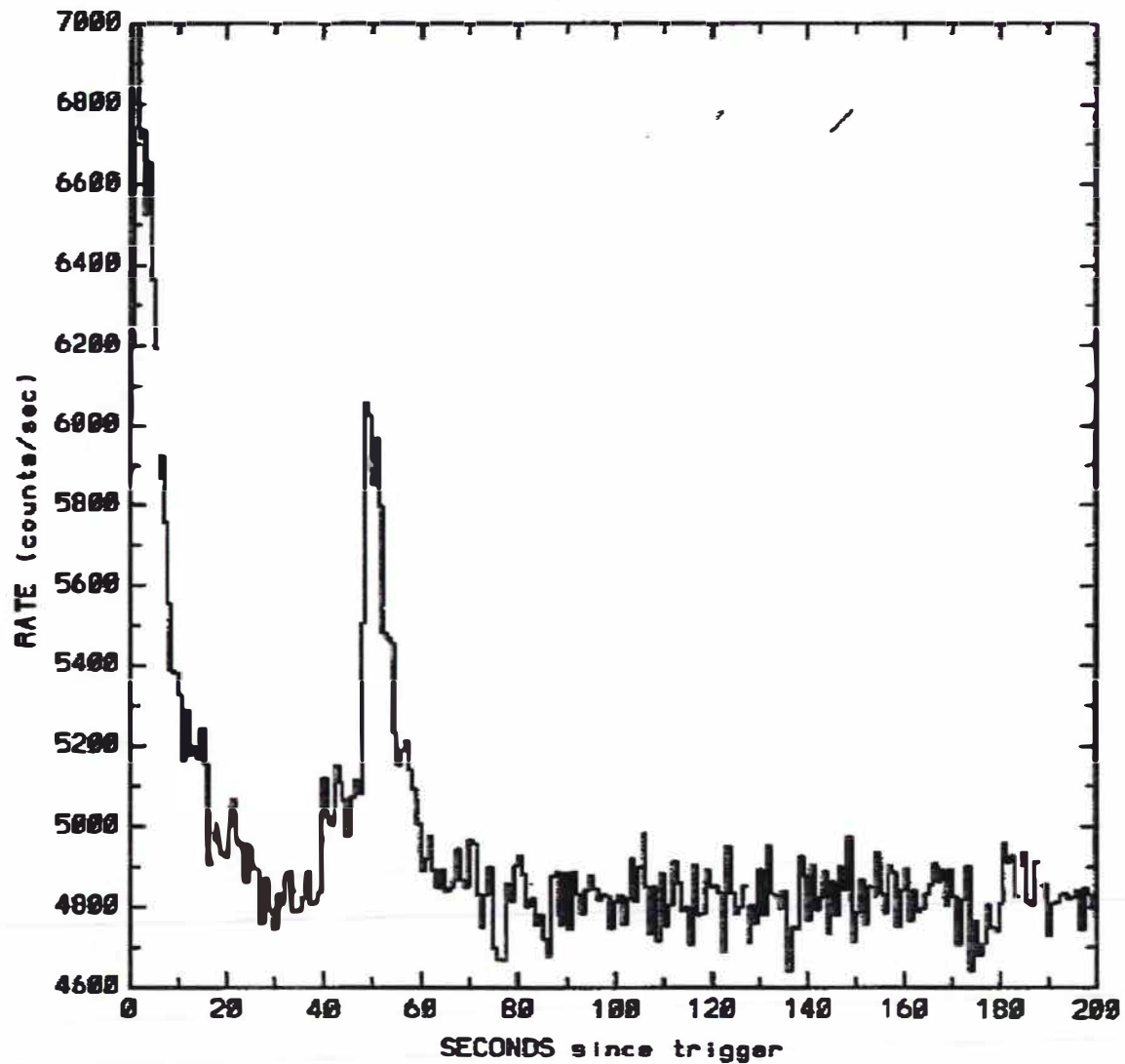
12/01/93

55082.114

25- 50 keV
COUNTS/S TTS



Data for K. Hurley



15-APR-1993 13:19:13

Created by MDPS BD
(Burst Display)
Version 12.19

Trigger # : 2128

Trigger Time:
8999 / 53882.114Burst Data Type:
TTSTime Corrected: Y
Maximum Time Error:
0.42348 second(s)Deadtime
Corrected: N
Background Data
Type: PREB + DISCLABin Count: 64
Detectors (7..8):
00110911
Discriminators:
(1..1)
Quality Mask:
B0ISP1

From root Fri Jul 16 15:29 1993
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA07838; Fri, 16 Jul 93 15:29:21
Received: from UCBSP.SSL.BERKELEY.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA21891; Fri, 16 Jul 93 15:30:05 PDT
Message-Id: <9307162230.AA21891@sunspot.ssl.berkeley.edu>
Date: Fri 16 Jul 93 15:31:54-PST
From: SC <046369@essdp2.span.nasa.gov>
To: KHURLEY@sunspot.ssl.berkeley.edu
Subject: [Resent-MM Mail] DMSP GAMMA-RAY BURST DATA
Status: R

Received: from ESSDP2 by UCBSP.SSL.BERKELEY.EDU via MAIL-11 with
DECnet; Fri, 16 Jul 93 15:31:29-PST
Date: Fri 16 Jul 93 15:31:29-PST
From: 046369@ESSDP2.SPAN.NASA.GOV
Subject: DMSP GAMMA-RAY BURST DATA
To: "UCBSP::HURLEY"@ESSDP2.SPAN.NASA.GOV

FROM: ESSDP2::TERRELL (JAMES TERRELL, LOS ALAMOS NATL LAB)
TO: UCBSP::HURLEY (KEVIN HURLEY)
CC:
SUBJ: DMSP GAMMA-RAY BURST DATA, AS OF 16 JULY 1993

HERE ARE SOME NOTES CORRECTING DMSP PEAKTIMES FOR YOUR MASTER BURST LIST.
I HAVE MORE GRAPHS AND INFO TO SEND, BUT HAVE RUN OUT OF TIME.
I WILL SEND MORE INFO AFTER RETURNING 28 JULY--JIM.

27SEP91 84415 YES (8SAA,9YES,10SAA)
16OCT91 36696 YES (8SAA,9YES,10NR)
4NOV91 54286 YES (8SR,9YES,10YES)
27NOV91 15739 YES (8NO,9NO,10YES)
2DEC91 73733 YES (8YES,9NO@144DEG,10NR)
9DEC91 66959 N/O (8SR,9SR,10NR,11ND)
21DEC91 22686 YES (8ND,9NO,10NO,11YES)
10JAN92 33478 NA (BLANK) (8ND,9NA,10SAA,11NA)
10FEB92 35633 YES (8NO,9WEAK,10SAA,11SAA)
6APR92 9855 N/O (OBSCURED) (8NO@141,10SR,11NO@137DEG)
1MAY92 76696 N/O (OBSCURED) (8NO@127,10NO@157,11NO@147DEG)
22JUN92 25506 N/O (8SAA,10NR,11SA)
28JUN92 76452 YES (8ND,10YES,11NO)
29JUN92 75897 YES (ALL YES, SOFT)
14JUL92 47069 NA (BLANK) (8NA,10SAA,11SR)
16JUL92 60933 YES (9NO,10YES,11YES)
20JUL92 11524 N/O (OBSCURED) (8NA@130,10NA@145,11SR)
23JUL92 72188 N/O (OBSCURED) (8ND,10NA@148,11NR)
10AUG92 79599 YES? (8YES?,10NA,11NA) (LONG SOFT PEAK)
4OCT92 50421 YES (8YES,10YES,11SR)
23NOV92 22727 YES (8YES,10YES,1SR) (NOT AT 22712)
23NOV92 46542 YES (8NR,10SR,11YES) (NOT AT 46584, BATSE GRB)
7DEC92 57649 YES (8YES,10YES,11YES)
6JAN93 55260 YES (8SAA,10YES,11SR)
12JAN93 55082 YES (8YES,10NO@138,11VERYWEAK) (8:BIG PEAK AT 55202)
20JAN93 84779 YES (8YES,10,YES,11YES) (NO, AT 84700!)

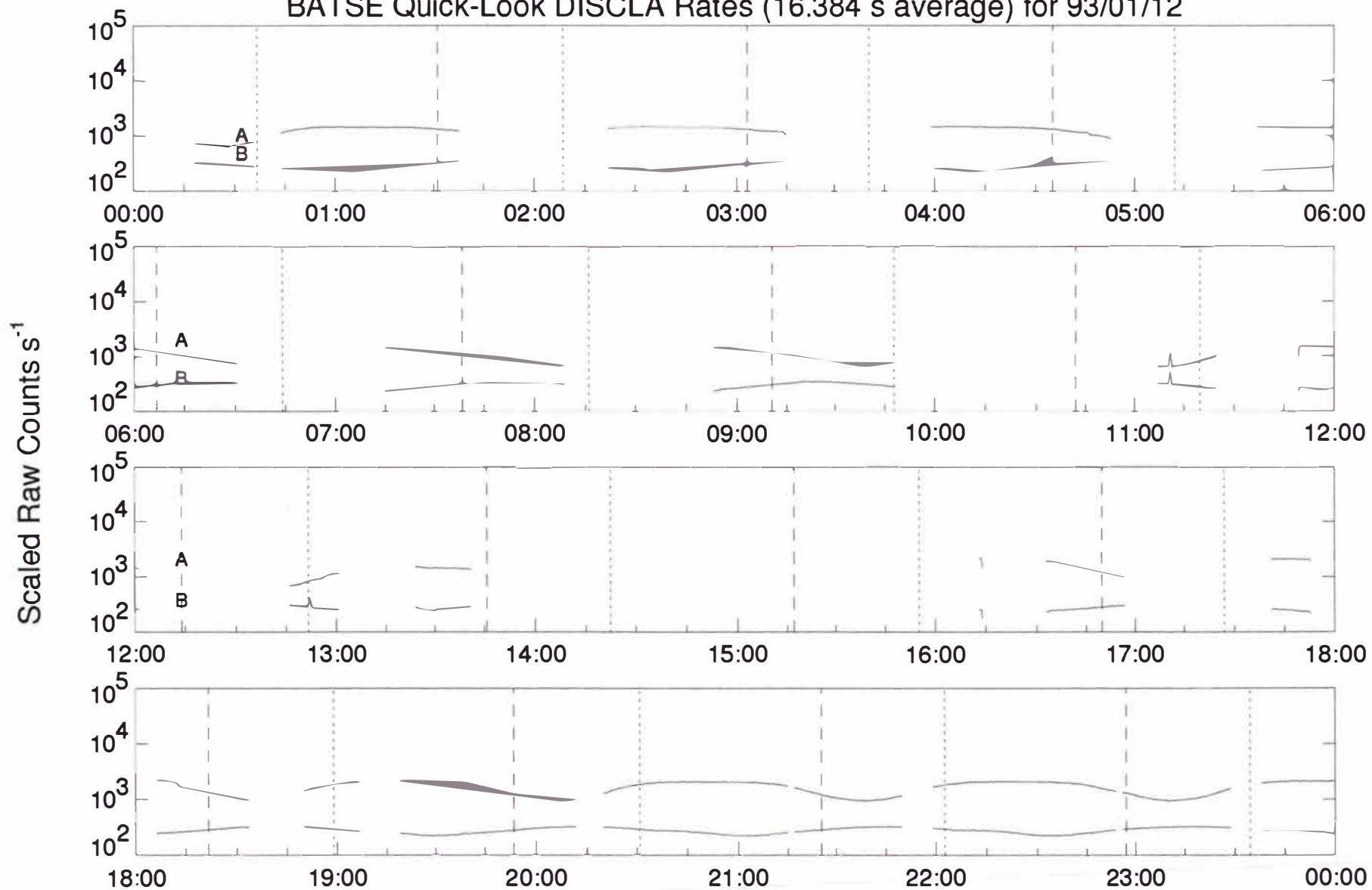
From ULSSCI@jplgp.span.nasa.gov Tue Dec 29 14:51:33 1992
Date: Tue, 29 Dec 92 14:55:55 PST
From: ULSSCI@jplgp.span.nasa.gov
X-To: KHURLEY
X-Cc: ULSSCI
Subject: Timing test
To: KHURLEY@sunspot.ssl.berkeley.edu
Content-Length: 168

We are planning to perform a HUS timing test using time-tagged commands on 12th January using DSS61 (34m at Madrid). Do you have any objections?

Best regards,

Nigel

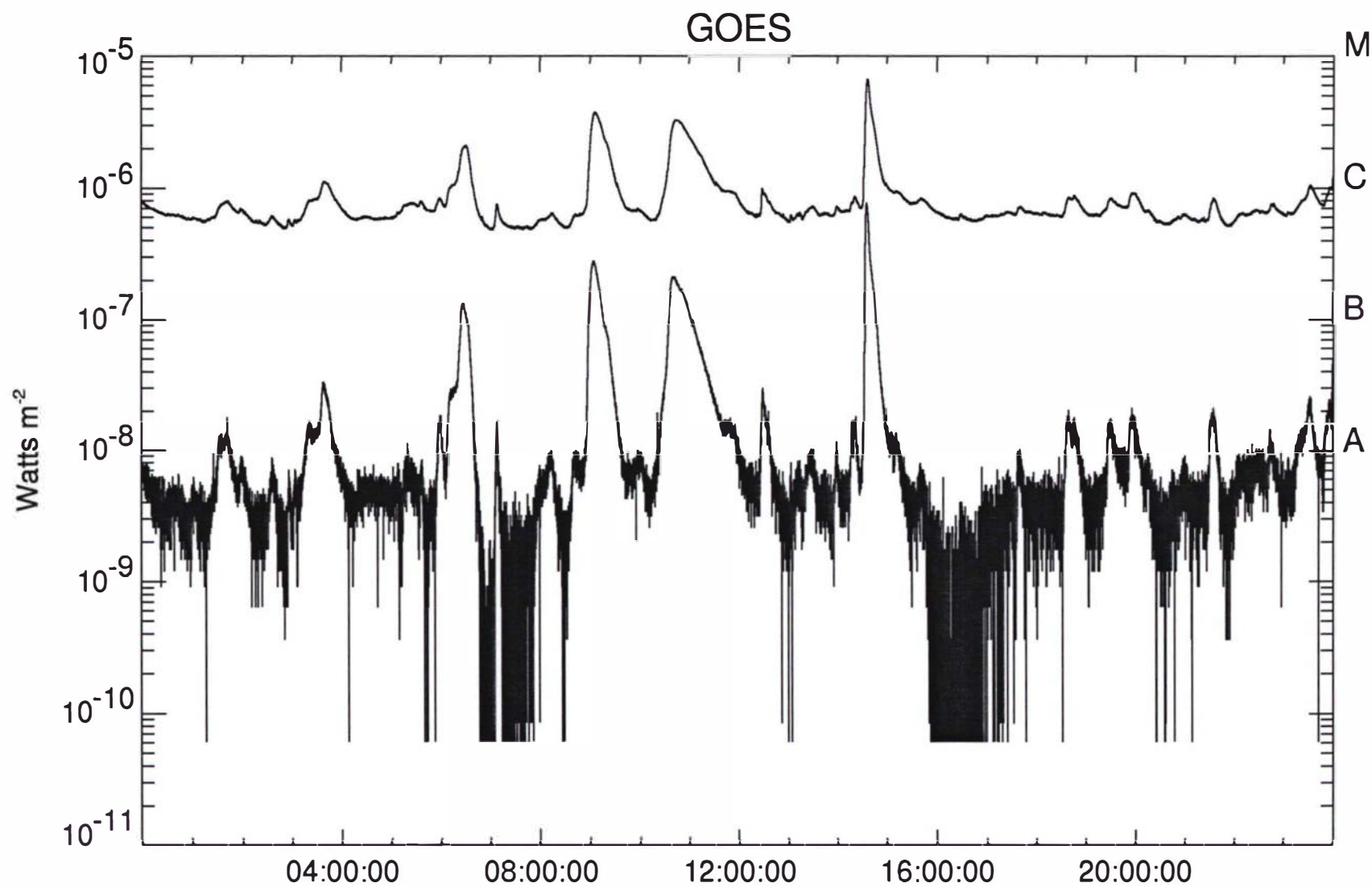
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/12



Current Time: 93/01/25, 1956 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



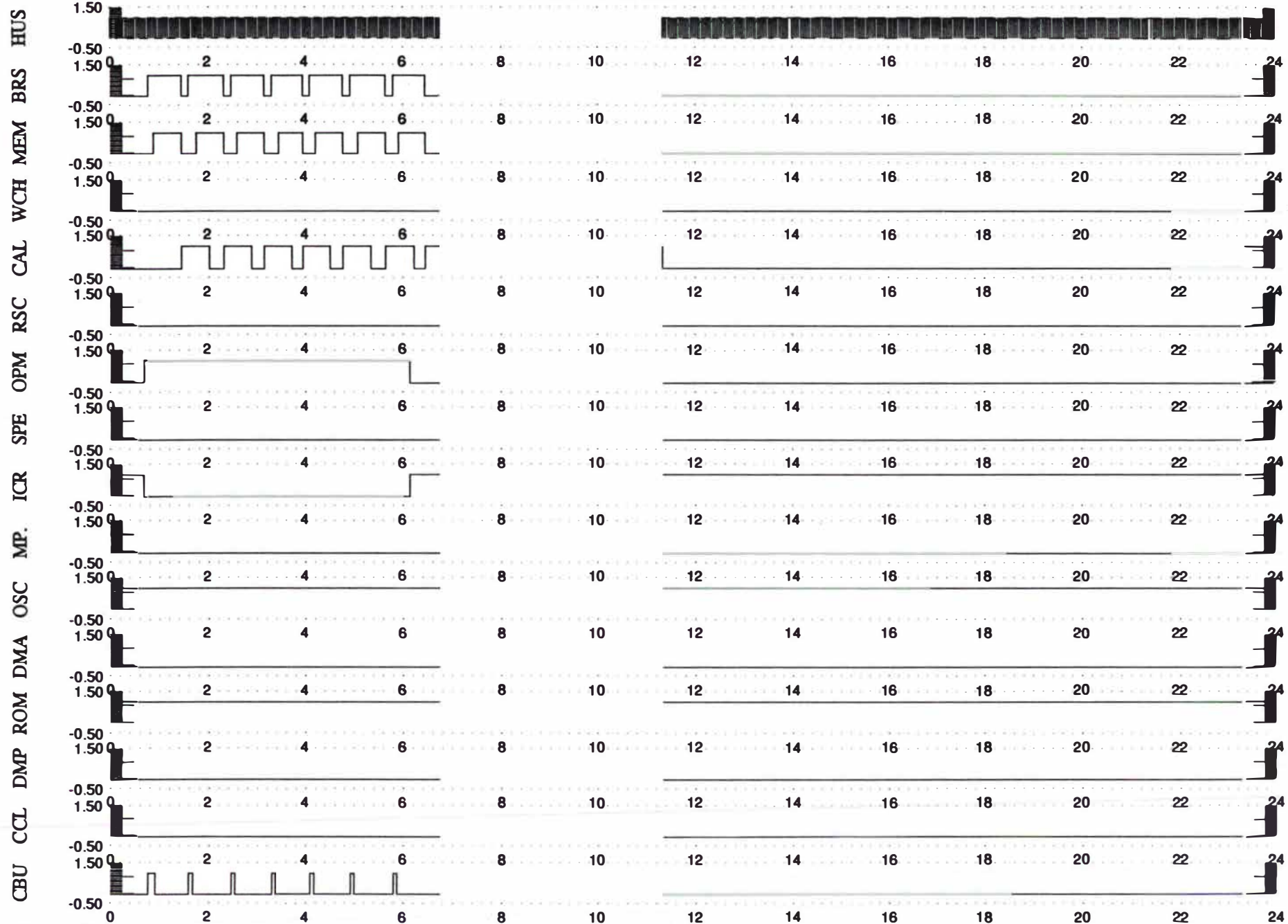
Data Start: 93/01/12, 0000:02

Plot created: 95/05/31, 2202

Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

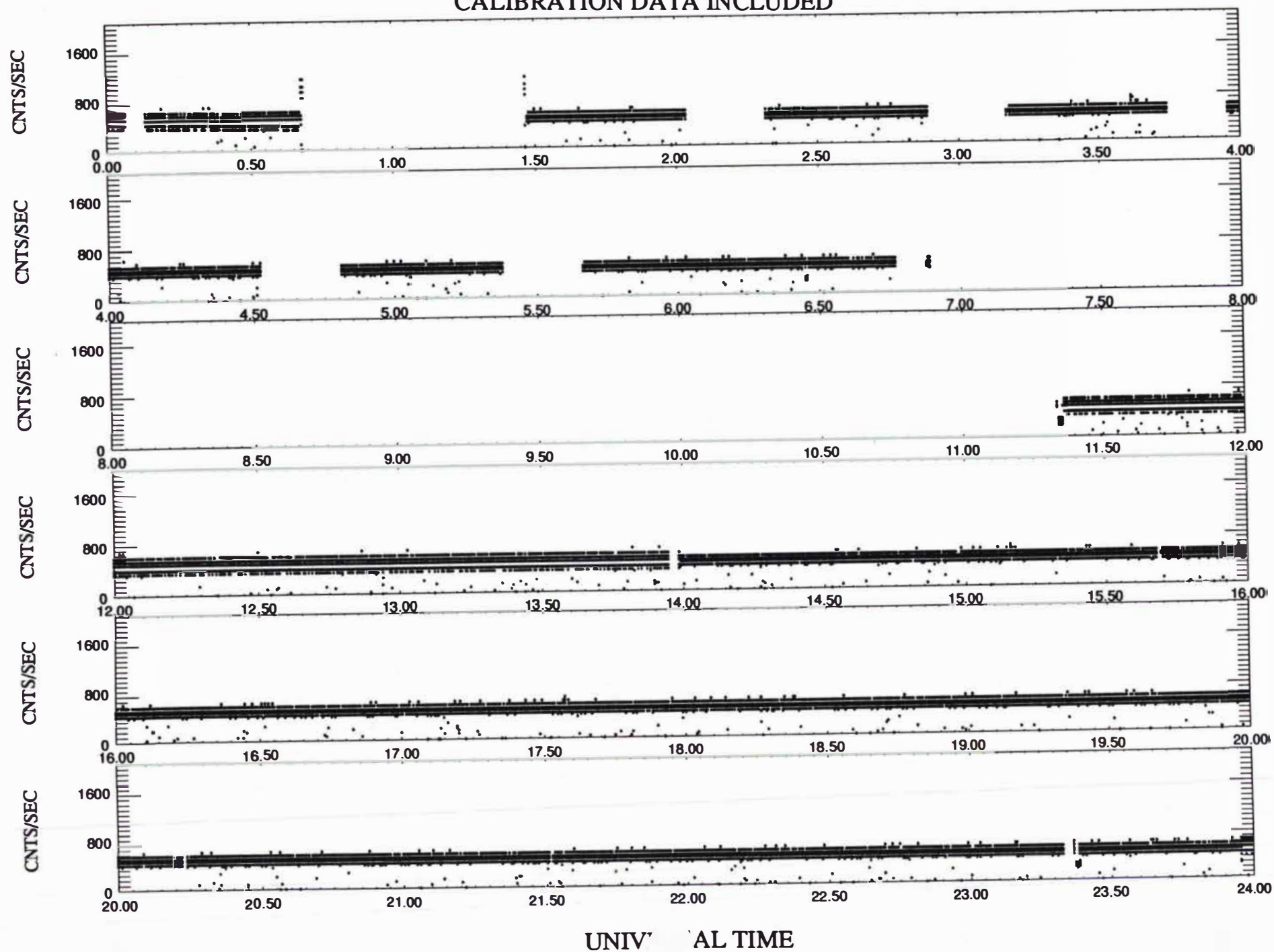
2 (0.5 - 4.0 Angstroms) Background not subtracted

BURST NUMBER 5 - 11

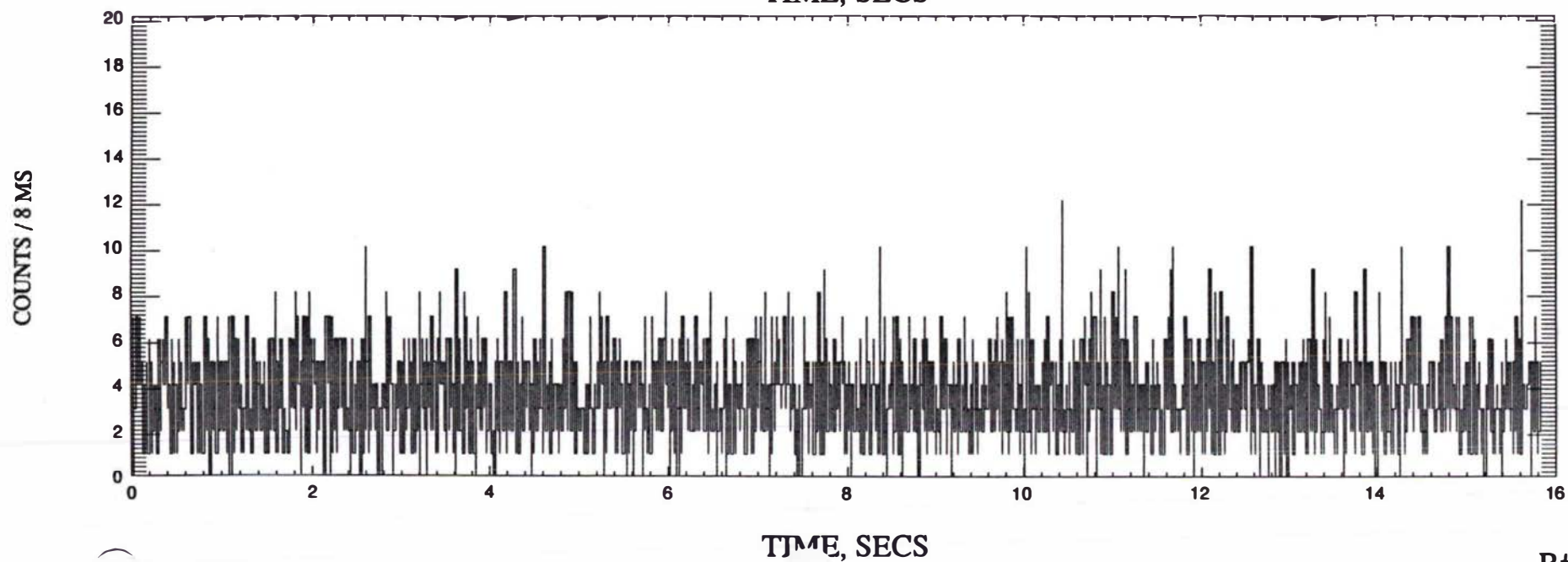
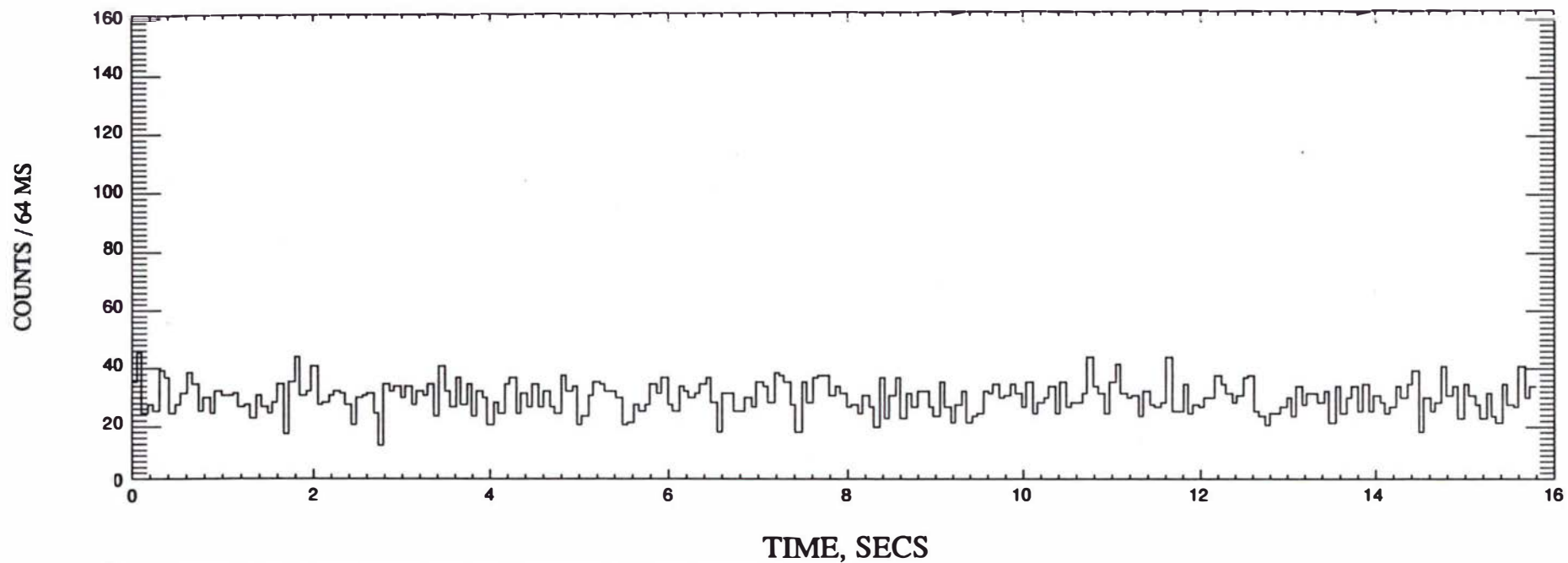


UNIV SAL TIME

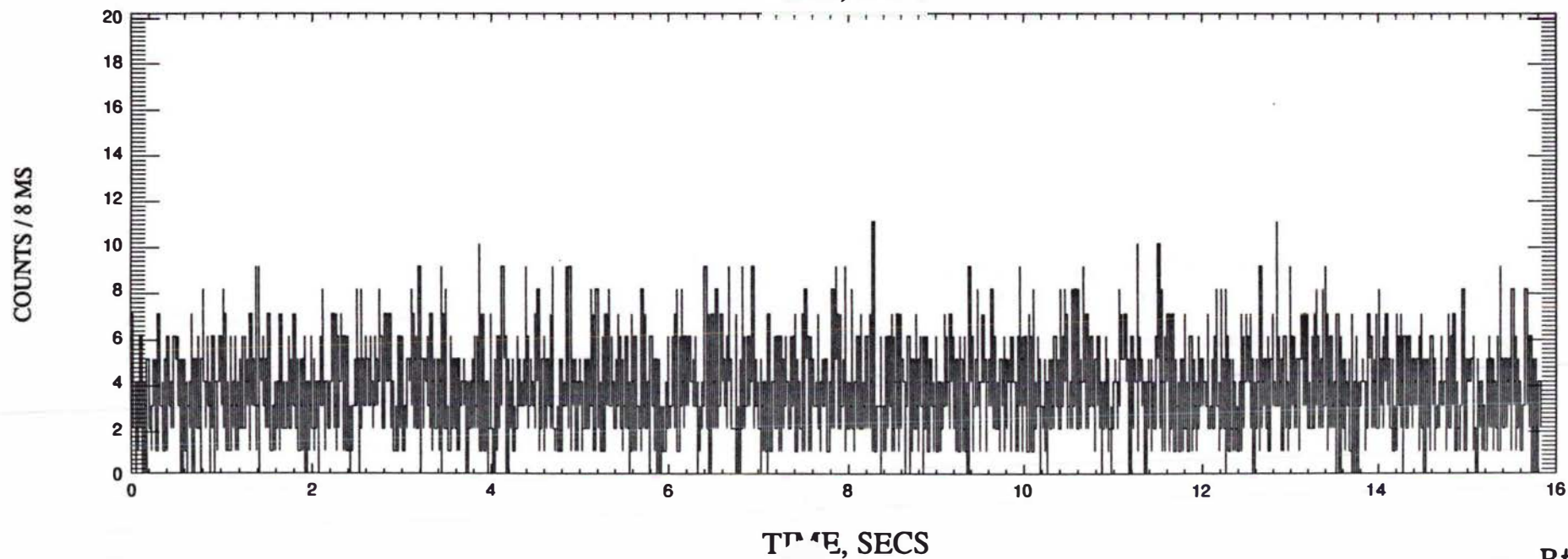
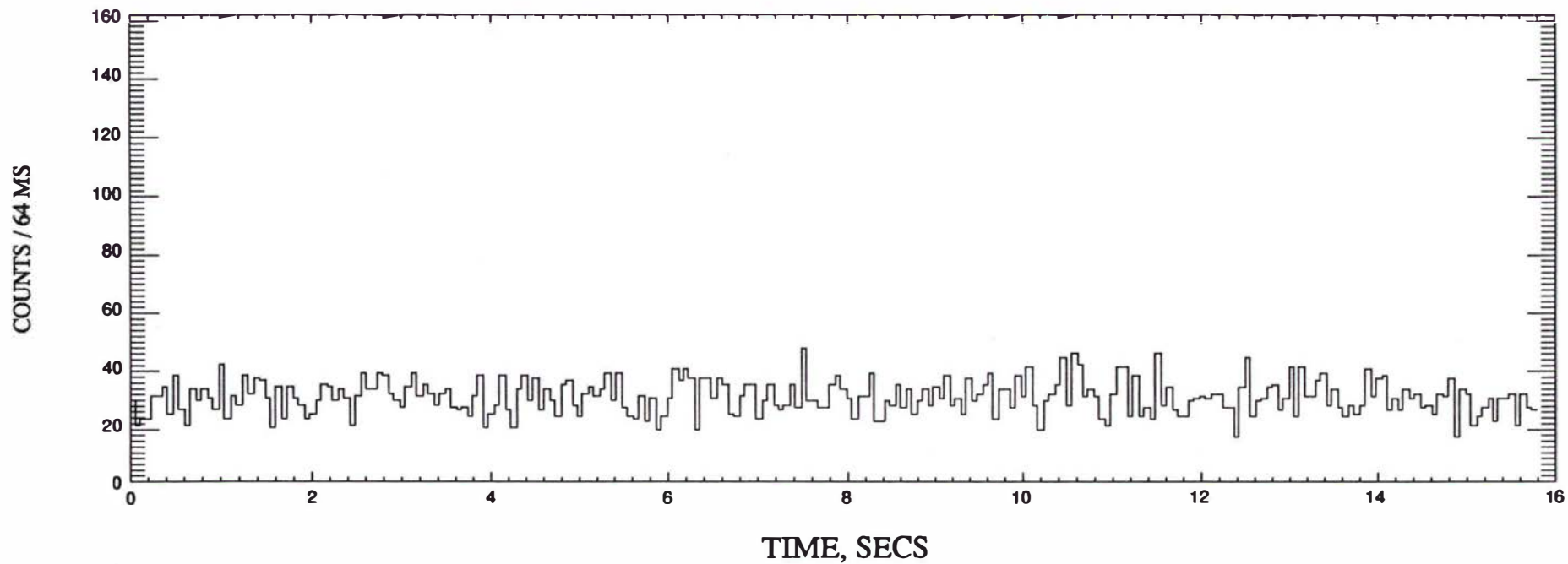
CALIBRATION DATA INCLUDED



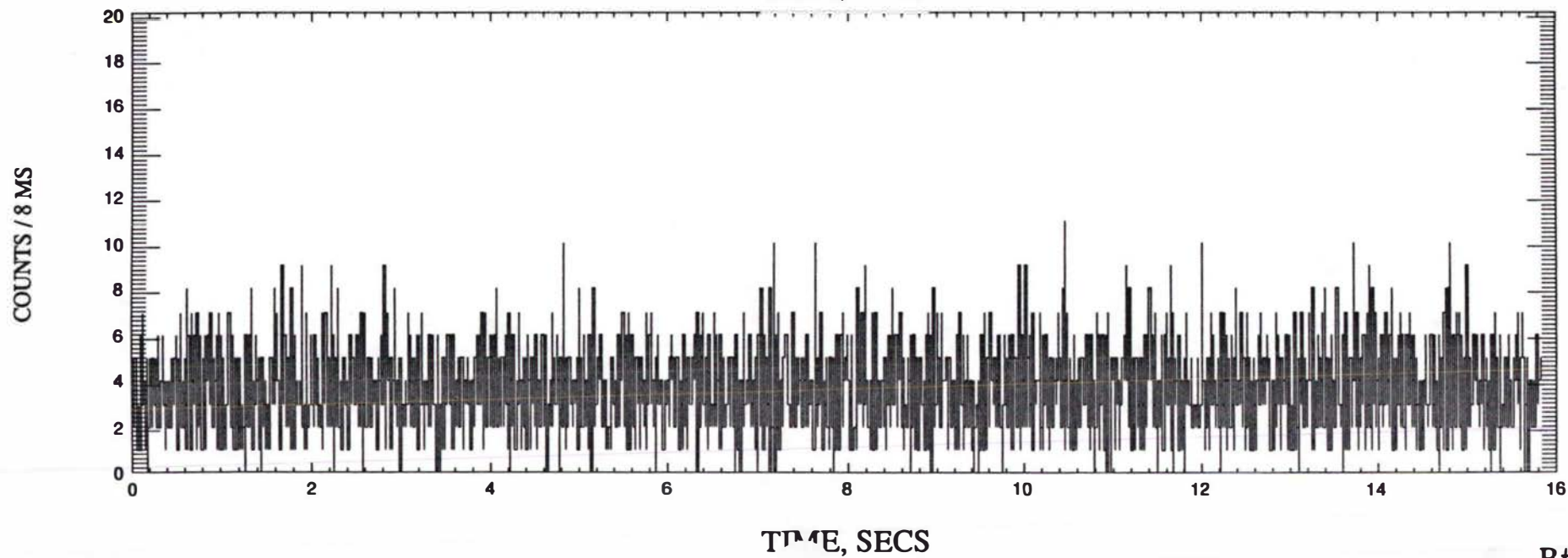
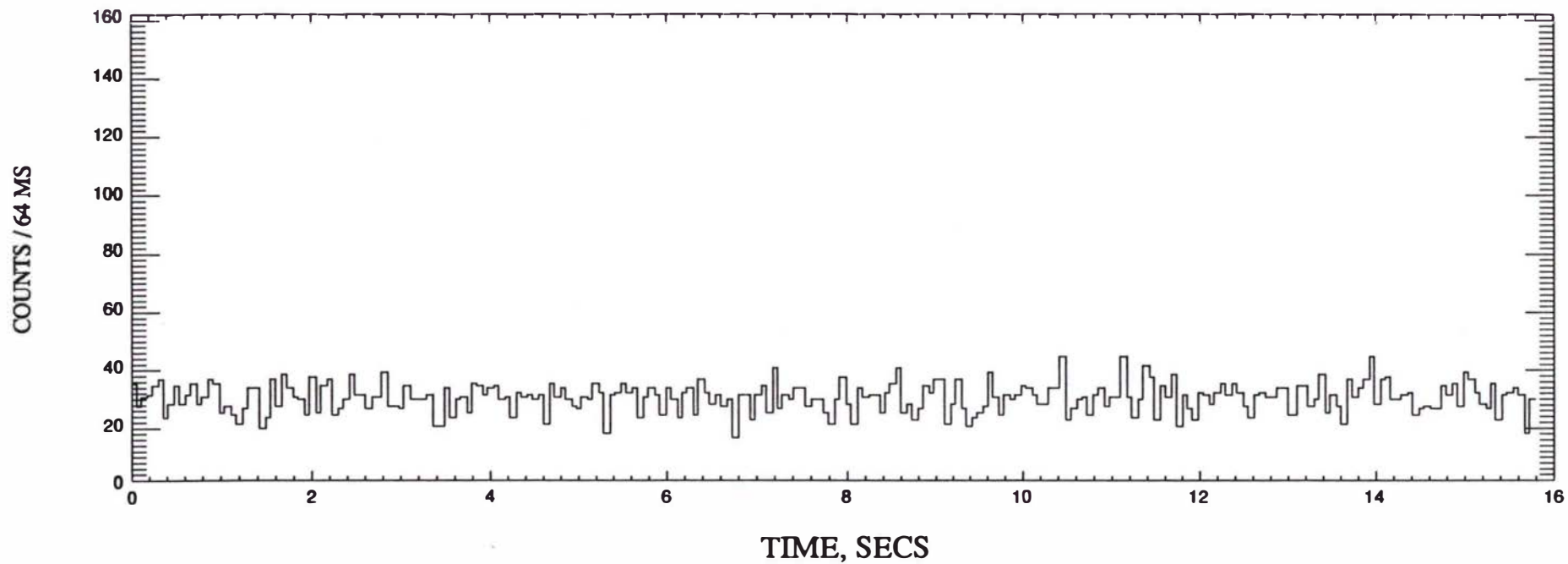
Burst Counter 5 at UT= 0.742694536845 h= 2673.700 s 00:44:33.700



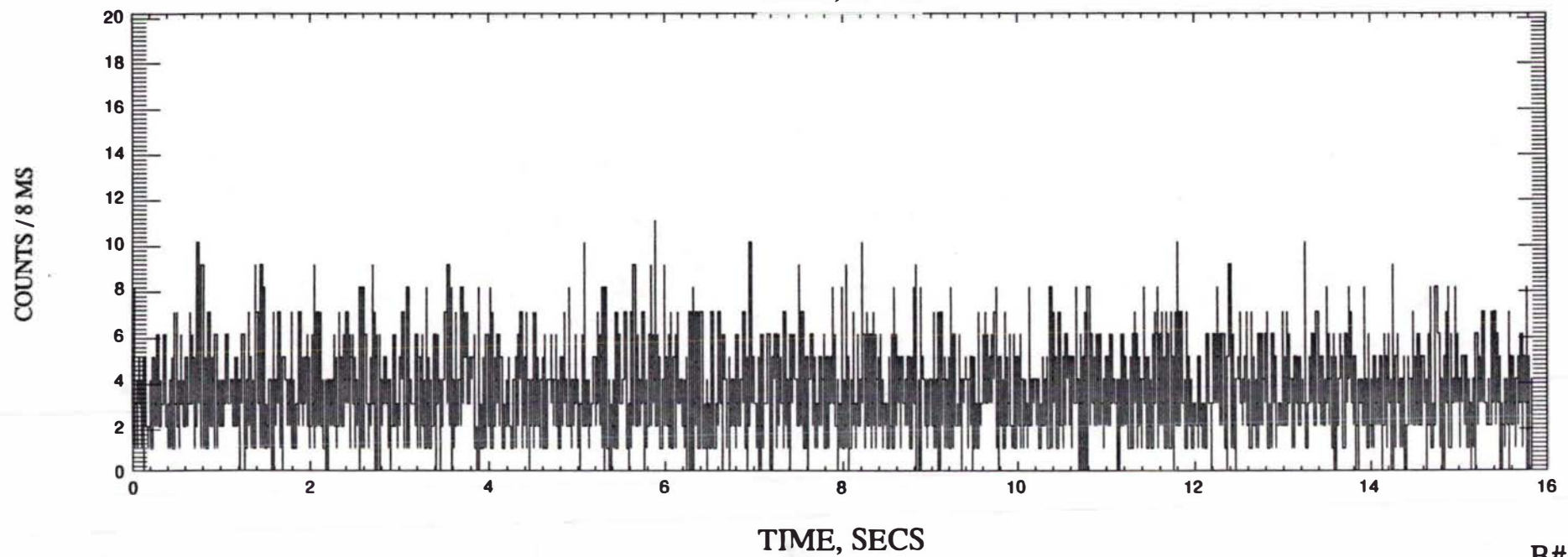
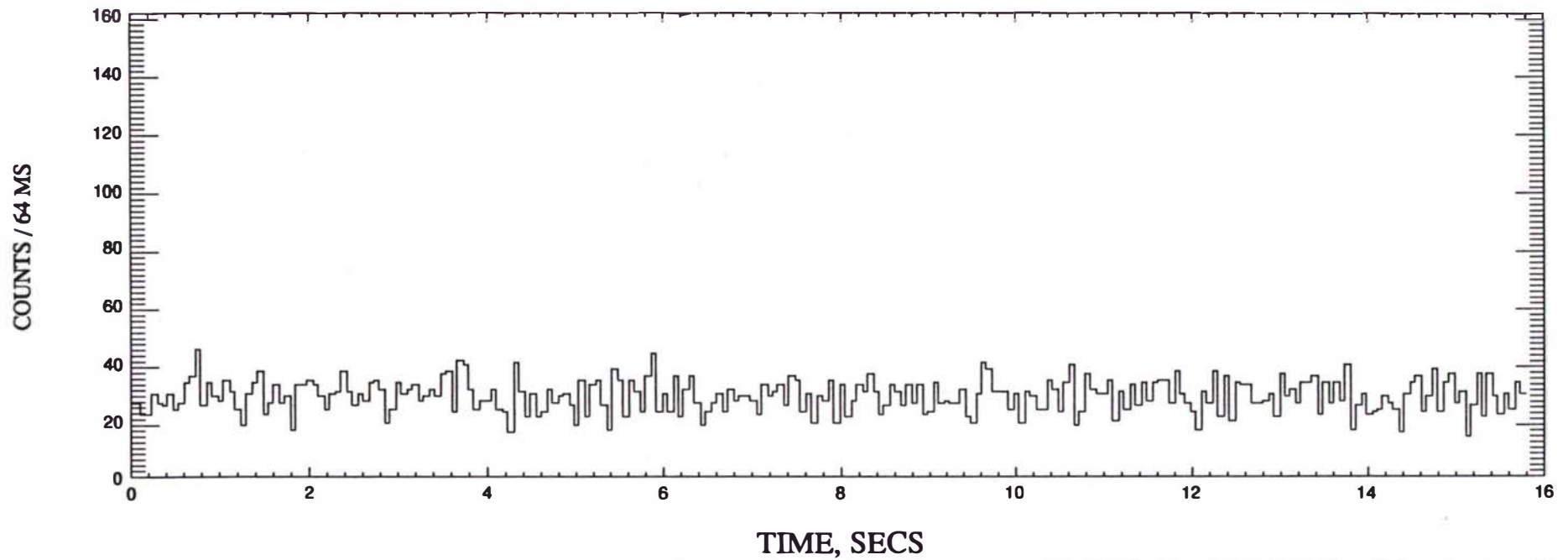
Burst Counter 6 at UT= 1.578263452318 h= 5681.748 s 01:34:41.748



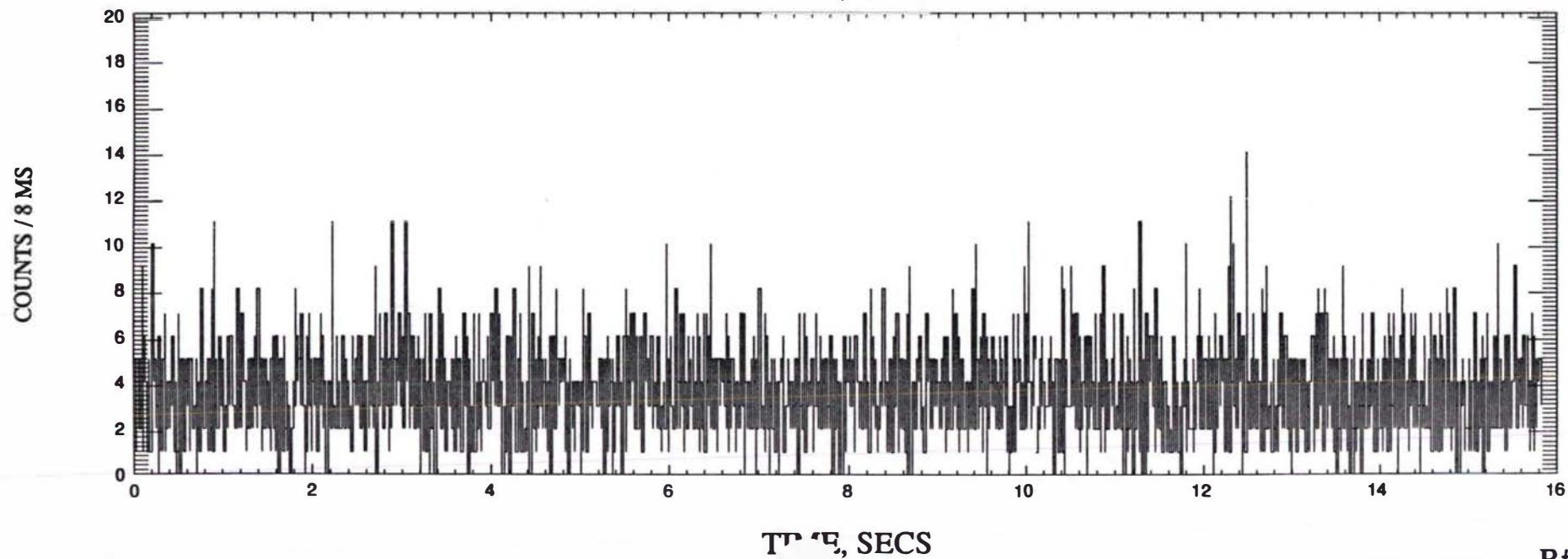
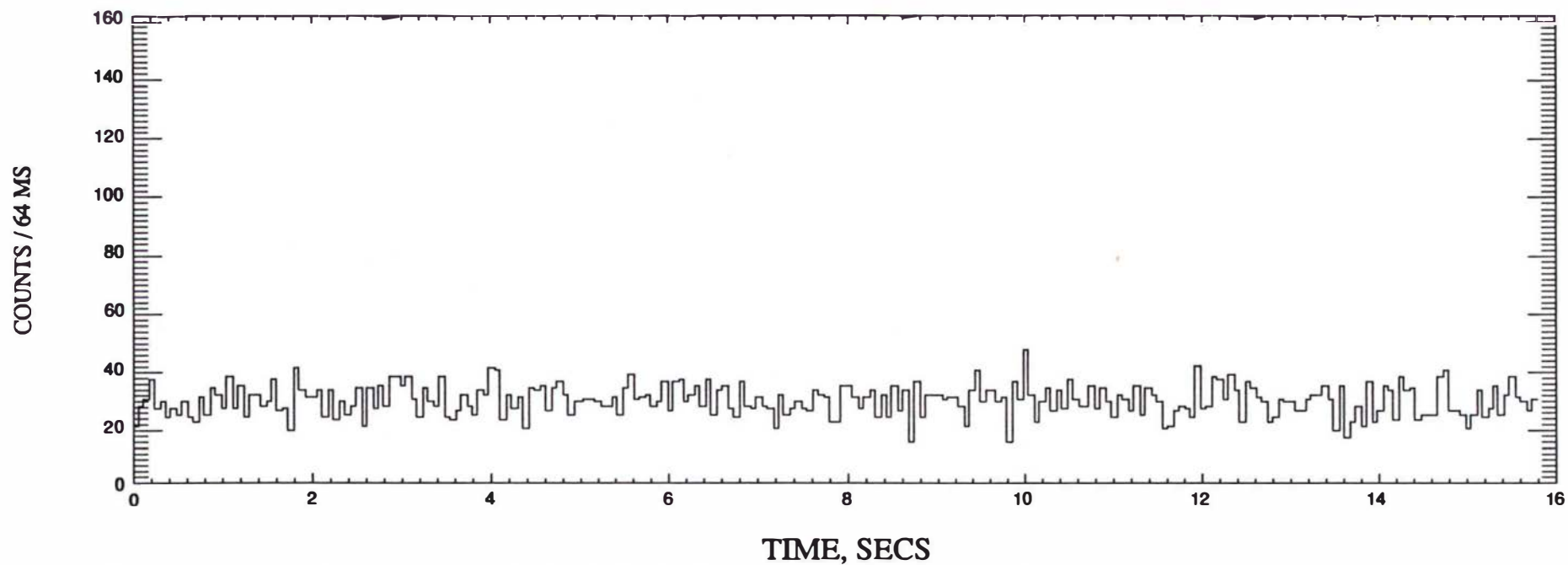
Burst Counter 7 at UT= 2.413832367791 h= 8689.797 s 02:24:49.797



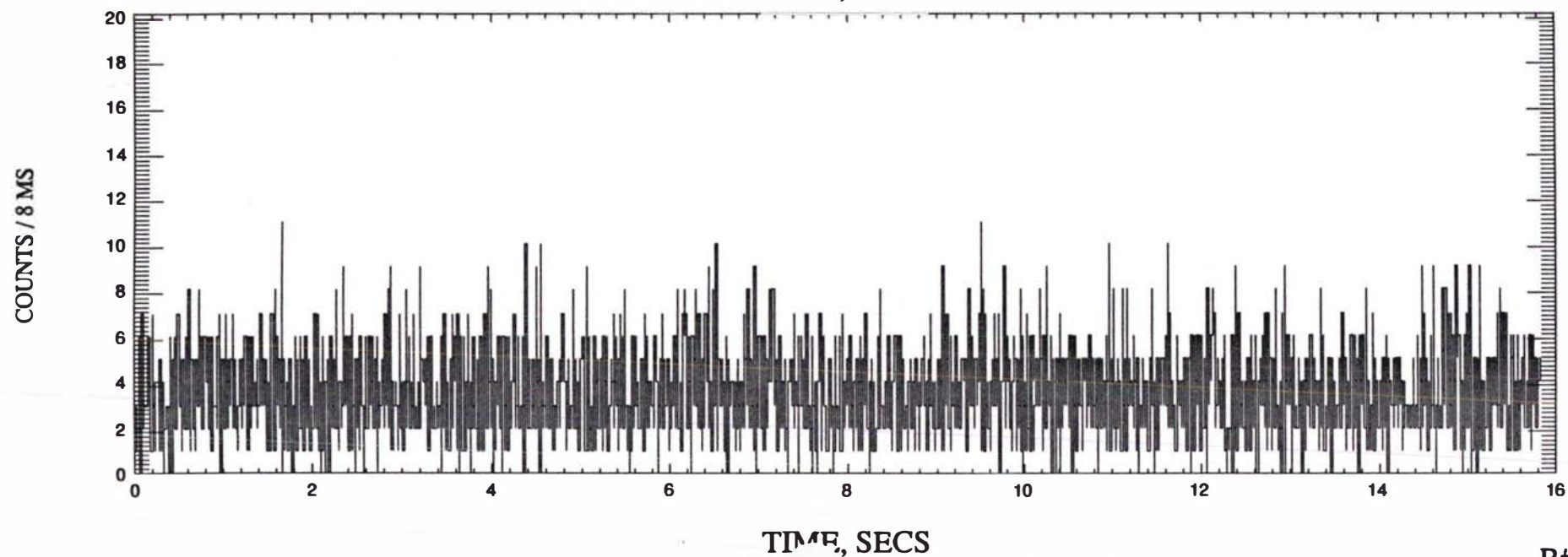
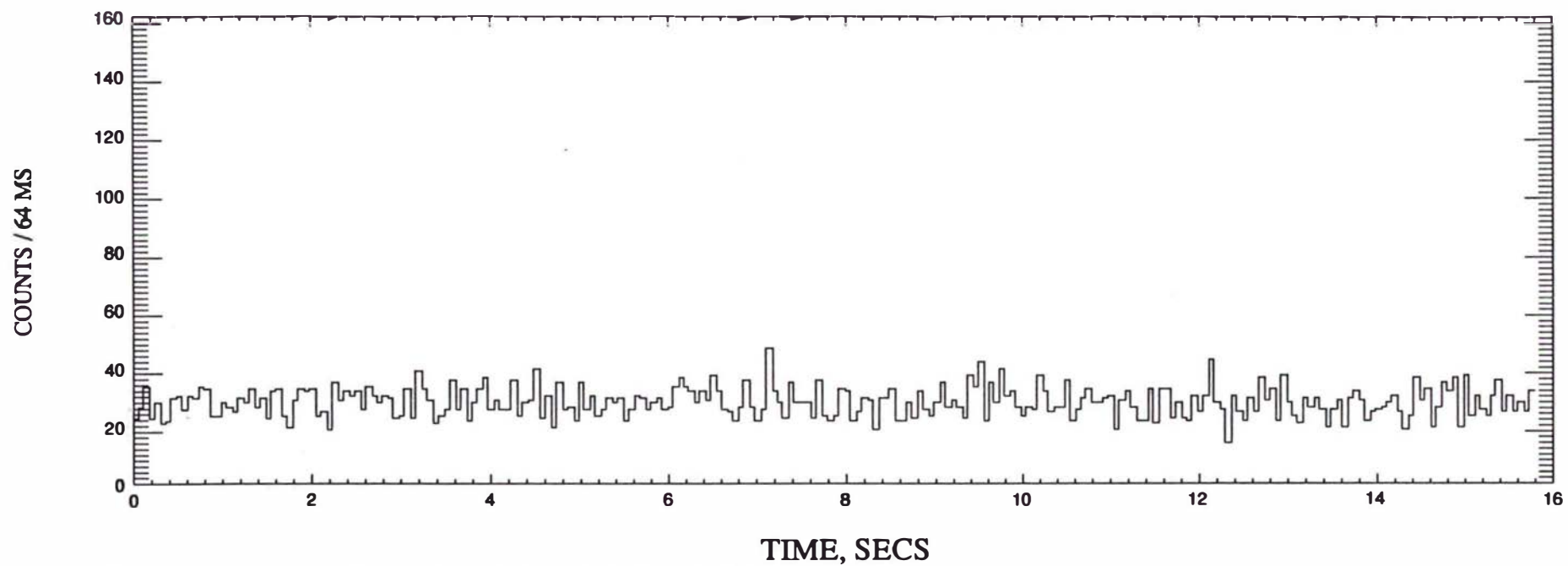
Burst Counter 8 at UT= 3.249401283264 h=11697.845 s 03:14:57.845



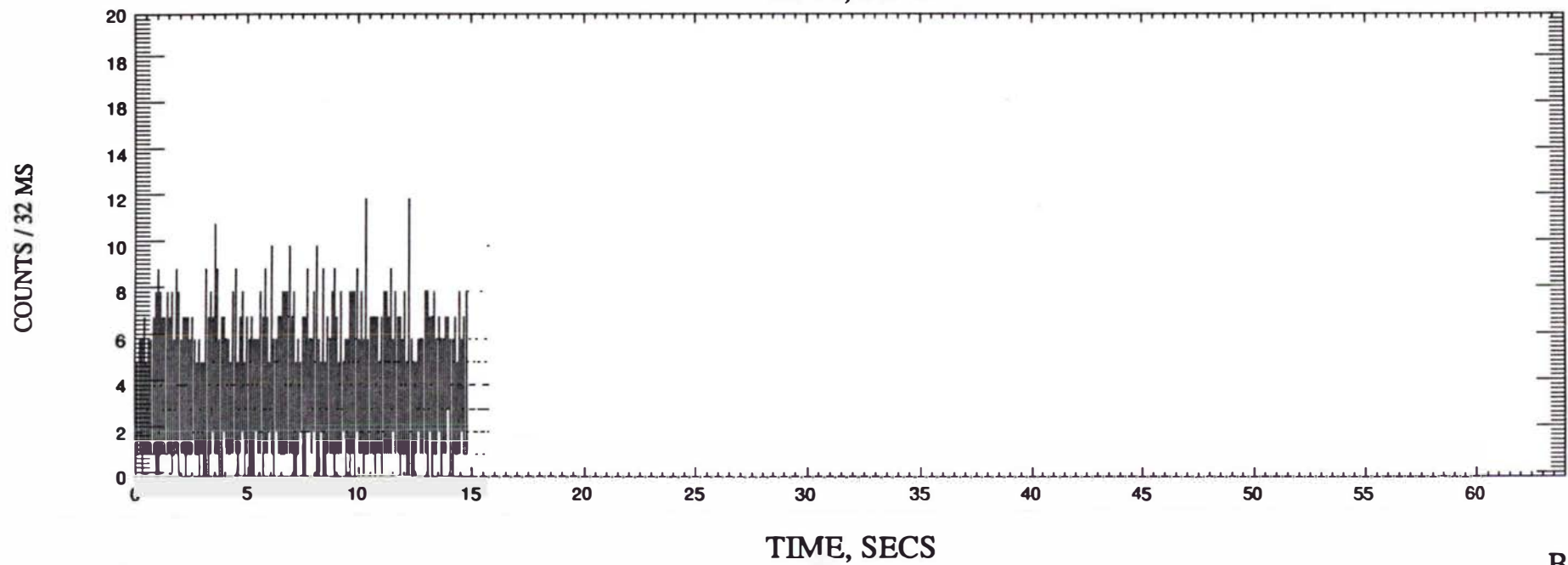
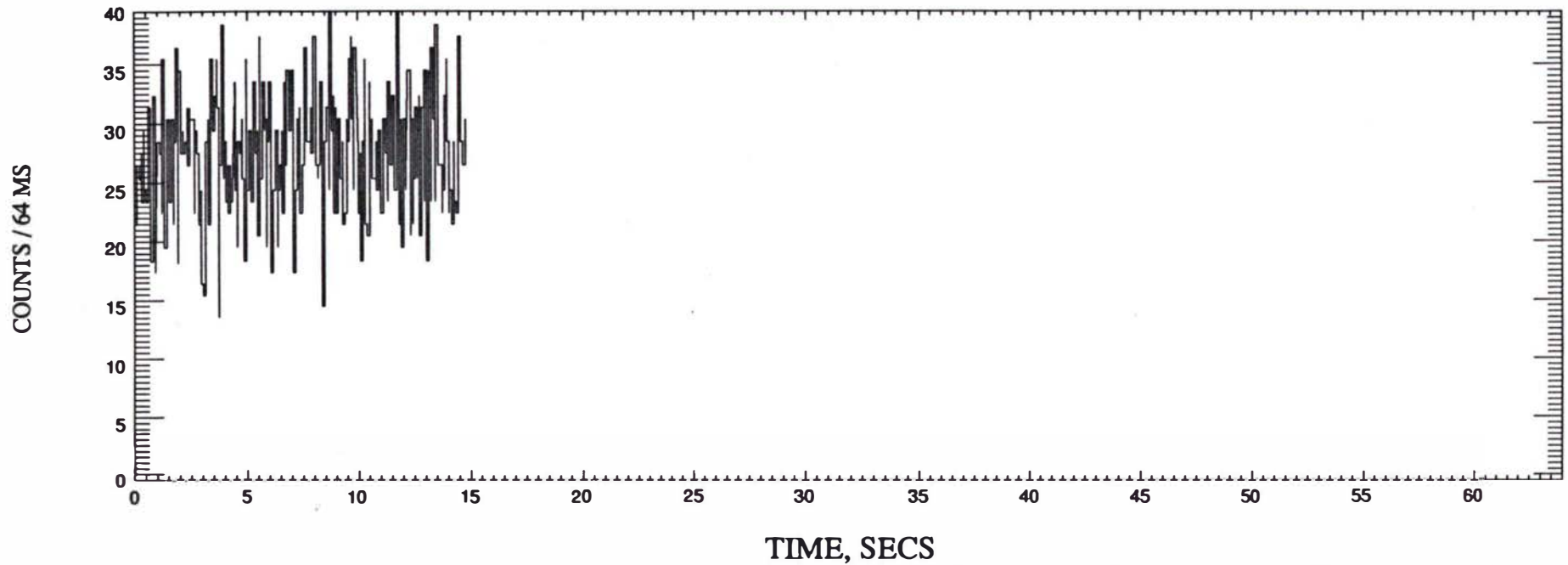
Burst Counter 9 at UT= 4.076080195109 h=14673.889 s 04:04:33.889

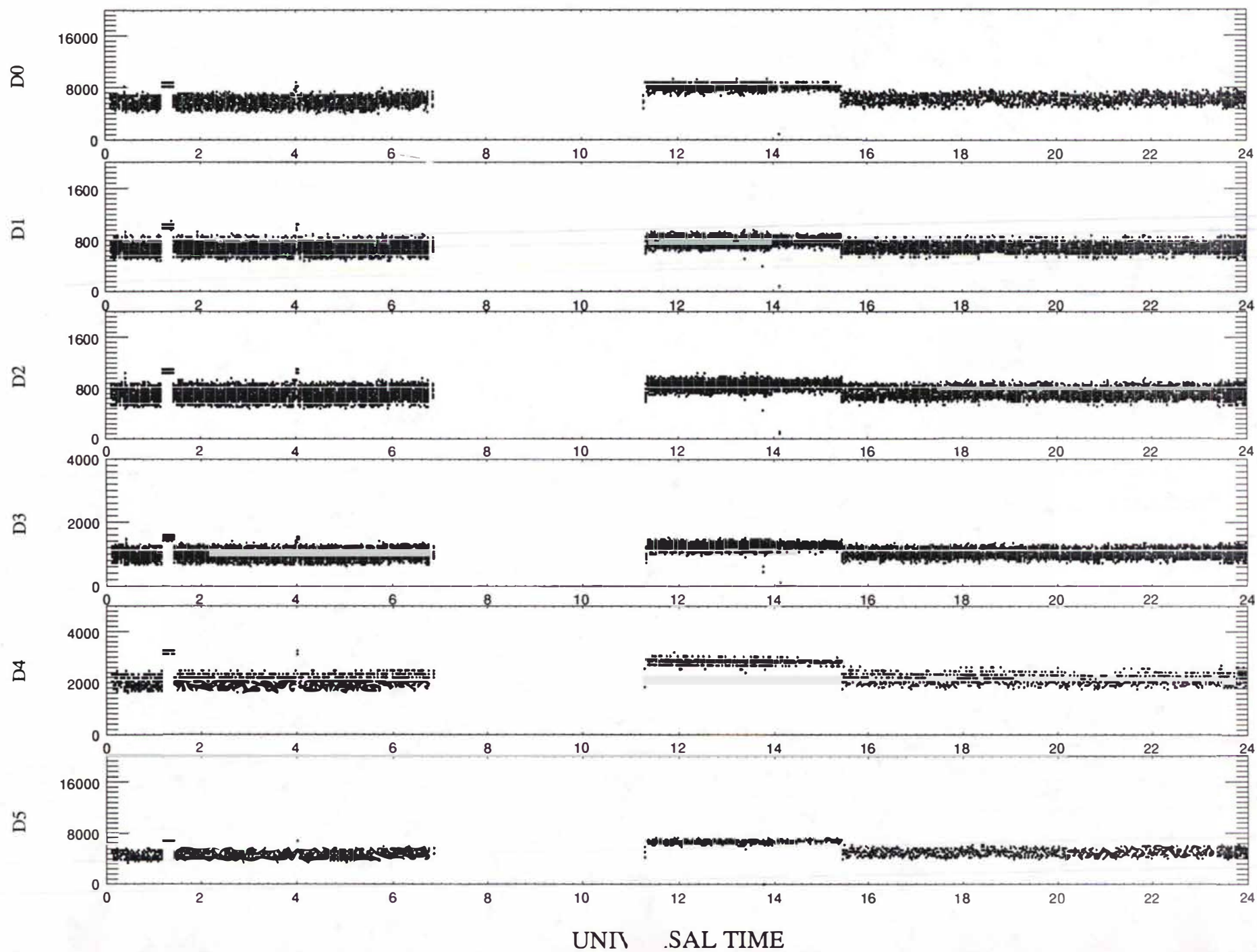


Burst Counter 10 at UT= 4.911649110582 h=17681.937 s 04:54:41.937



Burst Counter 11 at UT= 5.747218026055 h=20689.985 s 05:44:49.985





CATSEARCH PROGRAM

BATSE BURST # 2129
EVENT OF 1993 JAN 13 DAY OF YEAR= 13
EVENT CROSSING TIME AT BATSE : 542. S. OR 00:09:02.3
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 346.900 18.600
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 13/ 1/ 93 IS:
RA= 164.113 DEC= -13.210 DIST= 4.480 AU
BATSE-ULYSSES DISTANCE= 670282800. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 6.02 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2223.50 SECS.
CROSSING TIME AT ULYSSES IS 2766. S. OR 00:46:05.8 +/- 124.47 SECONDS

AJD

From MALLOZZI@ssl.msfc.nasa.gov Fri Jan 15 08:10:22 1993
Date: Fri, 15 Jan 1993 10:12:26 -0600 (CST)
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
2129	930113	9000	00542	3200	356	+12

ND

CATSEARCH PROGRAM

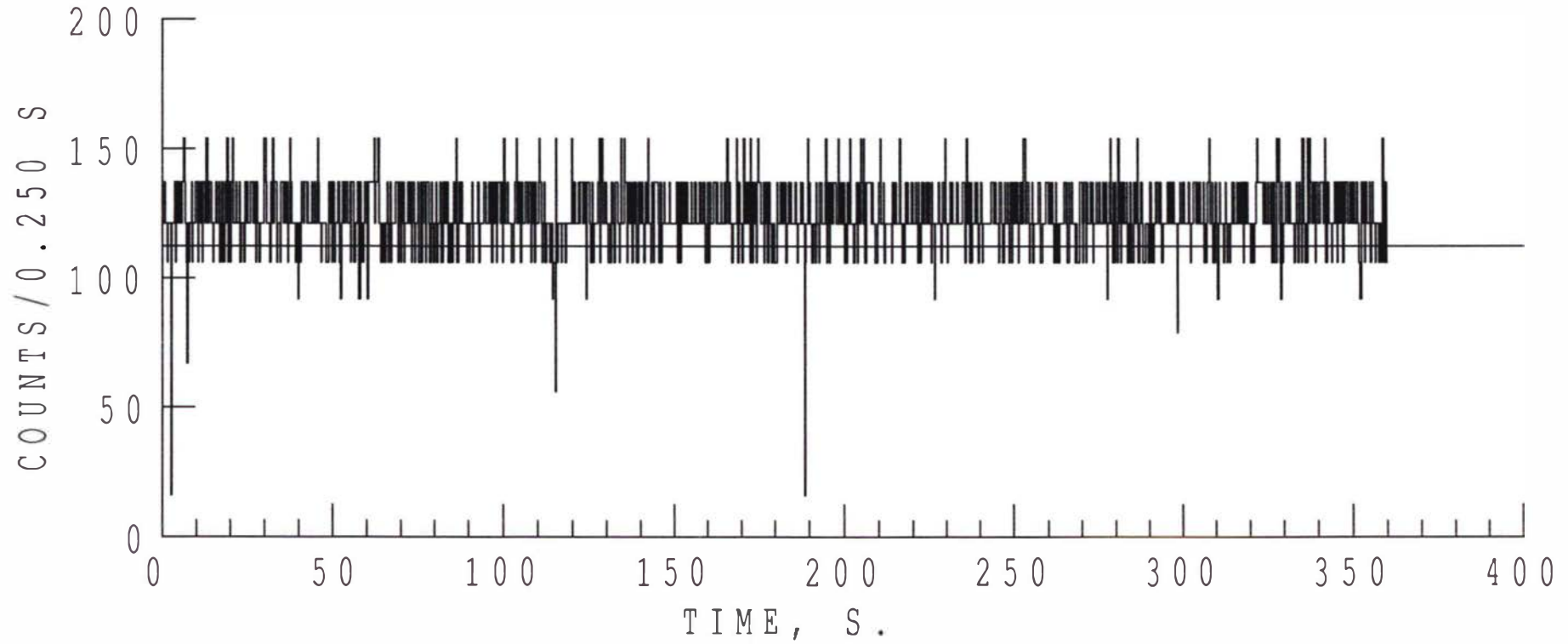
BATSE BURST # 2129
EVENT OF 1993 JAN 13 DAY OF YEAR= 13
EVENT CROSSING TIME AT BATSE : 542. S. OR 00:09:02.3
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 328.320 9.540
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 13/ 1/ 93 IS:
RA= 164.113 DEC= -13.210 DIST= 4.481 AU
BATSE-ULYSSES DISTANCE = 670285792. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 15.91 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2150.22 SECS.
CROSSING TIME AT ULYSSES IS 2693. S. OR 00:44:52.5 +/- 189.04 SECONDS

9 / 11 / 95

ULYSSES RT
13 / 1 / 93 2520.087 s
0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From MALLOZZI@ssl.msfc.nasa.gov Fri Jan 15 10:34:18 1993
Date: Fri, 15 Jan 1993 12:36:46 -0600 (CST)
From: MALLOZZI@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02130

Jan 13
TIME: TJD=9000 SECONDS=13446

TYPE: PARTICL SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:

APPEARS TO BE PARTICLE EVENT. OCCURS WHEN GRO IS AT HIGH LATITUDE,
AND IS EVIDENT IN ALL DETECTORS...

CATSEARCH PROGRAM

BATSE BURST # 2131
EVENT OF 1993 JAN 13 DAY OF YEAR= 13
EVENT CROSSING TIME AT BATSE : 21945. S. OR 06:05:45.5
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 330.800 -27.200
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 13/ 1/ 93 IS:
RA= 164.113 DEC= -13.210 DIST= 4.480 AU
BATSE-ULYSSES DISTANCE = 670282800. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 42.43 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1650.39 SECS.
CROSSING TIME AT ULYSSES IS 23596. S. OR 06:33:15.8 +/- 336.94 SECONDS

100

From MALLOZZI@ssl.msfc.nasa.gov Fri Jan 15 10:24:22 1993
Date: Fri, 15 Jan 1993 12:27:48 -0600 (CST)
From: MALLOZZI@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02131

TIME: TJD=9000 SECONDS=21945

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=103.3 AZIMUTH=315.9 ERROR= DEGREES

COMMENTS:

SINGLE PEAK BURST OF DURATION ~3 SEC.
NO EMISSION OBSERVED ABOVE 300 KEV.

From MALLOZZI@ssl.msfc.nasa.gov Fri Jan 15 10:24:20 1993
Date: Fri, 15 Jan 1993 12:29:34 -0600 (CST)
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
2131	930113	9000	21945	1800	331	-27

CATSEARCH PROGRAM

BATSE BURST # 2131
EVENT OF 1993 JAN 13 DAY OF YEAR= 13
EVENT CROSSING TIME AT BATSE : 21945. S. OR 06:05:45.4
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 341.750 -40.620
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 13/ 1/ 93 IS:
RA= 164.113 DEC= -13.210 DIST= 4.481 AU
BATSE-ULYSSES DISTANCE = 670285792. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 53.87 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1318.15 SECS.
CROSSING TIME AT ULYSSES IS 23264. S. OR 06:27:43.6 +/- 383.56 SECONDS

9 / 11 / 95

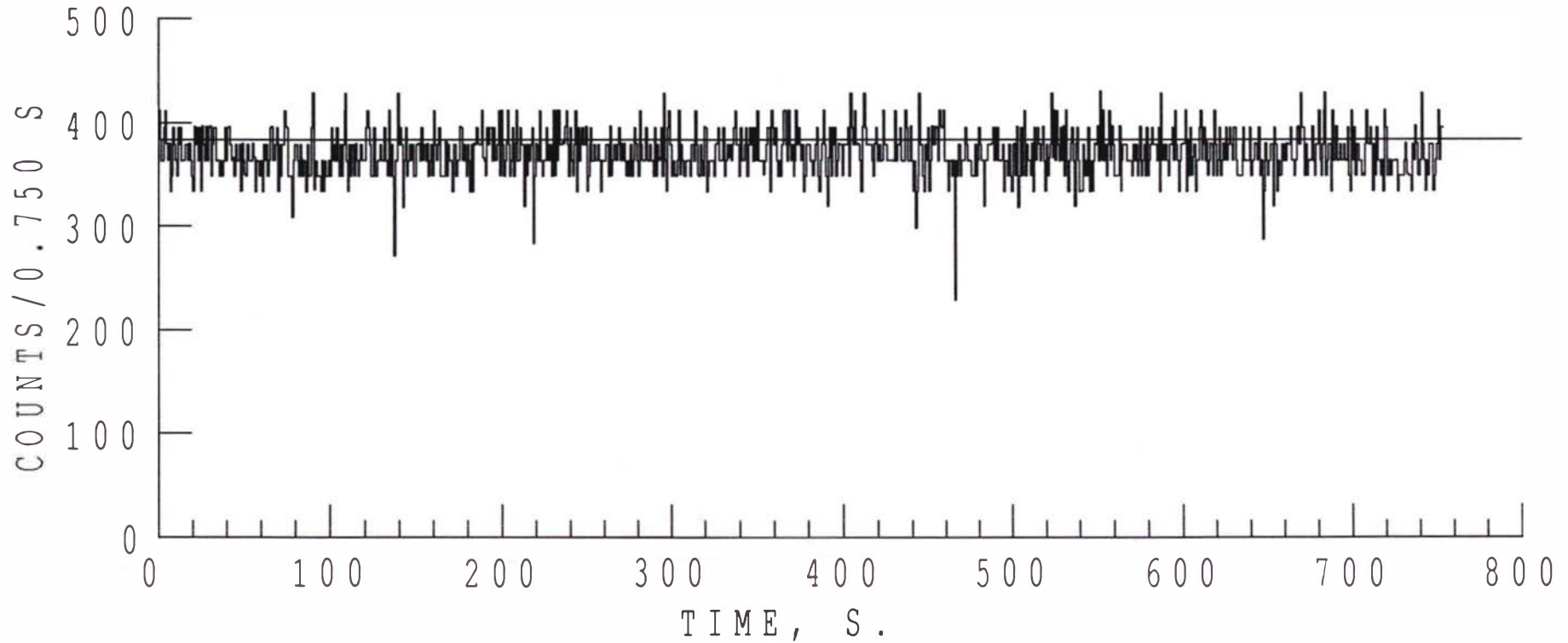
ULYSSES RT

13 / 1 / 93 22896.152 s

0.250 S INTERVALS REGROUPED BY 3

0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



CATSEARCH PROGRAM

BATSE BURST # 2132
EVENT OF 1993 JAN 13 DAY OF YEAR= 13
EVENT CROSSING TIME AT BATSE : 55859. S. OR 15:30:58.9
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 54.200 83.600
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 13/ 1/ 93 IS:
RA= 164.113 DEC= -13.210 DIST= 4.480 AU
BATSE-ULYSSES DISTANCE = 670282800. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 74.69 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 590.39 SECS.
CROSSING TIME AT ULYSSES IS 56449. S. OR 15:40:49.3 +/- 433.36 SECONDS

NO

From MALLOZZI@ssl.msfc.nasa.gov Fri Jan 15 08:30:55 1993
Date: Fri, 15 Jan 1993 10:36:11 -0600 (CST)
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
2132	930113	9000	55858	7200	038	+80

NO

9 / 6 / 94

ULYSSES RT

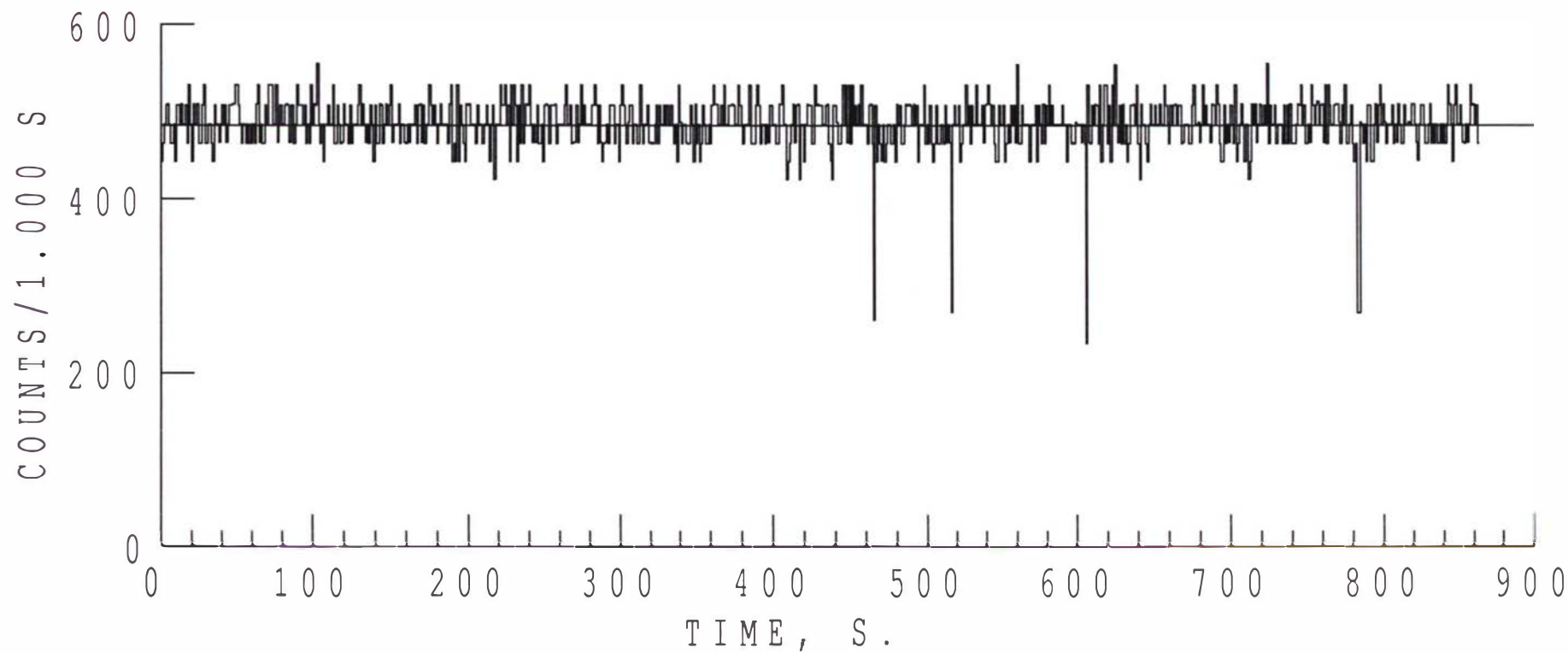
13 / 1 / 93 56016.176 s

0.500 S INTERVALS REGROUPED BY 2

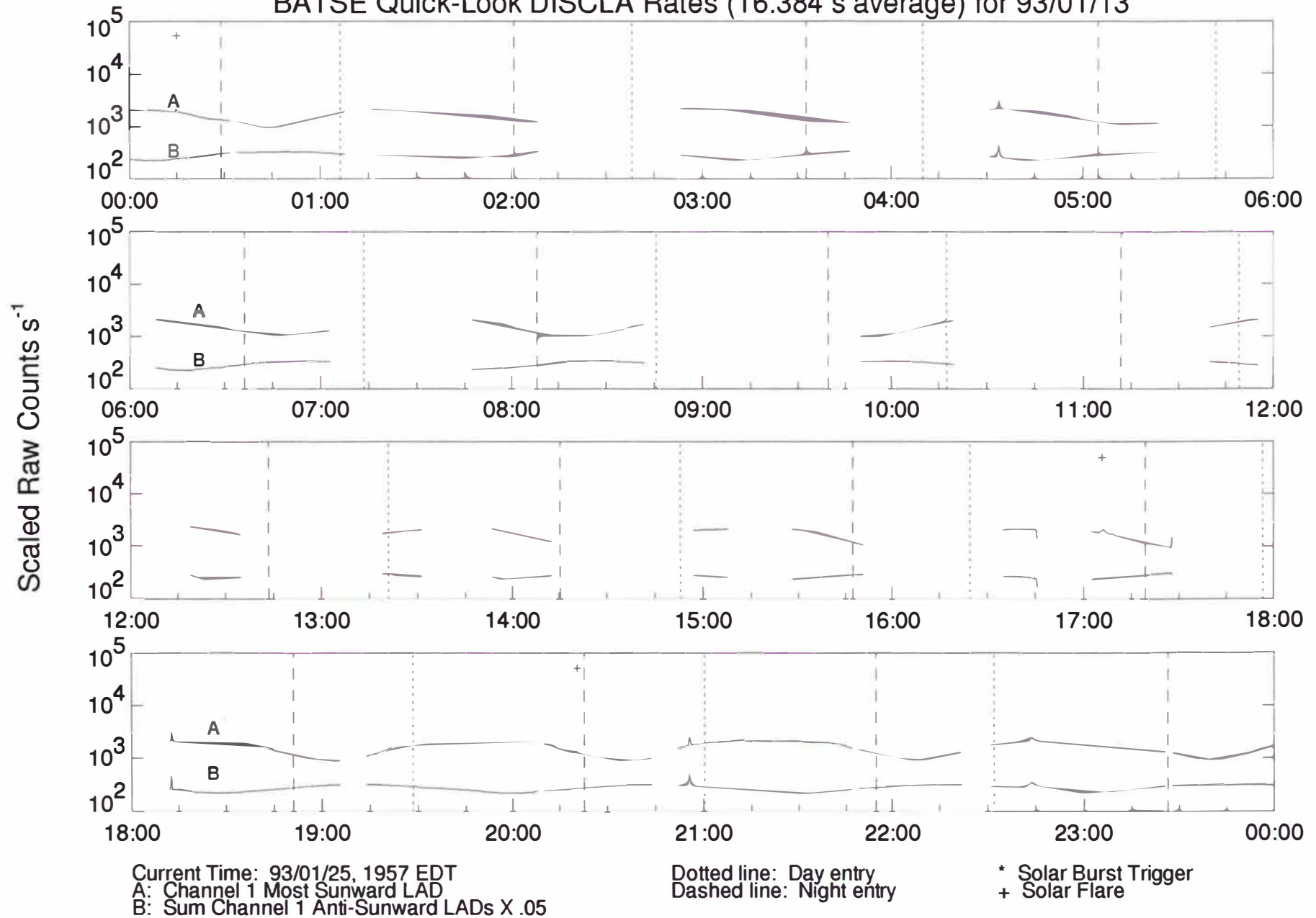
0 - 0 keV

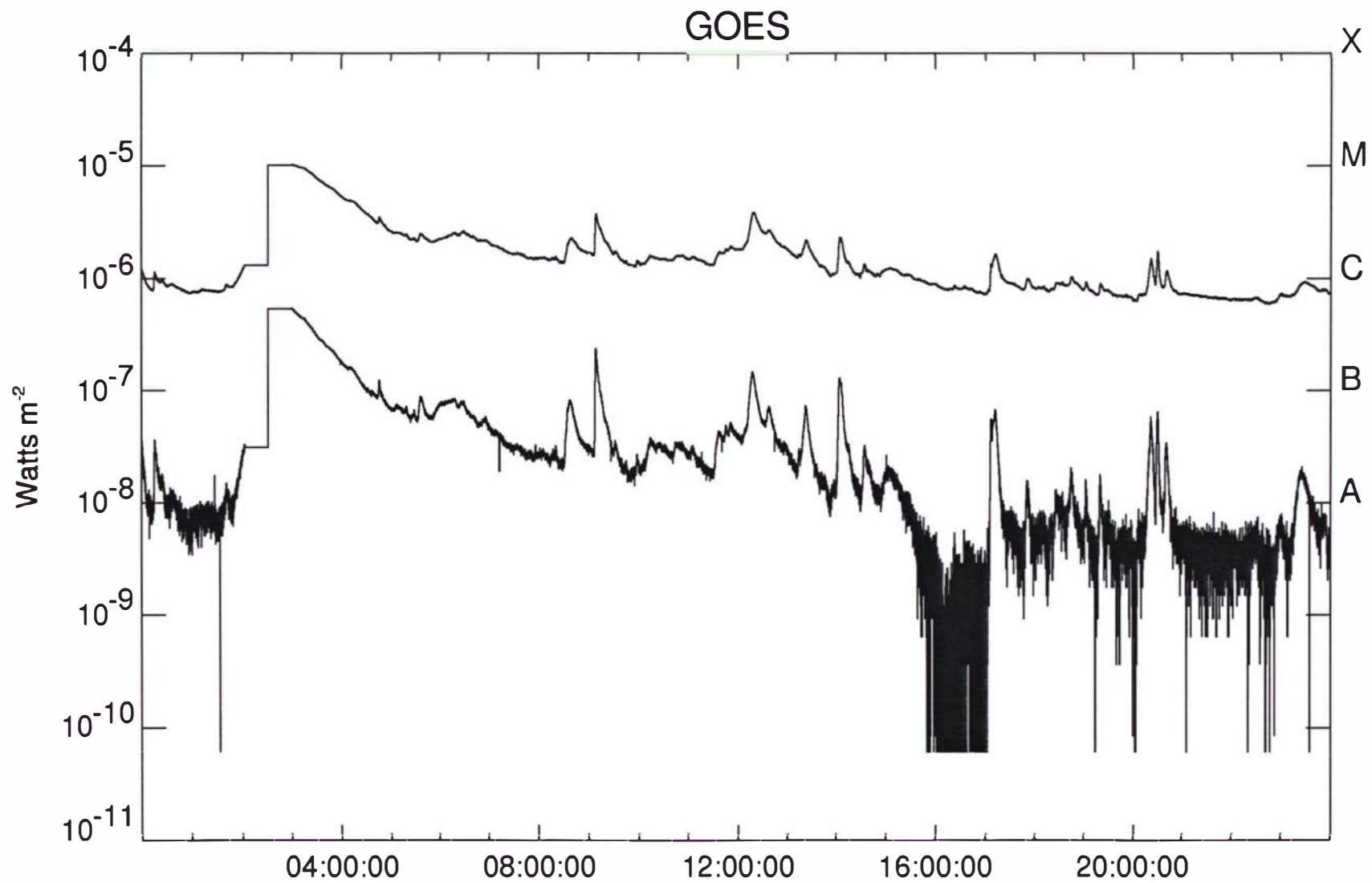
N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/13



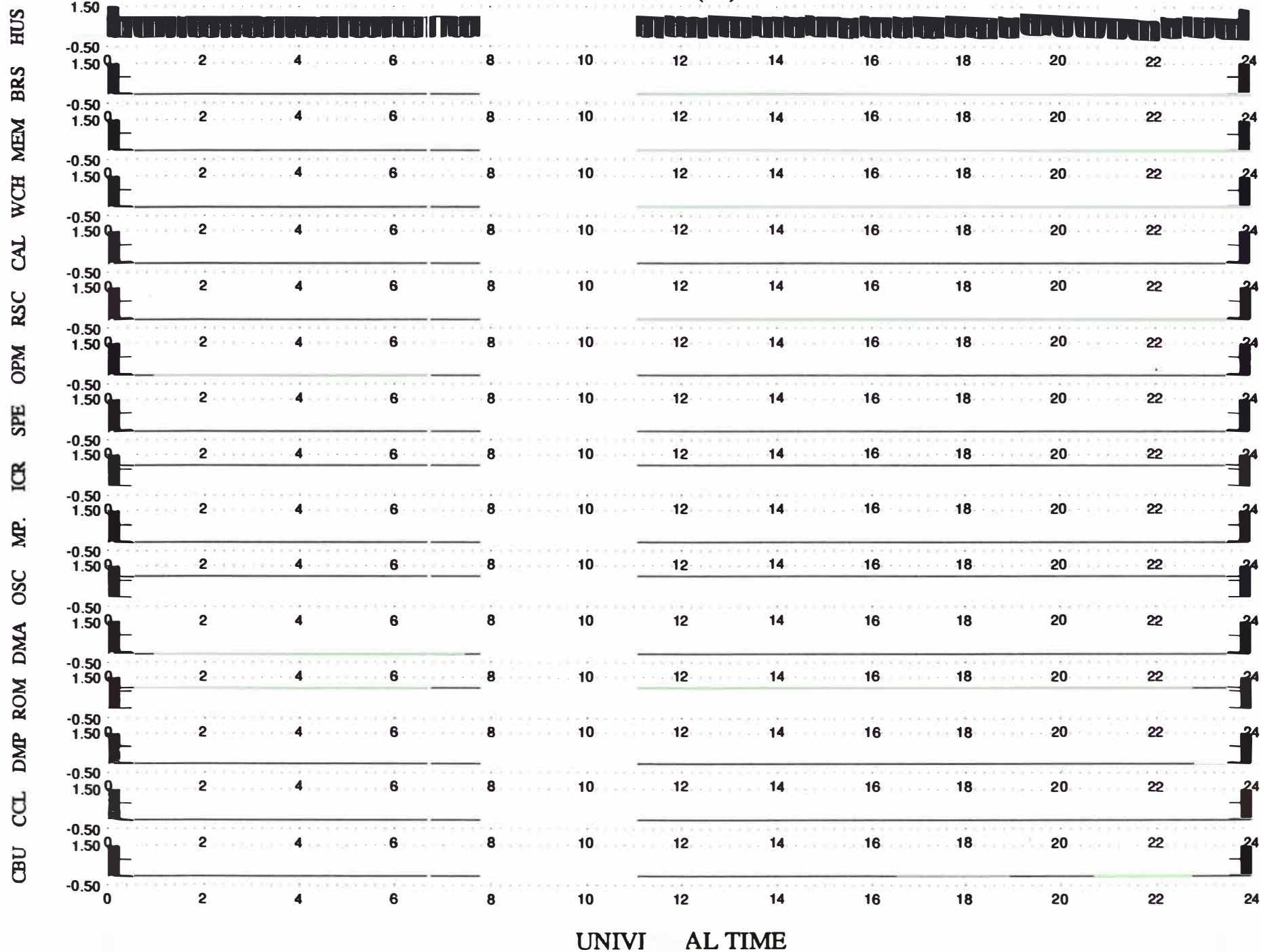


Data Start: 93/01/13, 0000:02

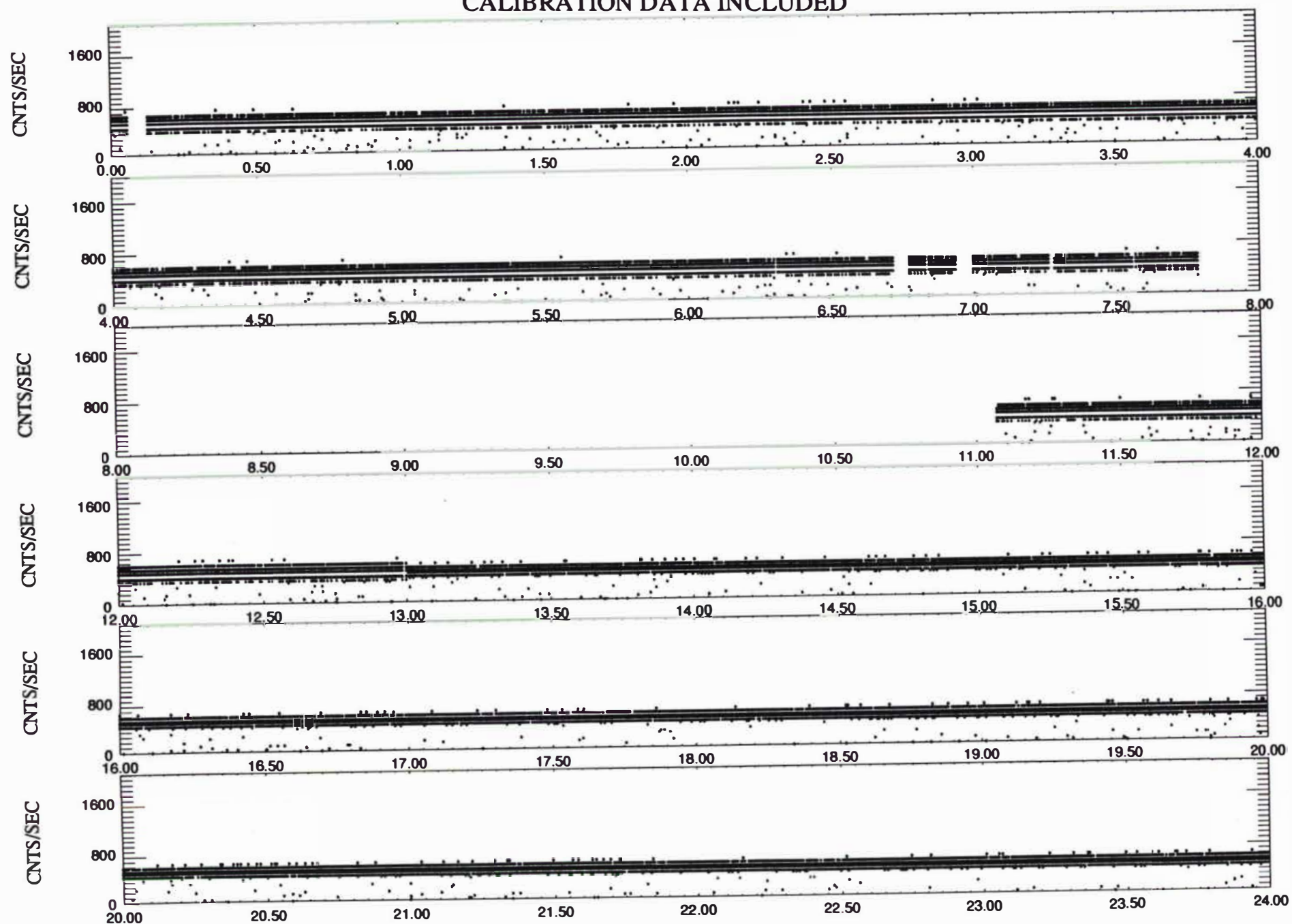
Plot created: 95/05/31, 2205

Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted

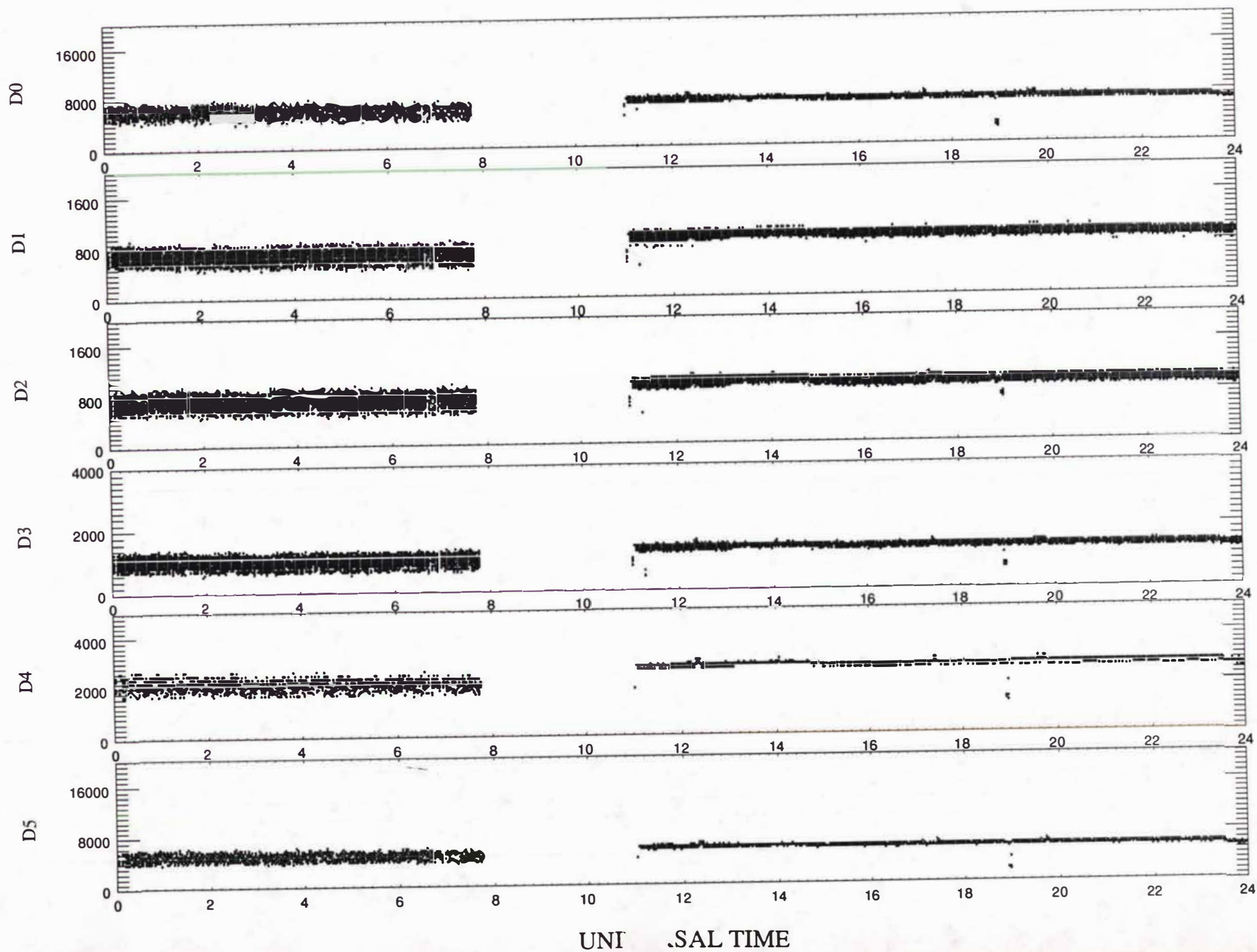
NO BURST (11)



CALIBRATION DATA INCLUDED



UNIV AL TIME



CATSEARCH PROGRAM

BATSE BURST # 2133
EVENT OF 1993 JAN 14 DAY OF YEAR= 14
EVENT CROSSING TIME AT BATSE : 2691. S. OR 00:44:50.7
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 285.900 63.700
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 14/ 1/ 93 IS:
RA= 163.969 DEC= -13.283 DIST= 4.465 AU
BATSE-ULYSSES DISTANCE = 667904160. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 64.28 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 967.01 SECS.
CROSSING TIME AT ULYSSES IS 3658. S. OR 01:00:57.7 +/- 413.15 SECONDS

From KOSHUT@ssl.msfc.nasa.gov Fri Jan 15 10:02:40 1993
Date: Fri, 15 Jan 1993 12:06:27 -0600 (CST)
From: KOSHUT@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.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.: 02133

TIME: TJD=9001 SECONDS=02690

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=112. AZIMUTH=56. ERROR= DEGREES

COMMENTS:

BURST OF ~5 SECONDS DURATION, NO EMISSION OBSERVED ABOVE 300 KEV.

From KOSHUT@ssl.msfc.nasa.gov Fri Jan 15 10:07:32 1993
Date: Fri, 15 Jan 1993 12:12:47 -0600 (CST)
From: KOSHUT@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
2133	930114	9001	02690	2550	286	+59

9 / 6 / 94

ULYSSES RT

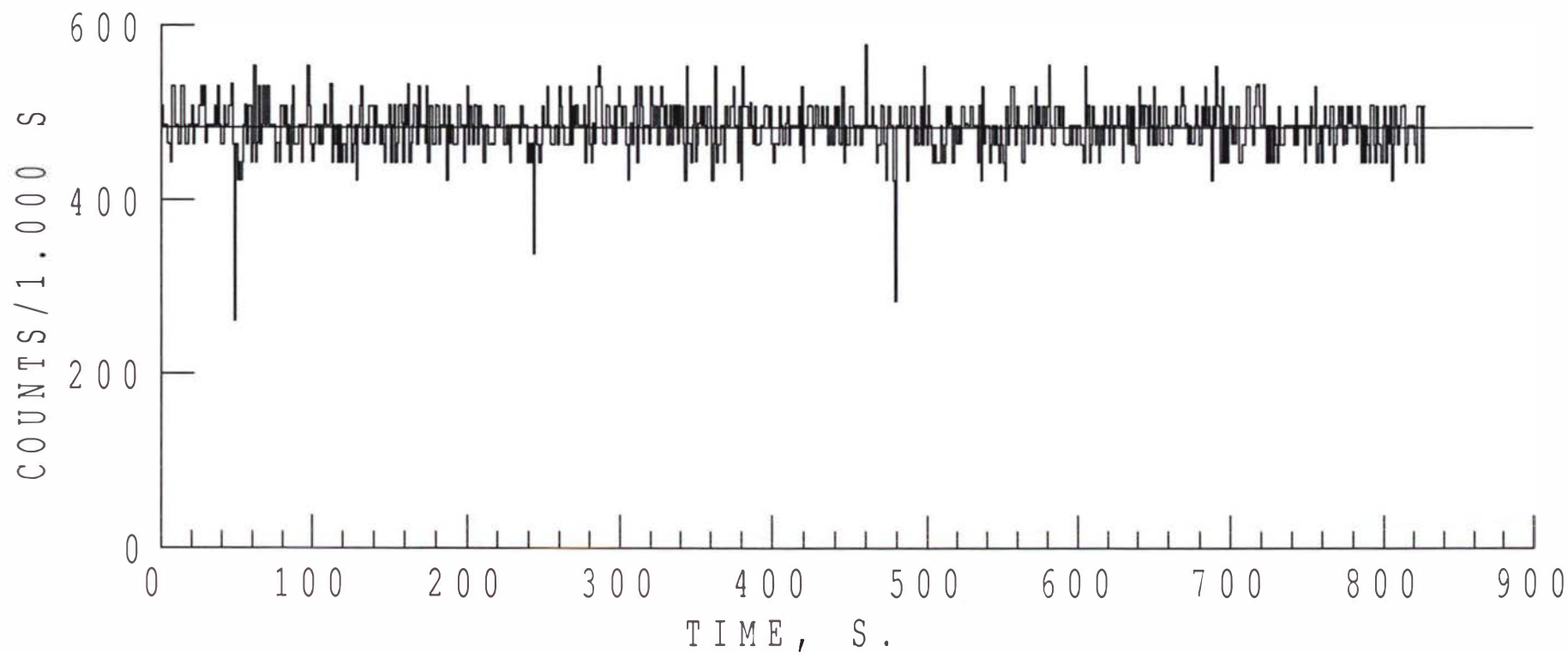
14 / 1 / 93 3240.195 s

0.500 S INTERVALS REGROUPED BY 2

0 - 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



CATSEARCH PROGRAM

BATSE BURST # 2134
EVENT OF 1993 JAN 14 DAY OF YEAR= 14
EVENT CROSSING TIME AT BATSE : 16015. S. OR 04:26:54.7
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 81.000 -23.200
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 14/ 1/ 93 IS:
RA= 163.969 DEC= -13.283 DIST= 4.465 AU
BATSE-ULYSSES DISTANCE = 667904160. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=101.54 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -445.60 SECS.
CROSSING TIME AT ULYSSES IS 15569. S. OR 04:19:29.1 +/- 422.21 SECONDS

No

From KOSHUT@ssl.msfc.nasa.gov Fri Jan 15 11:48:14 1993
Date: Fri, 15 Jan 1993 13:51:47 -0600 (CST)
From: KOSHUT@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unhrcc.unh.edu, jryan@unhrcc.unh.edu, GROBAD@ESTEC.BITNET,
khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: @mops\$send_msg:BURST_SPAN.DIS
Content-Length: 1458

BATSE BURST TRIGGER

NO.: 2134

TIME: TJD=9001 SECONDS=16014

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=100. AZIMUTH=213. ERROR= DEGREES

COMMENTS:

BURST OF ~ 12 SECONDS DURATION, WITH EMISSION OBSERVED ABOVE 300 KEV.
THE TIME HISTORY CONSISTS OF 2 PULSES SEPERATED BY 5 SECONDS. THE
FIRST PULSE (PEAK RATE ~ 1400 CPS) PEAKS AT THE TRIGGER TIME, AND
THE SECOND PULSE (PEAK RATE ~ 2200 CPS) PEAKS AT TRIGGER + 9 SECONDSA.

From KOSHUT@ssl.msfc.nasa.gov Fri Jan 15 11:51:03 1993
Date: Fri, 15 Jan 1993 13:56:21 -0600 (CST)
From: KOSHUT@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
2134	930114	9001	16014	2200	086	-23

9 / 6 / 94

ULYSSES RT

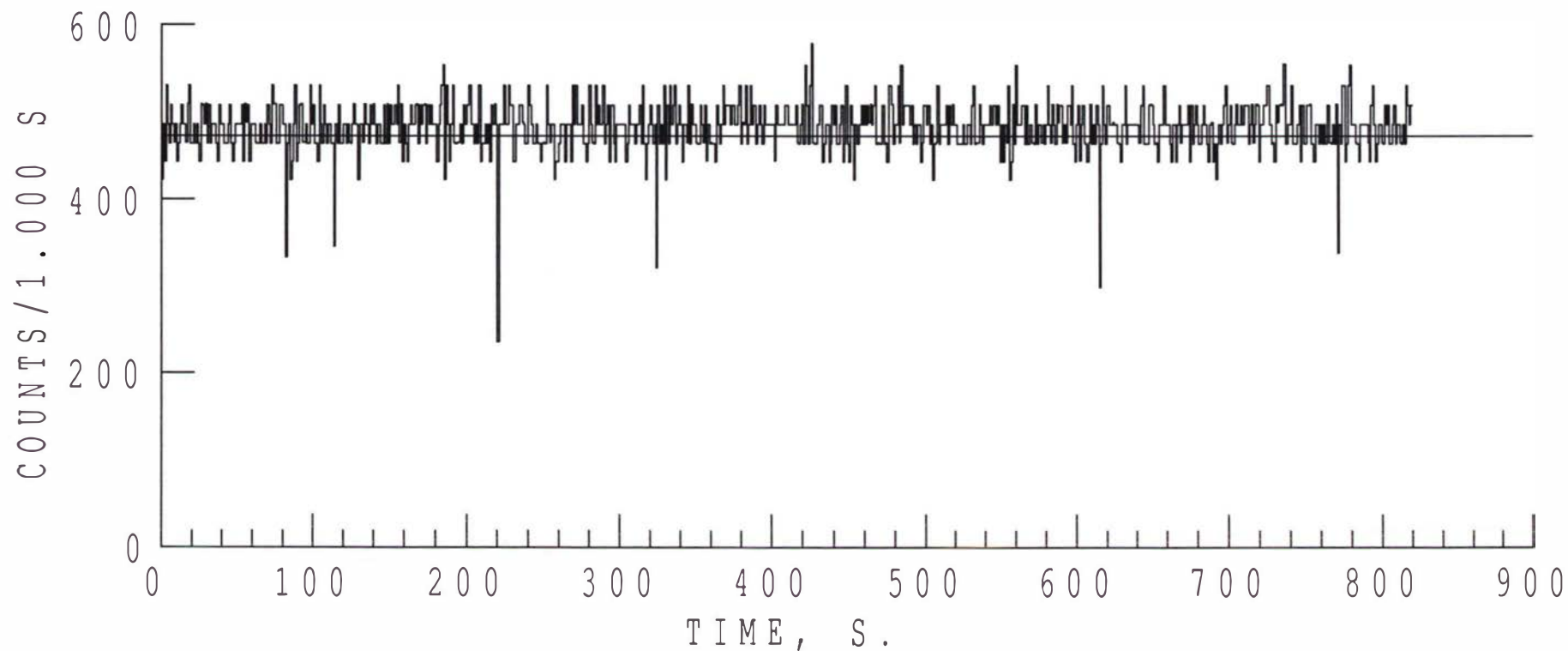
14 / 1 / 93 15156.388 s

0.500 S INTERVALS REGROUPED BY 2

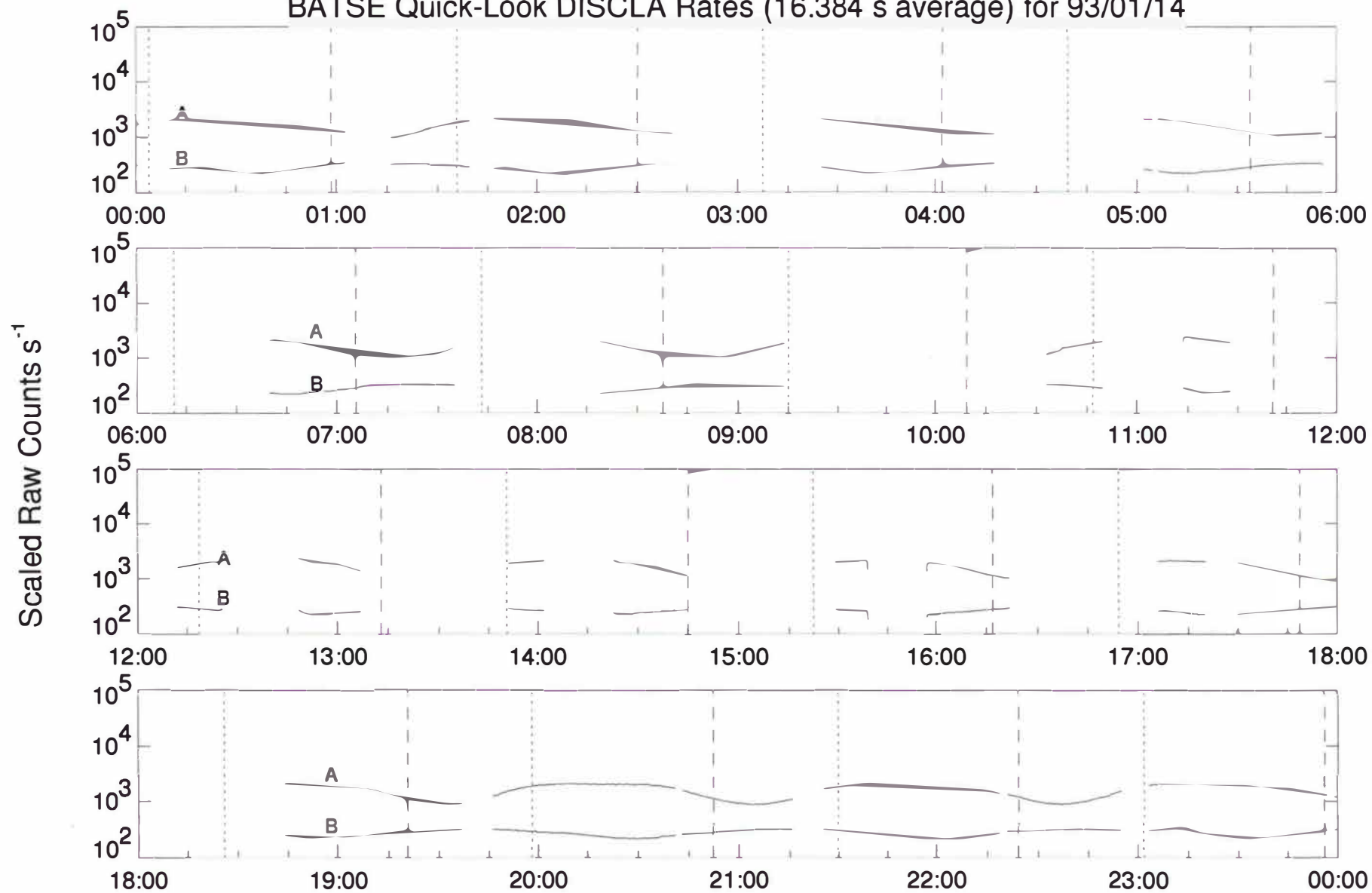
0 - 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



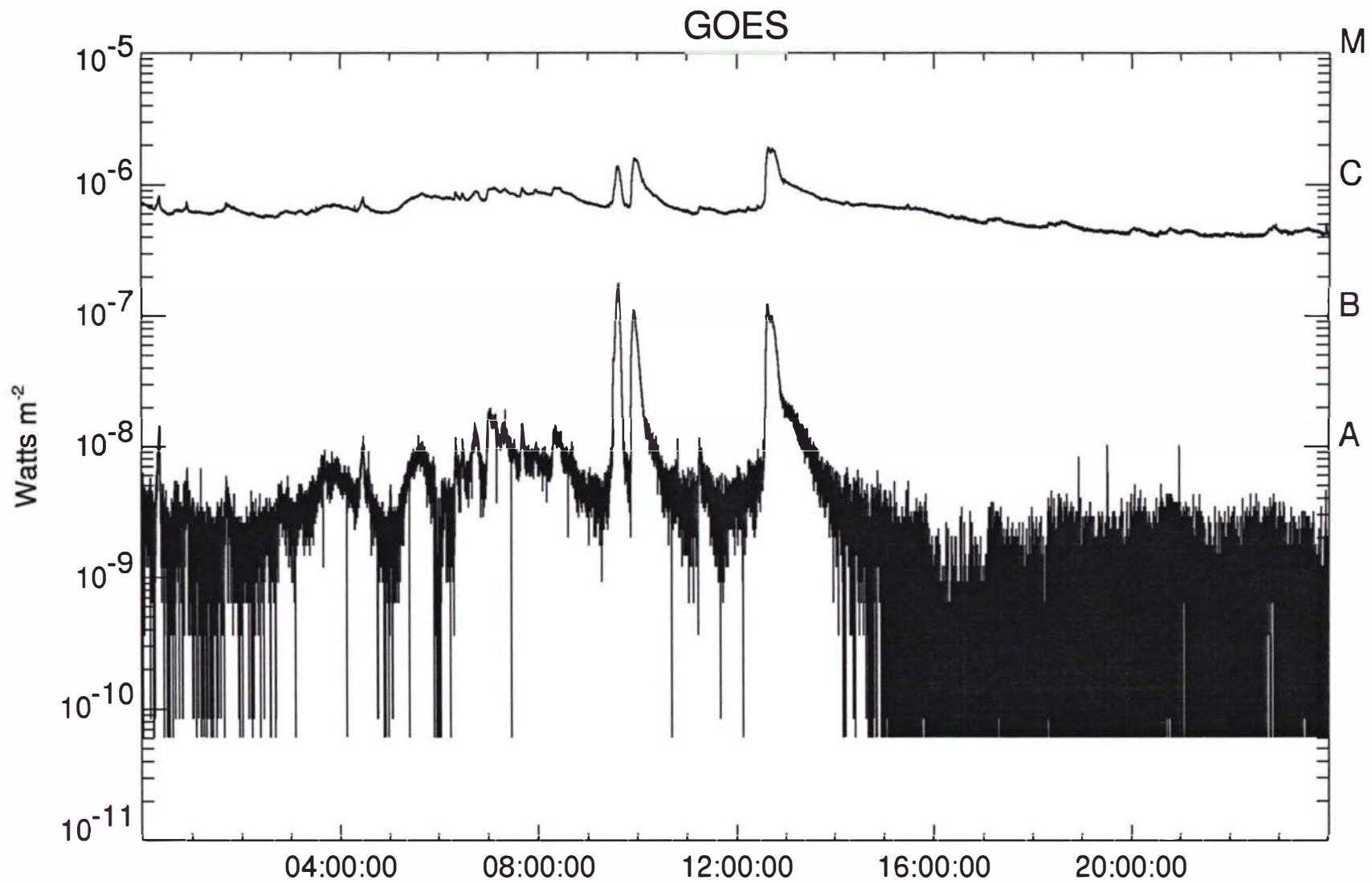
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/14



Current Time: 93/01/25, 1958 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



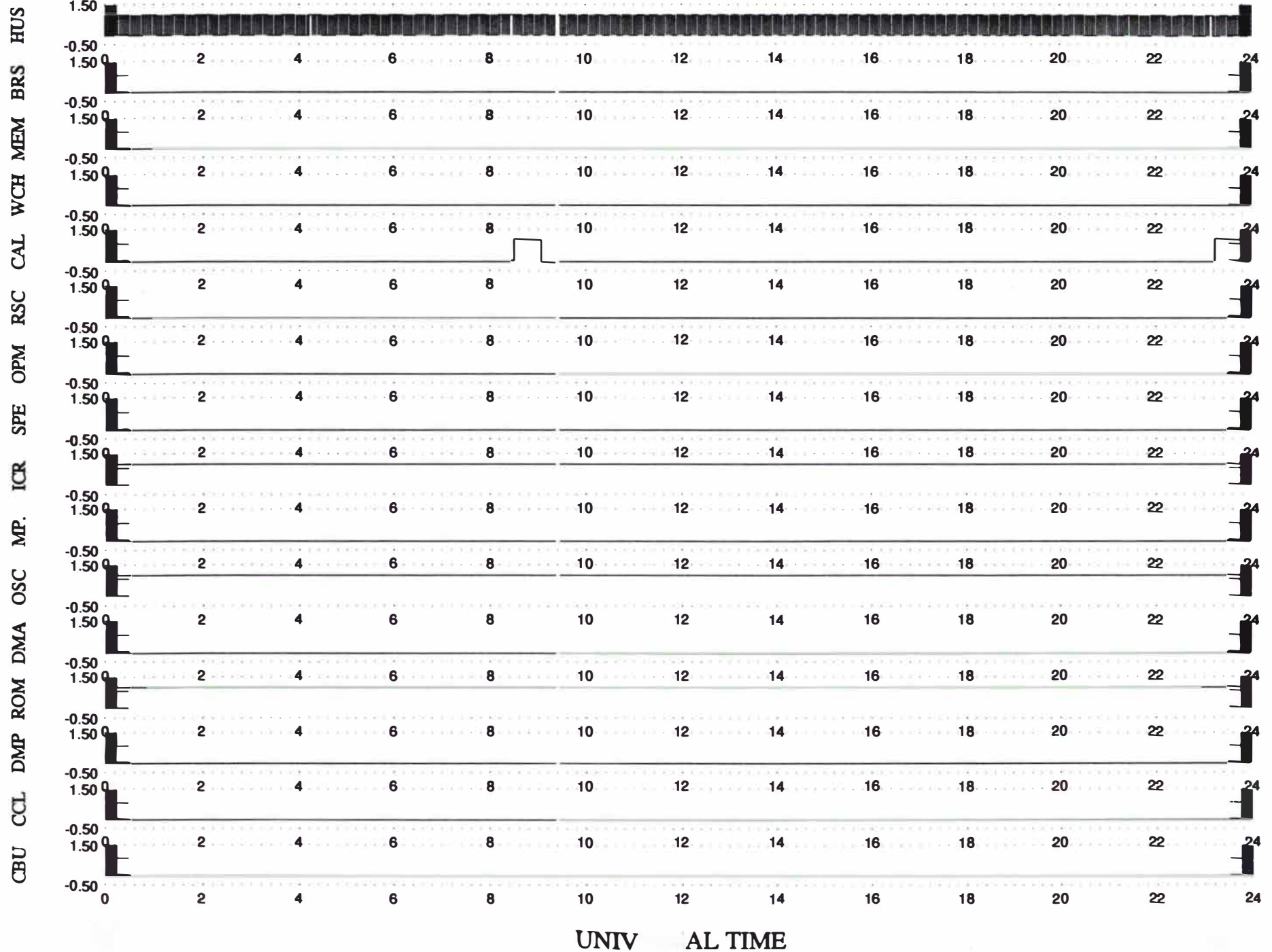
Data Start: 93/01/14, 0000:01

Plot created: 95/05/31, 2208

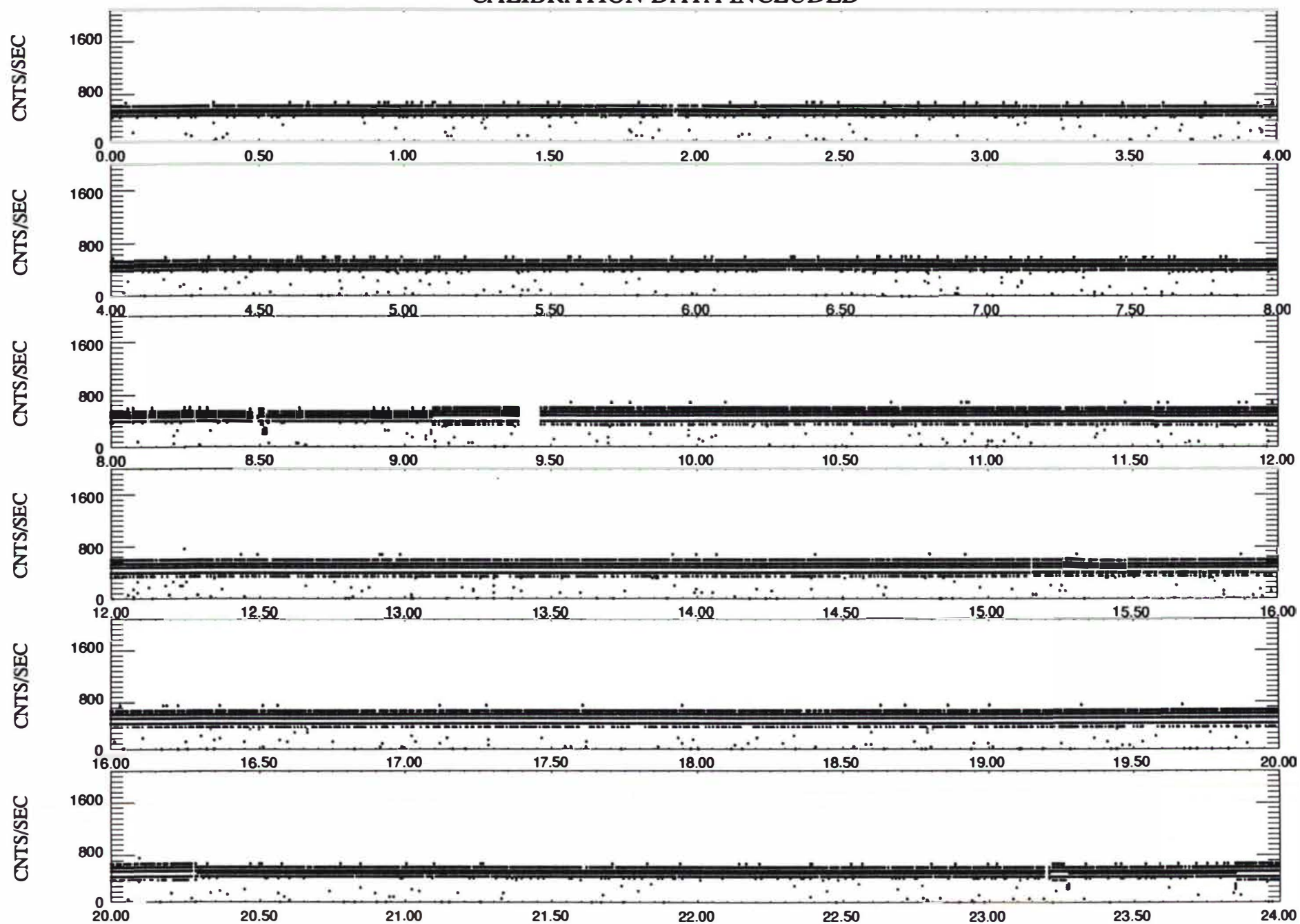
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

NO BURST (11)



CALIBRATION DATA INCLUDED



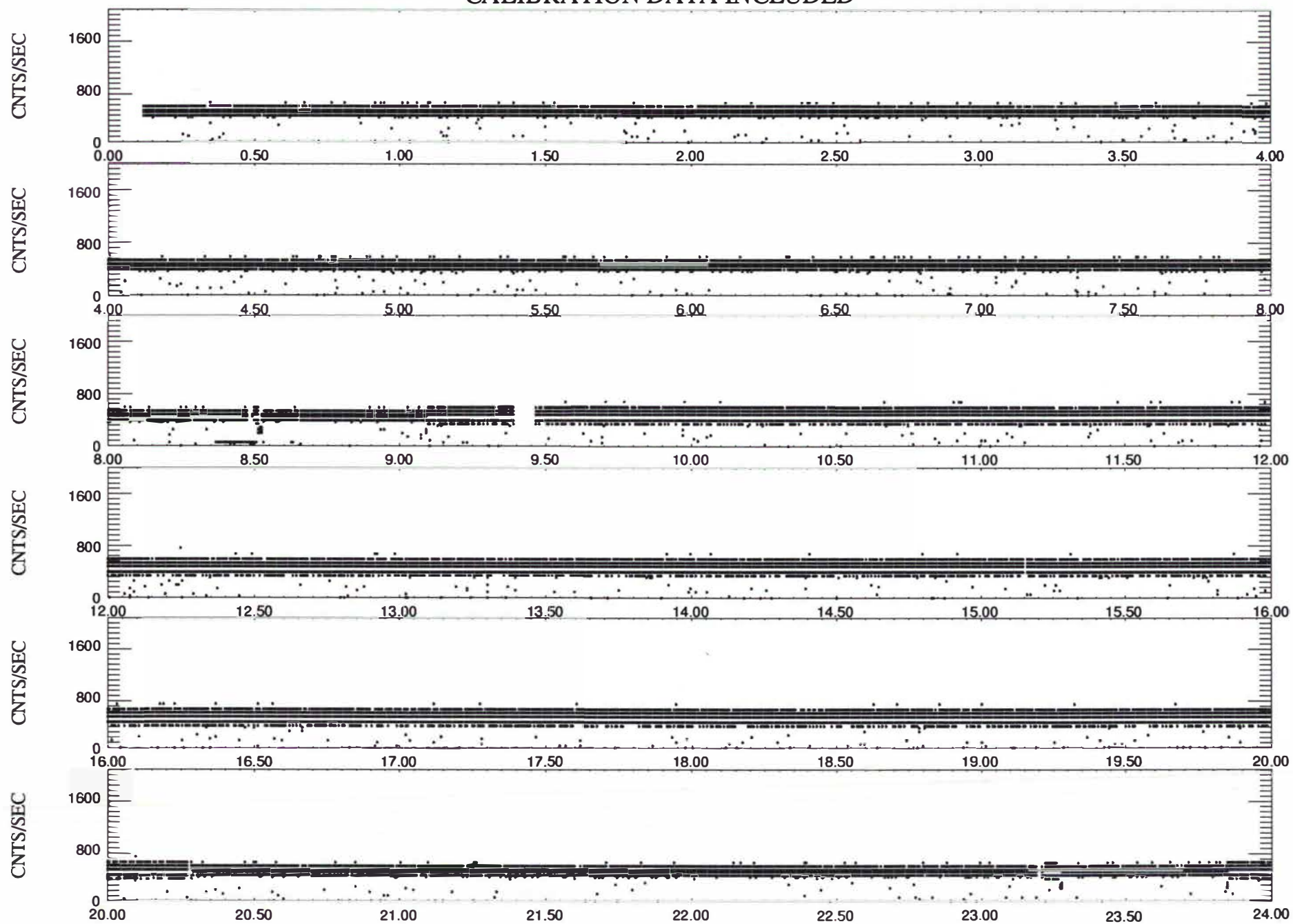
UNIVERSAL TIME

CBU	CCL	DMP	ROM	DMA	OSC	MP.	ICR	SPE	OPM	RSC	CAL	WCH	MEM	BRS	HUS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

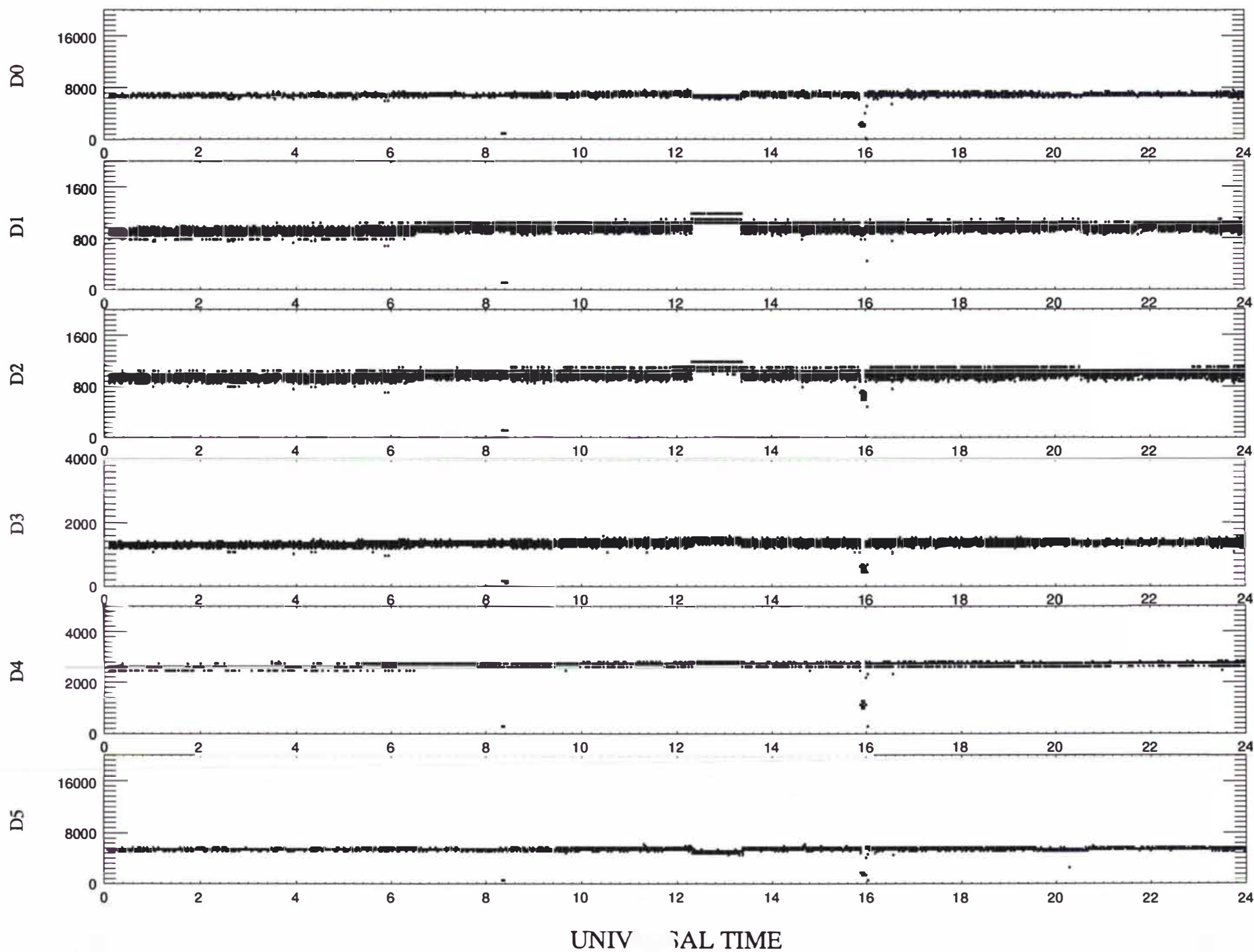


UNIV SAL TIME

CALIBRATION DATA INCLUDED



UNIV SAL TIME



From MEEGAN@ssl.msfc.nasa.gov Tue Jan 19 08:14:28 1993
Date: Tue, 19 Jan 1993 10:19:34 -0600 (CST)
From: MEEGAN@ssl.msfc.nasa.gov
Subject: Burst Trigger Message
To: igse@unh.edu, 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.: 02315

TIME: TJD=9002 SECONDS=74058

TYPE: FLARE SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

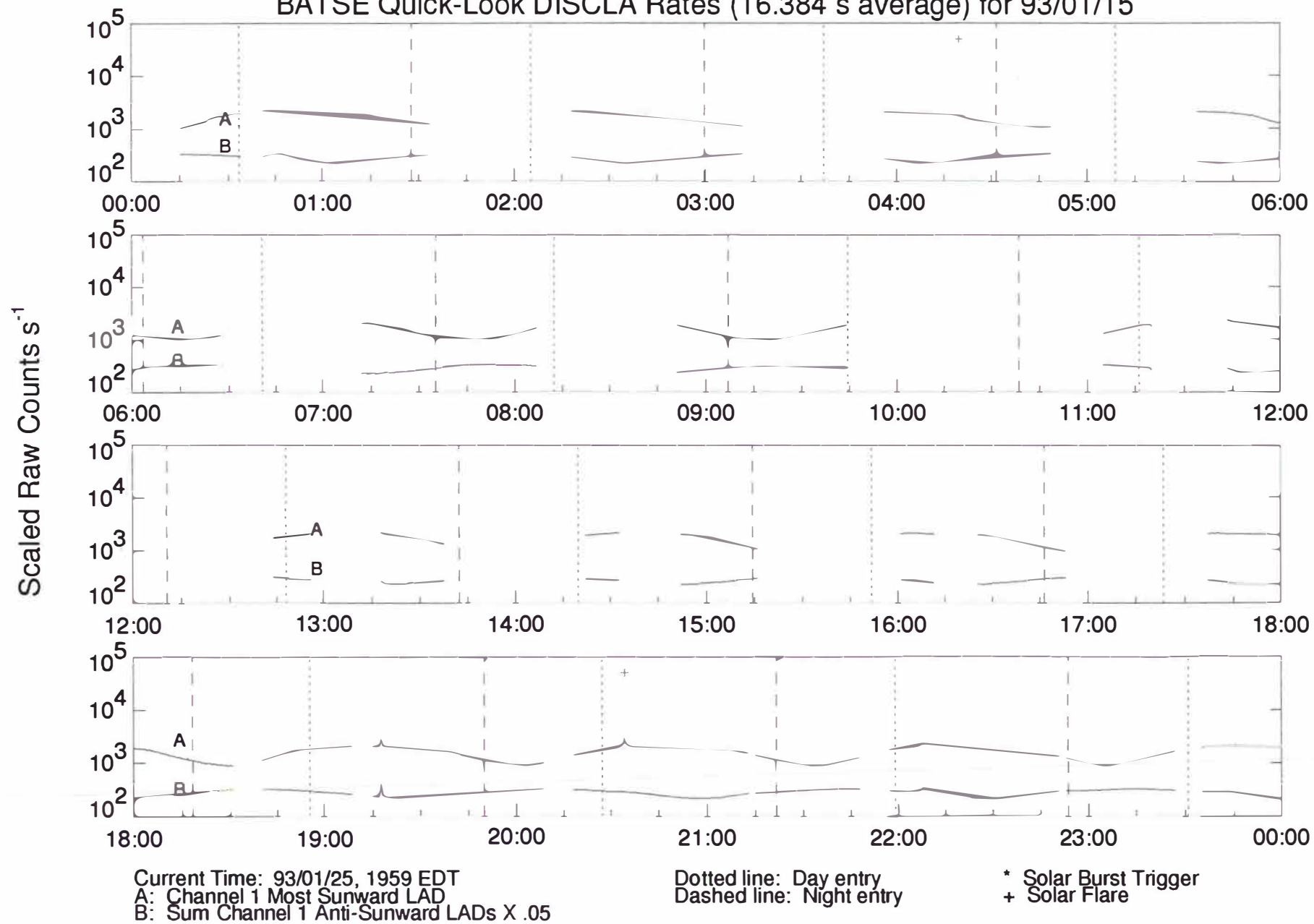
INTENSITY: COUNTS/CM2

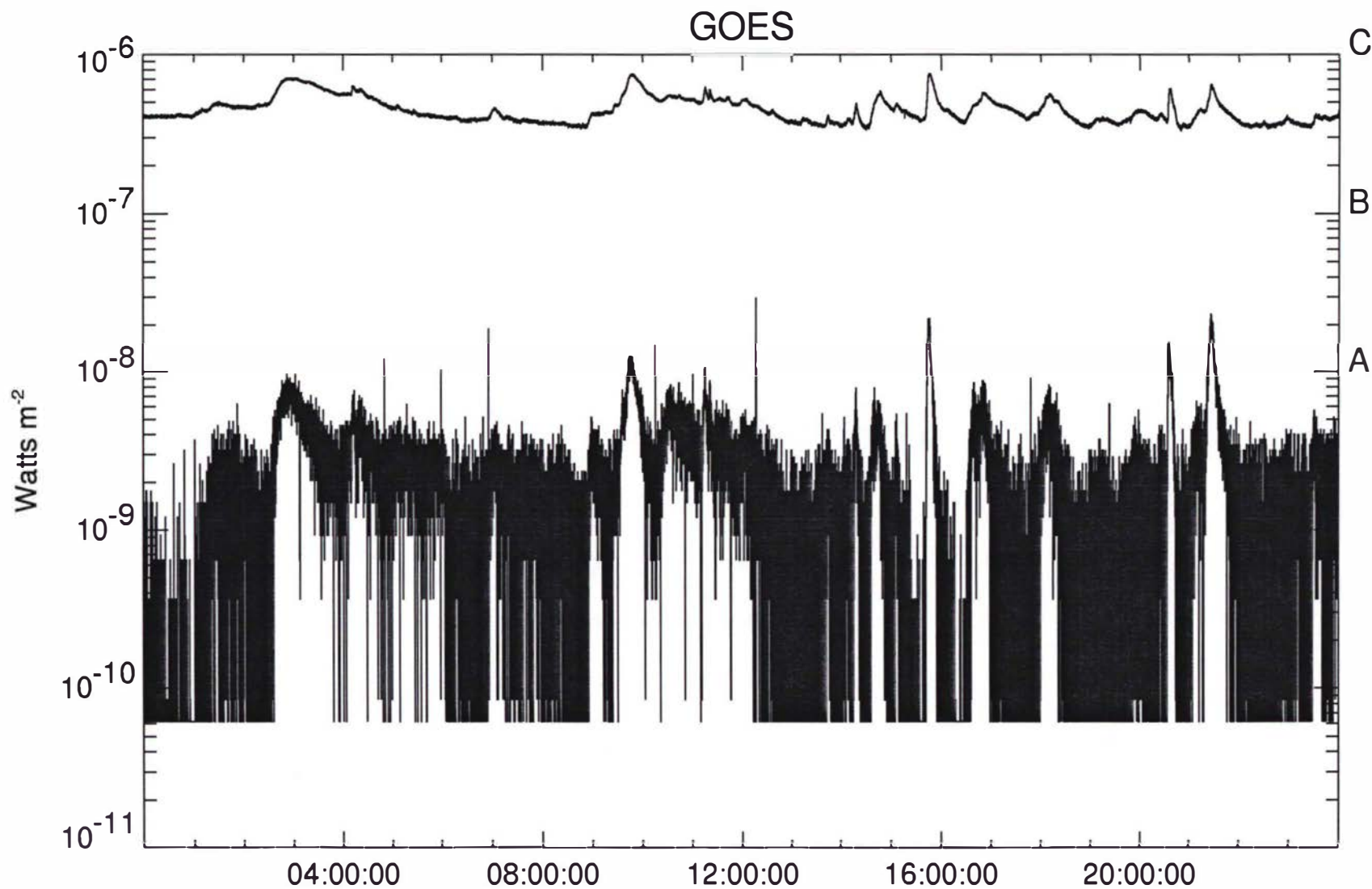
LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:

GOES B5.4 FLARE, ABOUT 40 S LONG.

BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/15





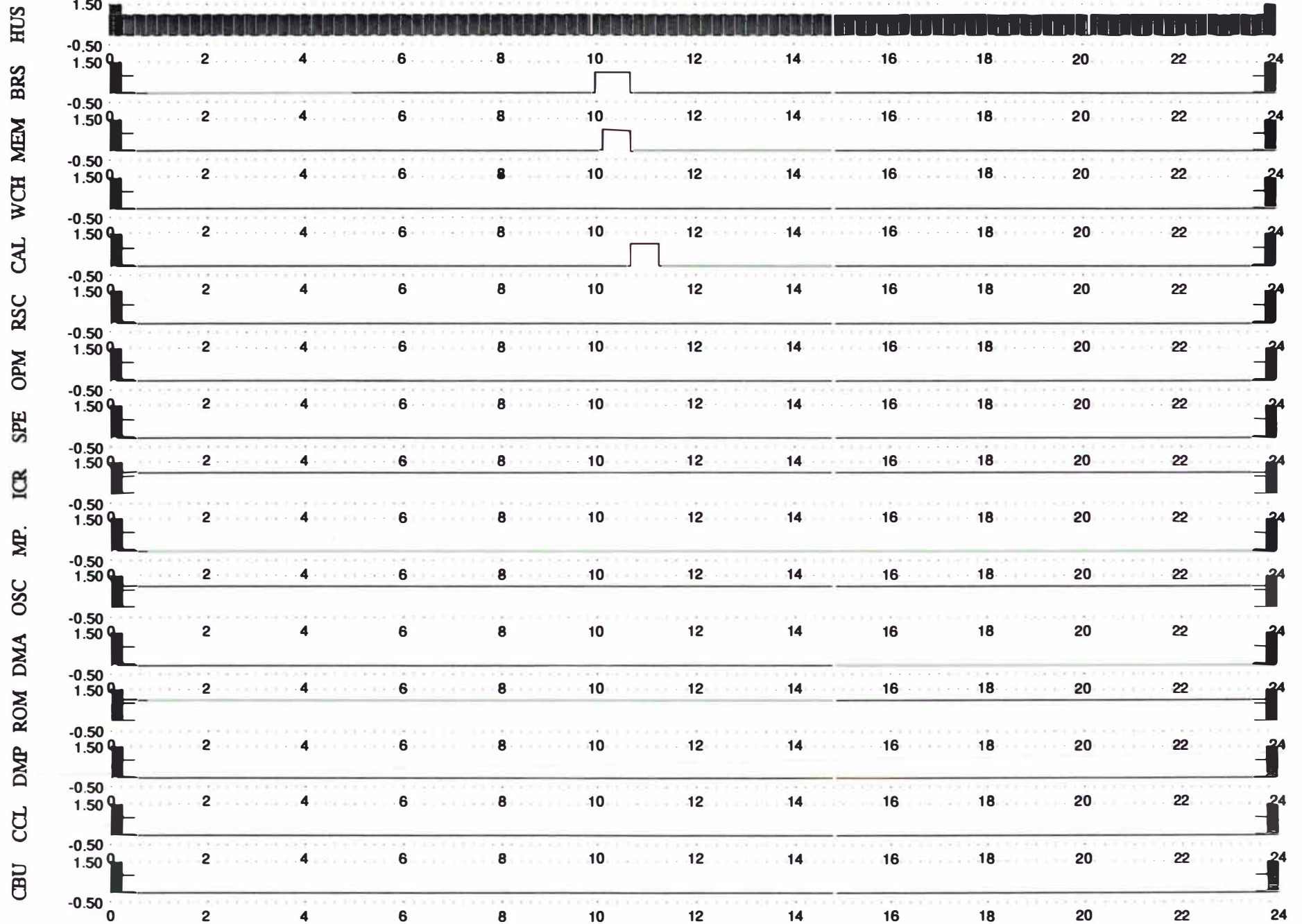
Data Start: 93/01/15, 0000:01

Plot created: 95/05/31, 2210

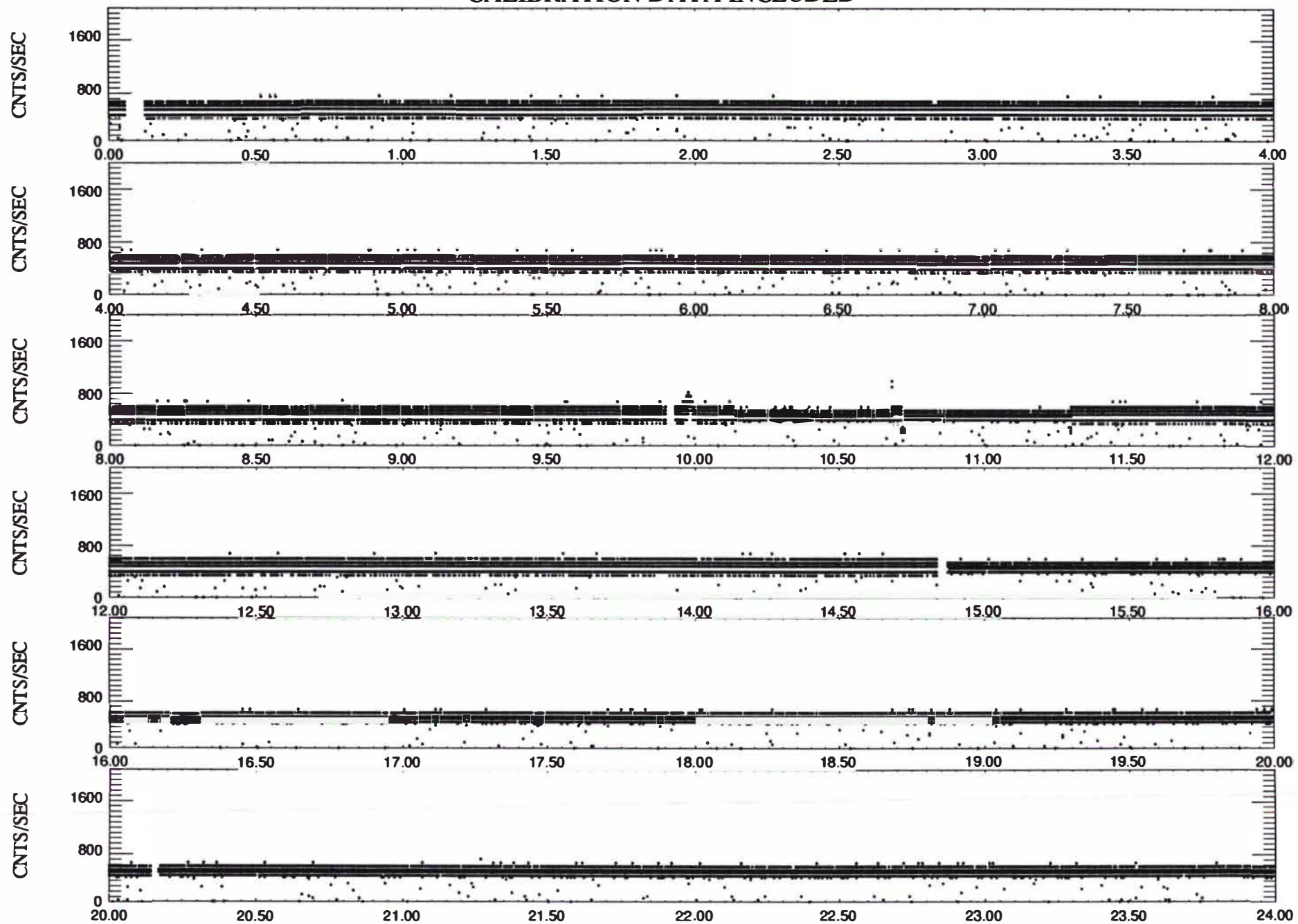
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

BURST NUMBER 12

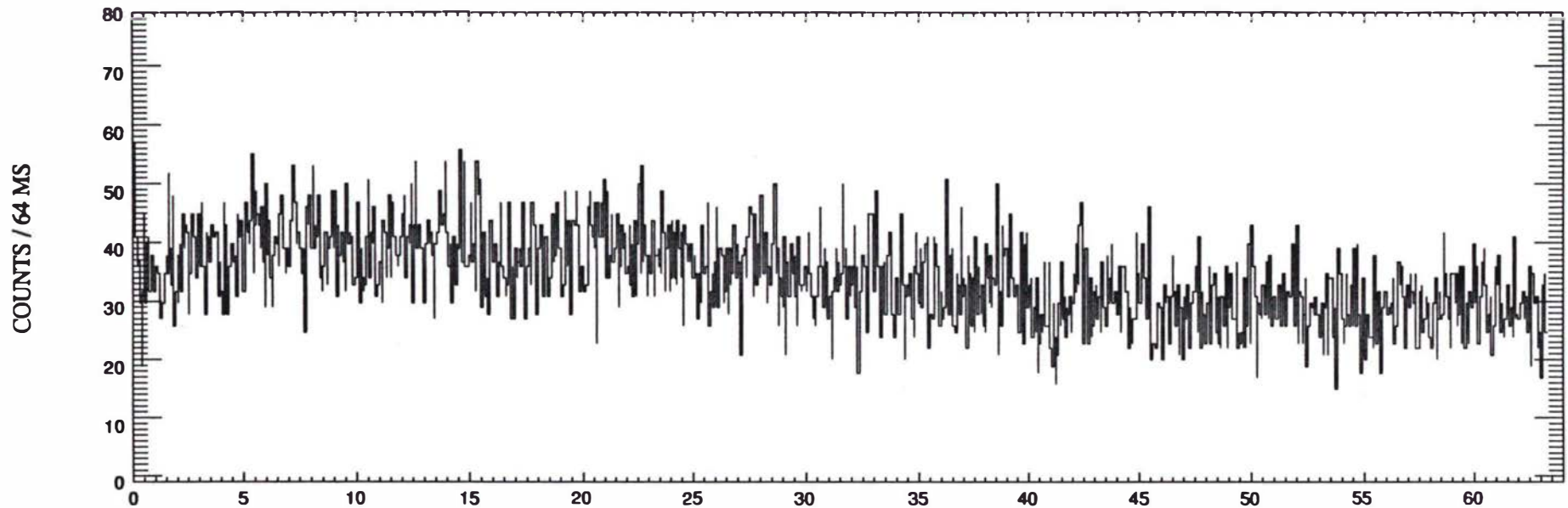


CALIBRATION DATA INCLUDED

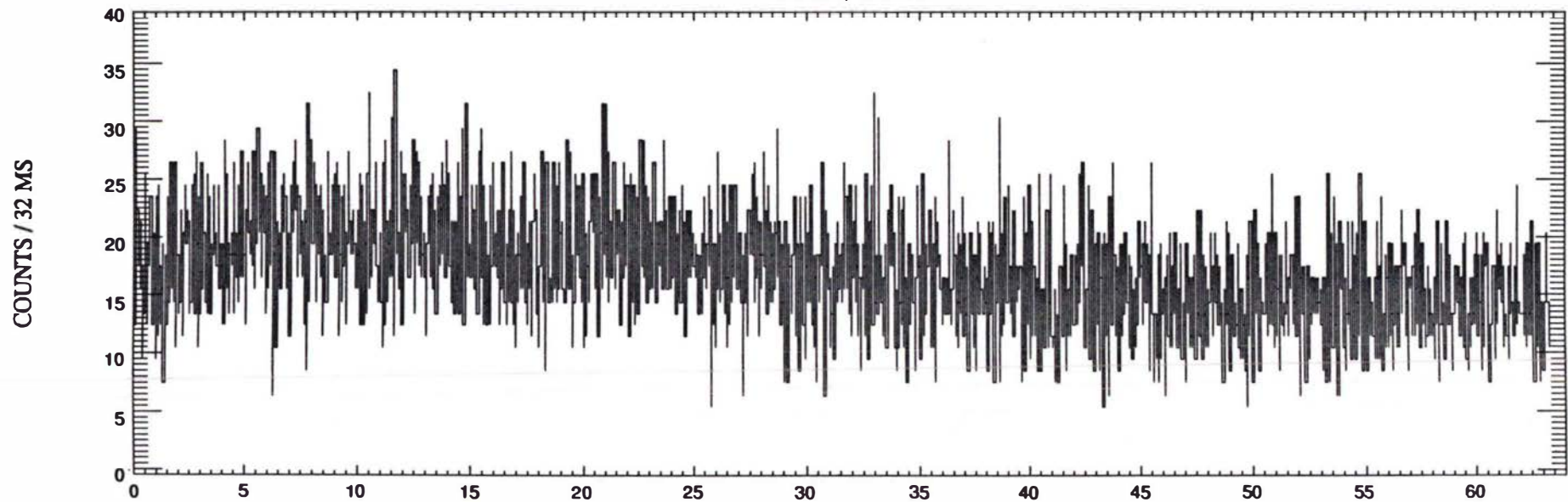


UNIV AL TIME

Burst Counter 12 at UT= 9.979427363078 h=35925.939 s 09:58:45.939

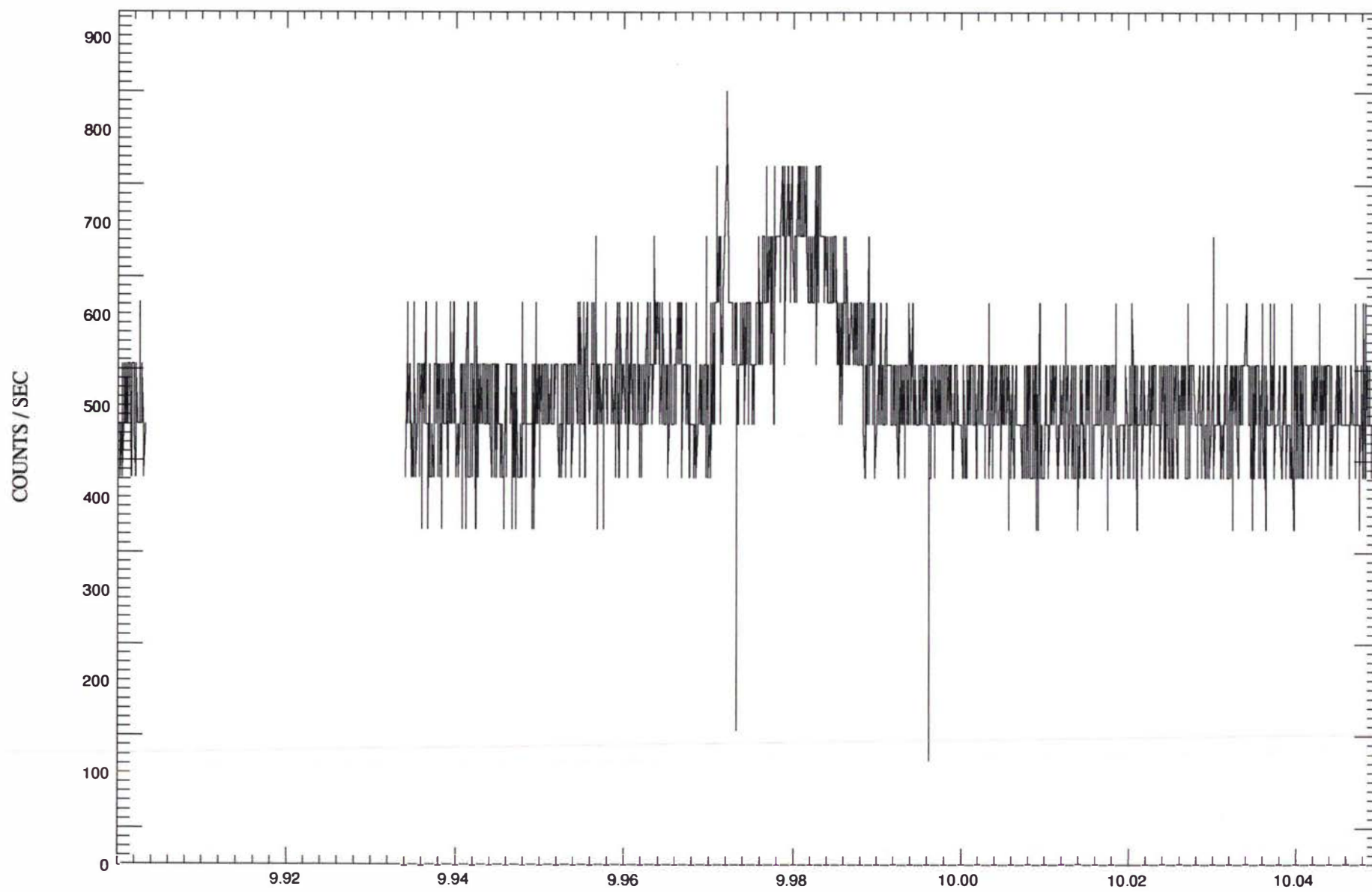


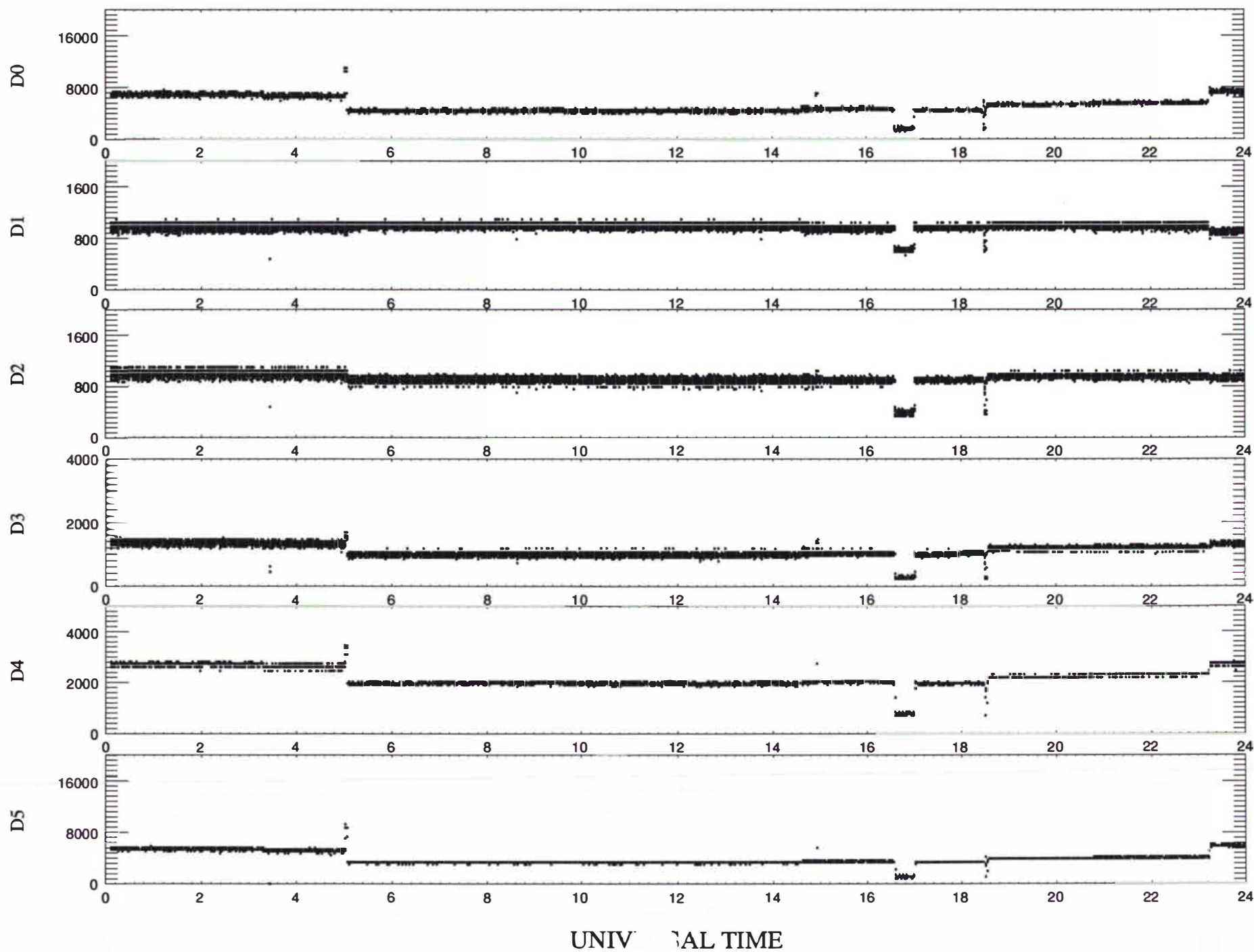
TIME, SECS



TIME, SECS

CALIBRATION DATA INCLUDED





CATSEARCH PROGRAM

BATSE BURST # 2136
EVENT OF 1993 JAN 16 DAY OF YEAR= 16
EVENT CROSSING TIME AT BATSE : 10022. S. OR 02:47:02.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 247.400 16.100
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 16/ 1/ 93 IS:
RA= 163.670 DEC= -13.425 DIST= 4.434 AU
BATSE-ULYSSES DISTANCE = 663251600. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 92.16 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -83.36 SECS.
CROSSING TIME AT ULYSSES IS 9939. S. OR 02:45:38.6 +/- 432.56 SECONDS

RI

From BRIGGS@fender.msfc.nasa.gov Tue Jan 19 08:48:07 1993
Date: Tue, 19 Jan 1993 10:53:26 -0600 (CST)
From: BRIGGS@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.: 02136

TIME: TJD=9003 SECONDS=10022

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=62.6 AZIMUTH=40.9 ERROR= DEGREES

COMMENTS:

FAIRLY STRONG BURST OF ABOUT 2 SECONDS DURATION.
POSSIBLE "POSTCURSOR" OF ABOUT 5 SECONDS DURATION 30 SECONDS LATER.

From BRIGGS@fender.msfc.nasa.gov Tue Jan 19 08:50:39 1993
Date: Tue, 19 Jan 1993 10:56:13 -0600 (CST)
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
2136	930116	9003	10022	14000	247	+16

Helio corr removed

Date: *Dec 15 '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 ? *No*
- ☒ 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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

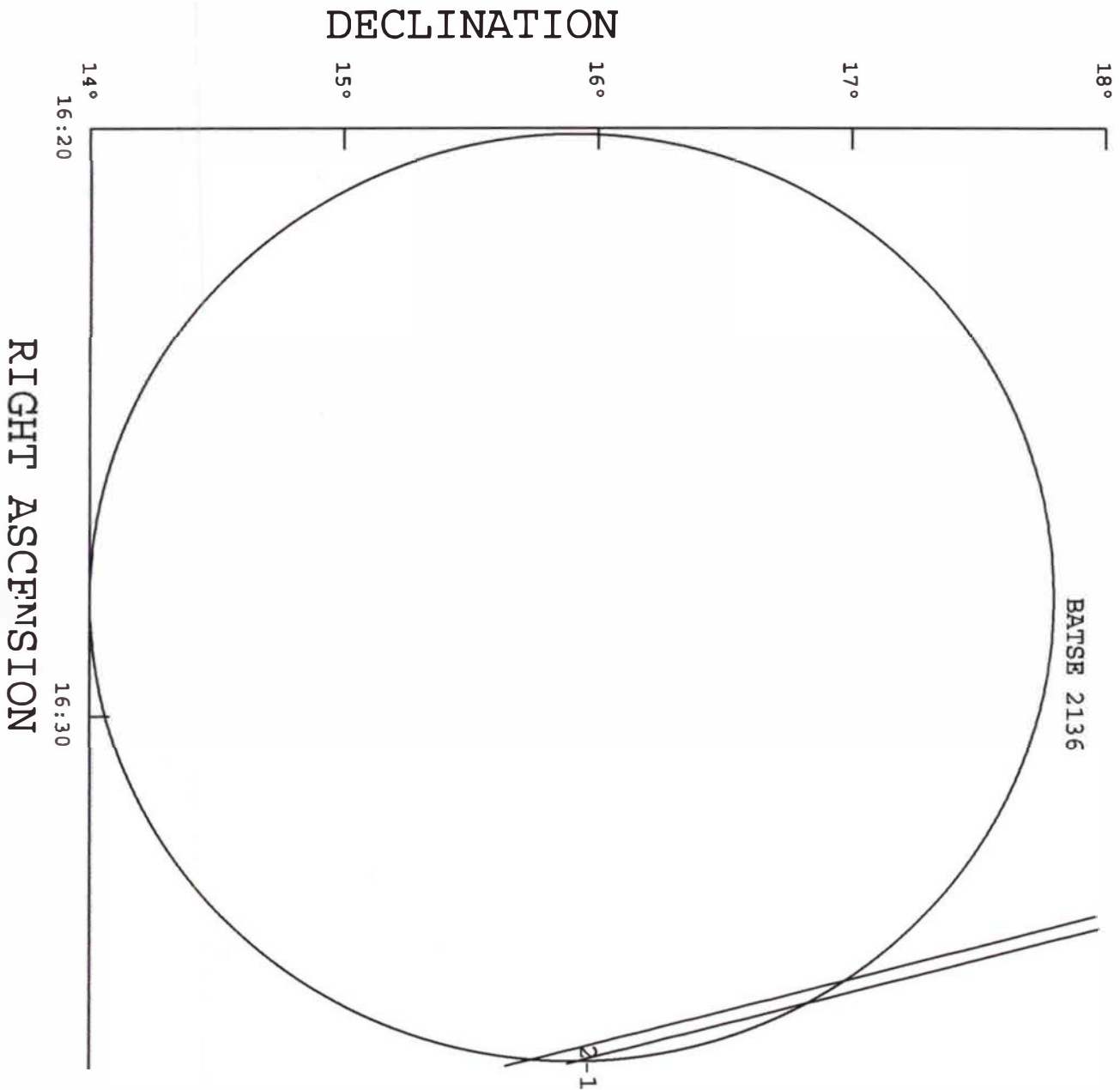
G=GALACTIC EQUATOR

1 ULYSSES

2 BATSE

EVENT OF JAN 16, 1993 2:45

15/12/97



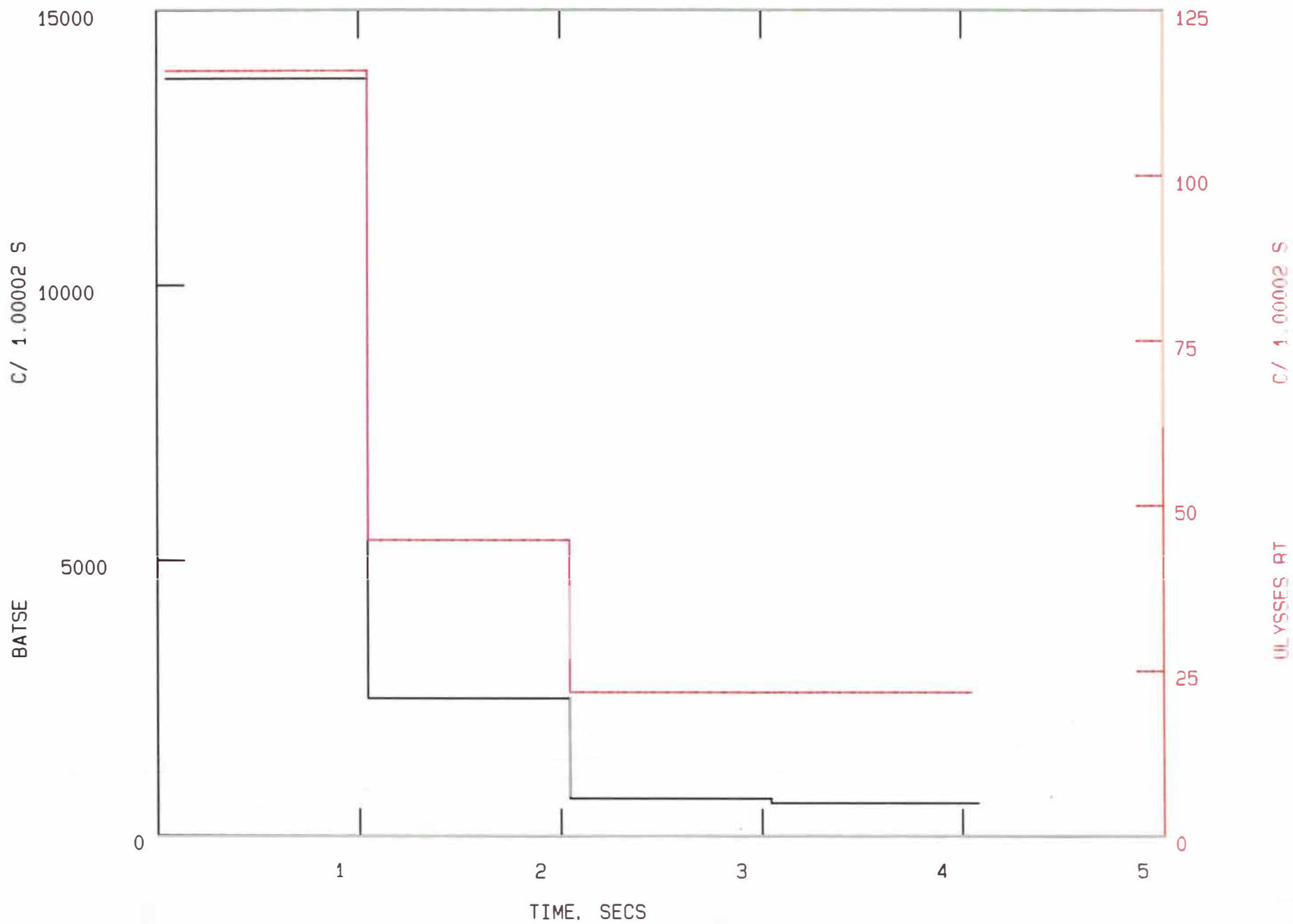
BATSE

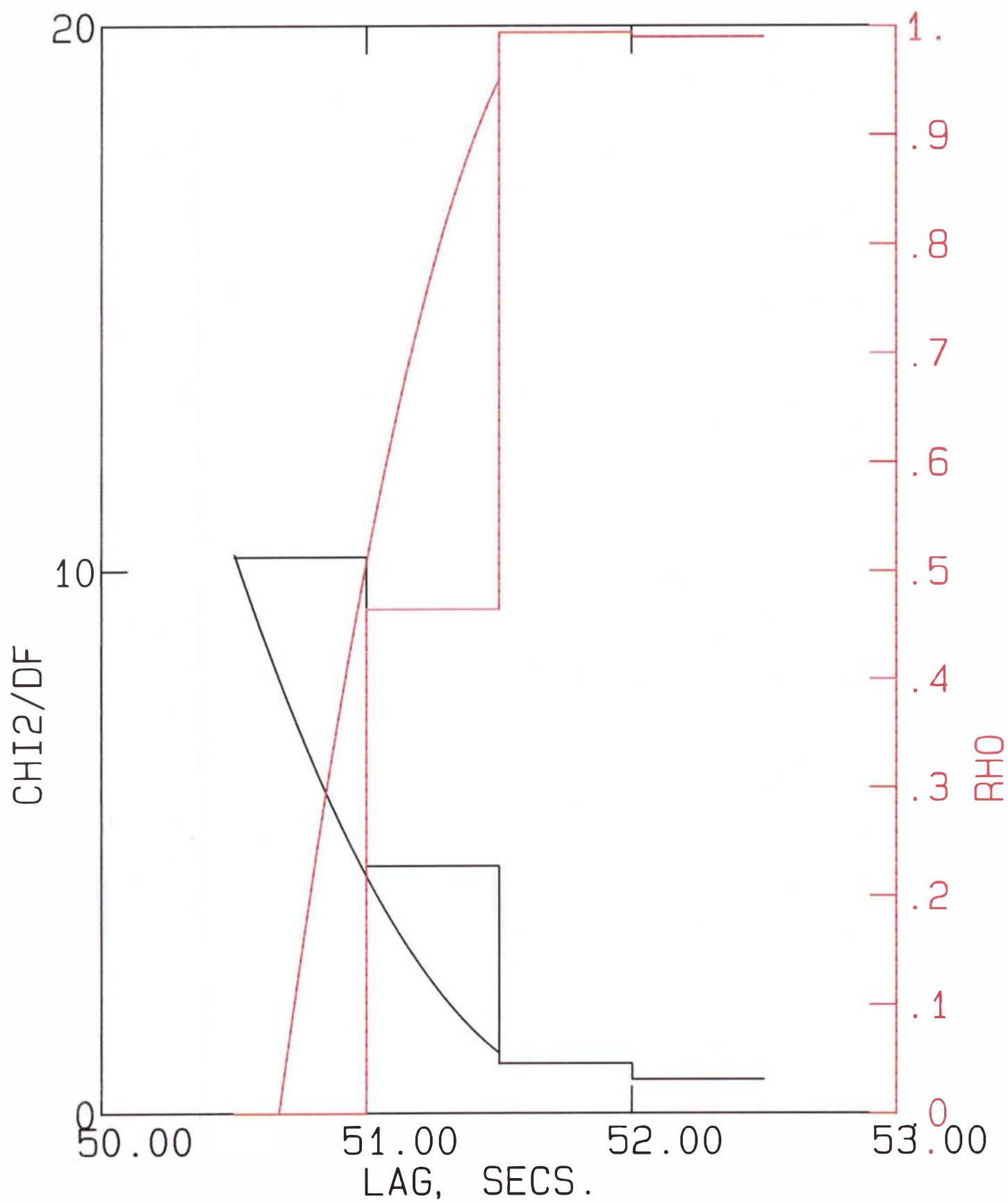
-ULYSSES RT CORRELATION

16/ 1/93

10022.018

15/12/97





ULYSSES RT

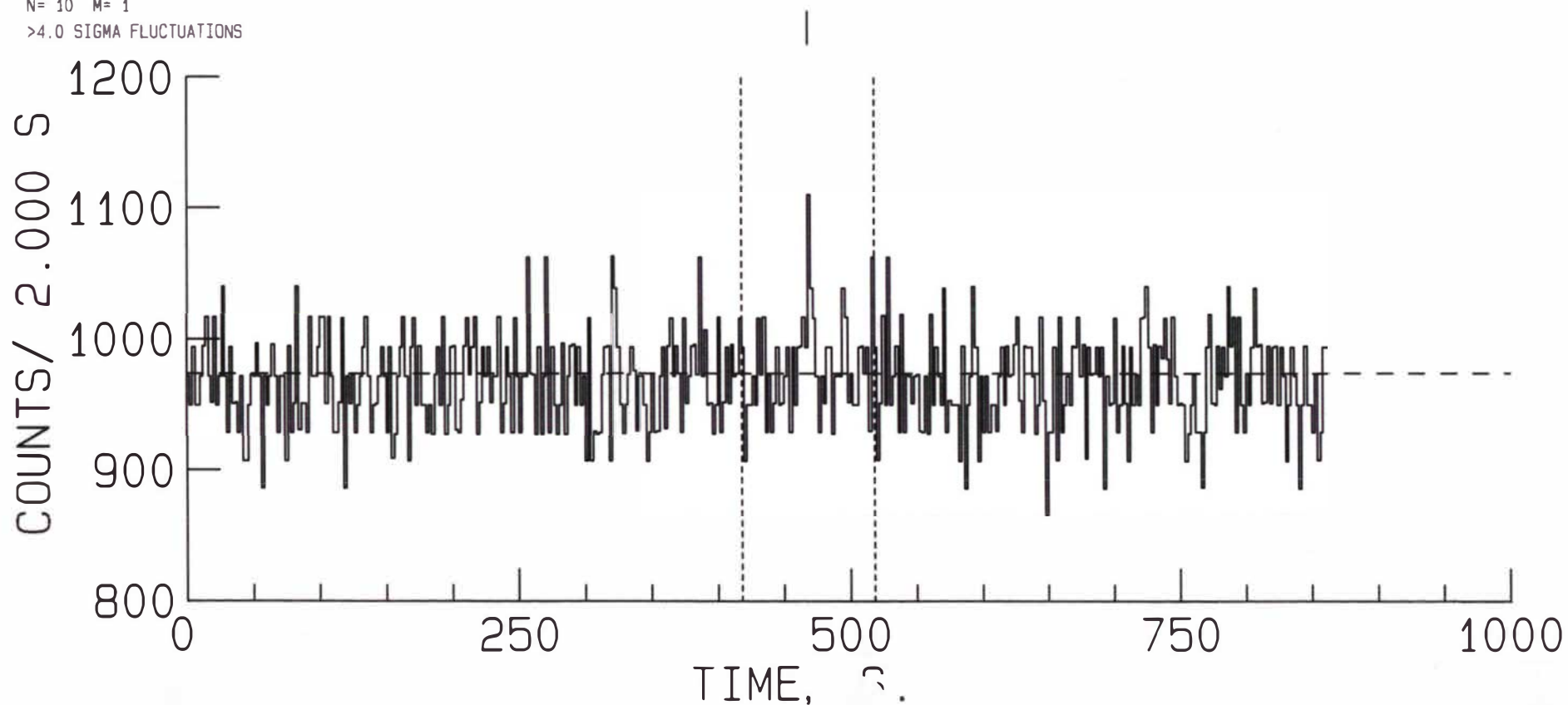
15/12/97

16/ 1/93 9504.497 s

0.500 S INTERVALS REGROUPED BY 4

22- 147 keV

N= 10 M= 1
>4.0 SIGMA FLUCTUATIONS

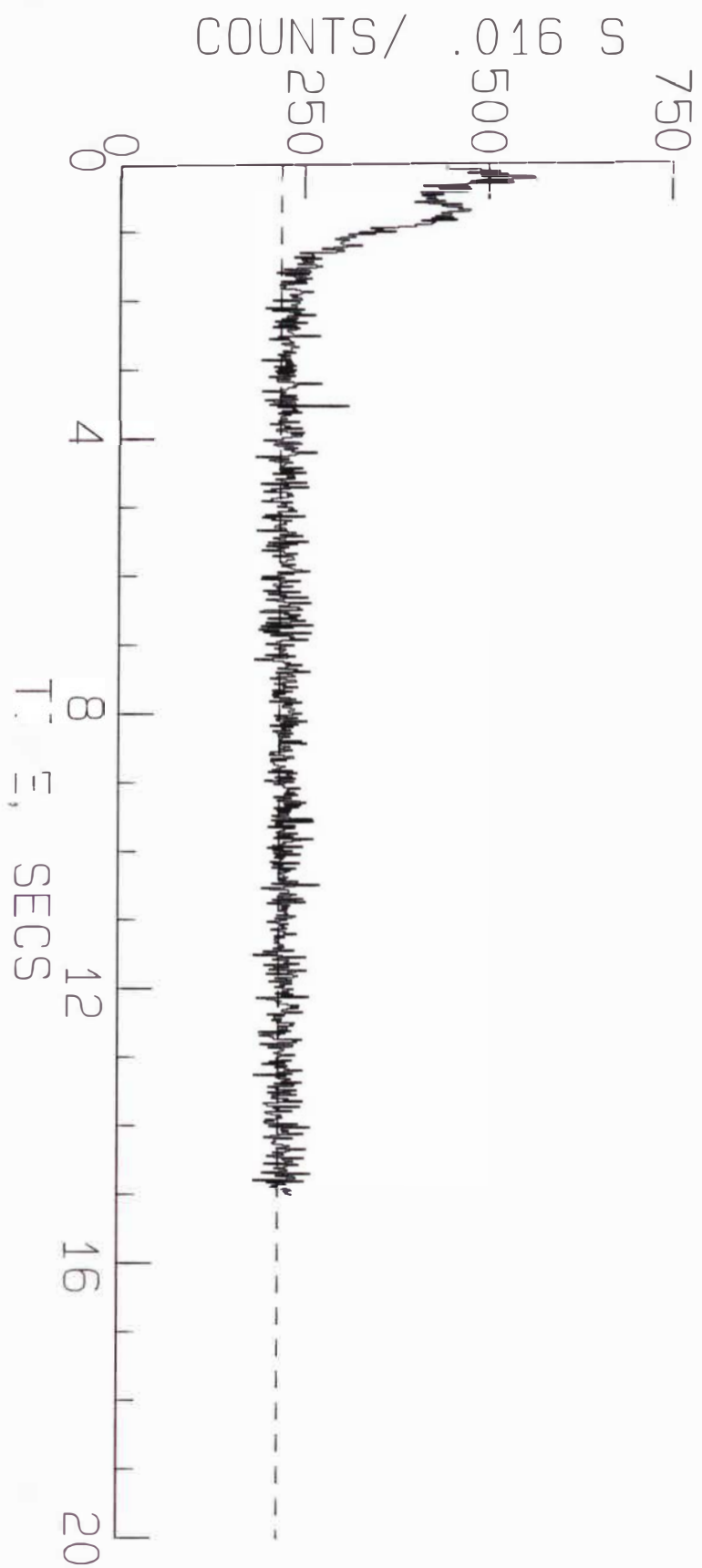


BATSE

16/01/93

10022.018

25- 100 keV



From khurley@space6.ssl.berkeley.edu Wed Apr 6 11:36 PDT 1994
Date: Wed, 6 Apr 94 11:29:55
From: khurley@space6.ssl.berkeley.edu
Content-Type: text
Content-Length: 166

Dear Chryssa,

The BATSE digital data file for #2136 has a trigger time of 10022.05 seconds, while the plot has 10022.018. Which is correct?

Kevin

cc: Stayce Cole

From root Thu Apr 7 06:29 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA14550; Thu, 7 Apr 94 06:29:13
Received: from Sdsc.Edu (sds.sdsc.edu) by sunspot.ssl.berkeley.edu (5.0/SMI-SVR4)
id AA23919; Thu, 7 Apr 1994 06:35:44 +0800
Received: from gibson.span by Sdsc.Edu with VMSmail ;
Thu, 7 Apr 94 13:37:49 GMT
Date: Thu, 7 Apr 94 13:37:49 GMT
From: cole@gibson.span@sdsc.edu
Message-Id: <940407133749.23a07a40@Sdsc.Edu>
Subject: RE:
To: khurley@space6.ssl.berkeley.edu
X-St-Vmsmail-To: SDS::"khurley@space6.ssl.berkeley.edu"
Content-Length: 223
Status: R

KEVIN

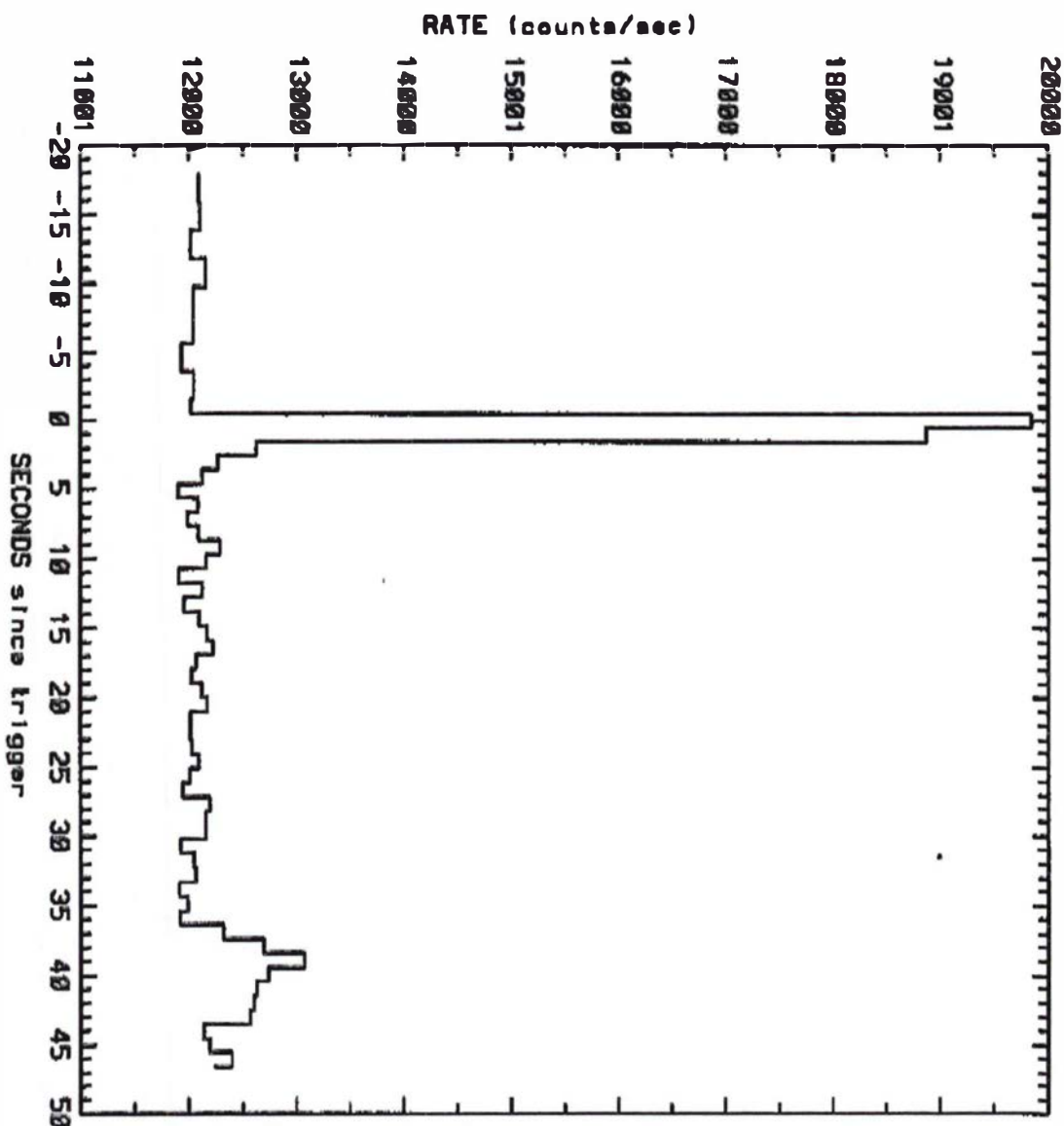
THE CORRECT TRIGGER TIME FOR 2136 IS 10022.018.

IF THERE IS EVER A DISCREPANCY I WOULD MOST LIKELY RELY ON THE PLOT IF IT IS CLEAR ENOUGH TO READ.

WHILE I TRY TO BE CAREFUL I'M SURE THERE WILL BE MISTAKES.

STAYCE

Data for K. Hurley



15-APR-1993 13:34:47

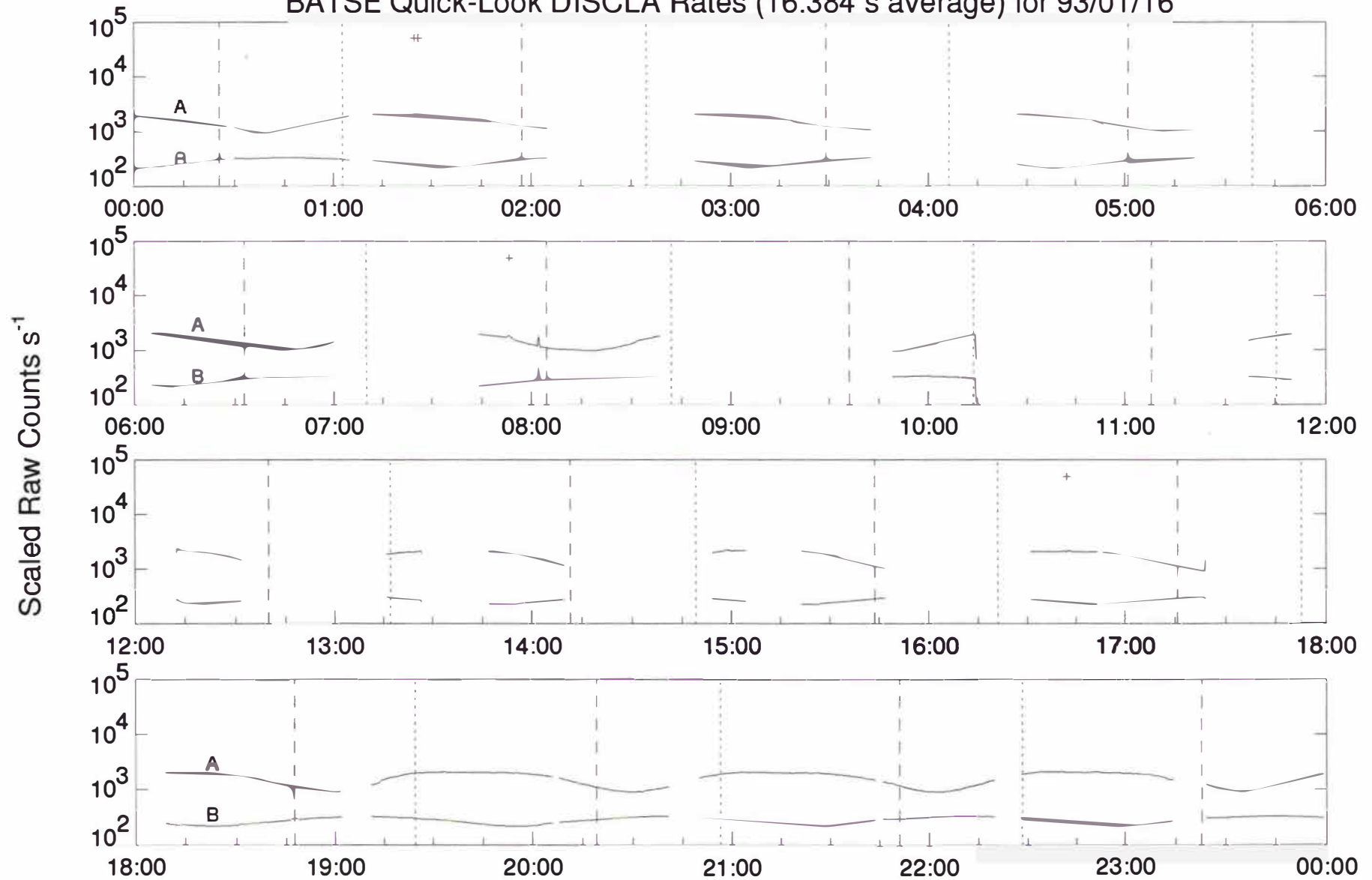
Created by MOPS BO
(Burst Display)
Version 12.19

Trigger # . 2136

Trigger Time:
9883 / 18022.818Burst Data Type:
DISCLB(10022.05 m
digital data)

Deadtime
Corrected: N
Background Data
Type: None
Minimum Integ. Time:
1.824 seconds
Detectors (7.0):
8801811
Discriminators:
(1.2)
Quality Mask:
801SP1

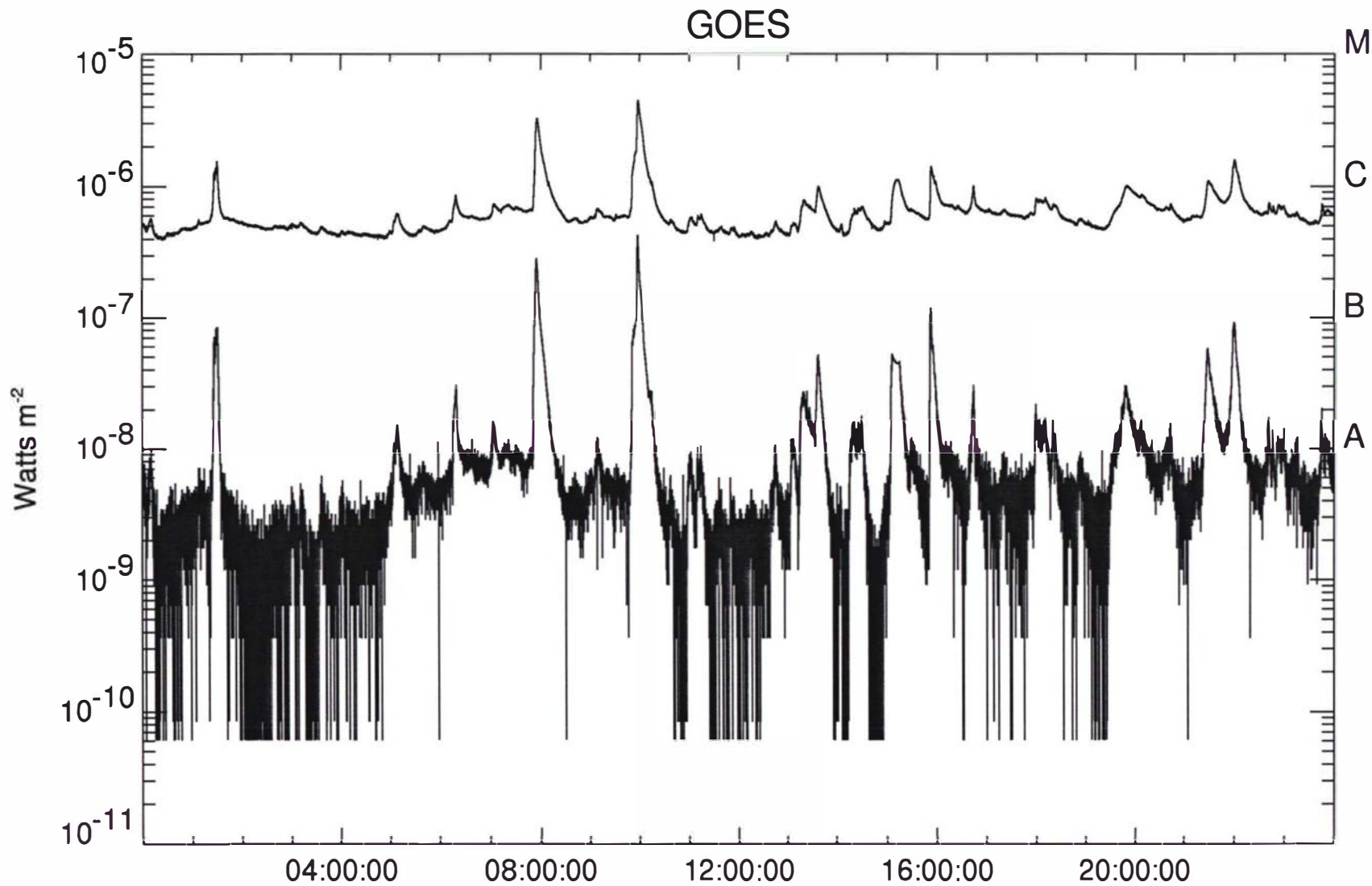
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/16



Current Time: 93/01/25, 2000 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



Data Start: 93/01/16, 0000:01

Plot created: 95/05/31, 2213

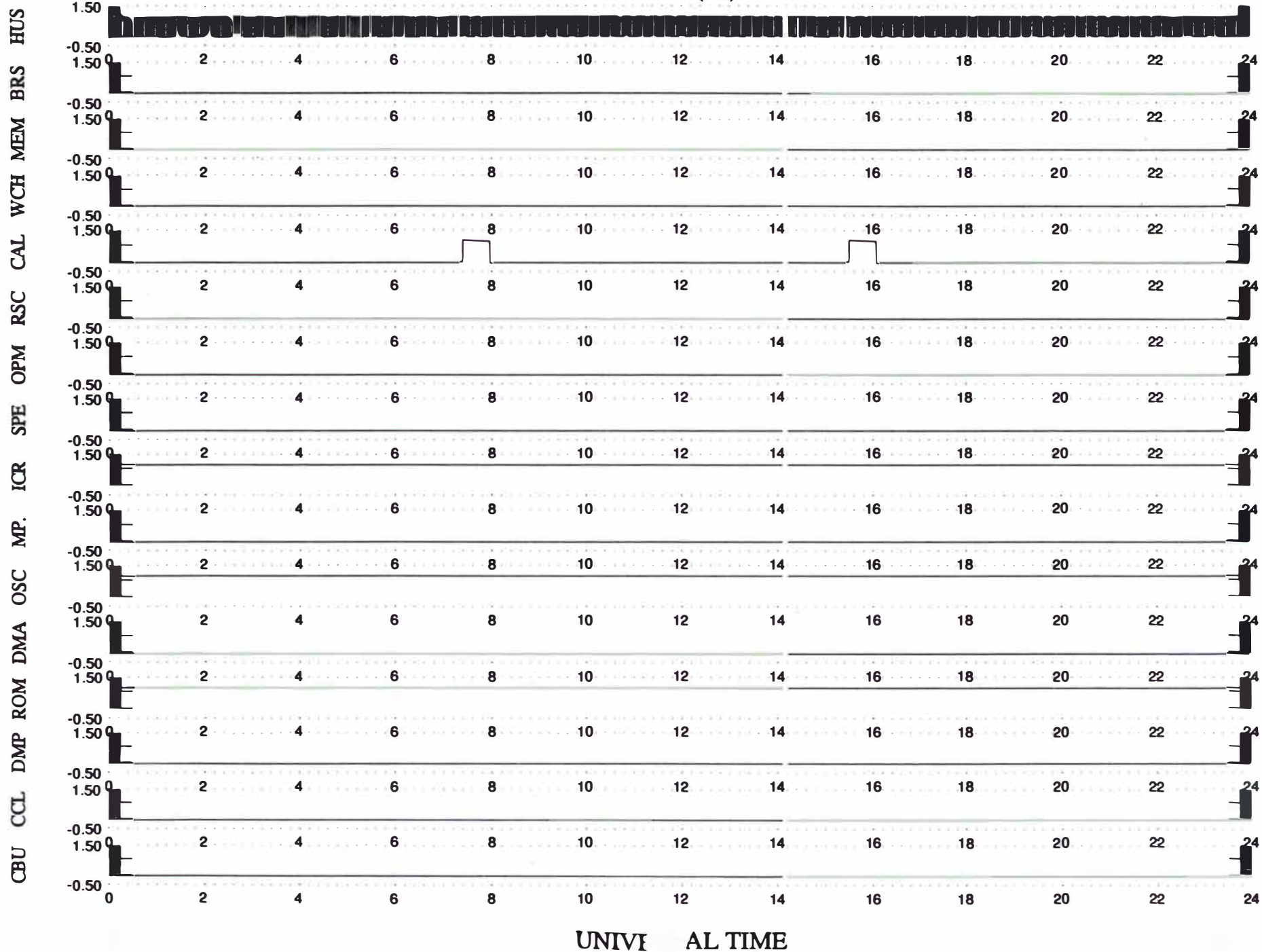
Channel 1 (1.0 - 8.0 Angstroms)

Background not subtracted

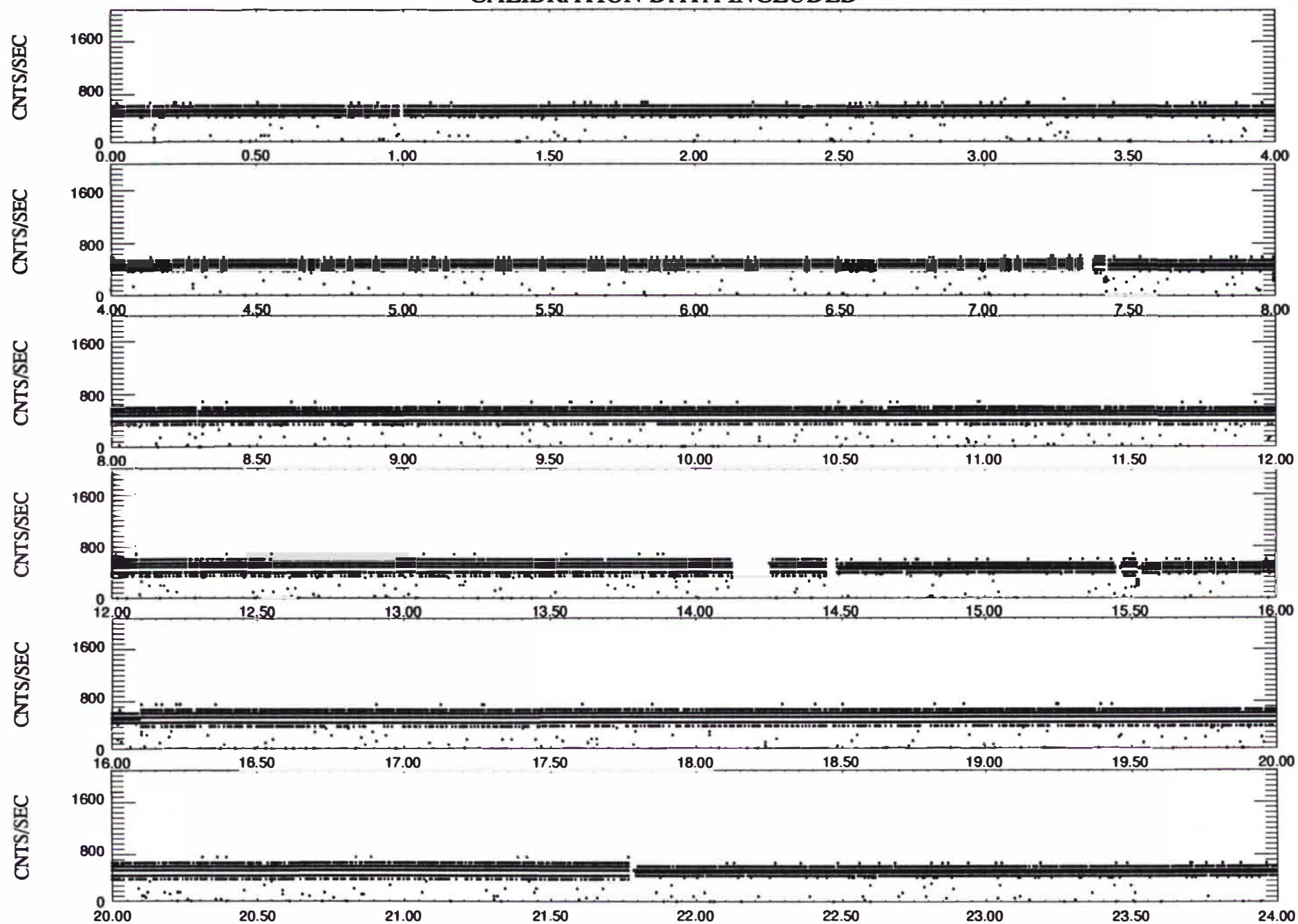
Channel 2 (0.5 - 4.0 Angstroms)

Background not subtracted

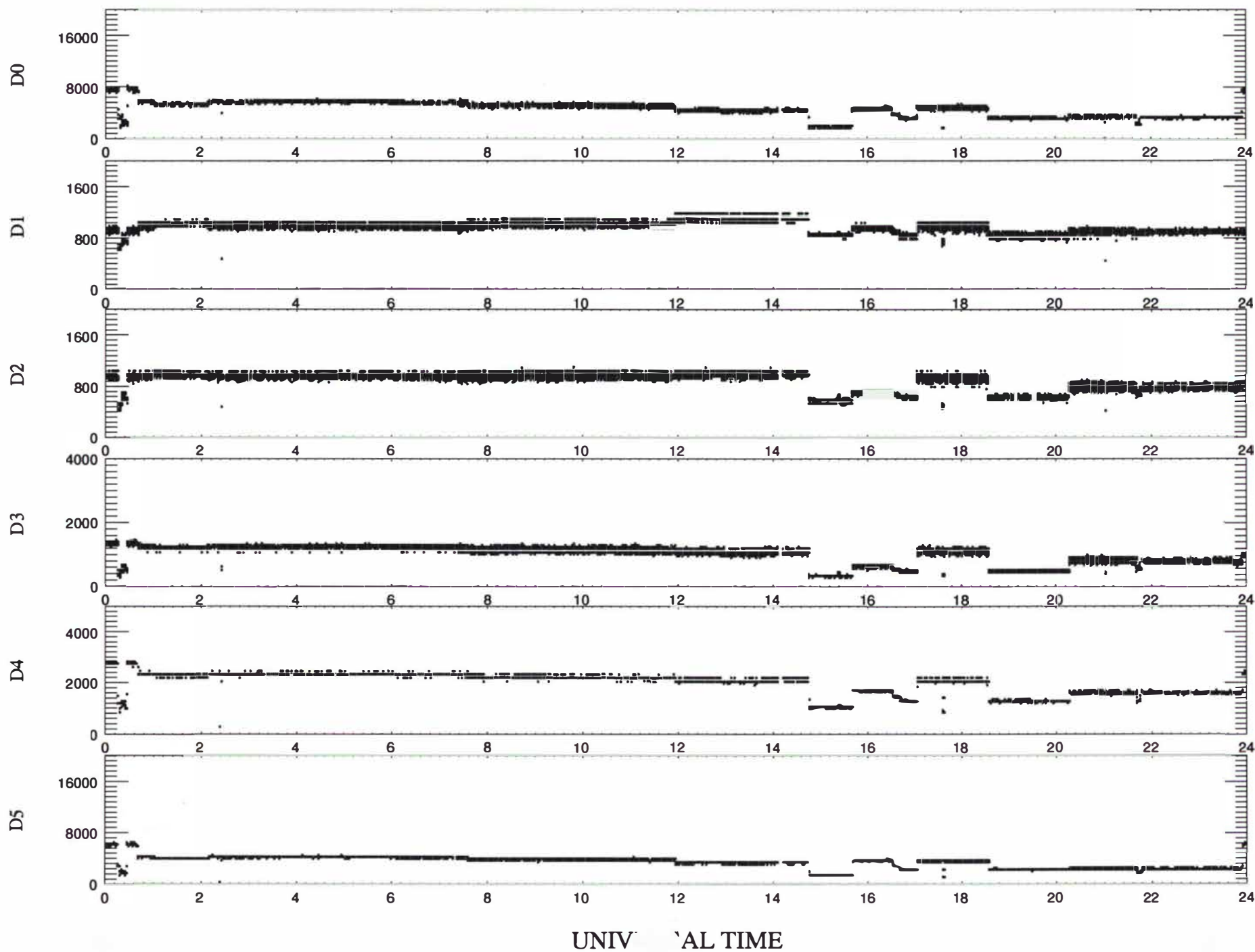
NO BURST (12)



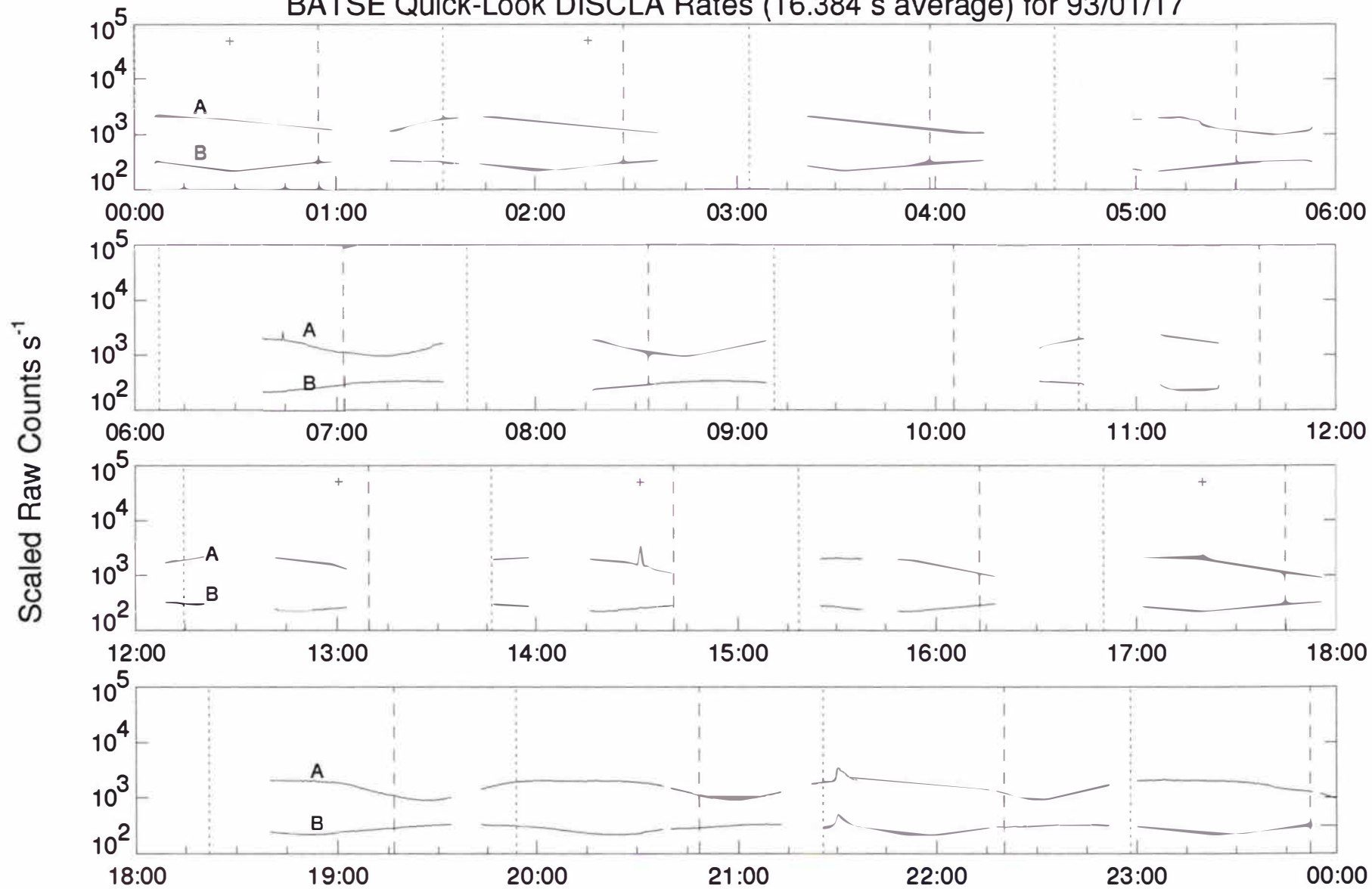
CALIBRATION DATA INCLUDED



UNIV AL TIME



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/17



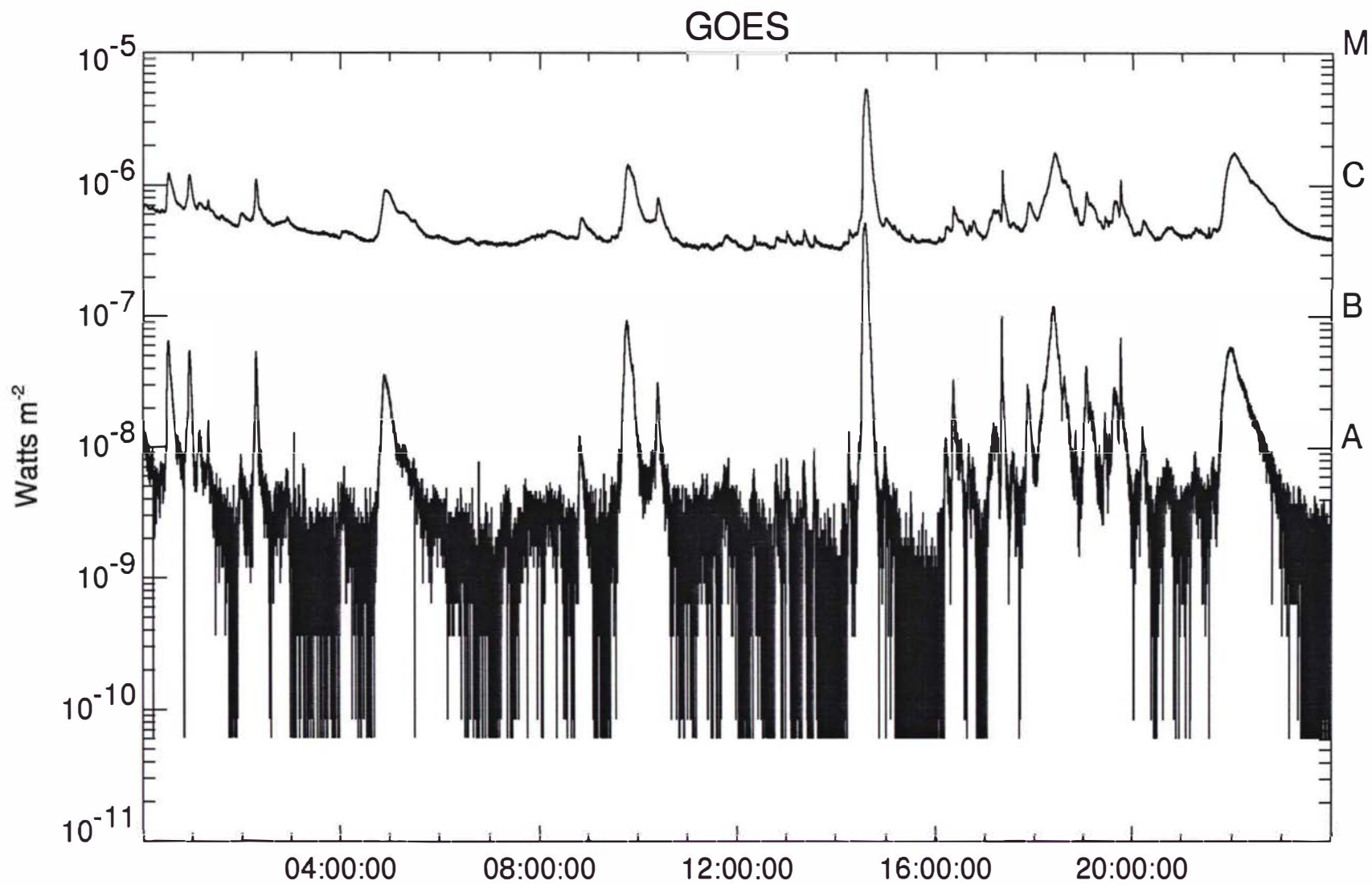
Current Time: 93/01/25, 2001 EDT

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



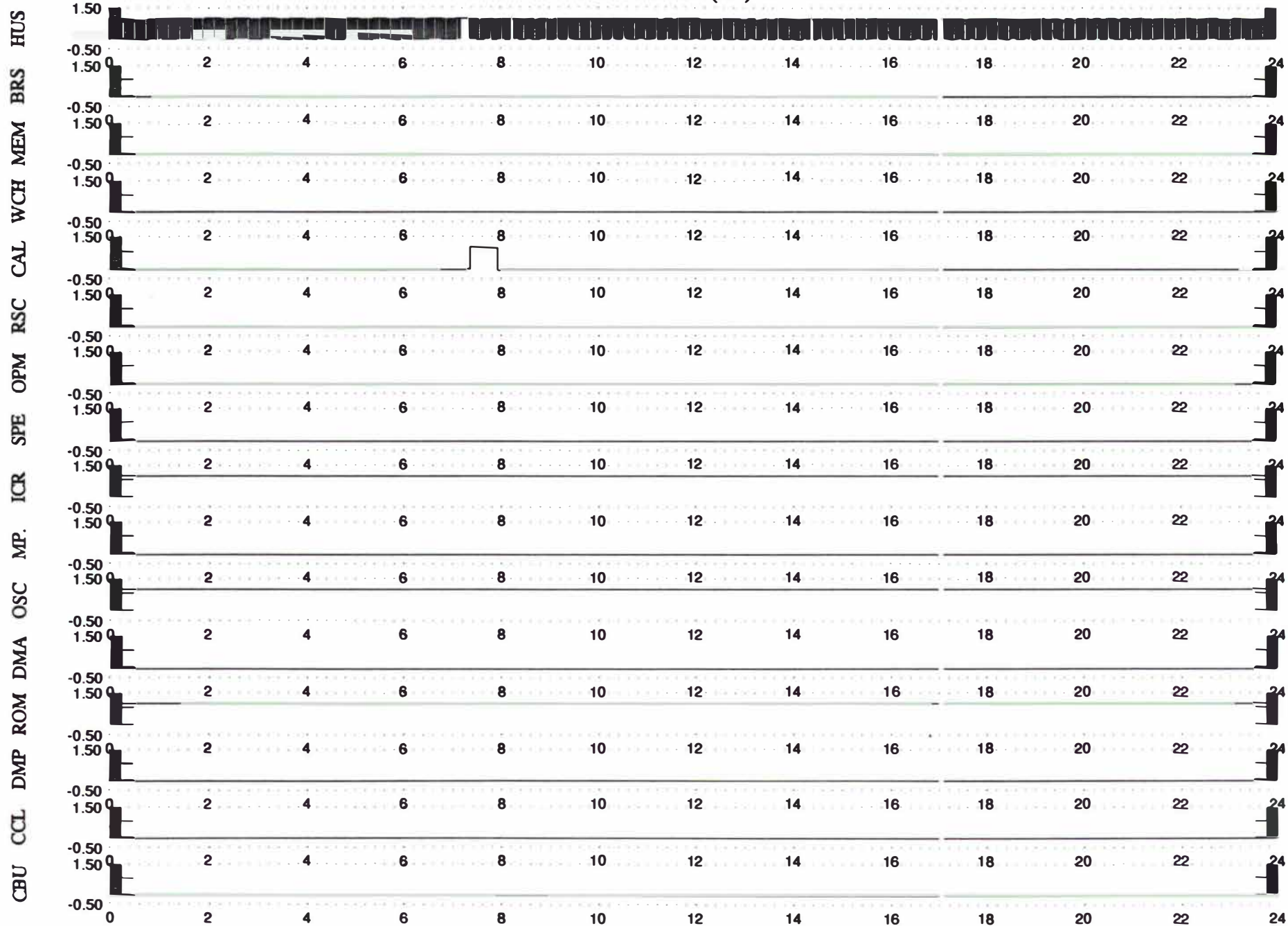
Data Start: 93/01/17, 0000:01

Plot created: 95/05/31, 2216

Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

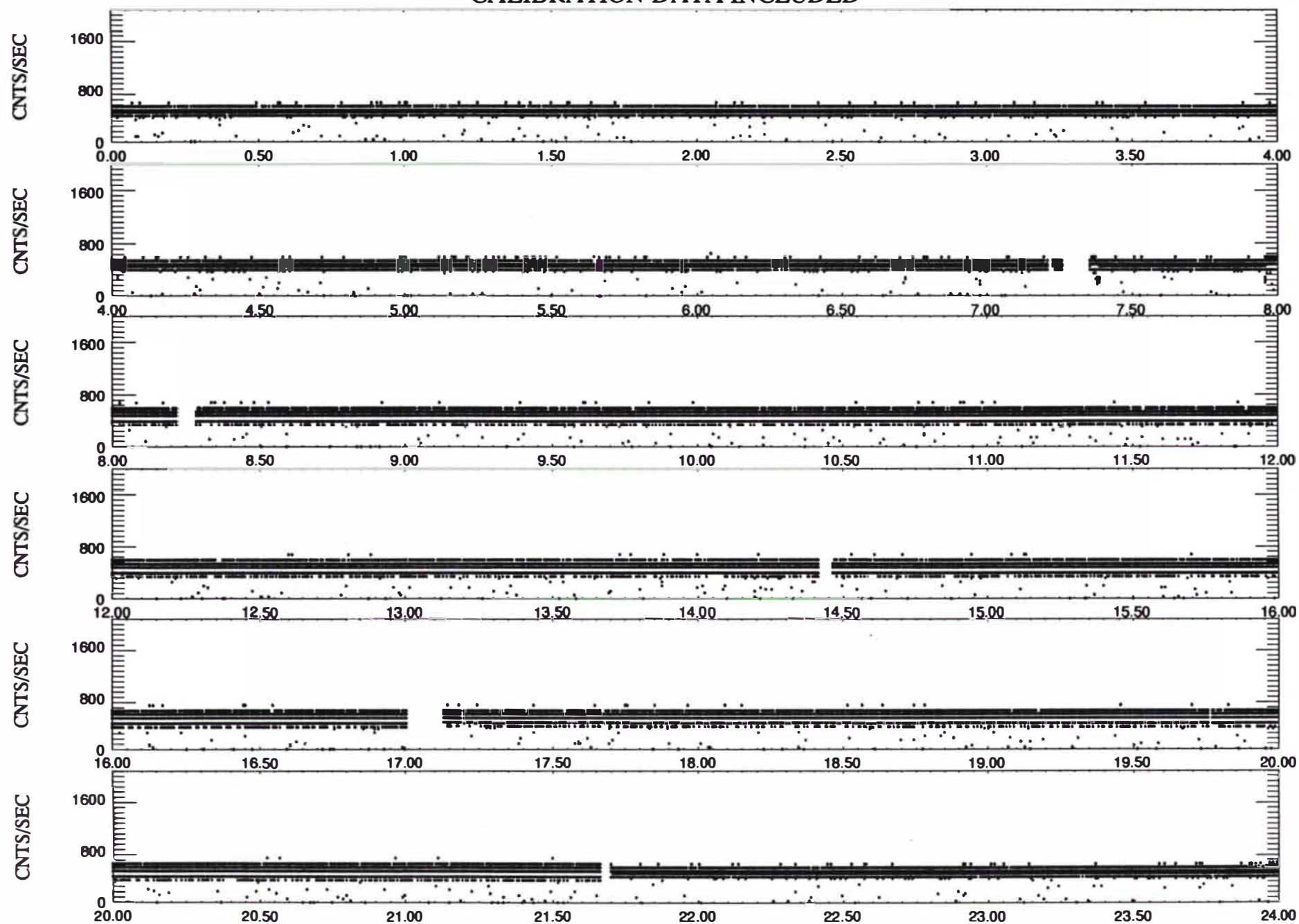
2 (0.5 - 4.0 Angstroms) Background not subtracted

NO BURST (12)

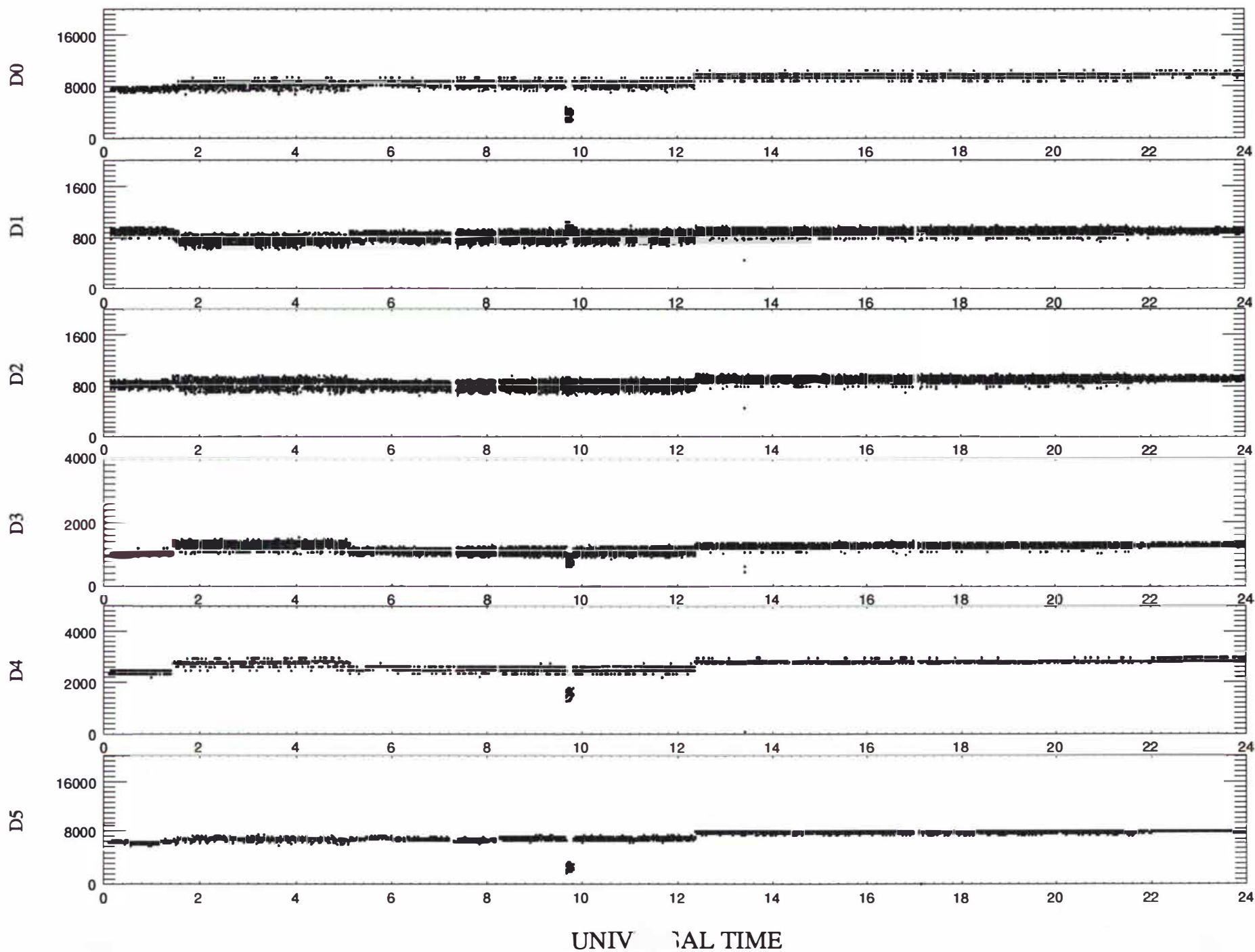


UNIV. AL TIME

CALIBRATION DATA INCLUDED



UNIVERSAL TIME



BATSE time corrected

Date: June 18 2002

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? **No**

2. BATSE Data

- ☐ 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. NEAR Data

- ☐ Final, correct time used? (Files postmarked vw@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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

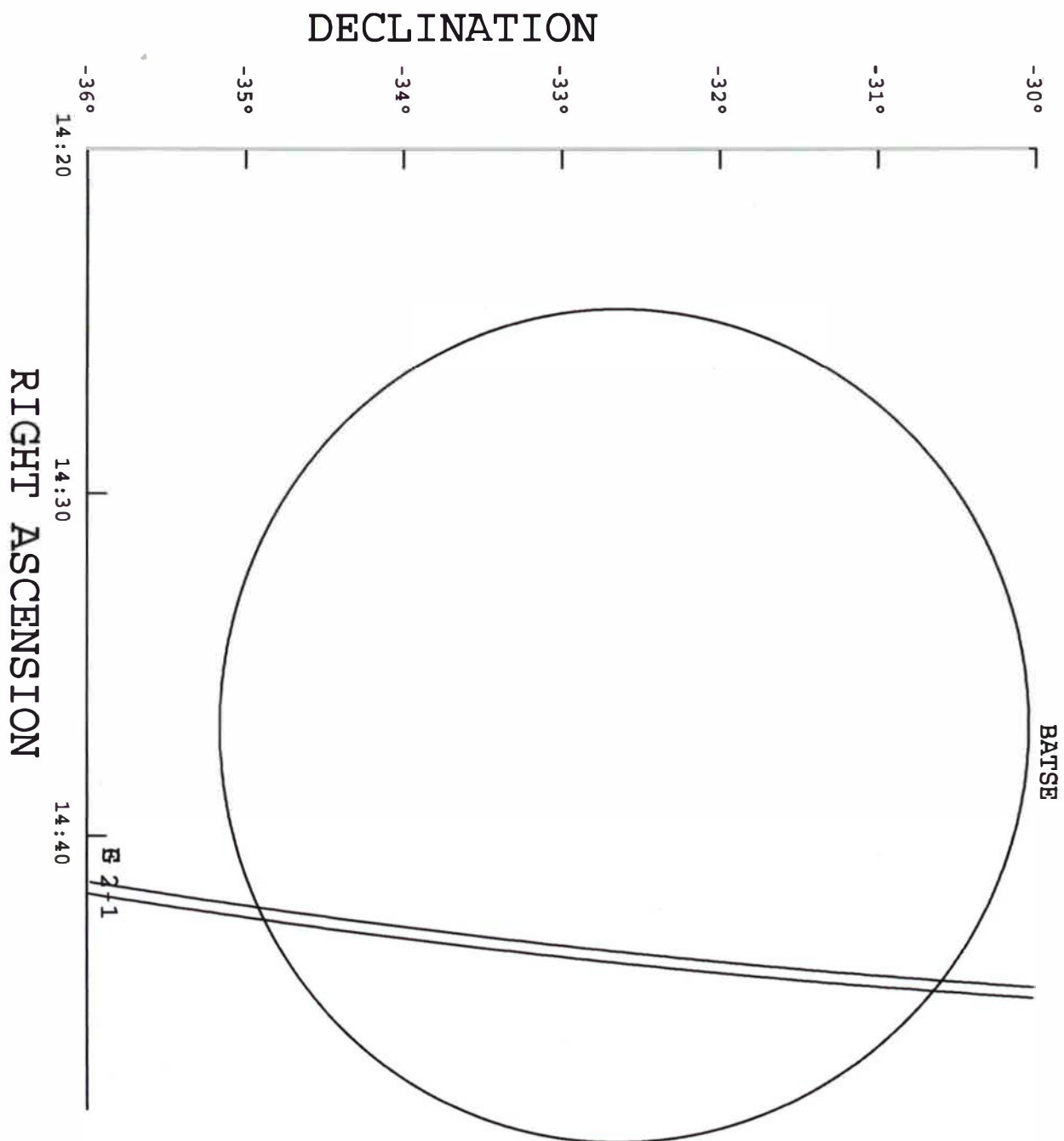
G=GALACTIC EQUATOR

1 BATSE

2 ULYSSES

EVENT OF JAN 18, 1993 17:53

18/ 6/ 2



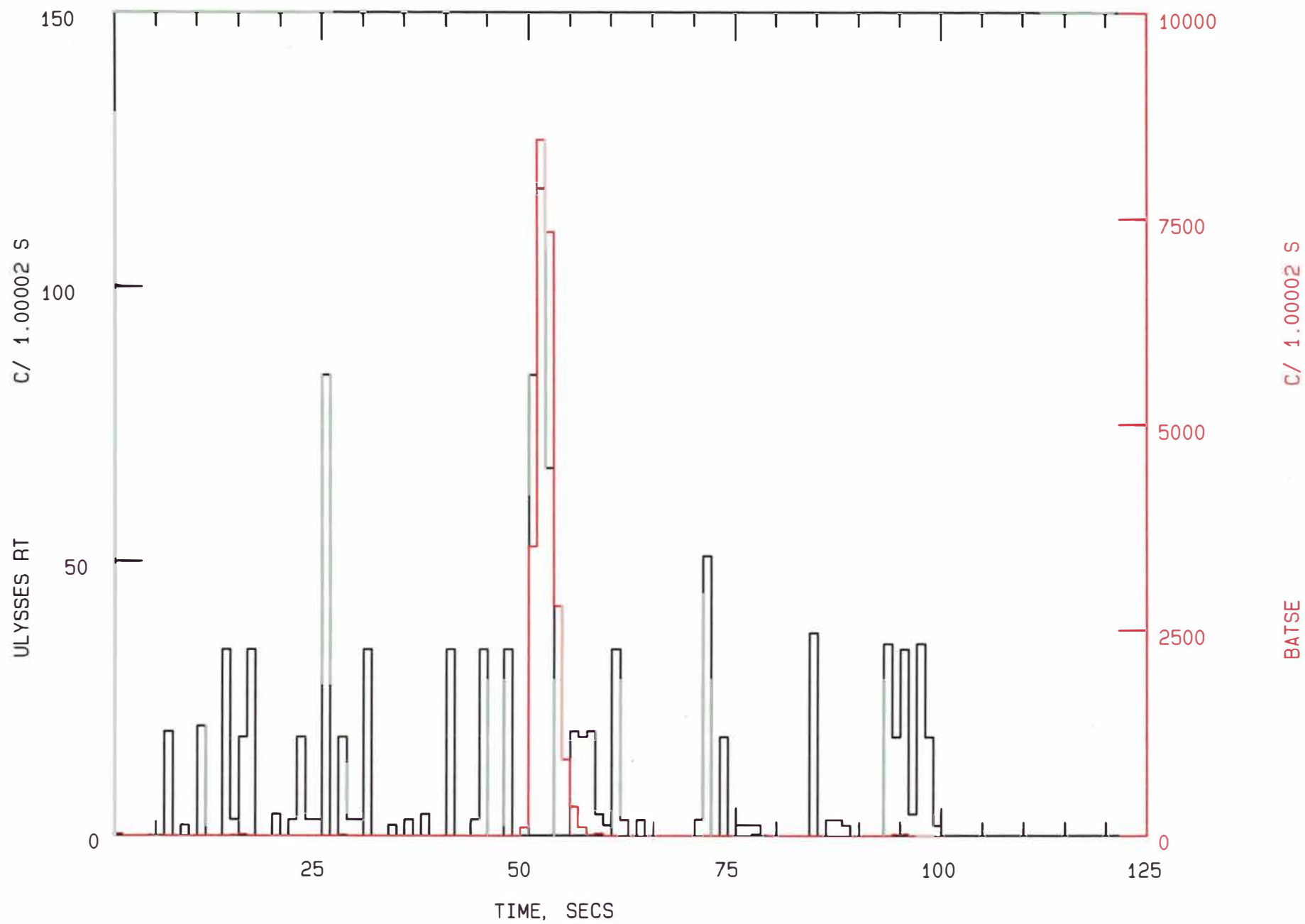
ULYSSES RT-BATSE

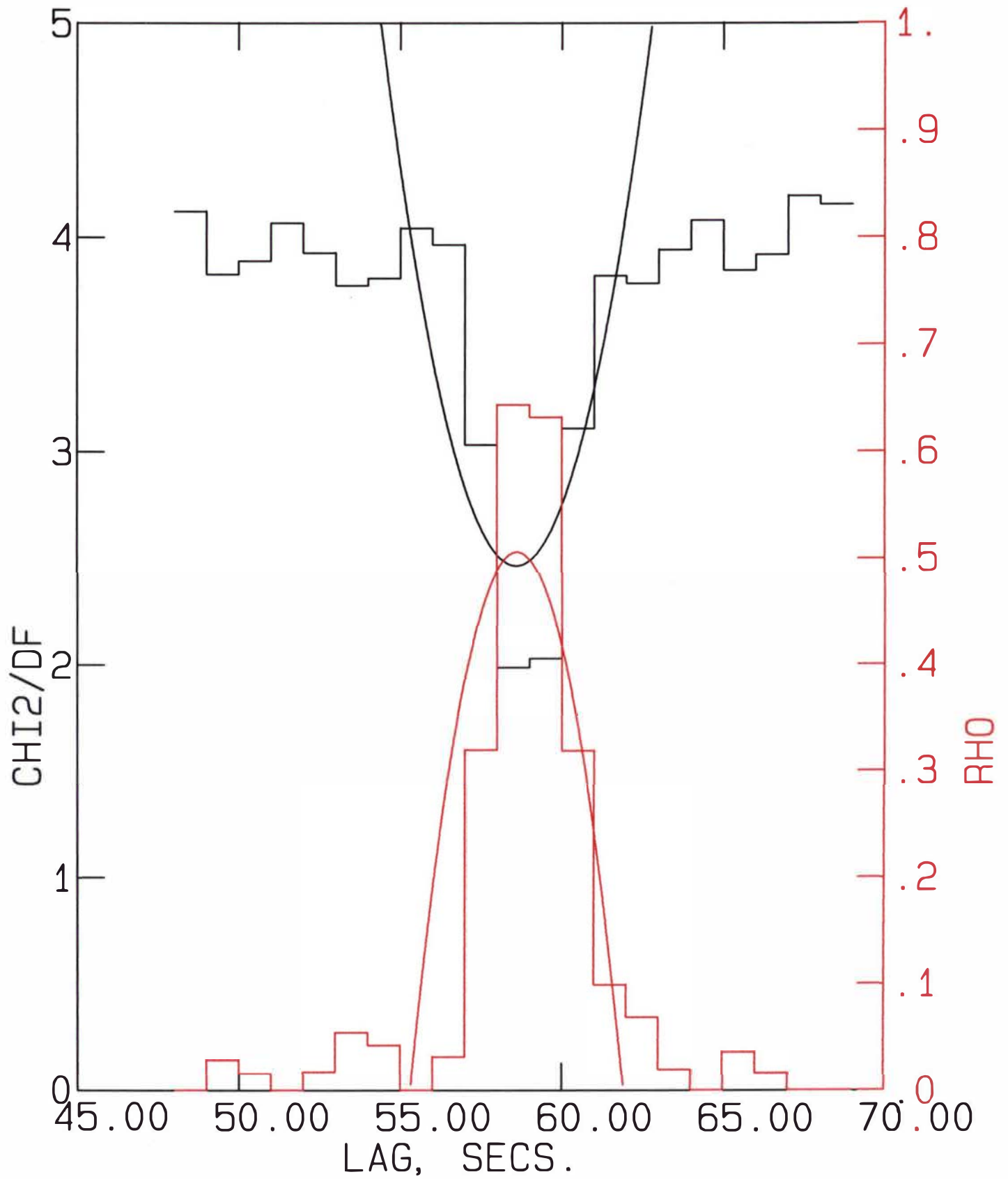
CORRELATION

18/ 1/93

63118.026

18/ 6/ 2

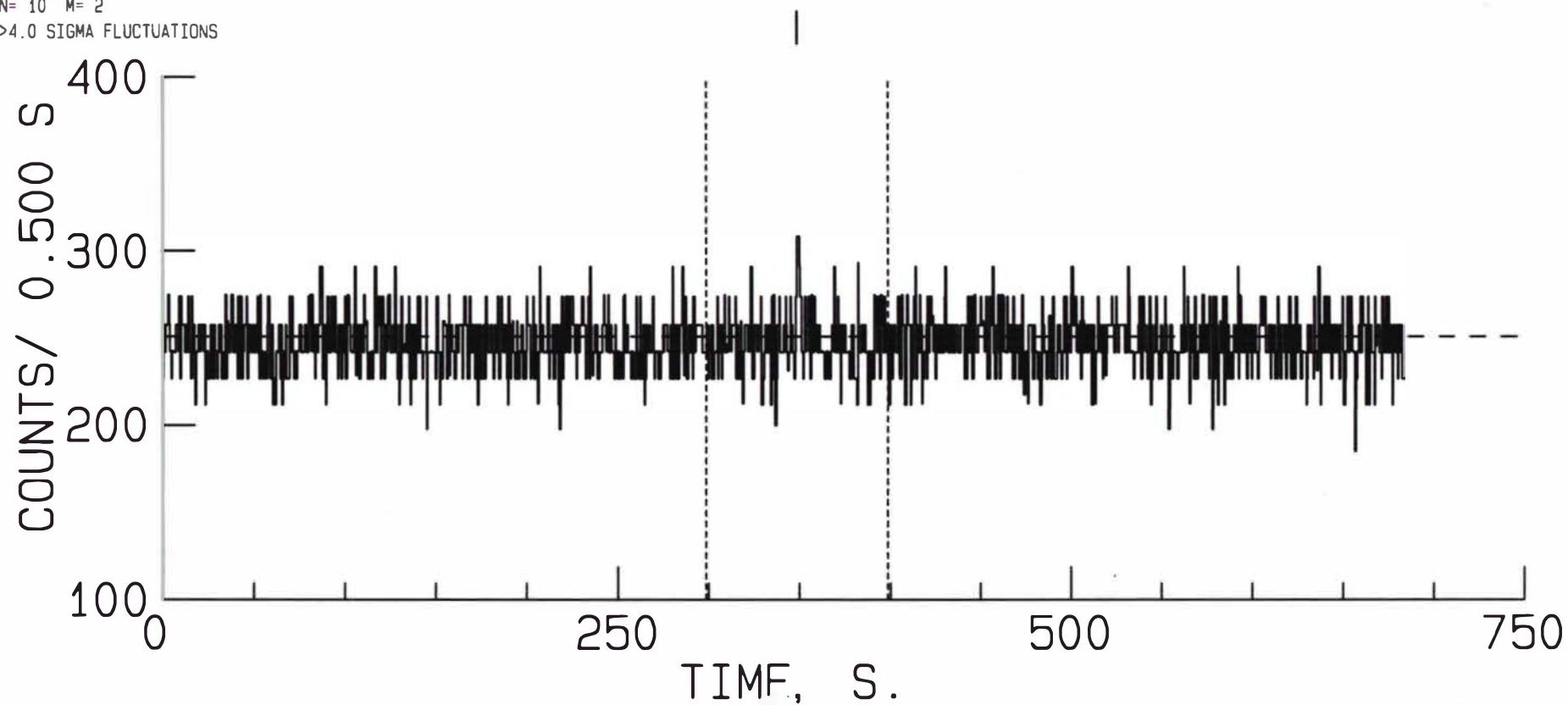




ULYSSES RT
18/ 1/93 62820.039 s
0.250 S INTERVALS REGROUPED BY 2
22- 148 keV

18/ 6/ 2

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



 BATSEARCH PROGRAM

BATSE BURST # 2137

EVENT OF 1993 JAN 18 DAY OF YEAR= 18

EVENT CROSSING TIME AT BATSE : 63898. S. OR 17:44:58.0

COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)

BURST ARRIVAL DIRECTION: 228.000 -34.000

BATSE PEAK COUNTING RATE: 0 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND

INTERPOLATED POSITION OF ULYSSES ON 13/ 1/ 93 IS:

RA= 163.356 DEC= -13.560 DIST= 4.403 AU

BATSE-ULYSSES DISTANCE = 686697556 KM

ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH BURST ARRIVAL DIRECTION=118.44 DEG.

LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1046.38 SECS.

CROSSING TIME AT ULYSSES IS 63852. S. OR 17:47:34.44 369.54 SECONDS

From HAGEDON@ssl.msfc.nasa.gov Wed Jan 20 09:51:04 1993

Date: Wed, 20 Jan 1993 11:45:39 -0600 (CST)

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: 1358

*Not in 2B catalog
 U-B annulus far off BATSE
 location. solar?*

*Yes - apparently -
 not in 3B either*

BATSE BURST TRIGGER

NO.: 02137

TIME: TJD=9005 SECONDS=63898

TYPE: FLARE

SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=106.7 AZIMUTH=299.4 ERROR= DEGREES

COMMENTS:

GOES B5.6 SOLAR FLARE. DUR.~15S.

SINGLE SPIKE BURST AT ~T+529S. DUR.~4S. BURST IS VISIBLE ABOVE 300KEV.

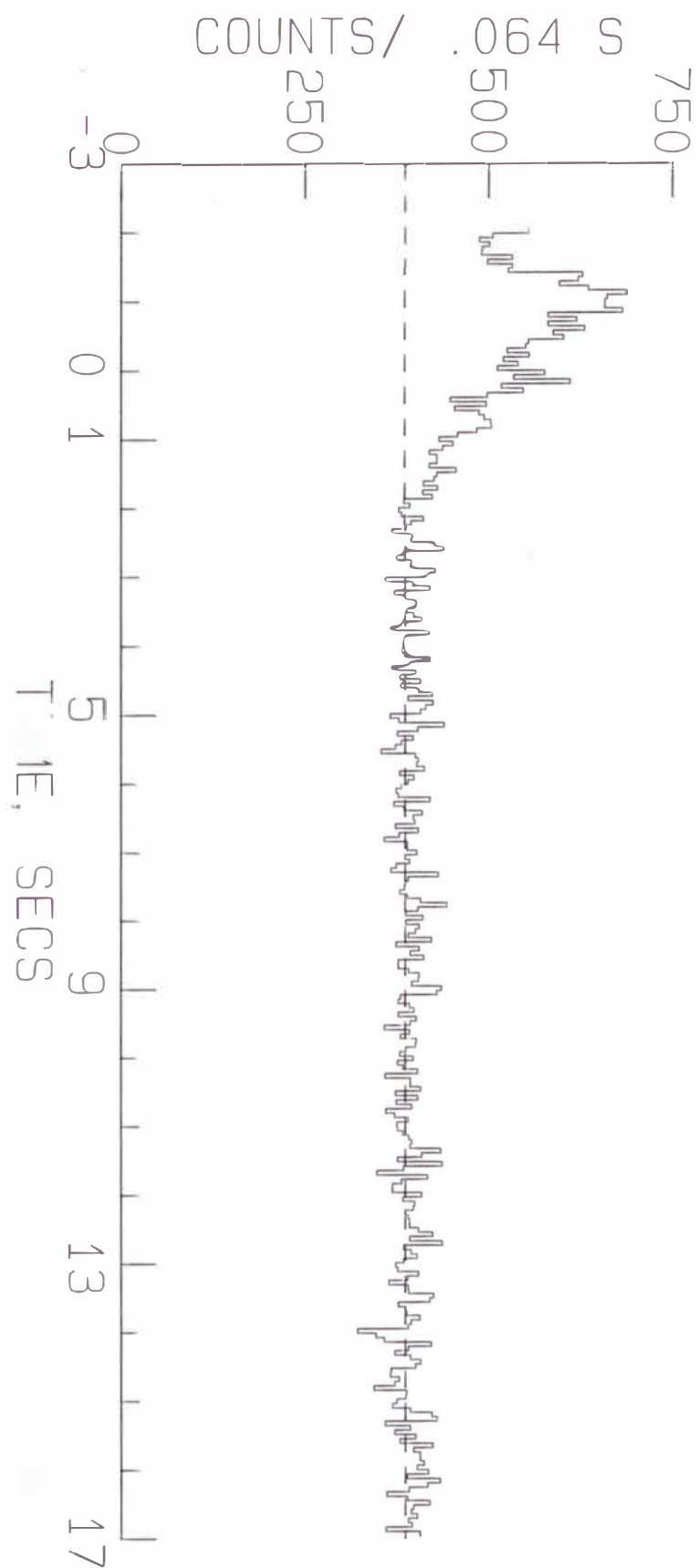
BURST DID NOT TRIGGER DUE TO LONG ACCUMULATION FOR THE FLARE.

BATSE

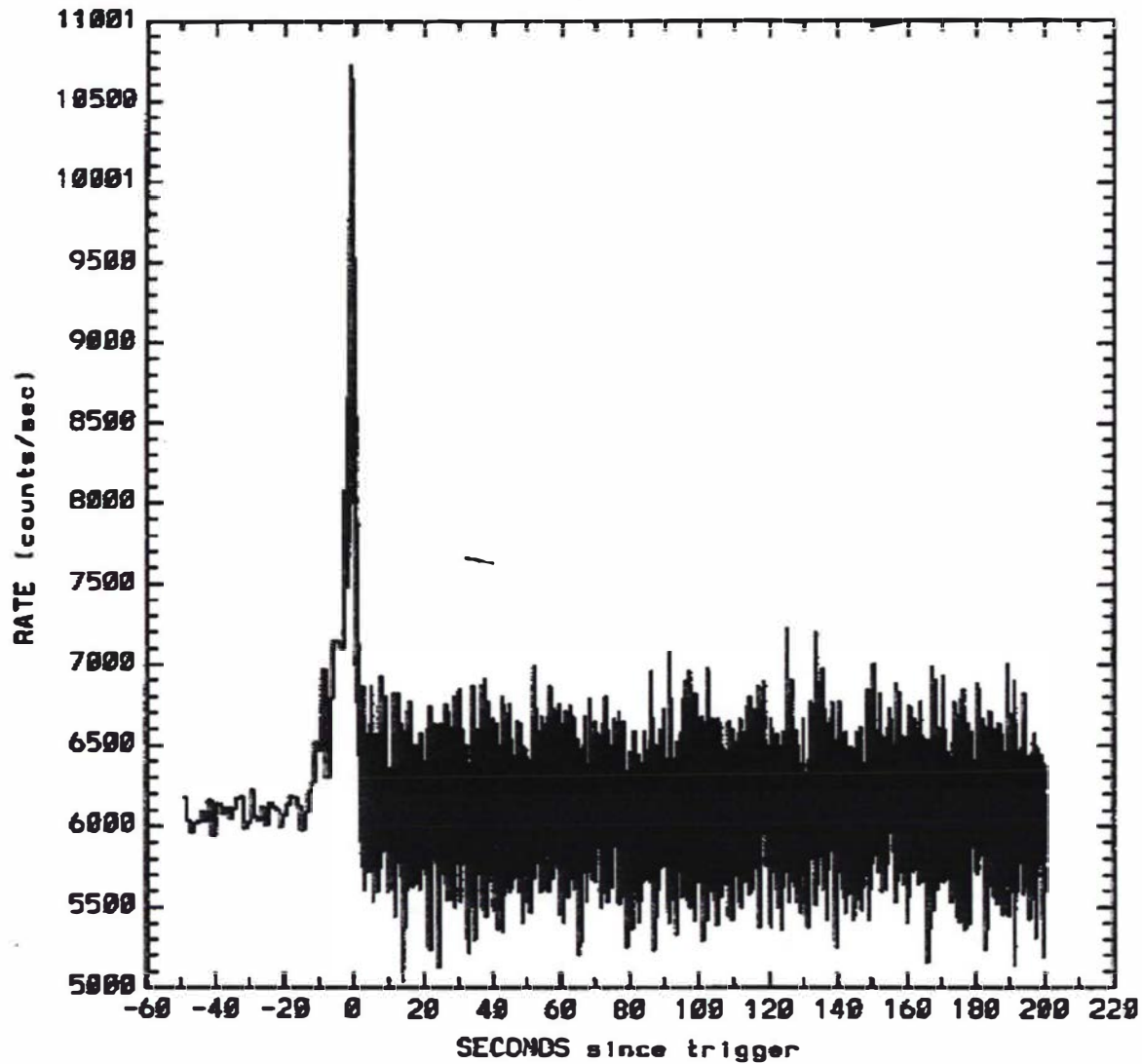
18/01/93

63898.242

25- 100 keV



Data for K. Hurley



15-APR-1993 13:58:36

Created by HQPS 80
(Burst Display)
Version 12.19

Trigger = 2137

Trigger Time:
9885 / 63898.242Burst Data Type:
OTSCSCDeadtime
Corrected: NBackground Data
Type: PREB + DISCLAMinimum Integ. Time:
8.064 secondsDetectors [7..8].
00001100Discriminators:
(1. 2)Quality Masl.
80ISP1

From lasilla%eso.uucp@germany.eu.net Wed Jan 20 04:19:55 1993
Date: Tue, 19 Jan 93 17:48:22-030
From: @space6.ssl.berkeley.edu:eso!lasilla@sunspot.ssl.berkeley.edu
To: khurley@space6.ssl.berkeley.edu
Subject: Follow up of bursts
Cc: kouveliotou@batse.dnet.nasa.gov
Content-Length: 501

Dear Kevin,
You may be aware of the burst of January 18
seen by BATSE. We would try to image the position,
but the error radius is twice big as the plate dimension.
I cannot consult the Ulysses database from here, but
is there any chance that the burst was seen by Ulysses and,
if yes, where does the ring cross the BATSE position
(there are technical problems here and it is unreasonable
to map the full error box. In addition there is a shortage of plates)

Best wishes
Michel

CC: C. Kouveliotou

COMPTEL/BATSE/IPN Burst Localizations

All Coordinates Epoch J2000.0

UB= Ulysses/BATSE		UP = Ulysses/PVO		BP= BATSE/PVO		BATSE Position						COMPTel Position				
		Center		Radius												
Burst	Rf	Ra	Dec	Raduis	(-/+)	D (AU)	Ra	Dec	lg	Smin	Rf	Ra	Dec	lg	Smin	
GRB910425	UB	1	115.140	23.172	51.733	0.053	2.848	91.29	-22.77	1.02	0.27	3	90.20	-22.20	0.92	0.28
GRB910503	UB	1	117.730	22.657	30.352	0.010	3.042	87.45	38.74	0.87	0.03	3	87.00	38.60	0.44	0.30
GRB910601	UB	1	307.038	-20.538	52.936	0.011	3.708	310.12	32.34	0.17	0.02	3	309.90	32.70	0.46	0.37
GRB910627	UB	1	134.824	18.425	66.820	0.031	4.215	197.99	-2.48	0.28	1.28	3	199.40	-5.00	1.63	0.96
	UP	1	133.523	18.792	68.352	0.036	3.621	-	-	-	1.53	-	-	-	-	0.71
GRB910709		NA	NA	NA	NA	NA	NA	172.77	81.67	2.31	NA	3	144.10	75.60	1.80	NA
GRB910814	UB	1	328.558	-13.966	45.699	0.018	4.918	346.35	30.43	0.48	1.89	3	343.80	29.50	0.39	0.19
	UP	1	328.287	-14.629	46.428	0.019	4.626	-	-	-	1.87	-	-	-	-	0.17
GRB911118	UB	1	166.979	6.889	30.110	0.017	4.972	167.03	-20.85	0.36	2.37	3	166.30	-22.50	1.11	0.71
	UP	1	162.619	8.562	32.018	0.019	4.248	-	-	-	2.29	-	-	-	-	0.75
	BP	1	190.131	-2.551	30.766	0.086	0.813	-	-	-	1.76	-	-	-	-	0.23
GRB920622	UB	1	150.167	6.667	41.335	0.009	5.800	162.1	47.17	0.31	0.43	3	162.50	49.20	0.81	2.44
GRB920627	UB	1	150.590	6.327	23.540	0.049	5.869	166.02	-2.58	0.65	5.74		166.80	-8.50	1.18	1.61
GRB920830	UB	1	338.192	0.949	86.268	0.018	?	258.53	-73.99	0.54	1.81	3	259.00	-74.50	1.35	1.78
GRB930118		NA	NA	NA	NA	NA	NA	228.40	-34.30	?	NA	4	221.80	-34.80	1.47	NA
GRB930131	UB	1	161.411	-14.563	22.256	0.011	4.218	182.04	-8.24	2.16	1.09	3	186.20	-7.90	1.77	2.93
GRB930309	UB	1	332.600	14.645	36.601	0.035	3.998	325.41	51.73	0.72	0.93	3	322.70	55.20	0.74	4.67
GRB930612	UB	1	143.974	-11.184	63.928	0.053	4.870	103.07	-69.76	0.4	0.07	3	106.50	-71.00	1.60	0.17
GRB930704	UB	1	146.146	-11.823	82.959	0.113	5.089	100.9	60.8	0.59	2.01	3	99.30	62.80	1.08	0.07
	BM	1	159.825	8.635	68.701	2.319	1.981	-	-	-	1.04	-	-	-	-	0.45
GRB931229		NA	NA	NA	NA	NA	NA	240.06	19.7	1.4	NA	3	241.90	21.00	2.35	NA
GRB940217	UB	1	328.736	51.947	69.334	0.050	3.038	29.07	4.55	0.69	0.84	3	30.10	3.10	0.32	0.94
GRB940301	UB	1	321.914	52.508	59.395	0.136	2.953	103.51	64.35	0.35	0.02	3	102.70	64.00	0.40	0.17
GRB940314	UB	1	314.850	51.972	64.530	0.220	?	354.86	-2.14	0.94	0.77	3	356.00	-1.40	1.43	0.92
GRB940520	UB	1	300.149	41.387	40.380	0.133	2.986	323.5	6.93	0.88	0.16	3	324.70	7.70	0.70	0.27
GRB940619	UB	1	303.998	39.140	69.375	0.211	3.039	299.05	-29.89	0.34	0.20	3	298.50	-31.50	1.15	1.44
GRB940708	UB	1	308.119	39.489	17.431	0.038	?	301.58	24.66	1.02	1.61	3	300.50	22.70	1.03	0.56
GRB940728	UB	1	133.614	-41.397	36.245	0.131	?	85.49	-39.87	1.44	0.17	3	85.10	-38.00	1.10	0.75
GRB940921	UB	2	155.516	-55.210	54.361	0.121	2.583	196.59	-18.71	?	6.49	4	207.10	-16.40	0.68	0.75
GRB941017		NA	NA	NA	NA	NA	NA	302.63	11.10	?	NA	4	301.70	13.30	2.10	NA
GRB950208	UB	2	334.715	-27.012	83.397	0.022	2.301	337.06	54.19	?	2.17	4	344.80	56.00	1.95	0.05
GRB950421	UB	2	177.048	-19.097	81.048	0.226	2.171	71.92	-63.03	?	1.41	4	70.10	-61.70	1.43	0.11
GRB950425	UB	2	178.121	-21.566	17.005	0.207	2.154	163.16	-35.21	?	1.90	4	164.90	-33.80	0.34	0.11
GRB950522	UB	2	7.656	42.578	86.989	0.063	2.039	109.57	19.31	?	1.60	4	110.81	20.34	1.14	1.47
1 Hurley, K. et al Huntsville workshop (1995)							Smin = minimum distance between point and IPN annulus									
2 BACODINE/IPN burst alert messages (Hurley)																
3 BATSE 3B Catalog																
4 Meegan, C. Priv. Comm. (Trigger Messages)																

=====													
UB= Ulysses/BATSE UP = Ulysses/PVO BP= BATSE/PVO							BATSE Position				COMPTTEL Position		
=====													
=====													
Center Radius													

Burst	Rf	Ra	Dec	Radius	(-/+)	D(AU)	Ra	Dec	lsig	Rf	Ra	Dec	lsig

GRB910425 UB	1	115.140	23.172	51.733	0.053	?✓	92.40	-18.60	4.11	6	90.20	-22.20	1.28
GRB910503 UB	1	117.730	22.657	30.352	0.010	?✓	87.20	37.60	4.04	6	87.00	38.60	0.54
GRB910601 UB	1	307.038	-20.538	52.936	0.011	3.708	311.40	33.70	4.07	6	309.90	32.70	0.49
GRB910627 UB	2	134.824	18.425	66.820	?	?✓	200.00	-3.20	4.01	6	199.40	-5.00	1.90
UP	2	133.523	18.792	68.352	?	?✓	-	-	-	-	-	-	-
GRB910709	NA	NA	NA	NA	NA	NA	64.20	50.00	15.03	6	144.10	75.60	2.41
GRB910814 UB	2	328.558	-13.966	45.699	0.018	4.918	352.10	32.30	4.03	6	343.80	29.50	0.47
UP	2	328.287	-14.629	46.428	0.019	4.626	-	-	-	-	-	-	-
GRB911118 UB	2	166.979	6.889	30.110	?	?✓	165.00	-15.60	4.06	6	166.30	-22.50	1.35
UP	2	162.619	8.562	32.018	?	?✓	-	-	-	-	-	-	-
BP	2	190.131	-2.551	30.766	?	?✓	-	-	-	-	-	-	-
GRB920622 UB	8	150.167	6.667	41.335	0.003	?✓	156.30	44.90	4.00	9	162.50	49.20	1.01
GRB920830	NA	NA	NA	NA	NA	NA	258.50	-73.40	4.03	9	259.00	-74.50	1.46
GRB930118	NA	NA	NA	NA	NA	NA	228.40	-34.30	?	7	221.80	-34.80	1.54
GRB930131 UB	3	161.411	-14.563	22.256	0.011	4.218	184.30	-10.90	4.05	9	186.20	-7.90	1.86
GRB930309 UB	8	332.600	14.645	36.601	0.033	?✓	327.10	49.20	4.03	9	322.70	55.20	0.94
GRB930612 UB	8	143.974	-11.184	63.928	0.053	4.870	114.00	-66.70	?	7	106.50	-71.00	1.61
GRB930704 UB	8	146.146	-11.823	82.959	0.114	5.089	90.30	59.40	?	7	99.30	62.80	1.22
GRB931229	NA	NA	NA	NA	NA	NA	230.60	20.00	?	7	241.90	21.00	2.66
GRB940217 UB	4	328.725	51.950	69.330	0.050	?✓	27.90	5.10	?	7	30.10	3.10	0.38
GRB940301 UB	5	321.913	52.508	59.260	0.150	?✓	103.00	64.30	?	7	102.70	64.00	0.42
GRB940314	NA	NA	NA	NA	NA	NA	353.60	-1.20	?	7	355.60	-1.20	1.54
GRB940520 UB	8	300.149	41.387	40.380	0.133	2.986	339.80	-15.82	?	7	324.60	73.76	1.18
GRB940619 UB	8	303.998	39.140	69.375	0.211	3.039	298.70	-33.29	?	7	297.70	-31.90	1.38

GRB940708	?	?	?	?	?	?	301.52	24.92	?	7	300.30	22.70	1.04
GRB940728✓	?	?	?	?	?	?	86.43	-39.76	?	7	85.00	-37.80	1.08
=====													

1 Hurley, K. et al Huntsville workshop (1994)

2 Cline, T. et al Compton Symposium (1993)

3 Hurley, K. et al Huntsville workshop (1994)

4 Hurley, K. et al IAUC 5940 (1994)

5 Hurley, K. et al IAUC 5944 (1994)

6 Fishman, G. et al ApJS 92 229-284 (1994)

7 Meegan, C. Priv. Comm. (Trigger Messages)

8 Hurley, K. Priv. Comm.

9 GROSSC Online BATSE 2B Catalog

From root Wed Aug 10 08:12 1994
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA02206; Wed, 10 Aug 94 08:12:52
Received: by comptel.unh.edu (4.1/SMI-4.1)
id AA12702; Wed, 10 Aug 94 11:23:36 EDT
From: mkippen@comptel.unh.edu (R Marc Kippen)
Message-Id: <9408101523.AA12702@comptel.unh.edu>
Subject: COMPTEL/IPN bursts
To: khurley@space6.ssl.berkeley.edu (Hurley)
Date: Wed, 10 Aug 1994 11:23:35 -0400 (EDT)
X-Mailer: ELM [version 2.4 PL23]
Mime-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Content-Length: 4437
Status: R

Kevin,

As promised, enclosed is a list of all the bursts which have been localized by COMPTEL since the start of its mission. The COMPTEL part is complete and up-to-date. Only unambiguous detections are included (>3.5 sigma), thus some questionable events you may have seen in the past are absent.

Included are all the IPN annuli I have knowledge of. Any updates/additions/corrections you could offer would be greatly appreciated. In particular, I am interested in the inter-spacecraft distances and multiple spacecraft measurements which are absent in some cases.

Best regards,

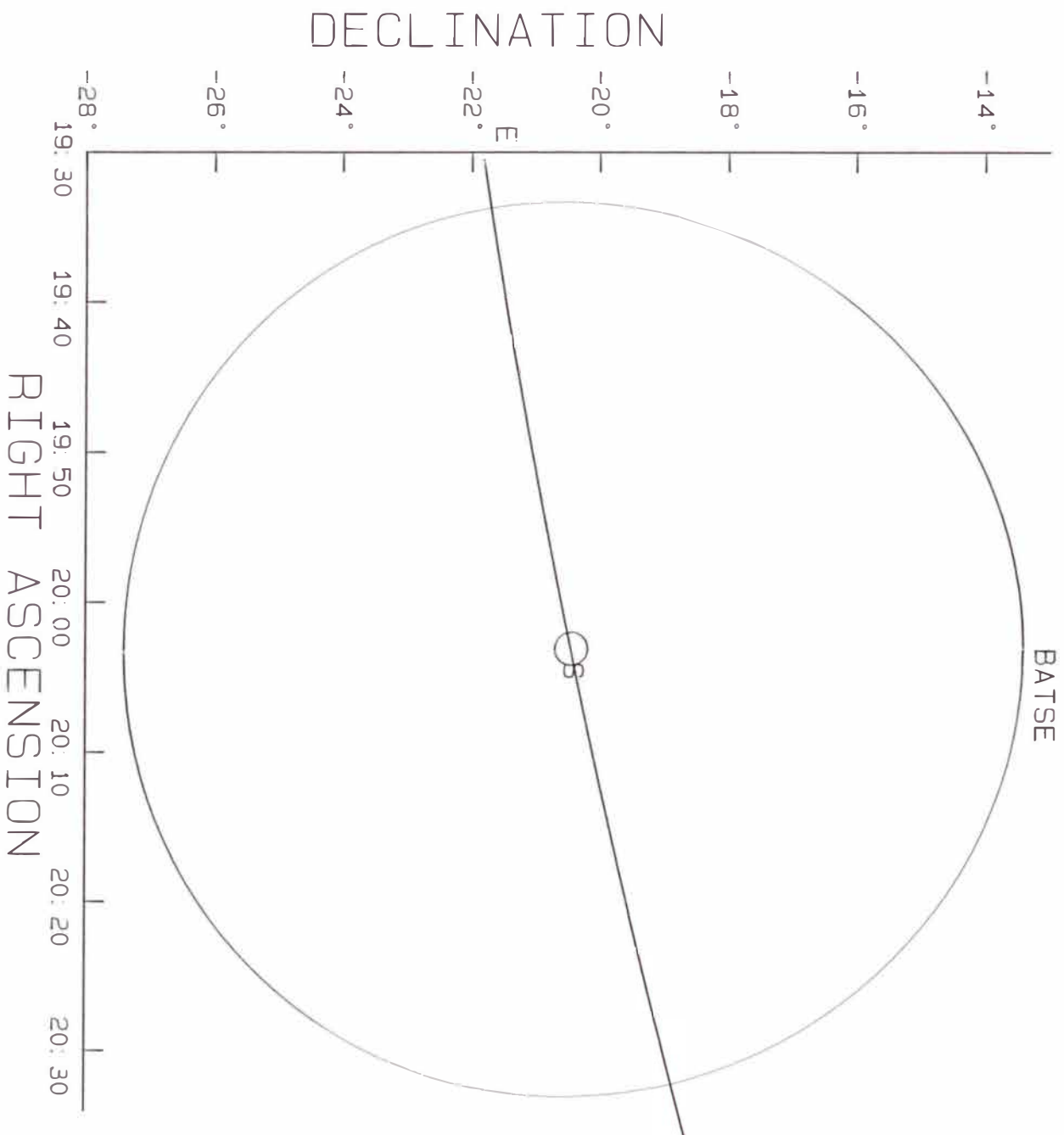
Marc

R. Marc Kippen	Internet: rmkippen@unh.edu
Space Science Center / Morse Hall	
University of New Hampshire	Phone : (603) 862-4703
Durham, NH 03824	FAX : (603) 862-4685

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

EVENT OF JAN 18, 1993 17:32

6 / 6/95



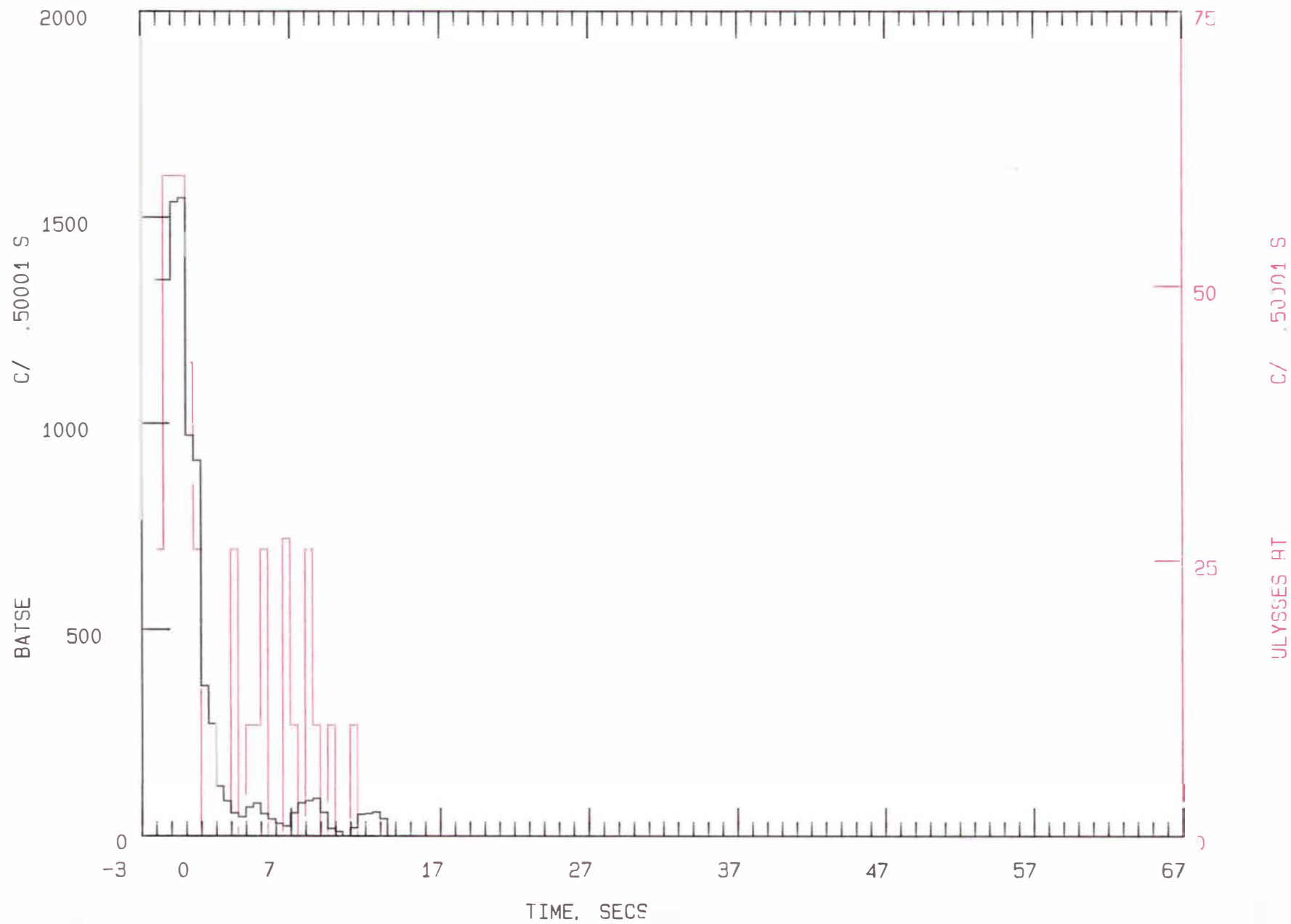
BATSE

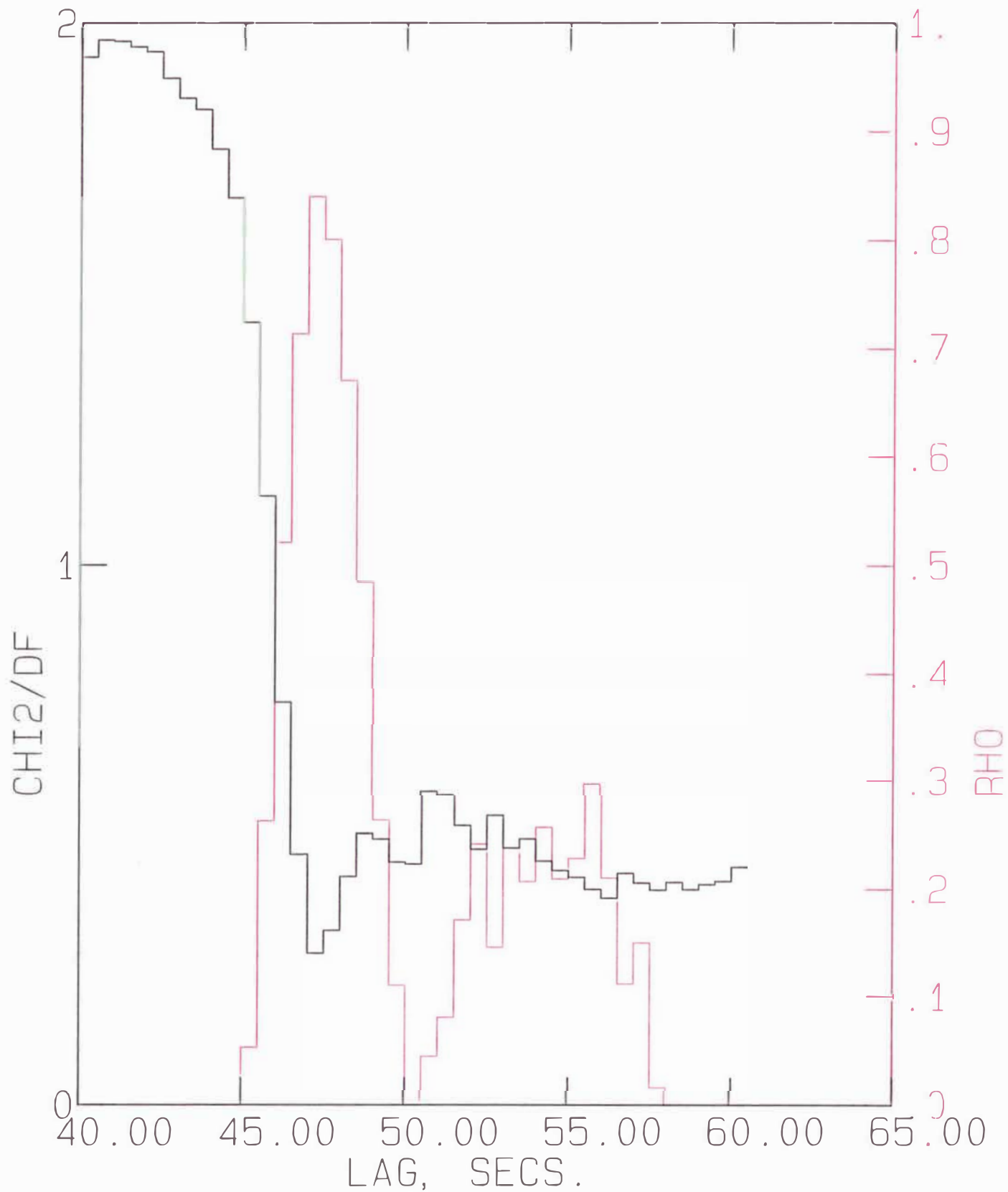
-ULYSSES RT CORRELATION

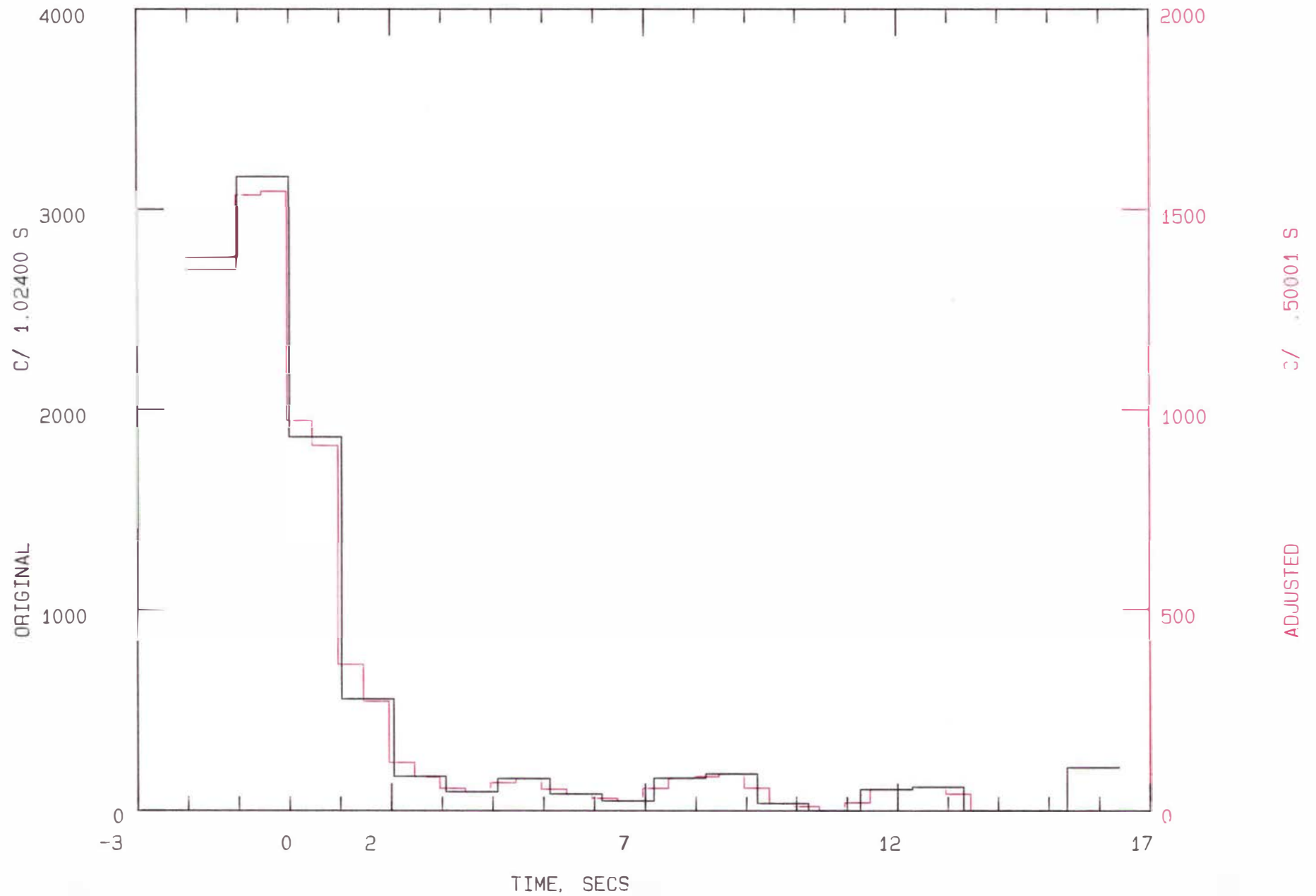
18/ 1/93

63898.242

6/ 6/95







ULYSSES RT

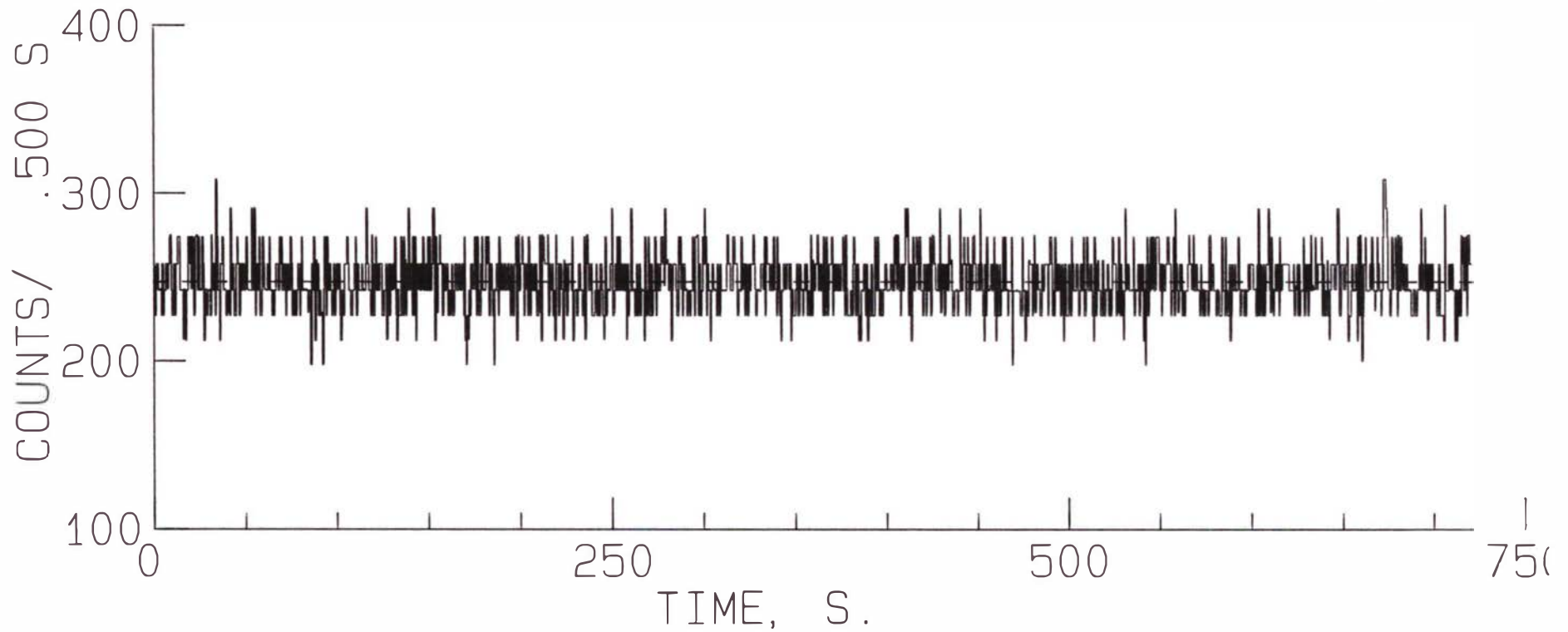
6/ 6/95

18/ 1/93 62496.035 s

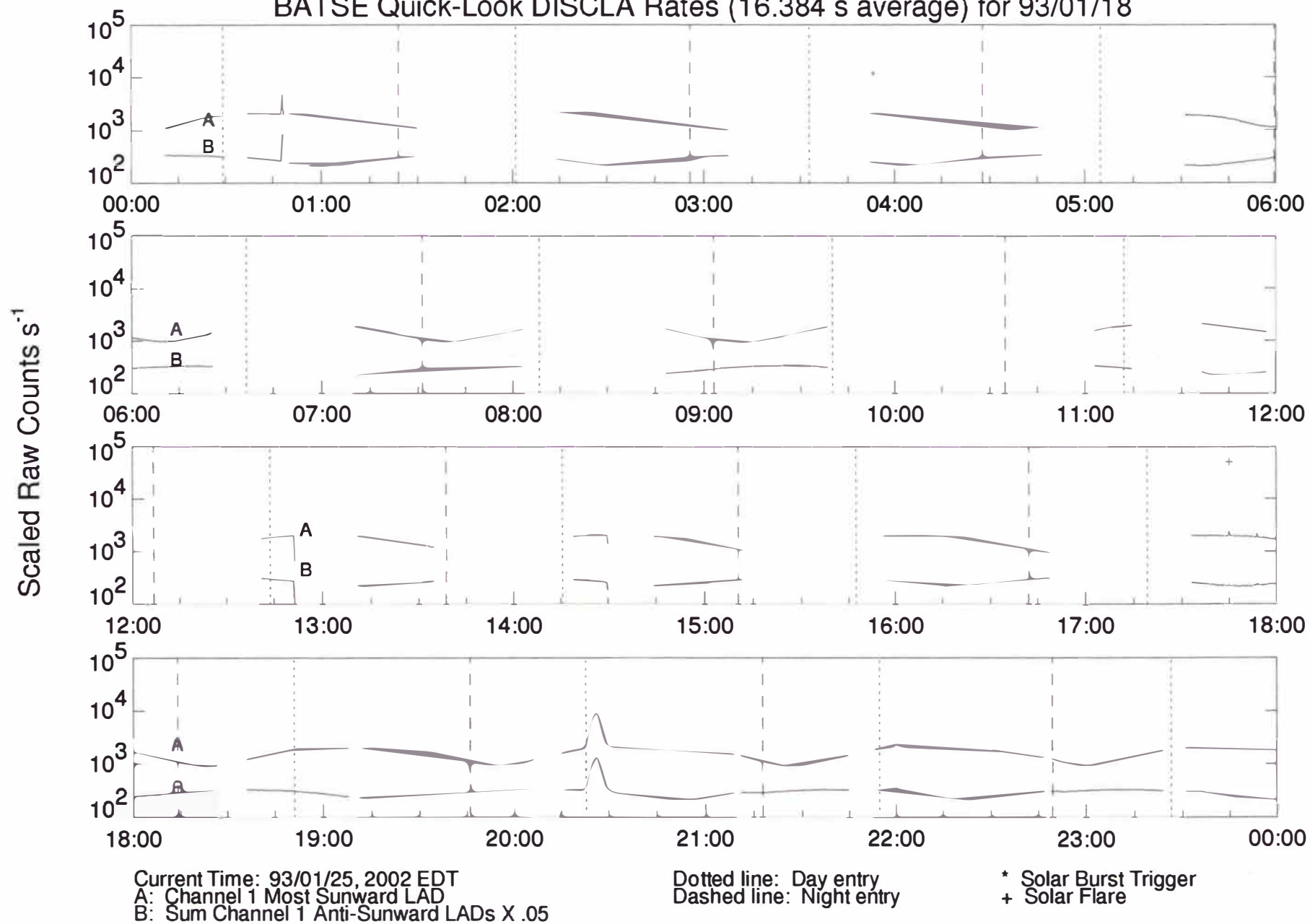
.250 S INTERVALS REGROUPED BY 2

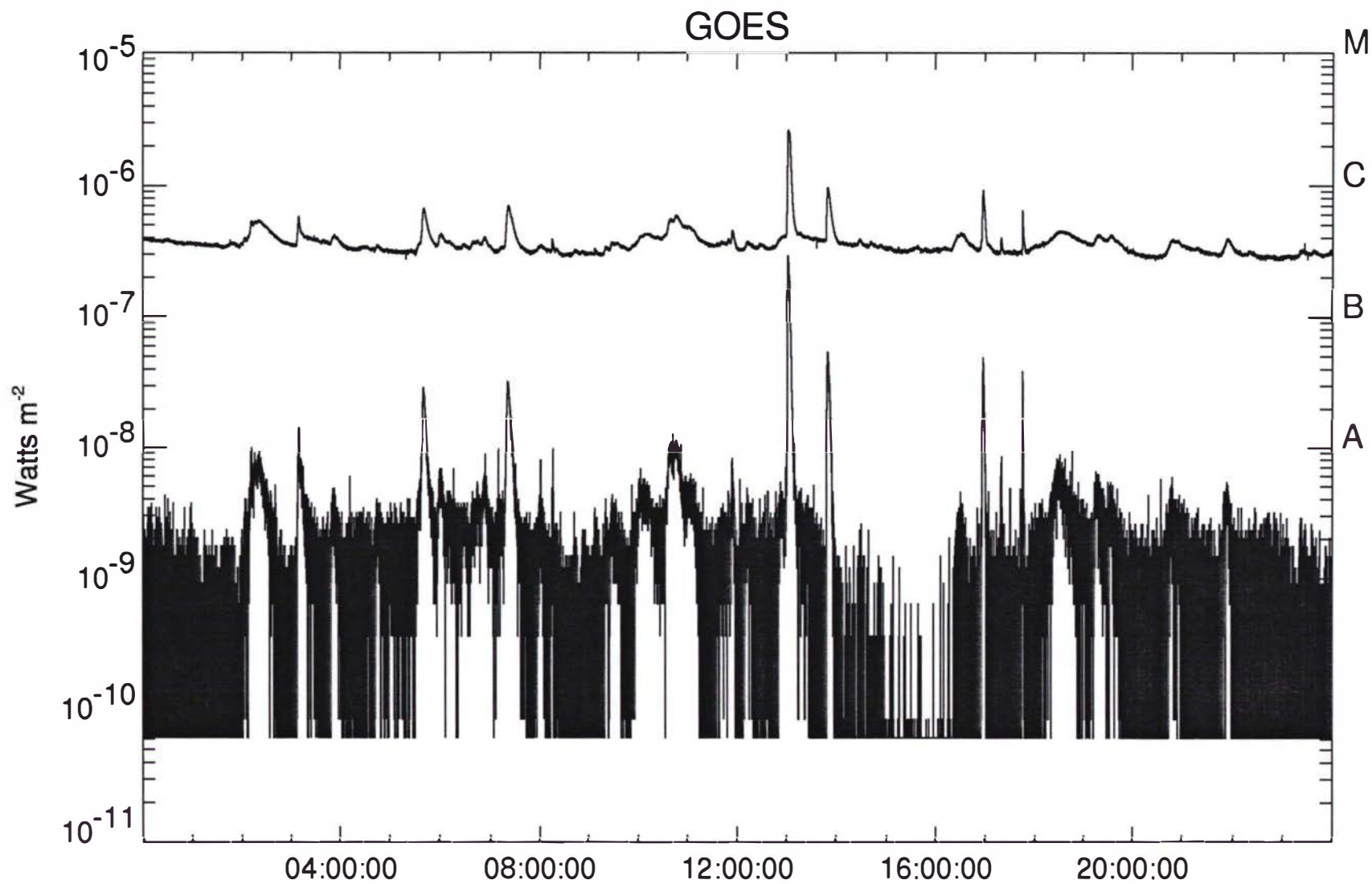
22- 148 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/18





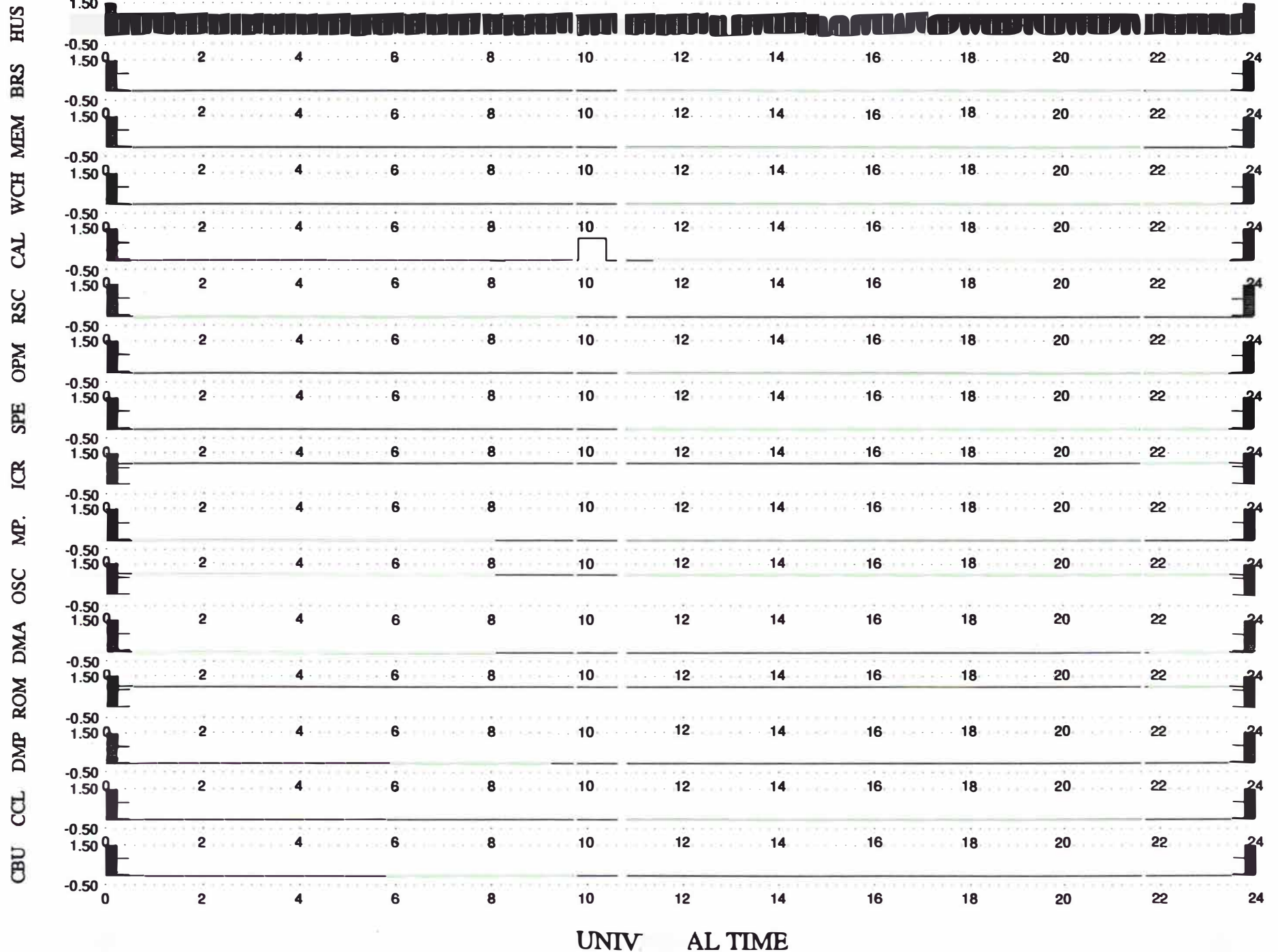
Data Start: 93/01/18, 0000:01

Plot created: 95/05/31, 2219

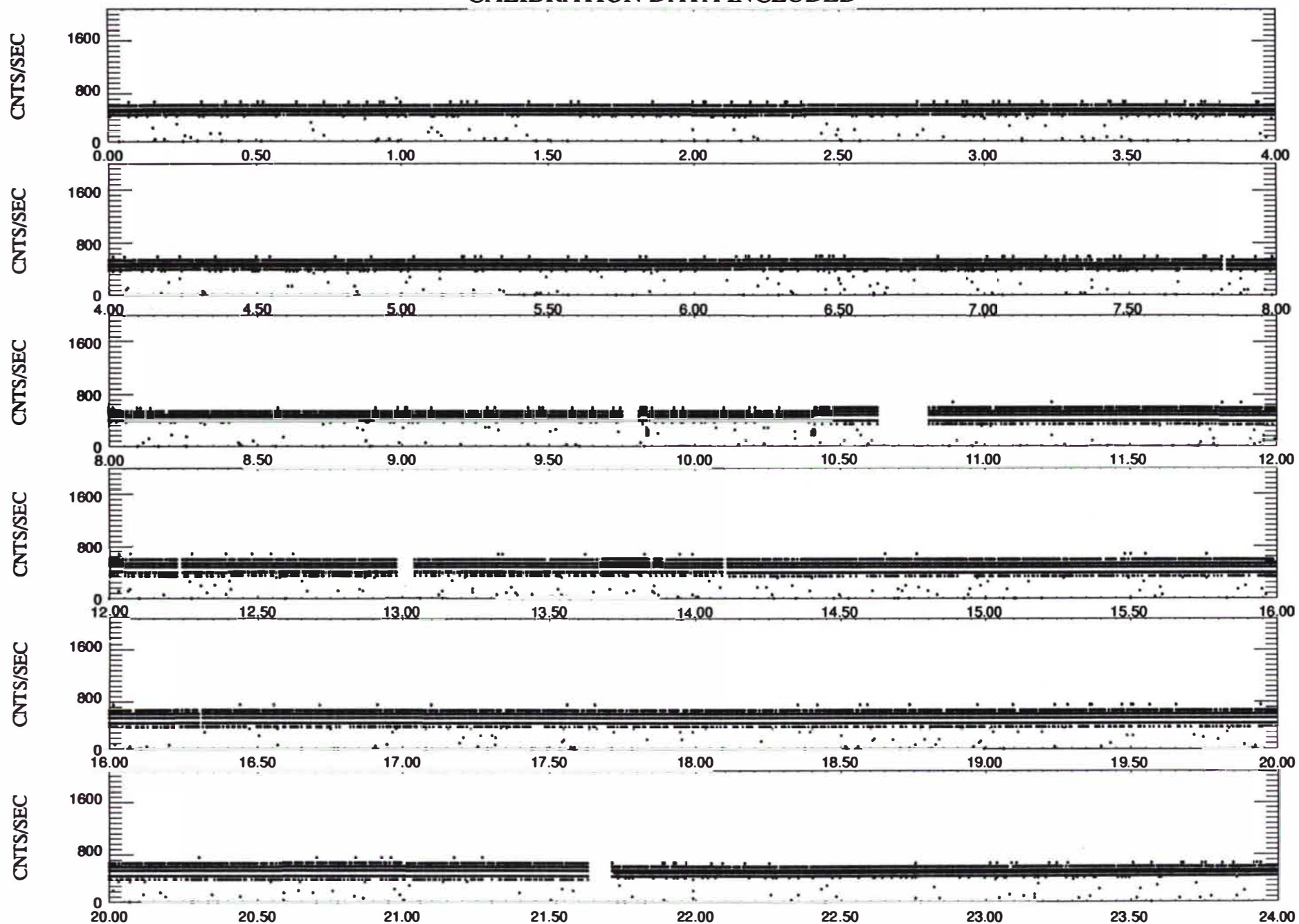
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

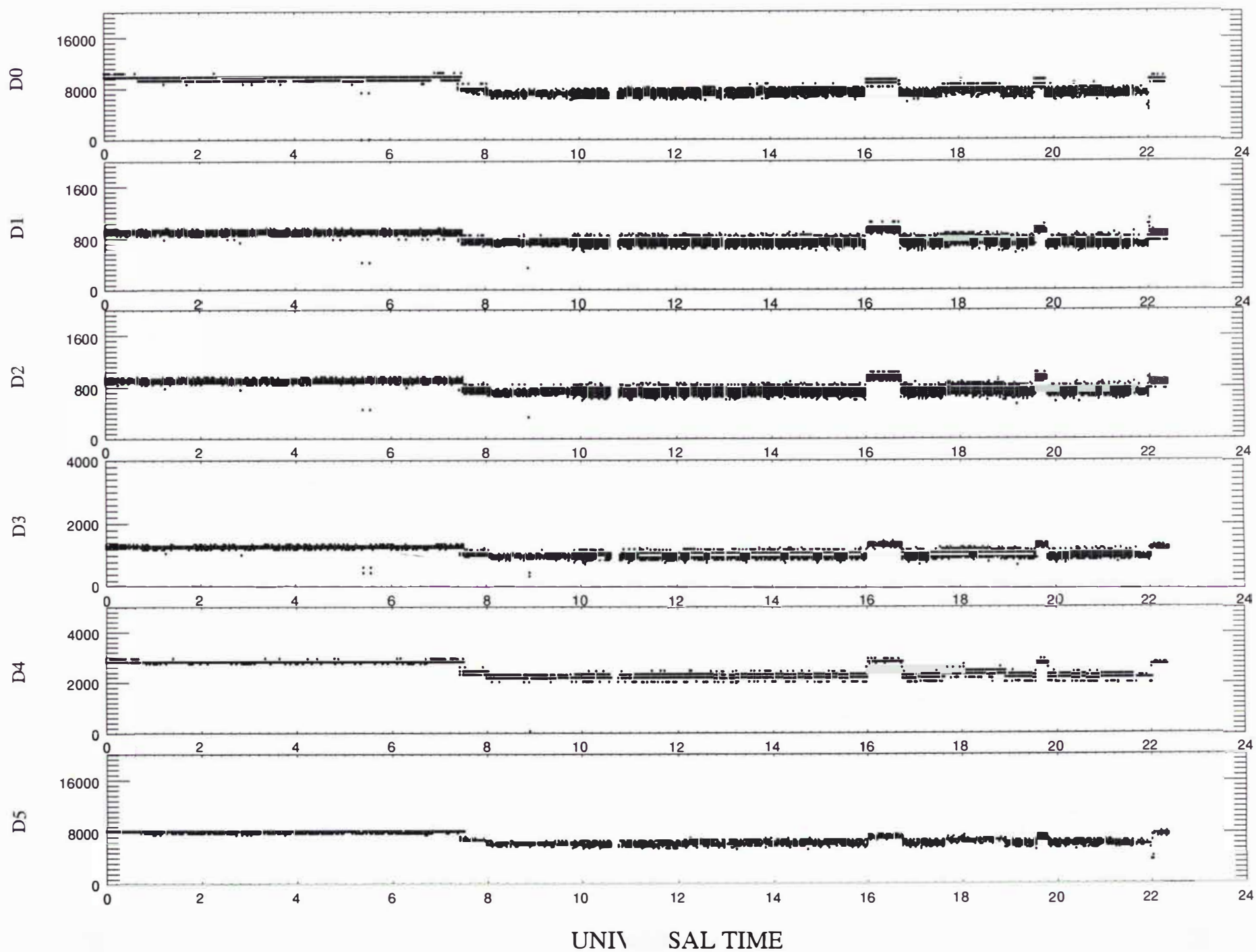
NO BURST (12)



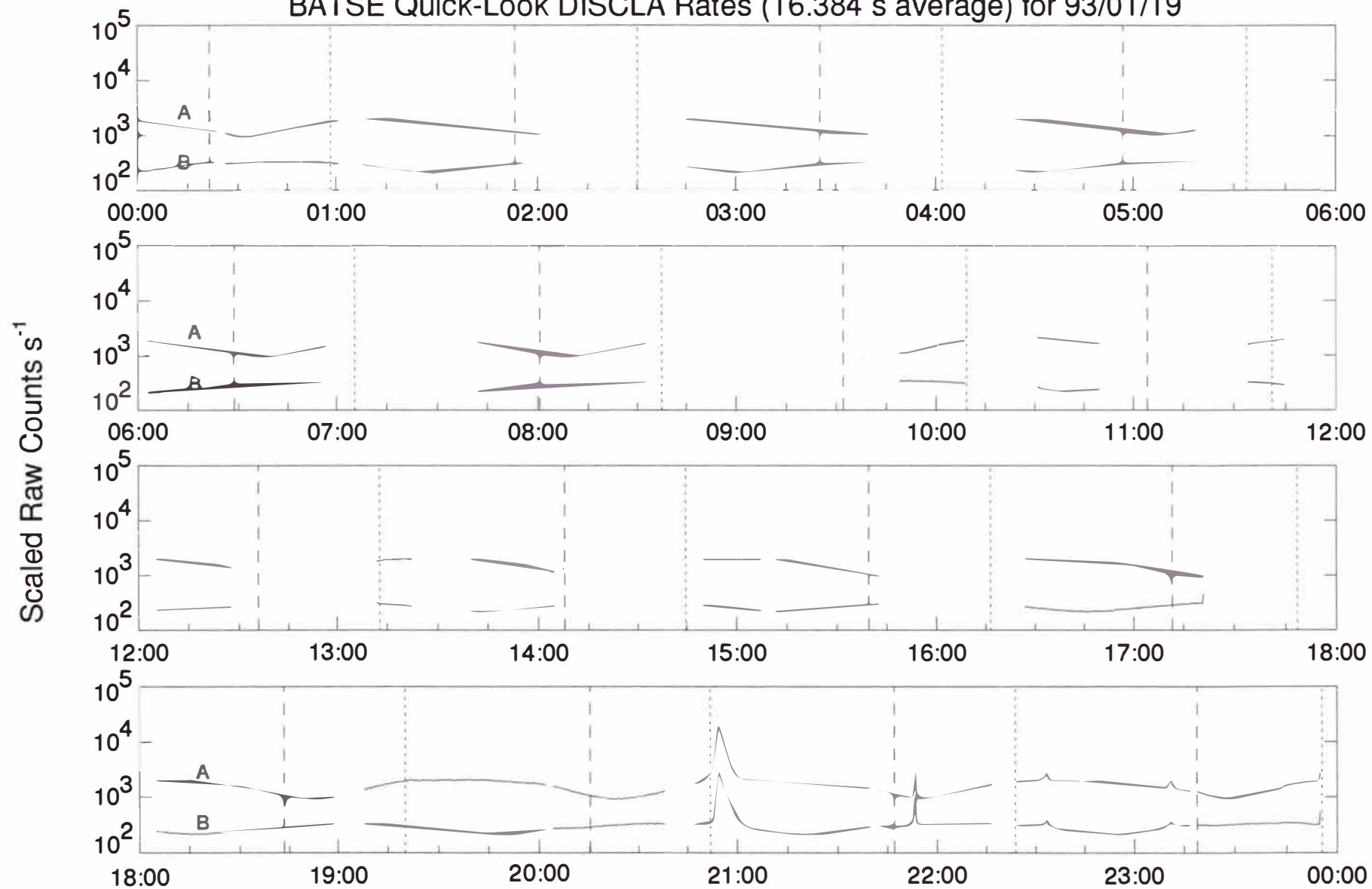
CALIBRATION DATA INCLUDED



UNIV AL TIME



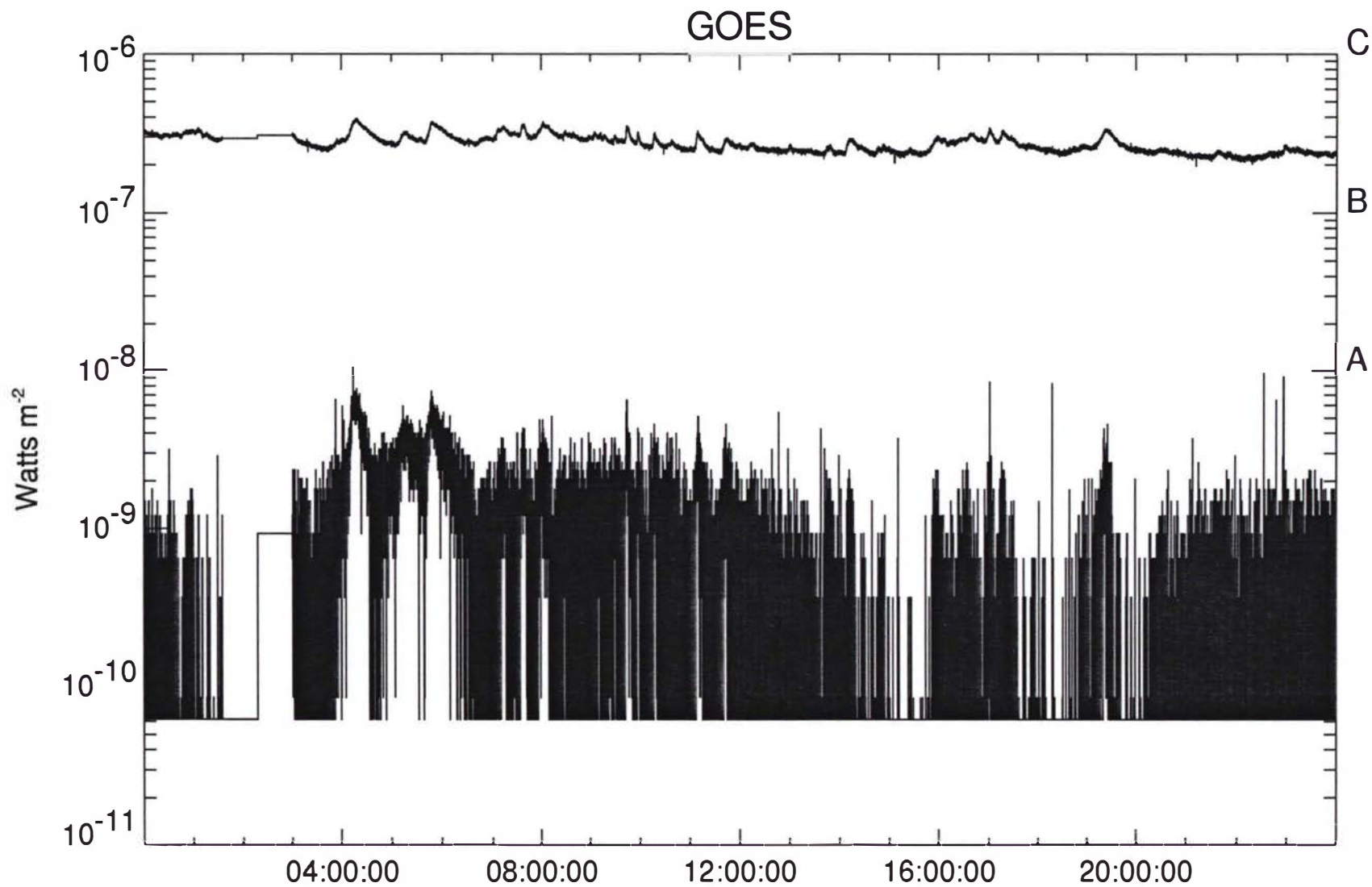
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/19



Current Time: 93/01/25, 2003 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



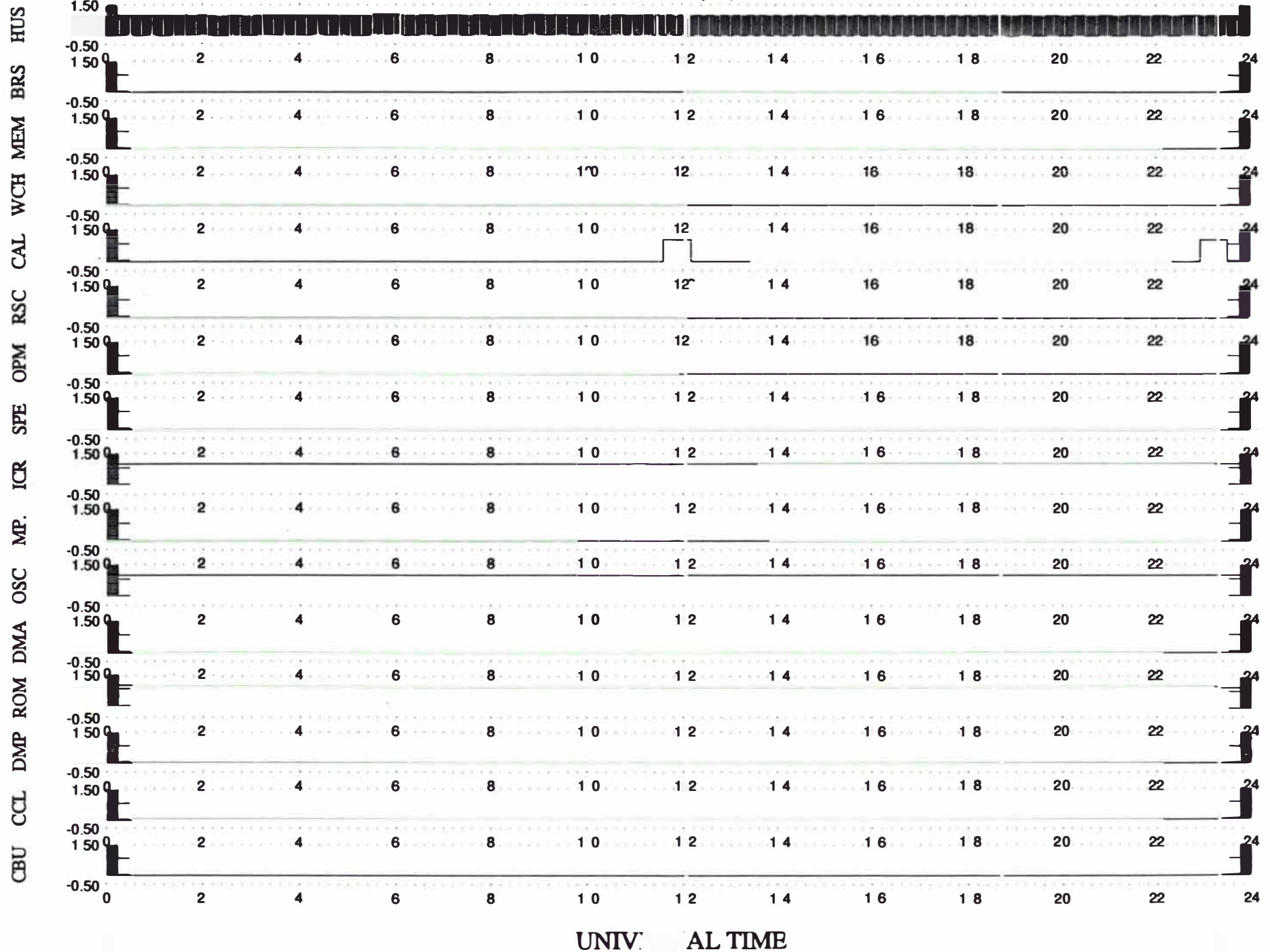
Data Start: 93/01/19, 0000:01

Plot created: 95/05/31, 2221

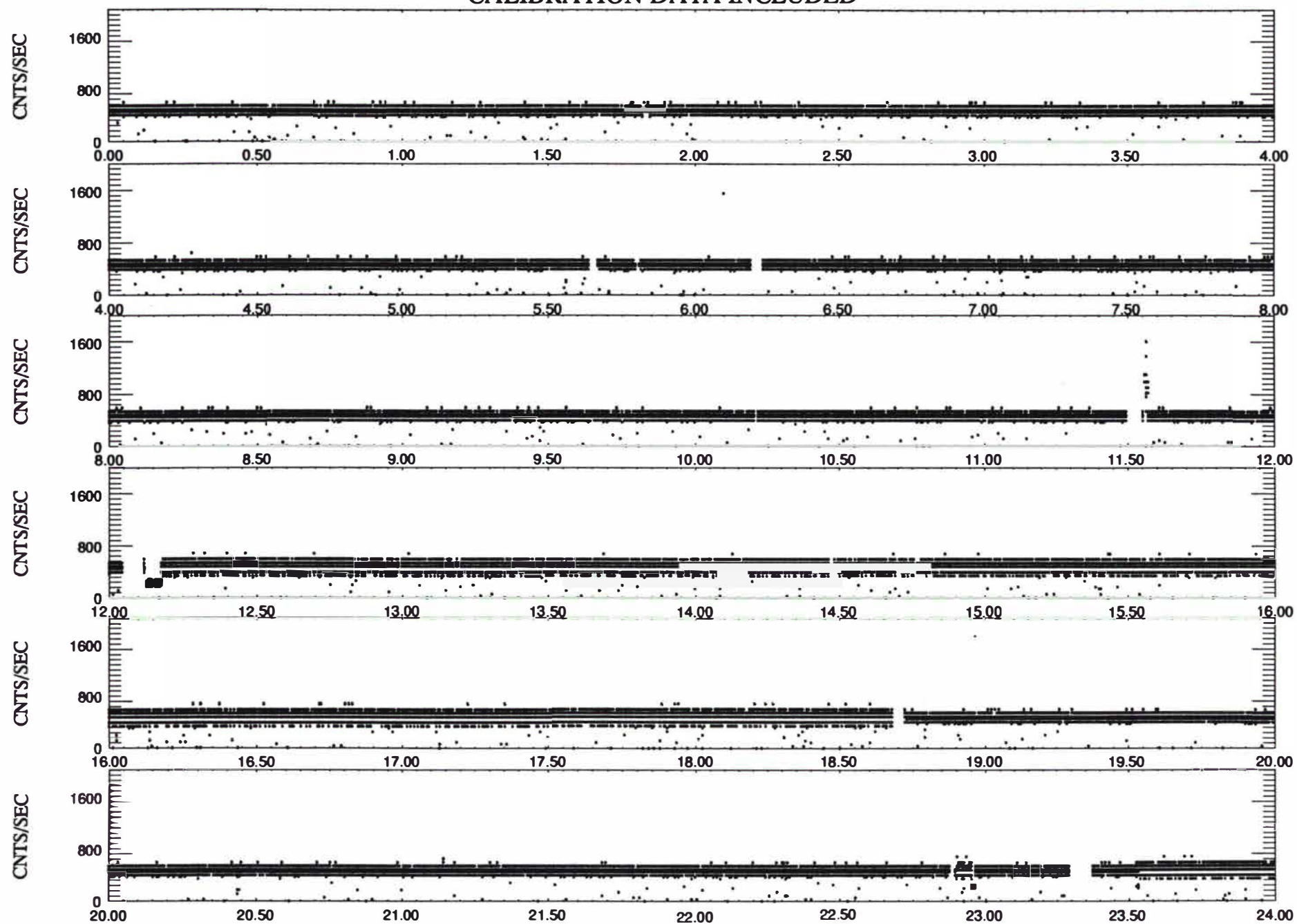
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

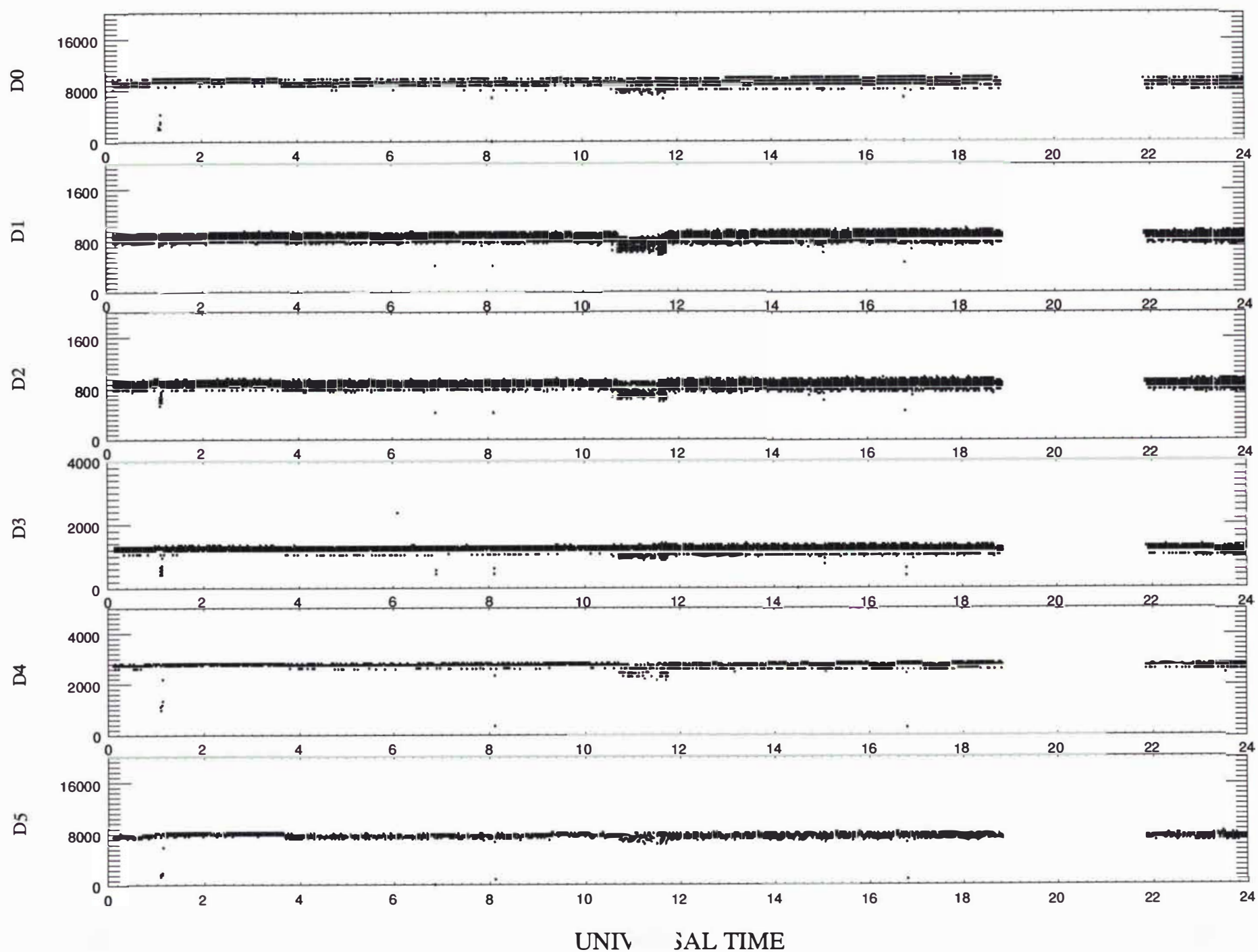
NO BURST (12)



CALIBRATION DATA INCLUDED



UNIV AL TIME



Helio corr removed

Date: July 1 '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?

3. PVO Data

- ☐ Ephemeris of PVO used (not Venus)?
- ☐ 2000 coordinates used?
- ☐ Geocentric time used?

- ☒ ACCESS database updated?

From springer@pop.jpl.nasa.gov Tue Nov 19 09:43 PST 1996
Return-Path: <springer@pop.jpl.nasa.gov>
Received: from pop.jpl.nasa.gov by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA13354; Tue, 19 Nov 1996 09:43:20 -0800
Received: from billevans (billevans.jpl.nasa.gov [137.78.252.52]) by pop.jpl.nasa.gov (8.7.5/8.7)
Message-Id: <3.0.32.19961119094312.00942100@pop.jpl.nasa.gov>
X-Sender: springer@pop.jpl.nasa.gov
X-Mailer: Windows Eudora Pro Version 3.0 (32)
Date: Tue, 19 Nov 1996 09:43:13 -0800
To: khurley@sunspot.ssl.berkeley.edu
From: Joe Springer <springer@pop.jpl.nasa.gov>
Subject: validation of 1993 data points
Mime-Version: 1.0
X-Lines: 26
Status: RO

Kevin,

As requested Thursday, I have checked the following
eleven data points and found no timing errors. Specifically,
we checked as follows:

Type	Date	Sec/Day	Validation Results:
ULYSSES	1/20/93	85352.726	no errors - 10 before to 60 after
ULYSSES RT	1/27/93	59477.129	no errors - 10 before to 10 after
ULYSSES RT	6/12/93	1558.242	no errors - 10 before to 10 after
ULYSSES RT	6/12/93	34201.245	no errors - 10 before to 10 after
ULYSSES RT	7/4/93	60210.297	no errors - 10 before to 10 after
ULYSSES	7/6/93	20282.957	no errors - 10 before to 60 after
ULYSSES RT	7/20/93	54122.35	no errors - 10 before to 10 after
ULYSSES RT	7/24/93	60281.23	no errors - 10 before to 10 after
ULYSSES RT	7/31/93	10688.221	no errors - 10 before to 10 after
ULYSSES RT	7/31/93	22050.147	no errors - 10 before to 10 after
ULYSSES RT	8/1/93	9752.522	no errors - 10 before to 10 after

NO events

Regards,

Joe

From springer@pop.jpl.nasa.gov Tue Nov 19 12:59 PST 1996
Return-Path: <springer@pop.jpl.nasa.gov>
Received: from pop.jpl.nasa.gov by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA15048; Tue, 19 Nov 1996 12:59:55 -0800
Received: from billevans (billevans.jpl.nasa.gov [137.78.252.52]) by pop.jpl.nasa.gov (8.7.5/8.7)
Message-Id: <3.0.32.19961119125948.00953bf0@pop.jpl.nasa.gov>
X-Sender: springer@pop.jpl.nasa.gov
X-Mailer: Windows Eudora Pro Version 3.0 (32)
Date: Tue, 19 Nov 1996 12:59:48 -0800
To: khurley@sunspot.ssl.berkeley.edu (Kevin Hurley)
From: Joe Springer <springer@pop.jpl.nasa.gov>
Subject: Re: validation of 1993 data points
Mime-Version: 1.0
X-Lines: 19
Status: RO

Kevin,

2 2 / 2 / 9 5

U L Y S S E S R T

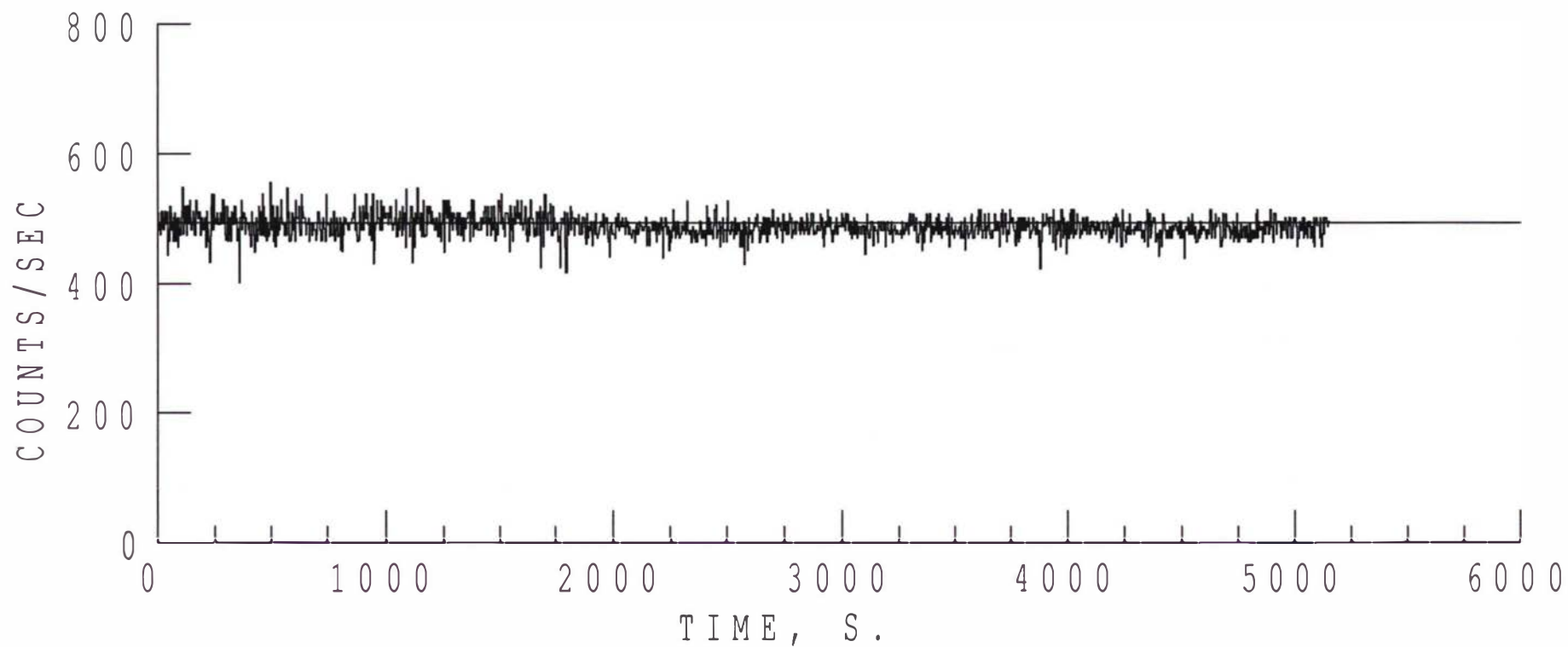
2 0 / 1 / 9 3 4 9 2 1 2 . 0 3 5 s

0 . 5 0 0 S I N T E R V A L S R E G R O U P E D B Y 7

0 - 0 k e V

N = 10 M = 2

> 4.0 SIGMA FLUCTUATIONS



CATSEARCH PROGRAM

BATSE BURST # 2138
EVENT OF 1993 JAN 20 DAY OF YEAR= 20
EVENT CROSSING TIME AT BATSE : 84700. S. OR 23:31:40.3
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 265.800 12.700
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 20/ 1/ 93 IS:
RA= 163.026 DEC= -13.688 DIST= 4.373 AU
BATSE-ULYSSES DISTANCE = 654275600. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 74.84 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 570.91 SECS.
CROSSING TIME AT ULYSSES IS 85271. S. OR 23:41:11.2 +/- 424.38 SECONDS

Trigger

From MALLOZZI@ssl.msfc.nasa.gov Thu Jan 21 09:02:12 1993
Date: Thu, 21 Jan 1993 10:58:48 -0600 (CST)
From: MALLOZZI@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: 1377

BATSE BURST TRIGGER

NO.: 02138

TIME: TJD=9007 SECONDS=84700

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=74.3 AZIMUTH=028.5 ERROR= DEGREES

COMMENTS:

BURST WITH THREE SEPARATE PEAKS, EACH WITH A FAST RISE AND A SLOWER
DECAY, WITH RETURN TO BACKGROUND BETWEEN EACH PULSE.
TOTAL DURATION ~110 SEC. EVENT CLEARLY OBSERVED ABOVE 300 KEV.

From MALLOZZI@ssl.msfc.nasa.gov Thu Jan 21 09:01:56 1993
Date: Thu, 21 Jan 1993 11:00:33 -0600 (CST)
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
2138	930120	9007	84700	34000	264	+16

From springer@pop.jpl.nasa.gov Tue Nov 19 09:43 PST 1996
Return-Path: <springer@pop.jpl.nasa.gov>
Received: from pop.jpl.nasa.gov by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA13354; Tue, 19 Nov 1996 09:43:20 -0800
Received: from billevans (billevans.jpl.nasa.gov [137.78.252.52]) by pop.jpl.nasa.gov (8.7.5/8.7)
Message-Id: <3.0.32.19961119094312.00942100@pop.jpl.nasa.gov>
X-Sender: springer@pop.jpl.nasa.gov
X-Mailer: Windows Eudora Pro Version 3.0 (32)
Date: Tue, 19 Nov 1996 09:43:13 -0800
To: khurley@sunspot.ssl.berkeley.edu
From: Joe Springer <springer@pop.jpl.nasa.gov>
Subject: validation of 1993 data points
Mime-Version: 1.0
X-Lines: 26
Status: RO

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ULYSSES RT	6/12/93	1558.242	no errors - 10 before to 10 after
ULYSSES RT	6/12/93	34201.245	no errors - 10 before to 10 after
ULYSSES RT	7/4/93	60210.297	no errors - 10 before to 10 after
ULYSSES	7/6/93	20282.957	no errors - 10 before to 60 after
ULYSSES RT	7/20/93	54122.35	no errors - 10 before to 10 after
ULYSSES RT	7/24/93	60281.23	no errors - 10 before to 10 after
ULYSSES RT	7/31/93	10688.221	no errors - 10 before to 10 after
ULYSSES RT	7/31/93	22050.147	no errors - 10 before to 10 after
ULYSSES RT	8/1/93	9752.522	no errors - 10 before to 10 after

Regards,

Joe
Kevin,

Roger suggested that the appropriate data to examine
for a trigger was ten minutes before and 60 minutes
after the event time, while ten minutes before and after
the other times was sufficient.

Joe

At 12:58 PM 11/19/96 -0800, you wrote:

>Dear Joe,

>

>Thanks. Can you tell me what units 10 and 60 are? Minutes? Headers?

>

>Kevin

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/SMI)
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

From root Fri Jul 16 15:29 1993
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)
id AA07838; Fri, 16 Jul 93 15:29:21
Received: from UCBSP.SSL.BERKELEY.EDU by sunspot.ssl.berkeley.edu (4.1/1.30.1)
id AA21891; Fri, 16 Jul 93 15:30:05 PDT
Message-Id: <9307162230.AA21891@sunspot.ssl.berkeley.edu>
Date: Fri 16 Jul 93 15:31:54-PST
From: \$C <046369@essdp2.span.nasa.gov>
To: KHURLEY@sunspot.ssl.berkeley.edu
Subject: [Resent-MM Mail] DMSP GAMMA-RAY BURST DATA
Status: R

Received: from ESSDP2 by UCBSP.SSL.BERKELEY.EDU via MAIL-11 with
DECnet; Fri, 16 Jul 93 15:31:29-PST
Date: Fri 16 Jul 93 15:31:29-PST
From: 046369@ESSDP2.SPAN.NASA.GOV
Subject: DMSP GAMMA-RAY BURST DATA
To: "UCBSP::HURLEY"@ESSDP2.SPAN.NASA.GOV

FROM: ESSDP2::TERRELL (JAMES TERRELL, LOS ALAMOS NATL LAB)
TO: UCBSP::HURLEY (KEVIN HURLEY)
CC:
SUBJ: DMSP GAMMA-RAY BURST DATA, AS OF 16 JULY 1993

HERE ARE SOME NOTES CORRECTING DMSP PEAKTIMES FOR YOUR MASTER BURST LIST.
I HAVE MORE GRAPHS AND INFO TO SEND, BUT HAVE RUN OUT OF TIME.
I WILL SEND MORE INFO AFTER RETURNING 28 JULY--JIM.

27SEP91 84415 YES (8SAA,9YES,10SAA)
16OCT91 36696 YES (8SAA,9YES,10NR)
4NOV91 54286 YES (8SR,9YES,10YES)
27NOV91 15739 YES (8NO,9NO,10YES)
2DEC91 73733 YES (8YES,9NO@144DEG,10NR)
9DEC91 66959 N/O (8SR,9SR,10NR,11ND)
21DEC91 22686 YES (8ND,9NO,10NO,11YES)
10JAN92 33478 NA (BLANK) (8ND,9NA,10SAA,11NA)
10FEB92 35633 YES (8NO,9WEAK,10SAA,11SAA)
6APR92 9855 N/O (OBSCURED) (8NO@141,10SR,11NO@137DEG)
1MAY92 76696 N/O (OBSCURED) (8NO@127,10NO@157,11NO@147DEG)
22JUN92 25506 N/O (8SAA,10NR,11SA)
28JUN92 76452 YES (8ND,10YES,11NO)
29JUN92 75897 YES (ALL YES, SOFT)
14JUL92 47069 NA (BLANK) (8NA,10SAA,11SR)
16JUL92 60933 YES (9NO,10YES,11YES)
20JUL92 11524 N/O (OBSCURED) (8NA@130,10NA@145,11SR)
23JUL92 72188 N/O (OBSCURED) (8ND,10NA@148,11NR)
10AUG92 79599 YES? (8YES?,10NA,11NA) (LONG SOFT PEAK)
4OCT92 50421 YES (8YES,10YES,11SR)
23NOV92 22727 YES (8YES,10YES,1SR) (NOT AT 22712)
23NOV92 46542 YES (8NR,10SR,11YES) (NOT AT 46584, BATSE GRB)
7DEC92 57649 YES (8YES,10YES,11YES)
6JAN93 55260 YES (8SAA,10YES,11SR)
12JAN93 55082 YES (8YES,10NO@138,11VERYWEAK) (8:BIG PEAK AT 55202)
20JAN93 84779 YES (8YES,10,YES,11YES) (NO, AT 84700!)

ULYSSES

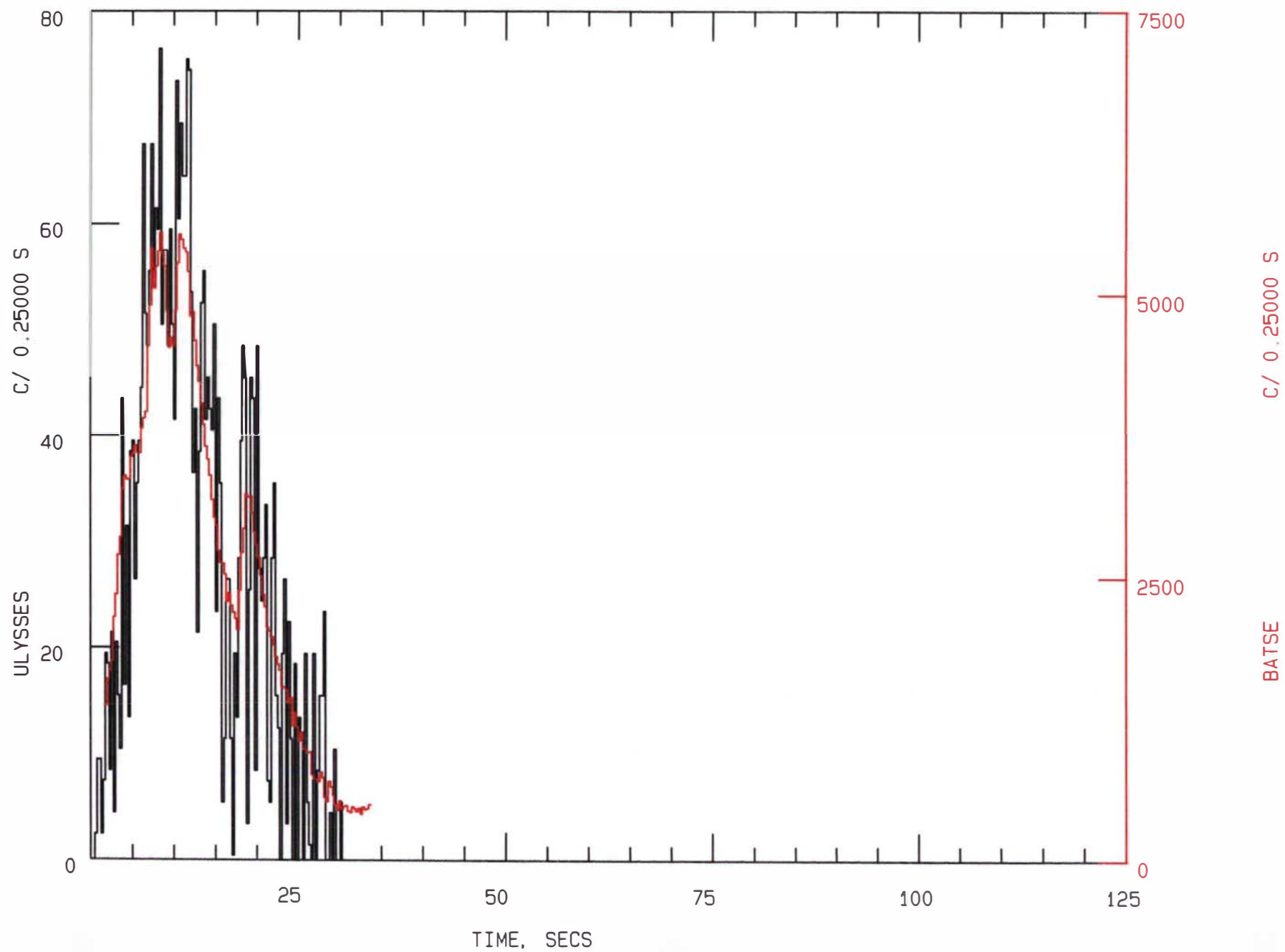
-BATSE

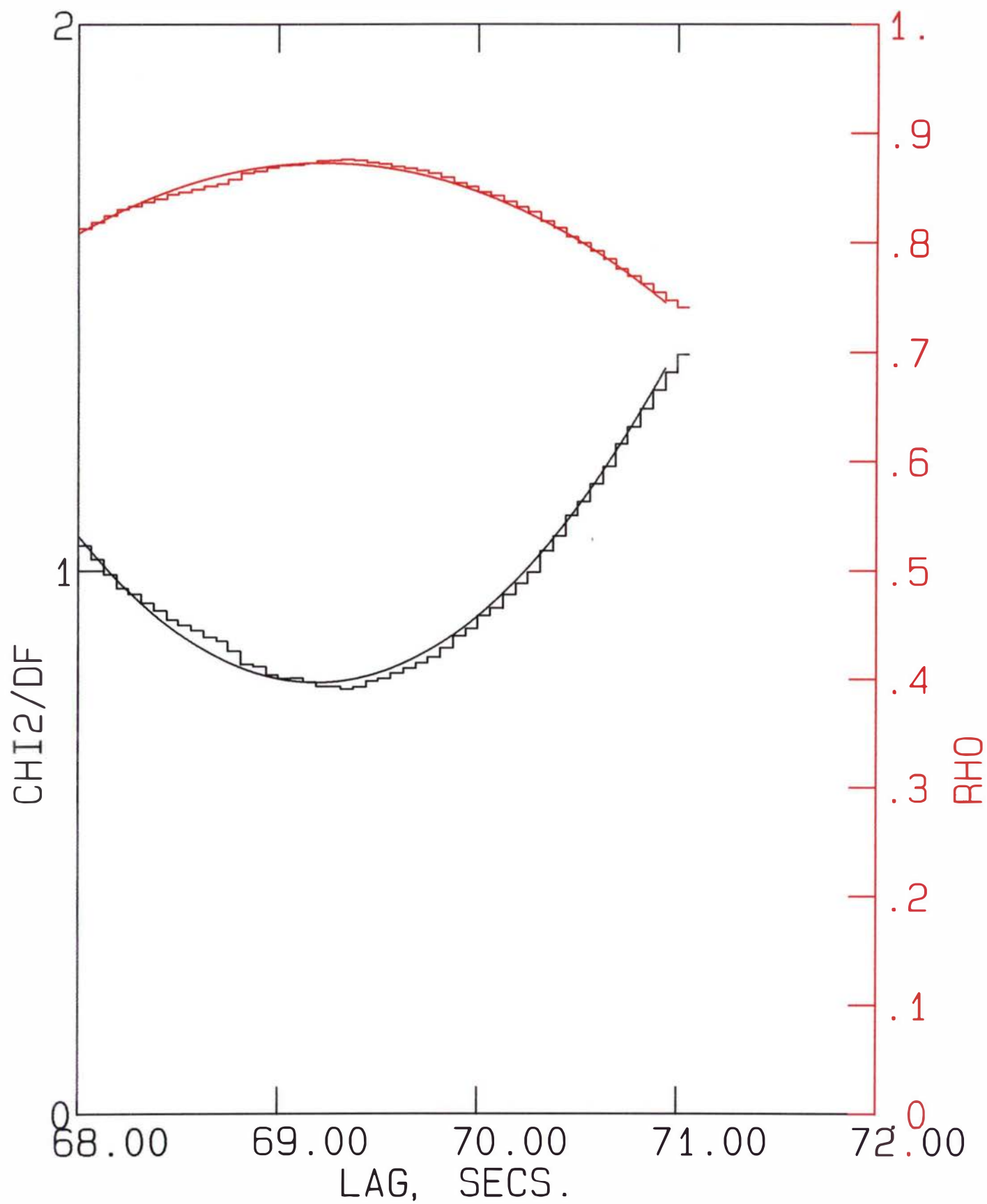
CORRELATION

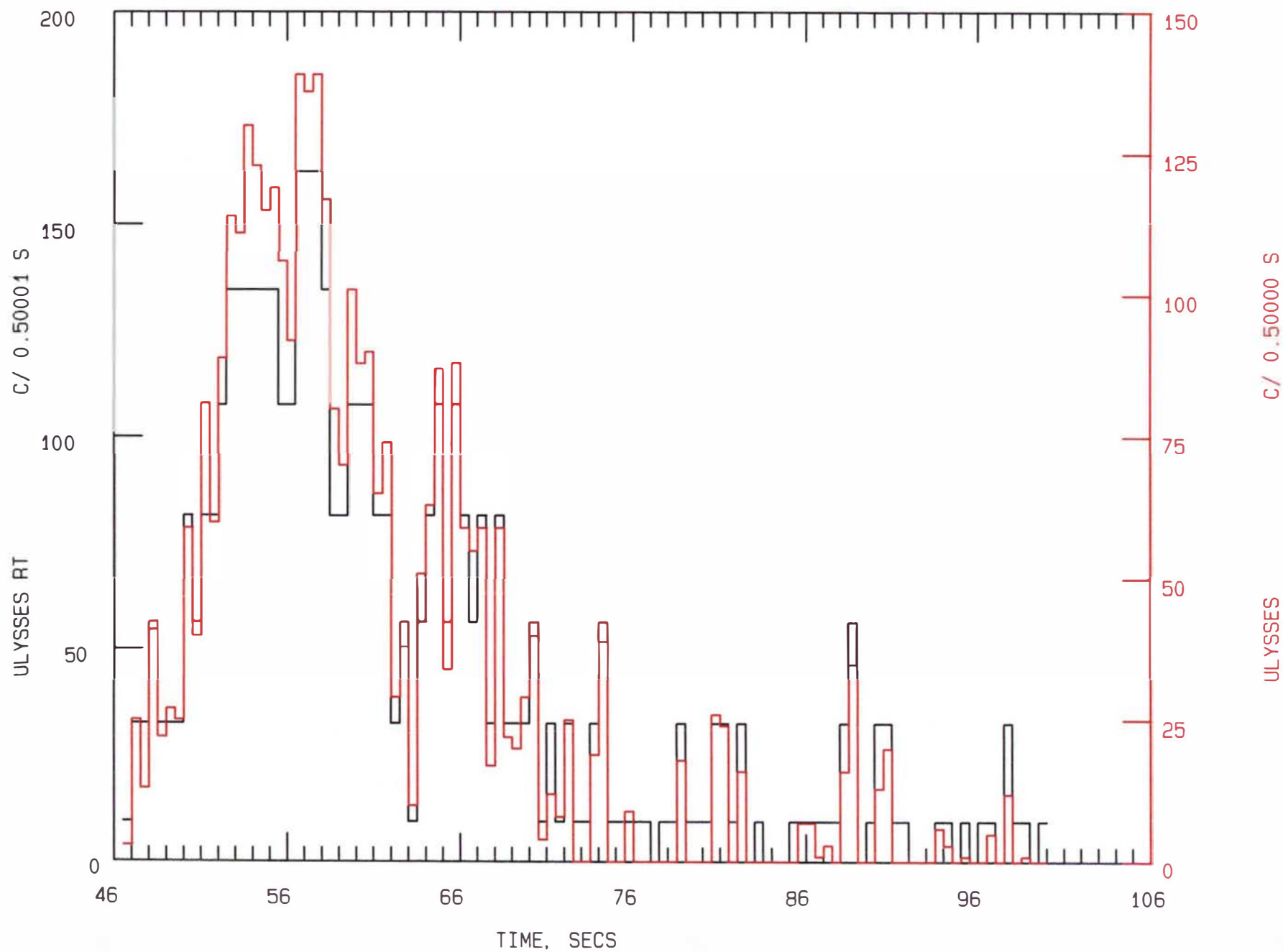
20/01/93

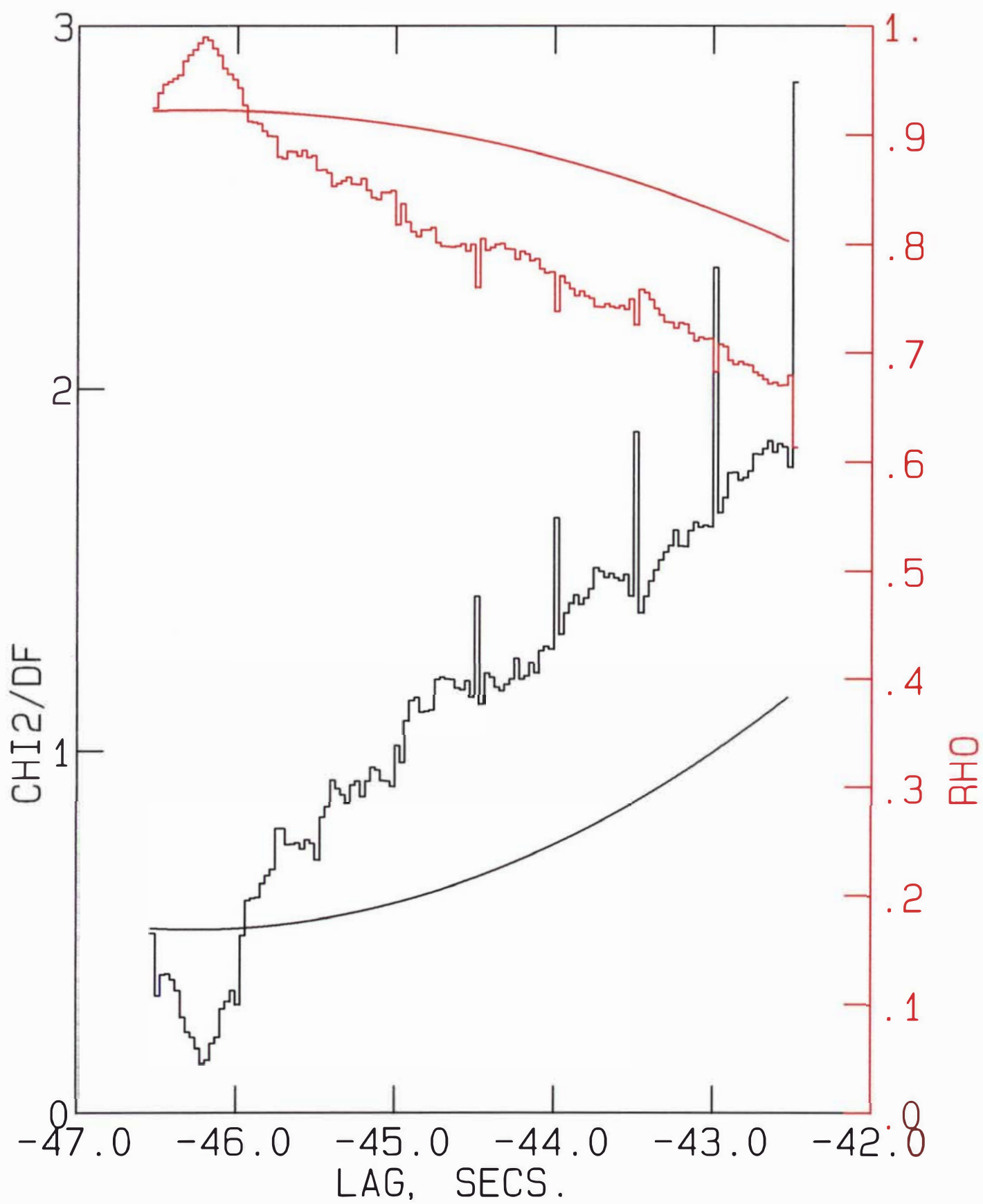
85352.857

1/ 7/97





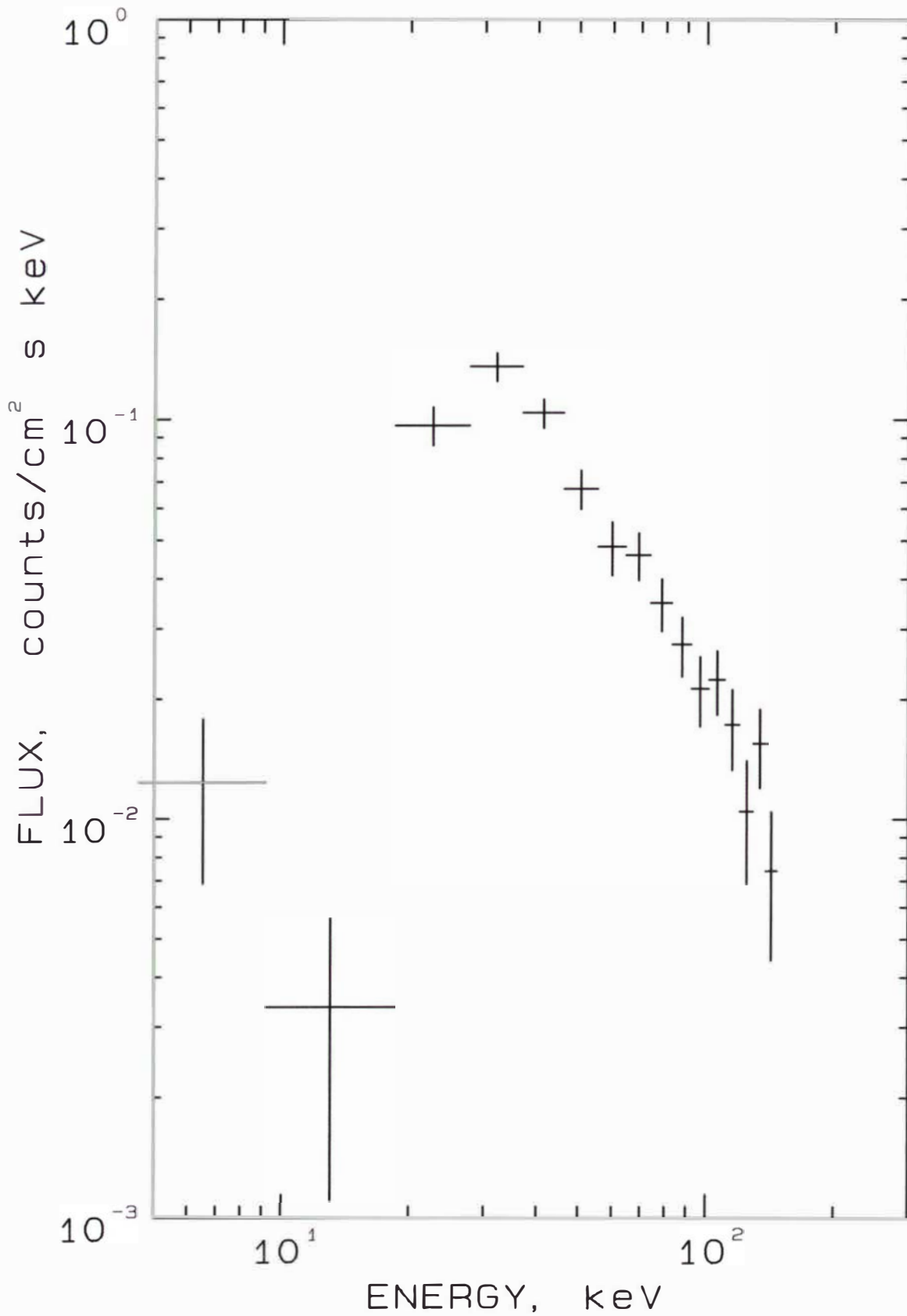




ULYSSES 20/01/93 85352.715

1/ 7/97

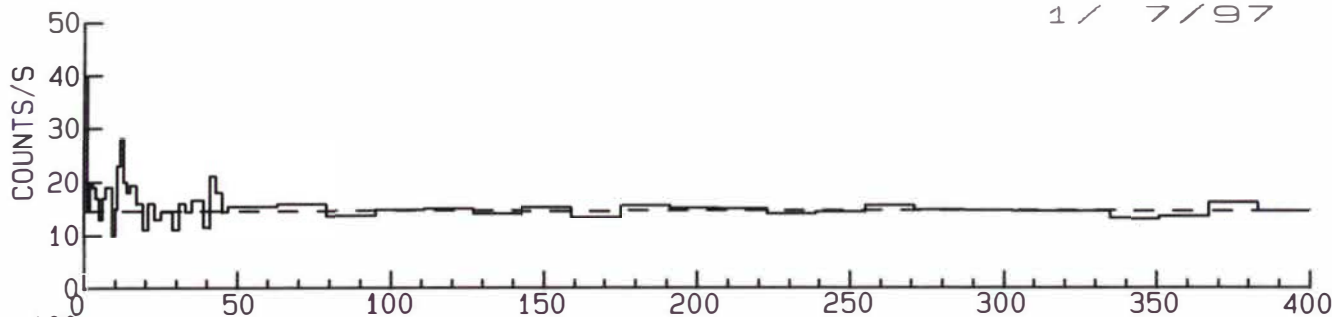
SPECTRUM INTEGRATED OVER 40.9 SECONDS, INTERVALS 2 TO 30



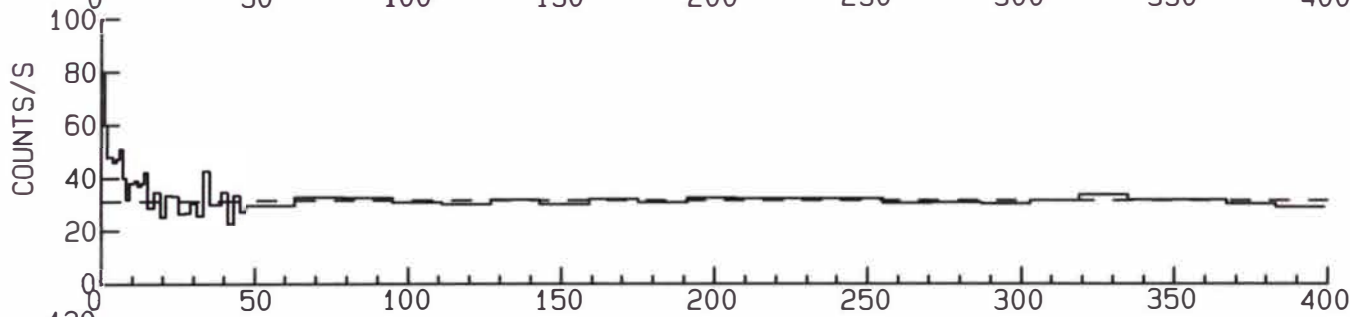
ULY. S 20/01/93 85352.715 BURST SPECTRAL COUNT RATES

1 / 7 / 97

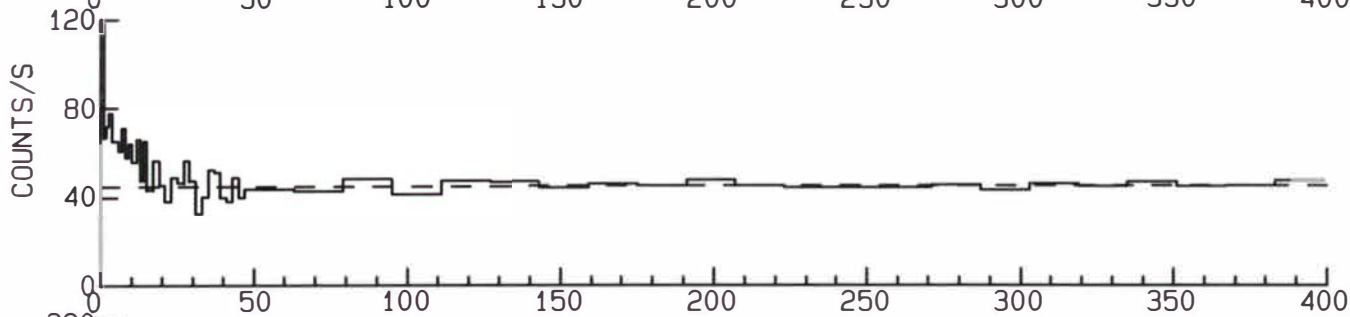
129-147 keV



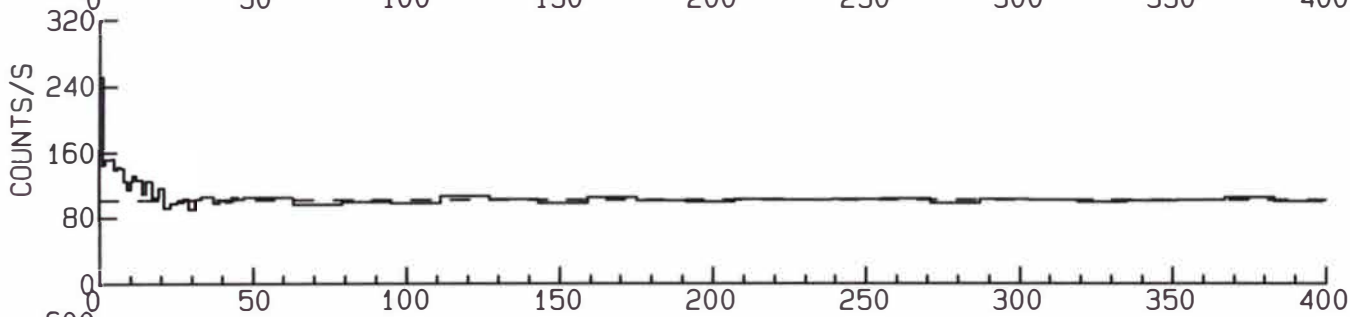
101-129 keV



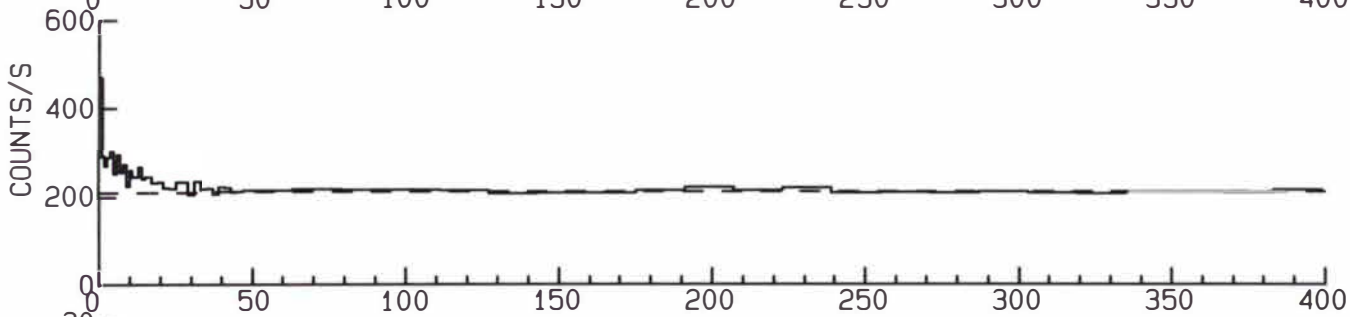
73-101 keV



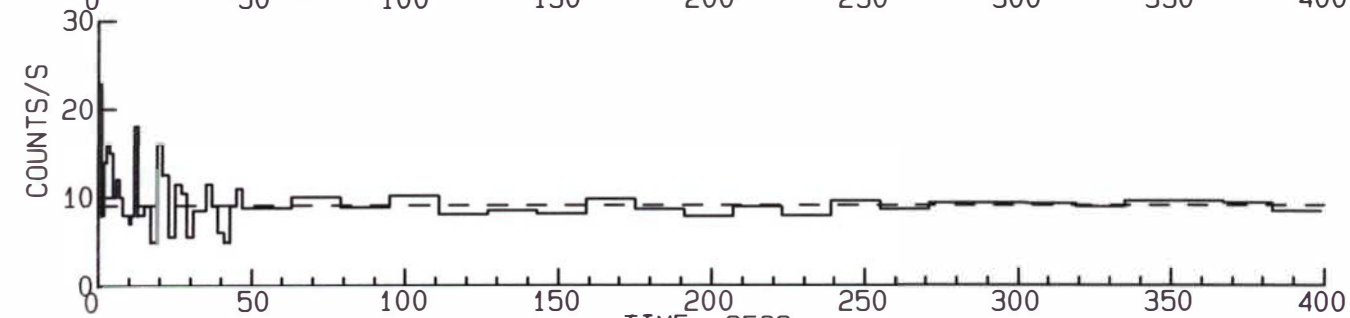
46-73 keV



18-46 keV



4-18 keV



TIME, SECS

ULYSSES

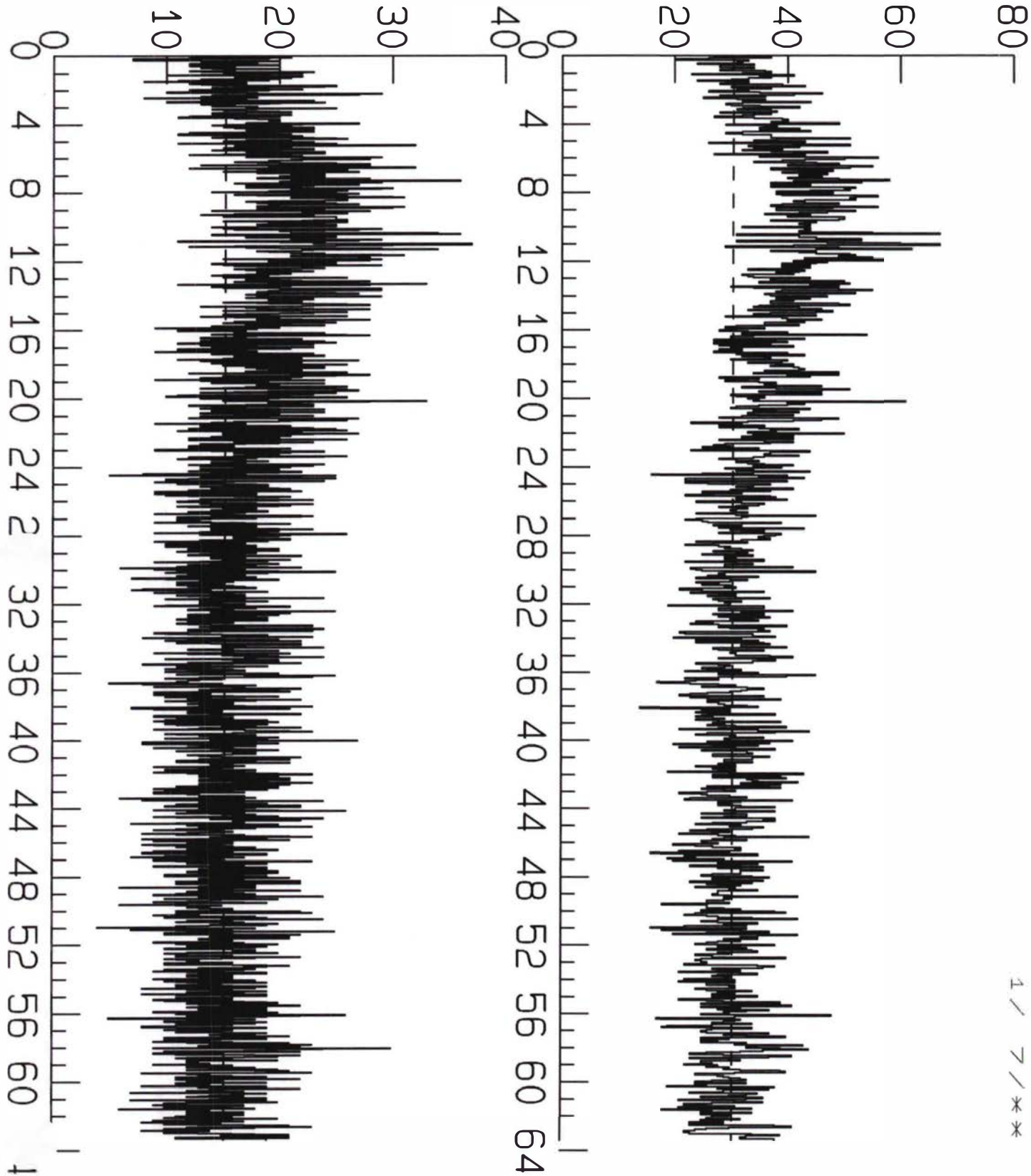
20/01/93

Ttrig=85352.857

22- 147 keV

COUNTS/0.031 S

COUNTS/0.062 S



1 / 7 / **

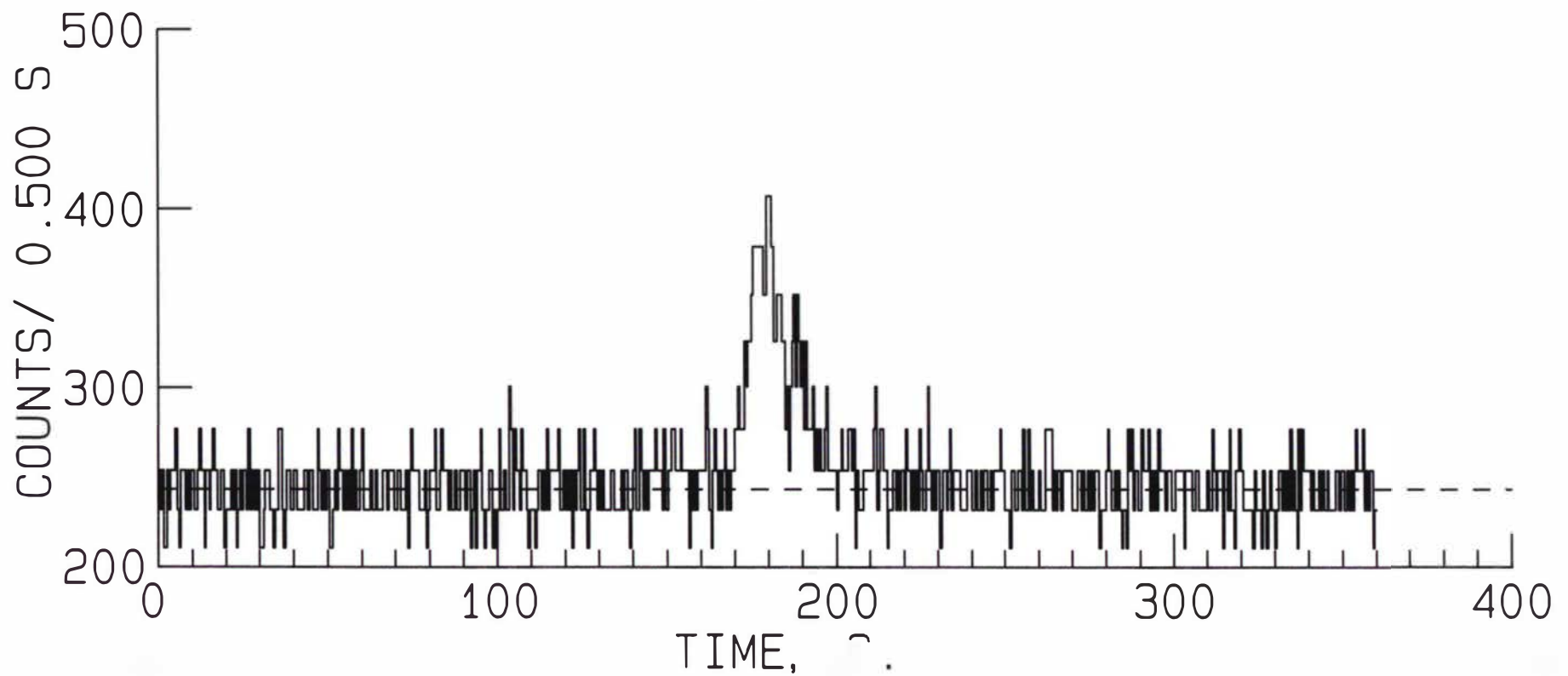
ULYSSES RT

1 / 7 / 97

20/ 1/93 85176.098 s

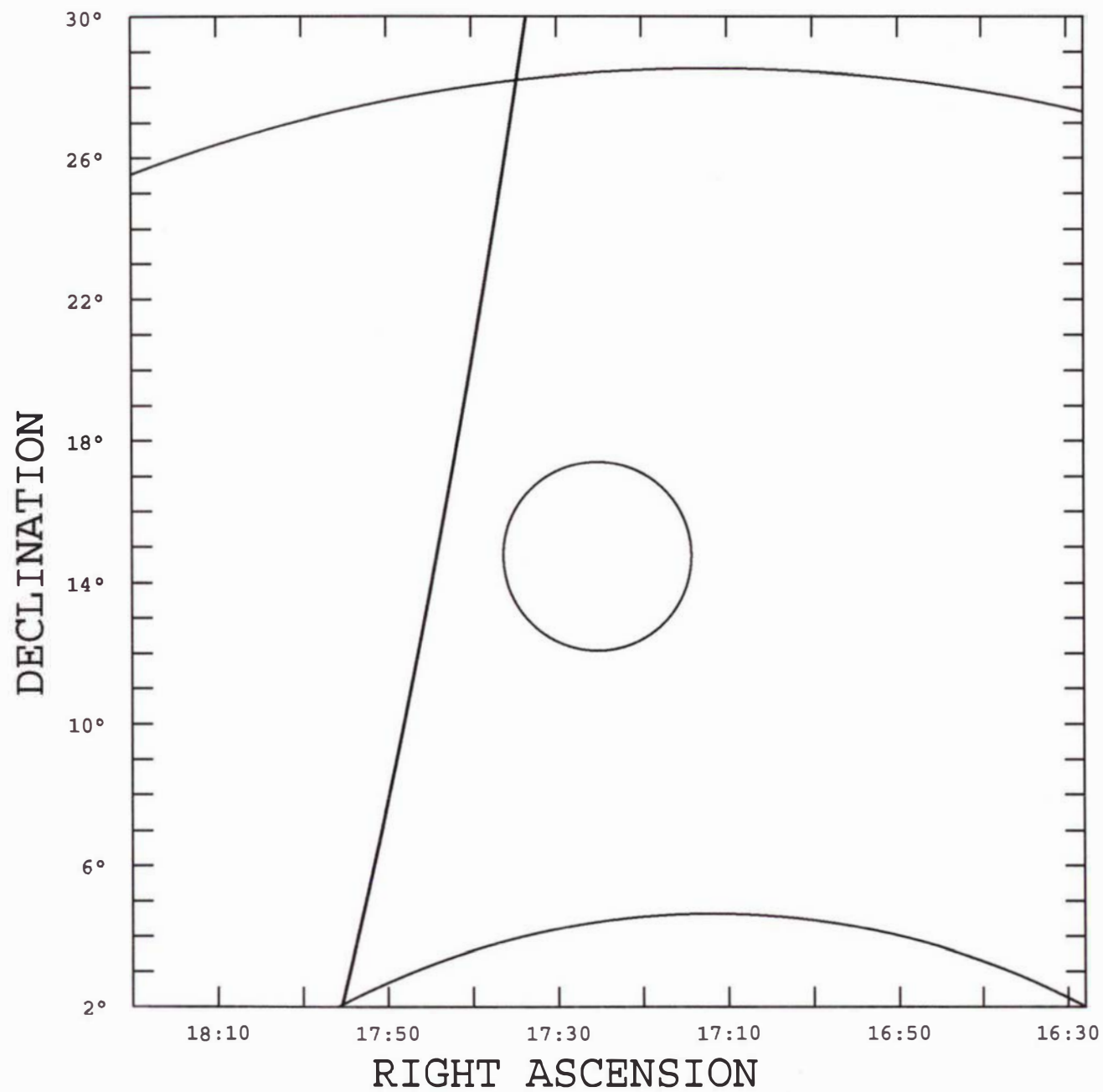
22- 147 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

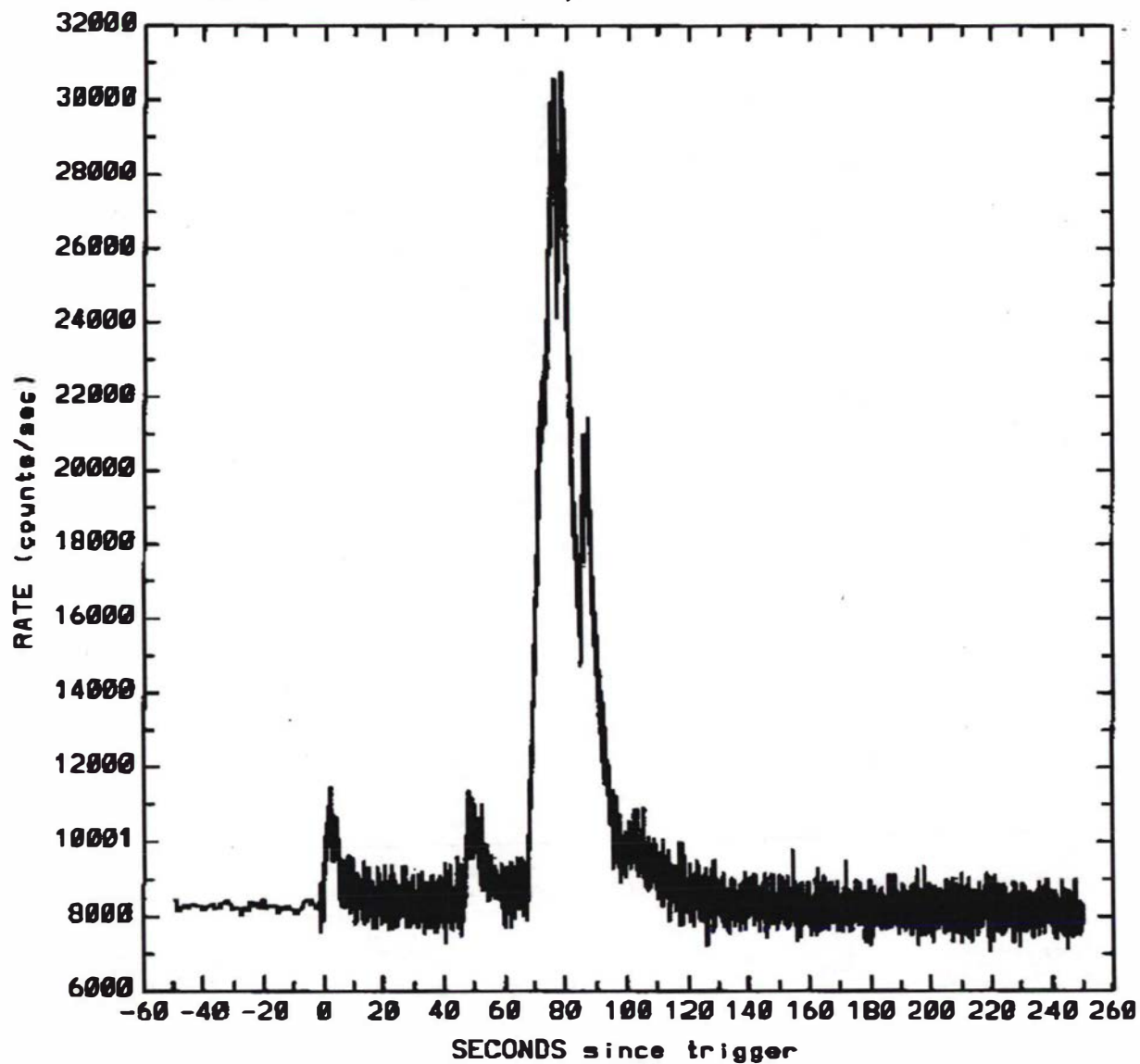


17/10/95

JAN 20, 1993 23:31



Data for K. Hurley



25-MAR-1993 08.45.56

Created by MOPS BD
(Burst Display)
Version 2.18

Trigger # : 2138

Trigger Time:
9887 / 84788.298

Burst Data Type:
DISCSC

Deadtime
Corrected: N

Background Data
Type: PREB + DISCLA

Minimum Integ. Time:
0.064 second(s)

Detectors (7..0):
00000111

Discriminators:
(1..2)

Quality Mask:
BDISP1

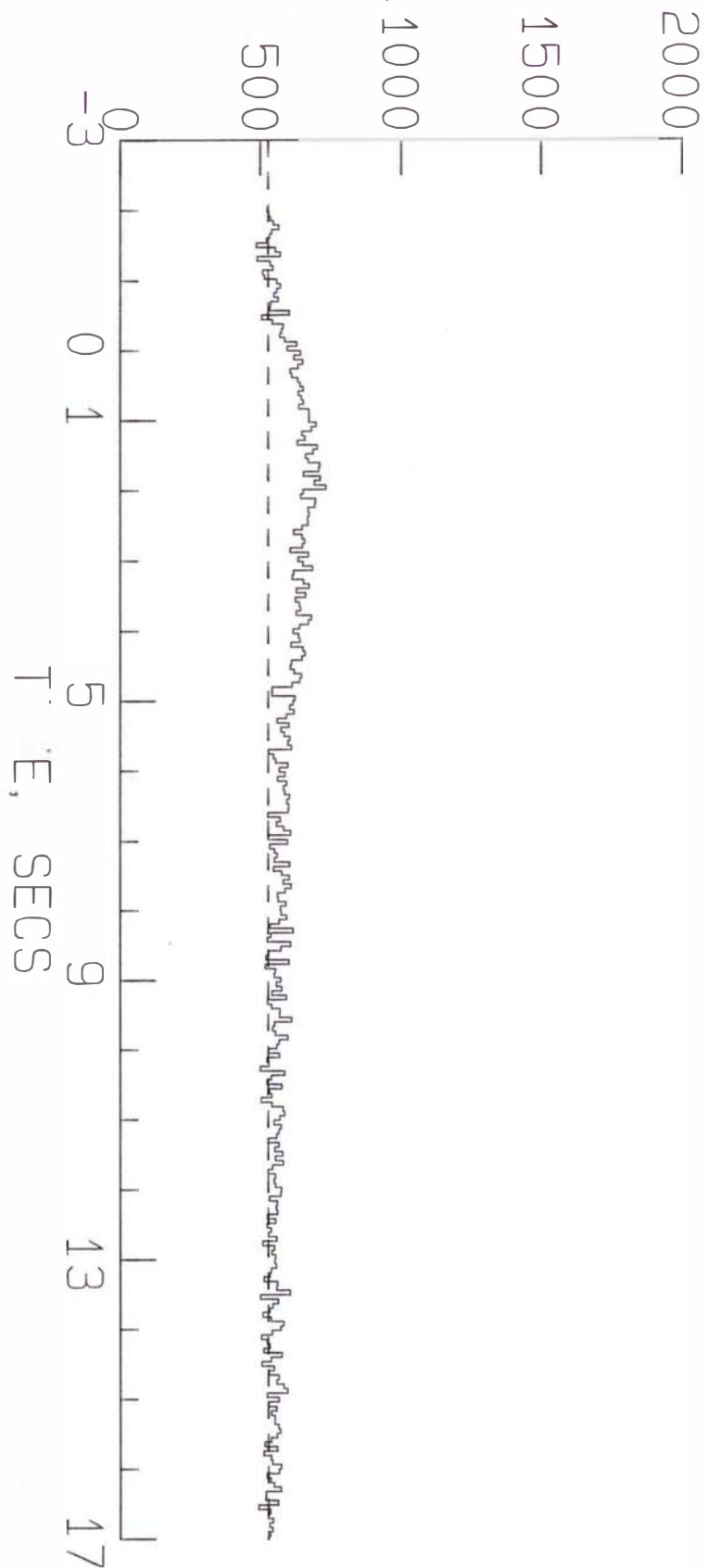
BATSE

20/01/93

84700.290

25- 100 keV

COUNTS/ .064 S



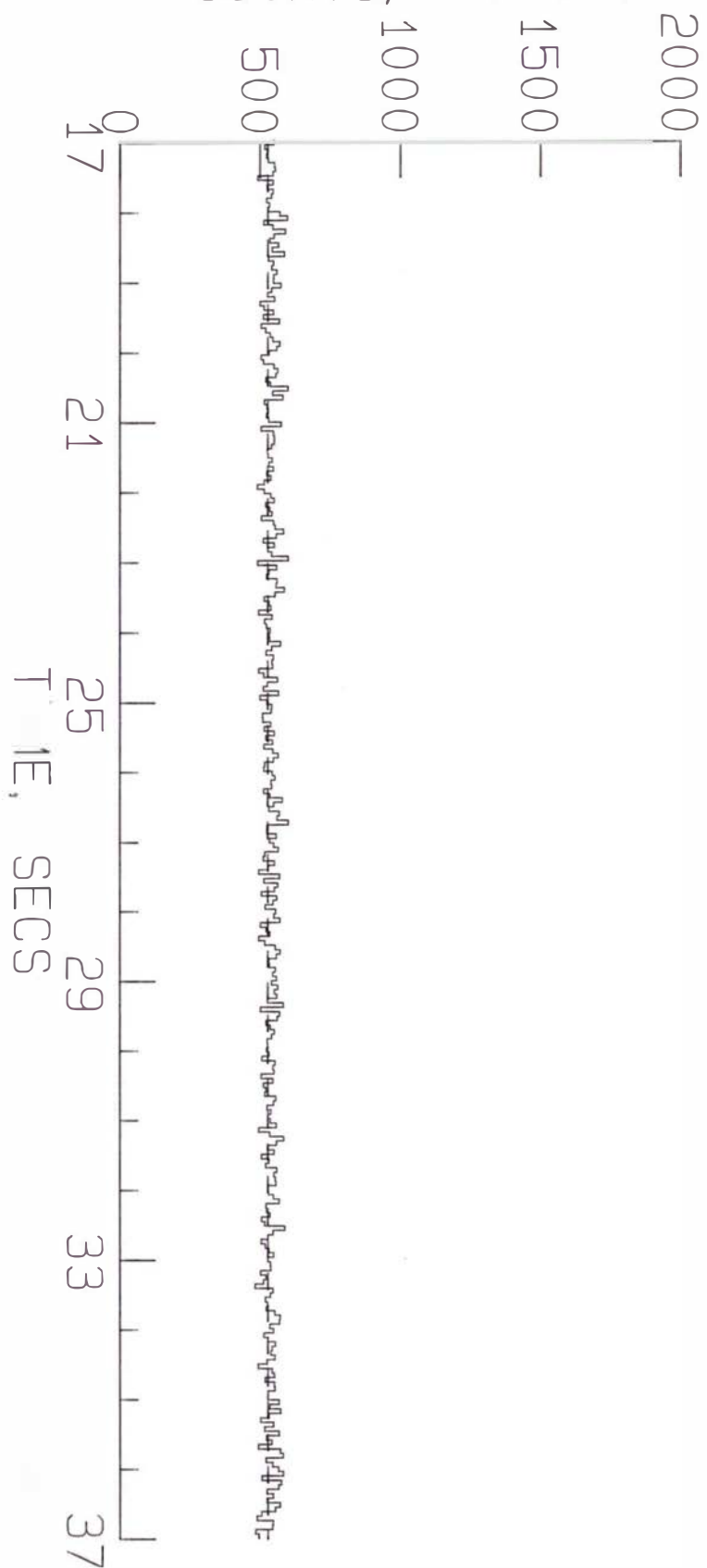
BATSE

20/01/93

84700.290

25- 100 keV

COUNTS/ .064 S



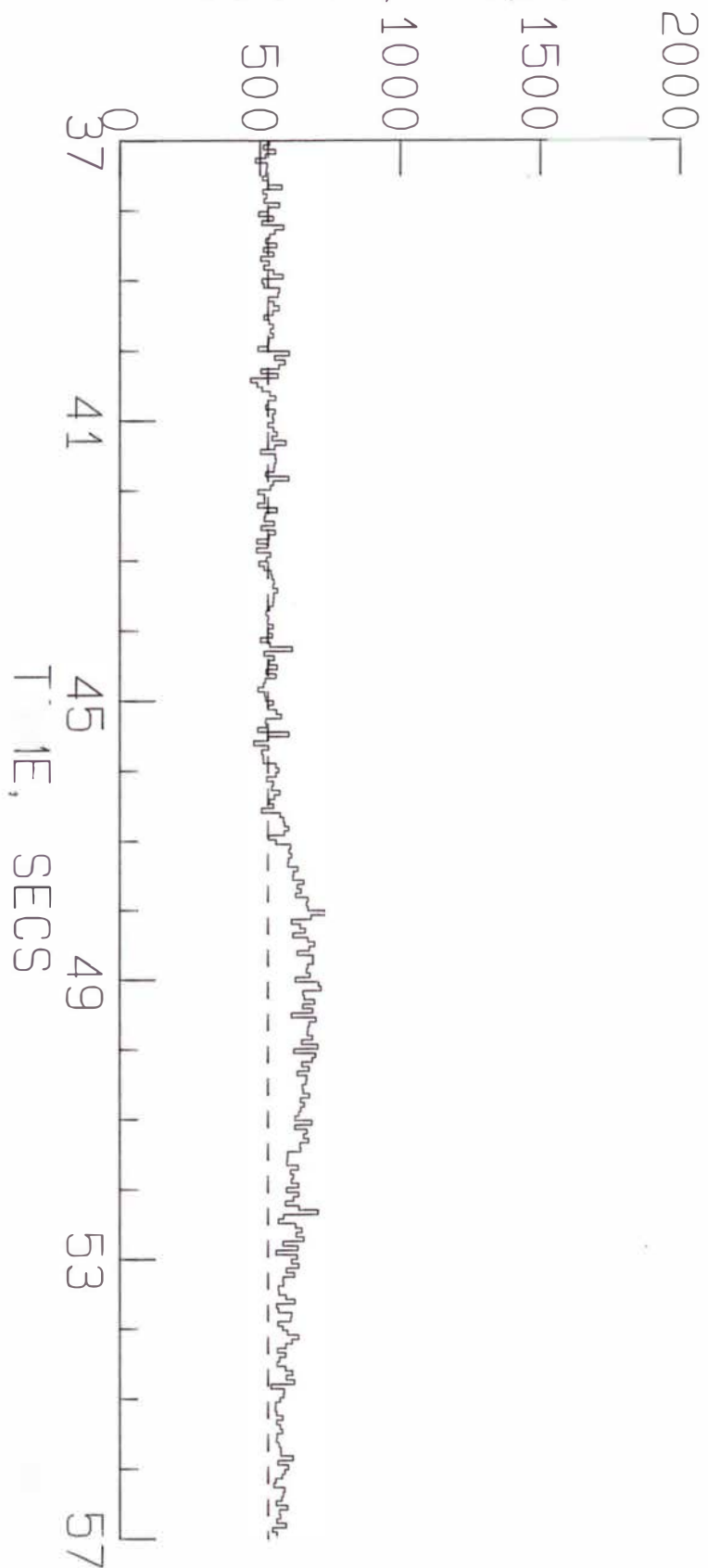
BATSE

20/01/93

84700.290

25- 100 keV

COUNTS/ .064 S



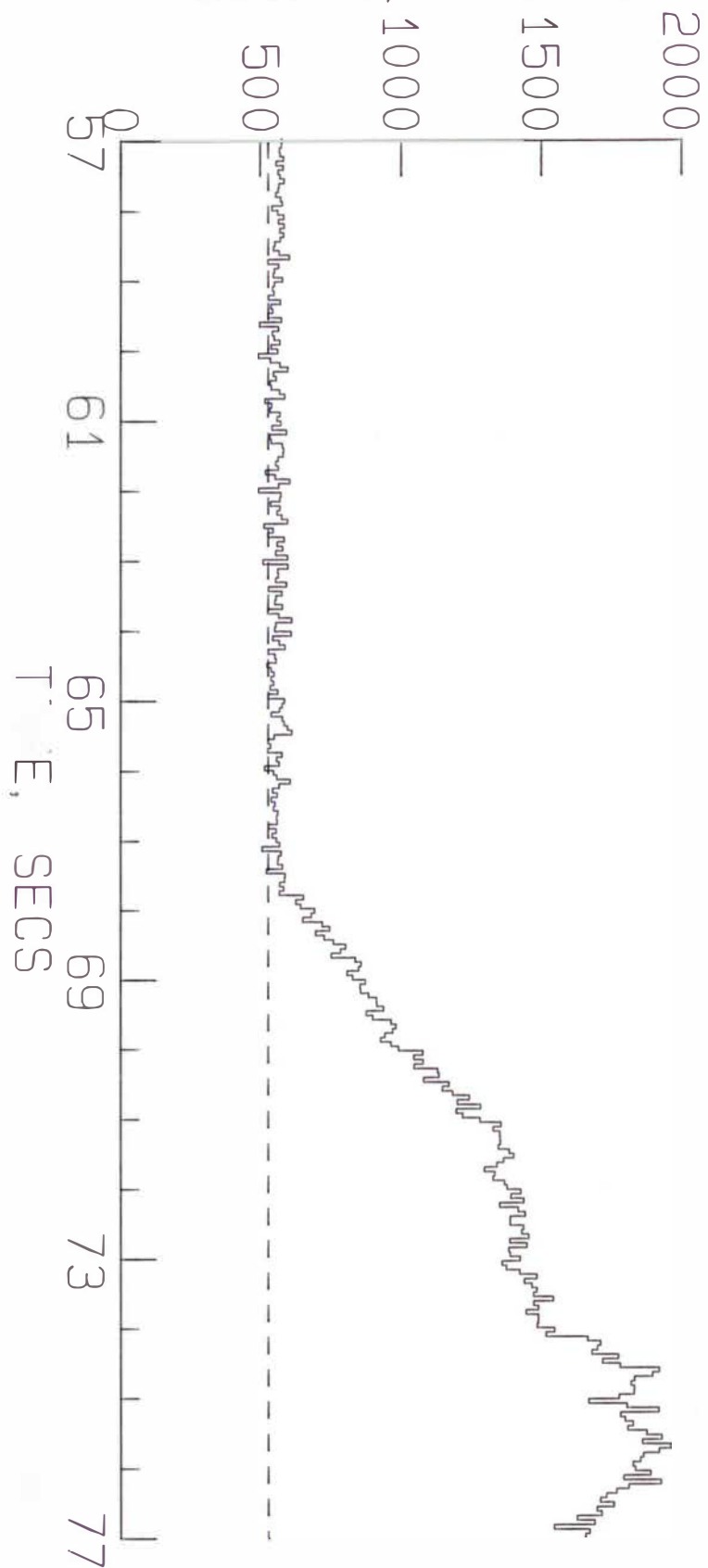
BATSE

20/01/93

84700.290

25- 100 keV

COUNTS/ .064 S



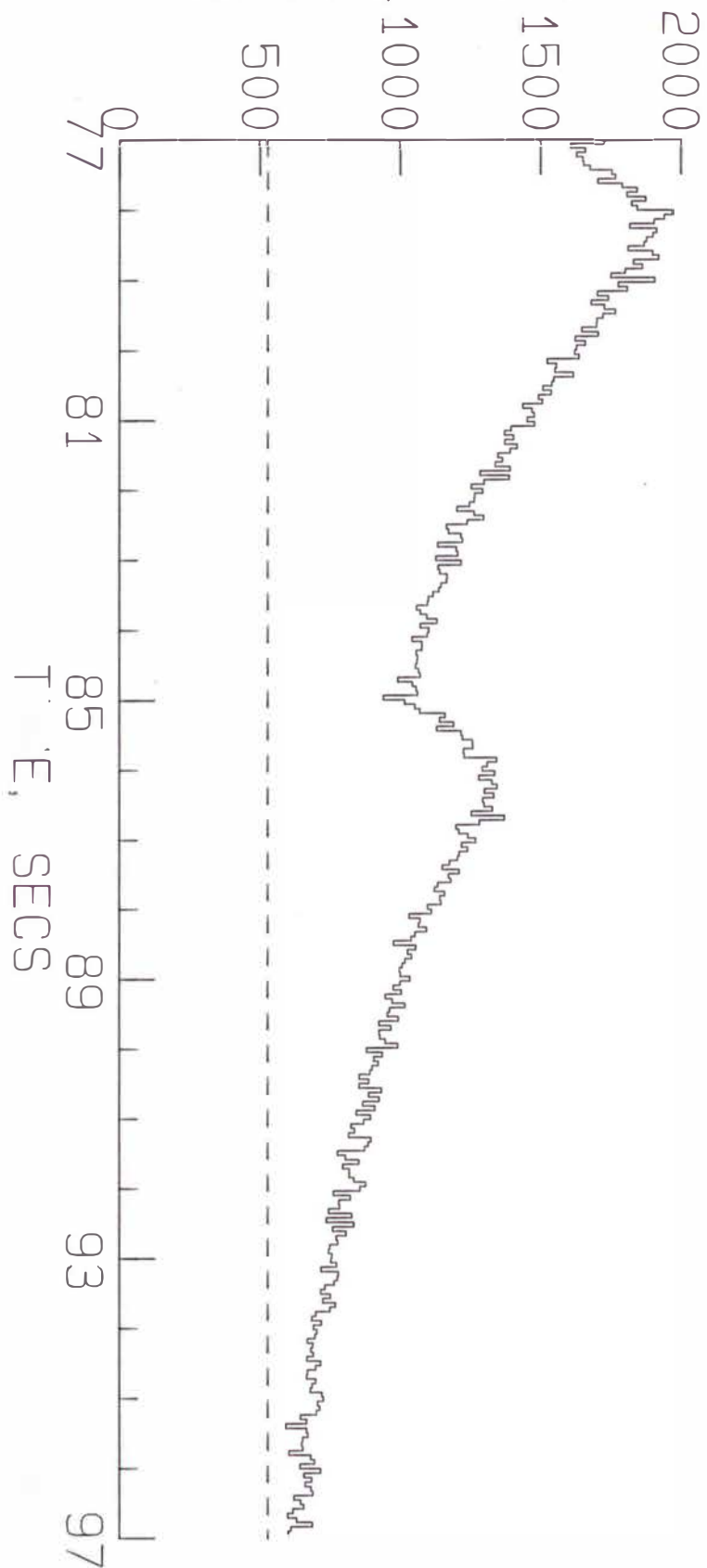
BATSE

20/01/93

84700.290

25- 100 keV

COUNTS/ .064 S



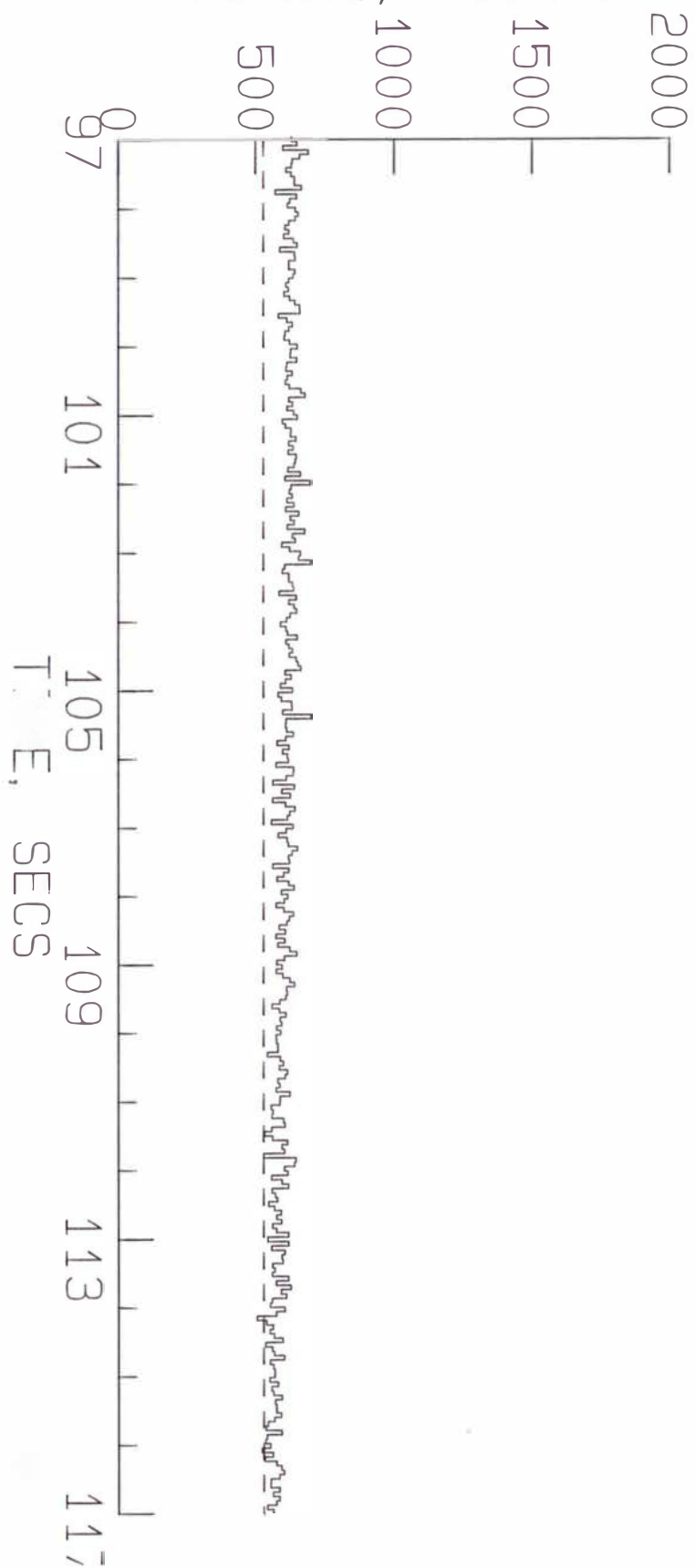
BATSE

20/01/93

84700.290

25- 100 keV

COUNTS/ .064 S

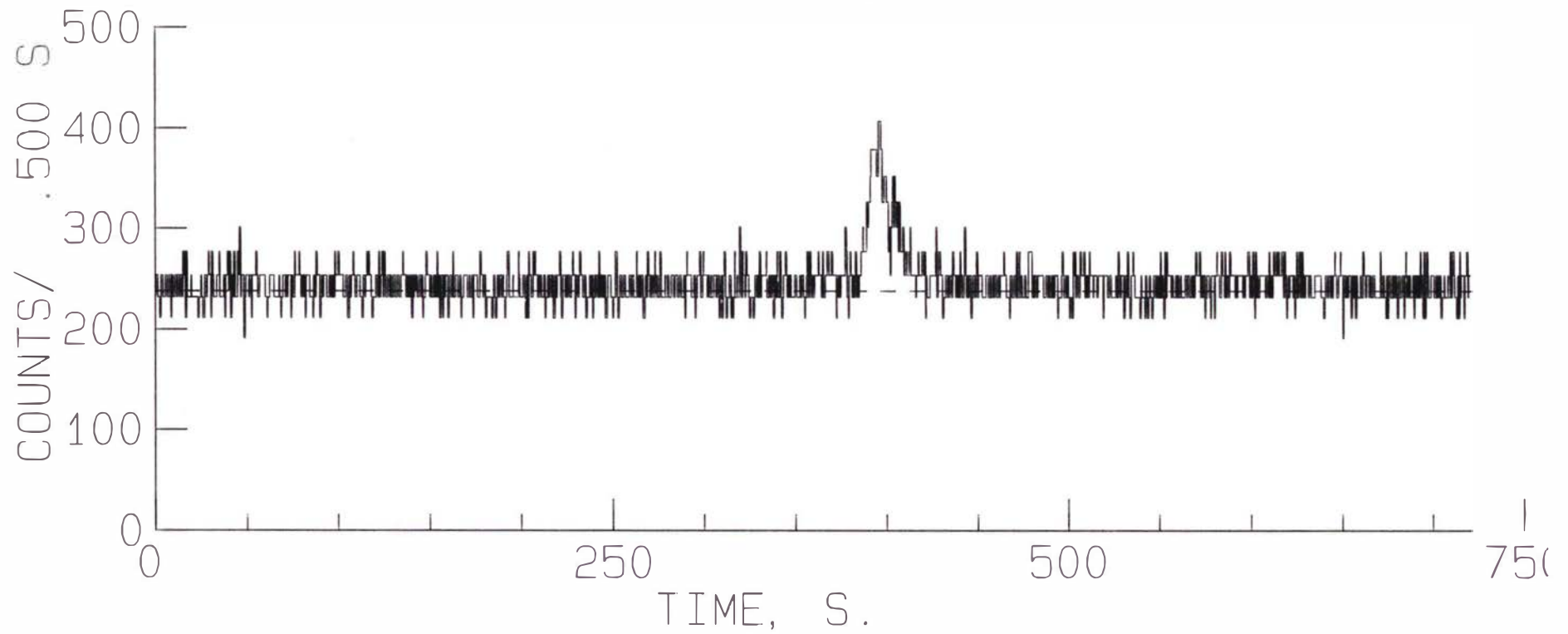


ULYSSES RT
20/ 1/93 84960.086 s
22- 147 keV

2138

5/ 4/94

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



MO-RT

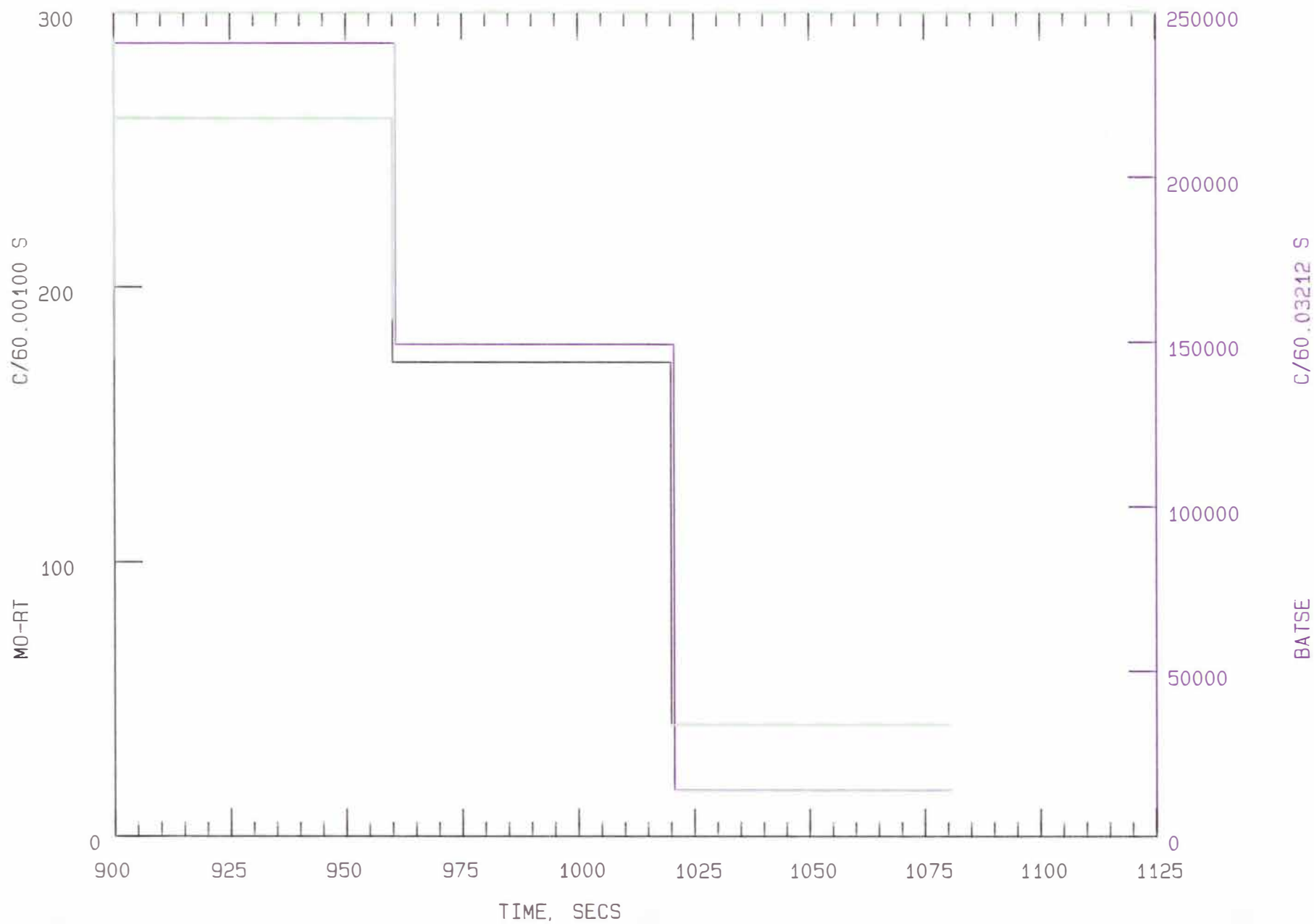
-BATSE

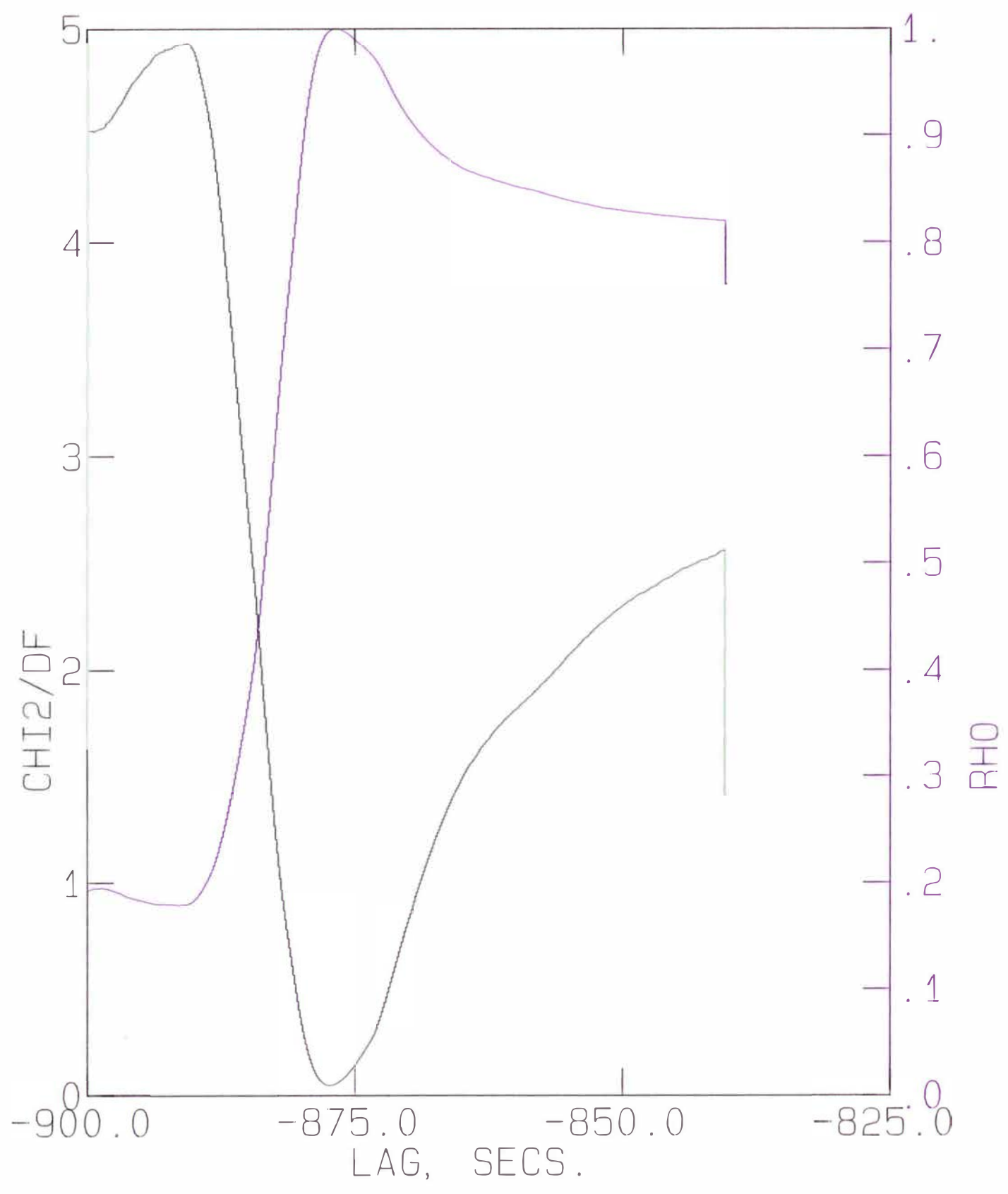
CORRELATION

20/ 1/93

83980.107

10/ 7/95





10 / 7 / 95

MO-RT

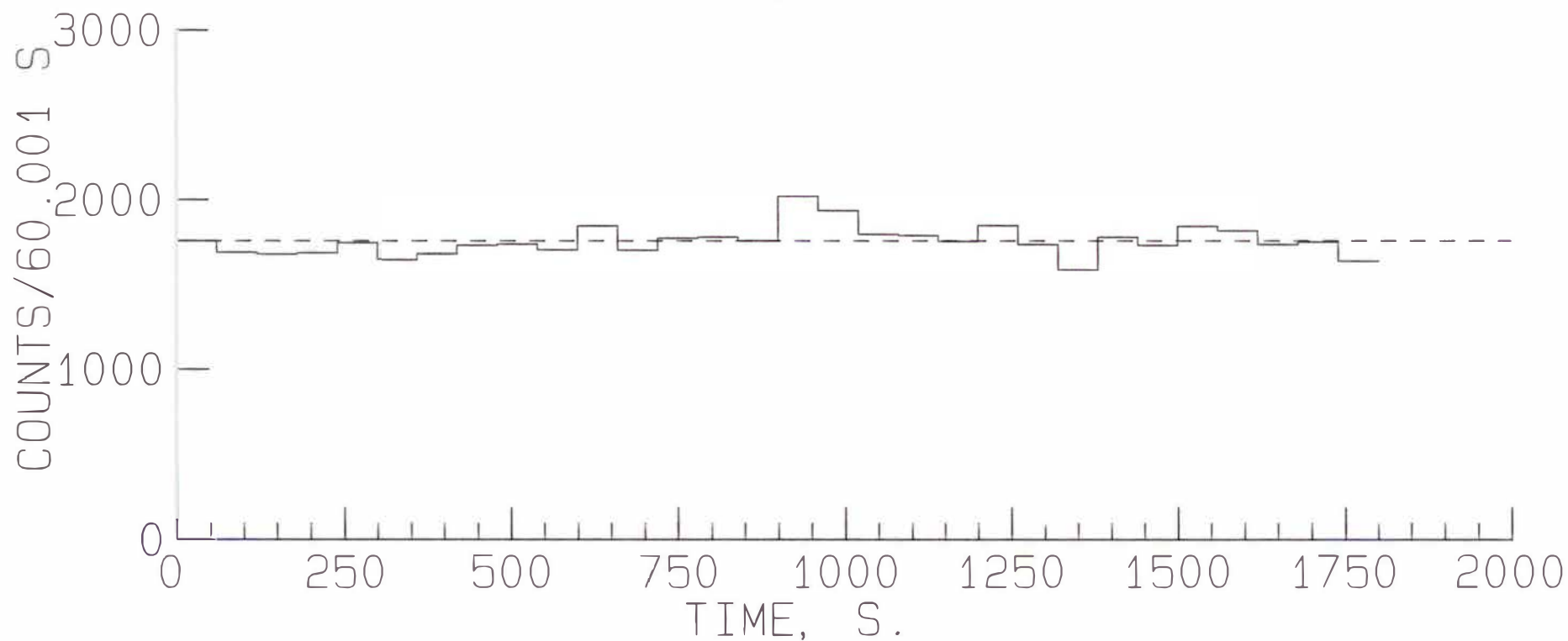
20 / 1 / 93

83980.107 s.

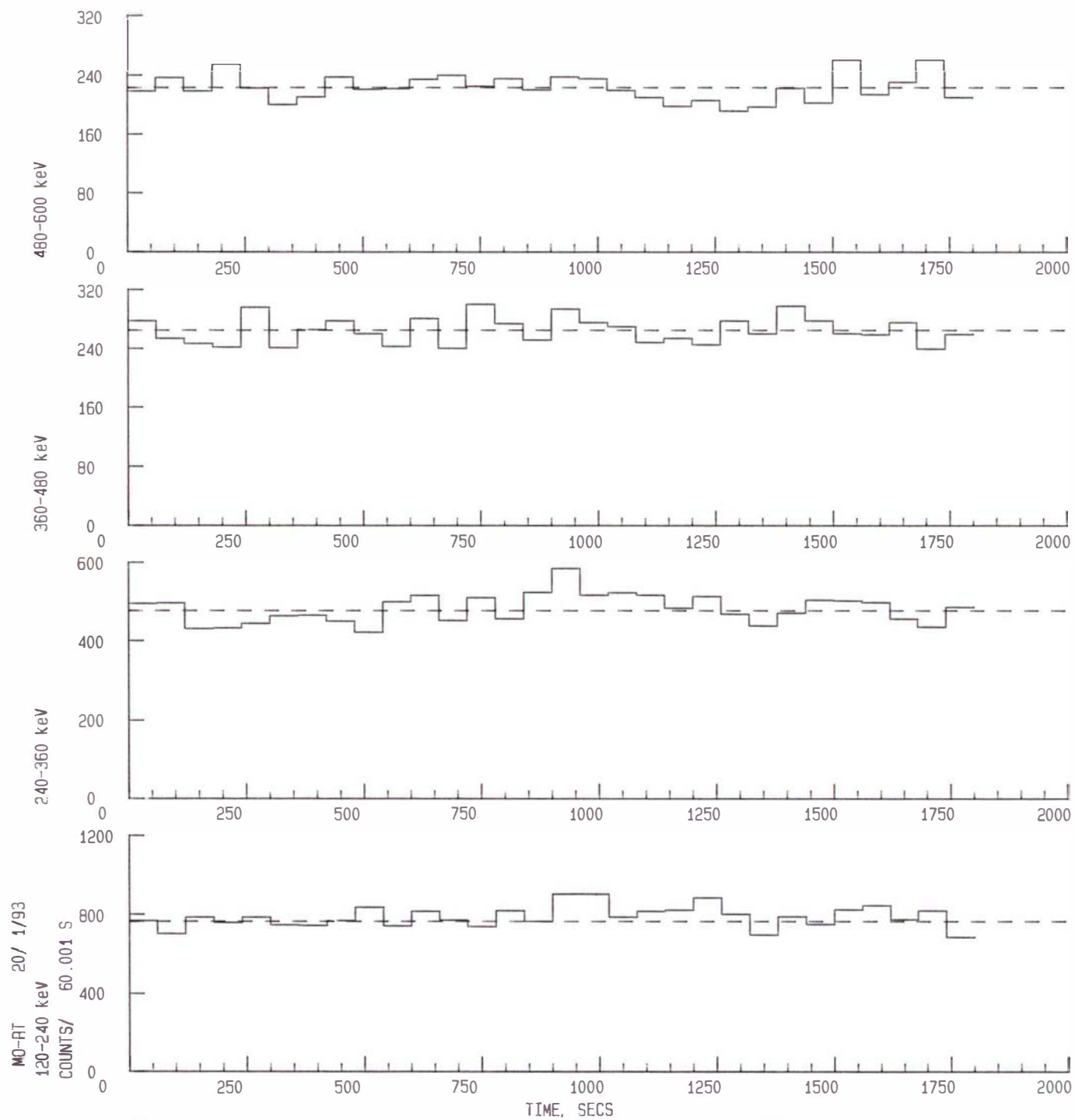
60.001 S. INTERVALS REGROUPED BY 1

119- 599 keV

N= 10 M= 1
>3.0 SIGMA FLUCTUATIONS



10/ 7/95



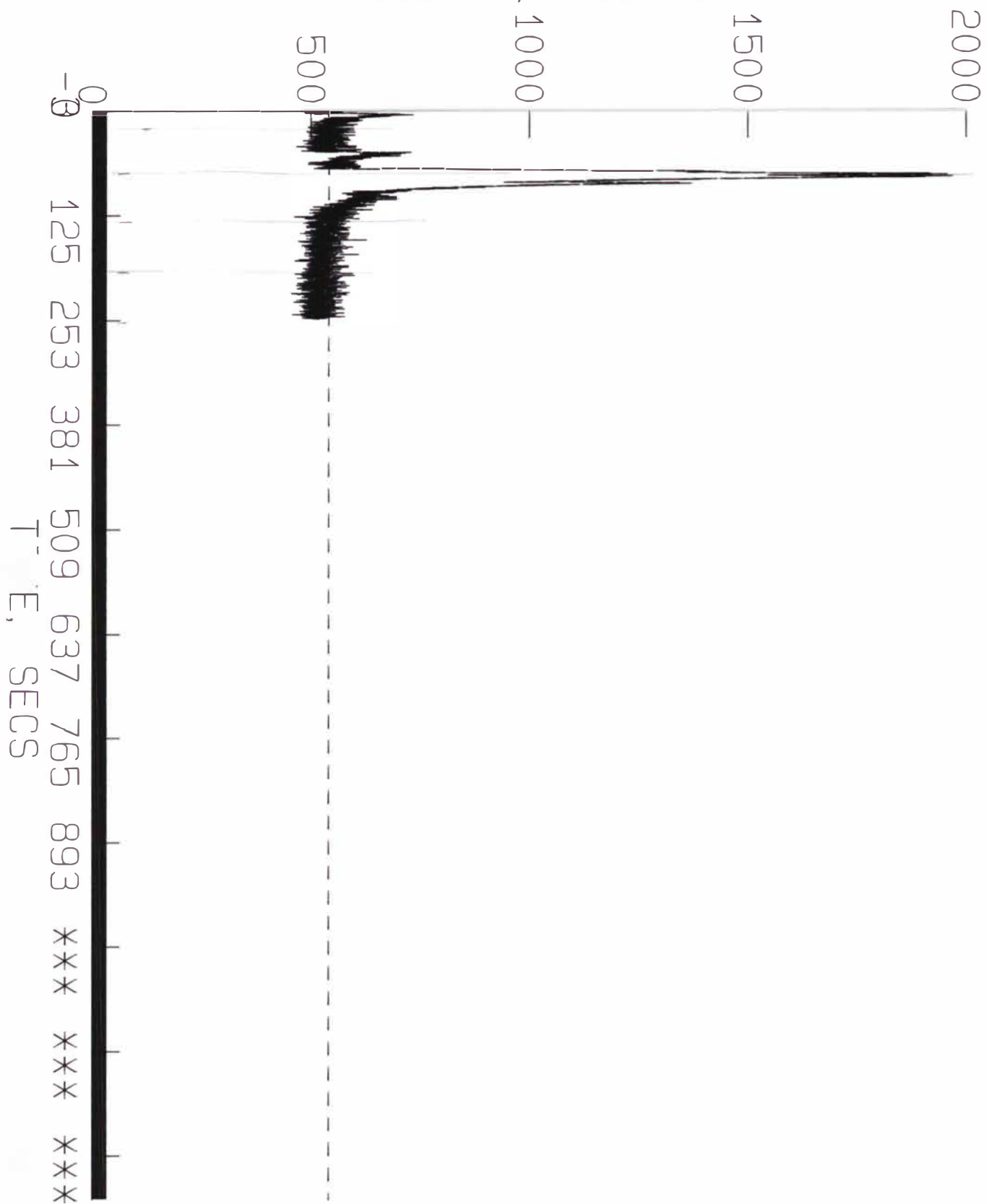
BATSE

20/01/93

84700.290

25- 100 keV

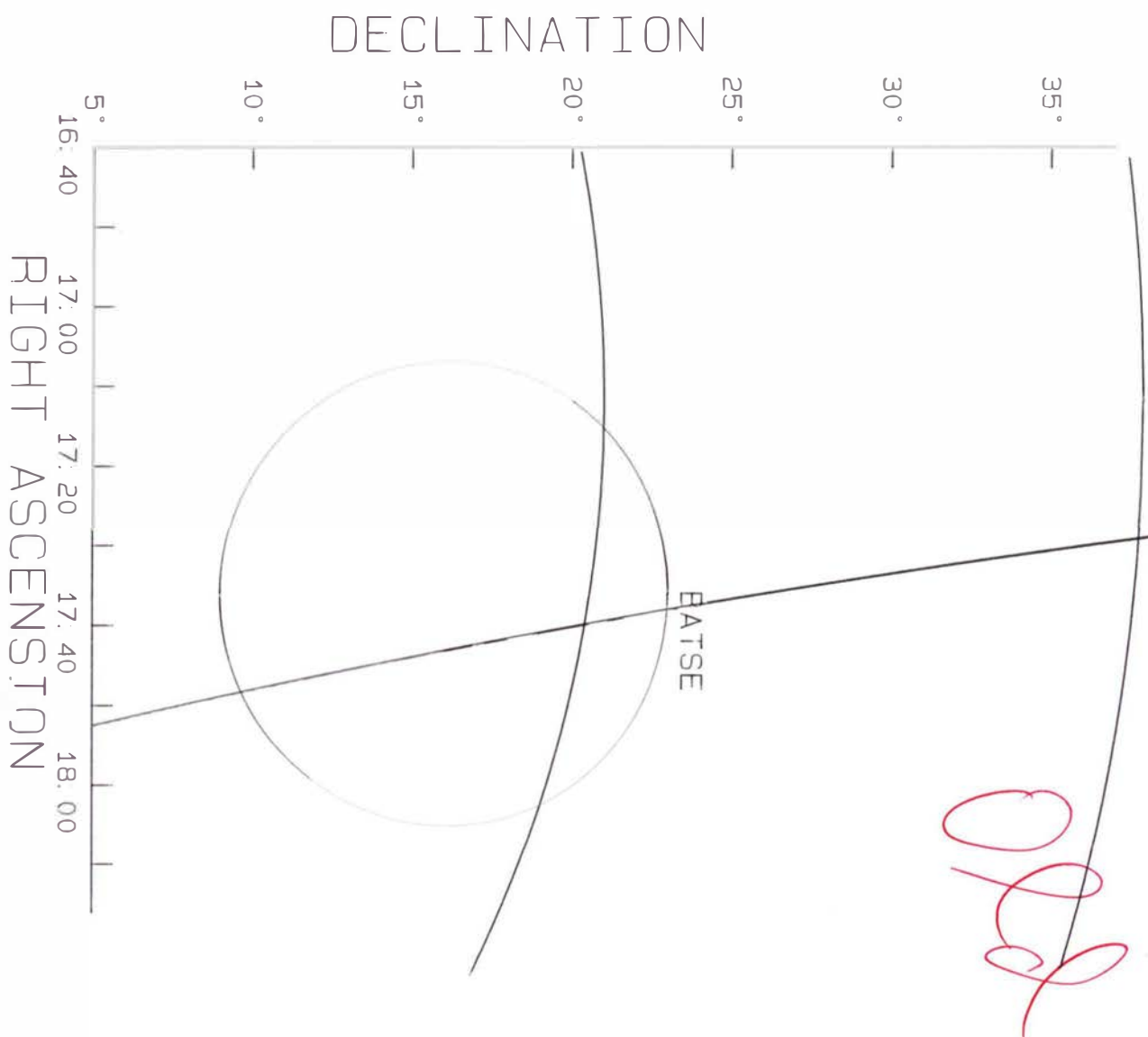
COUNTS/ .064 S



EARTH-N = EARTH AS SEEN FROM SATELLITE N
 S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
 1 BATSE 2 ULYSSES 3 MO

EVENT OF JAN 20²⁻¹₃₋₁ 1993 23:31

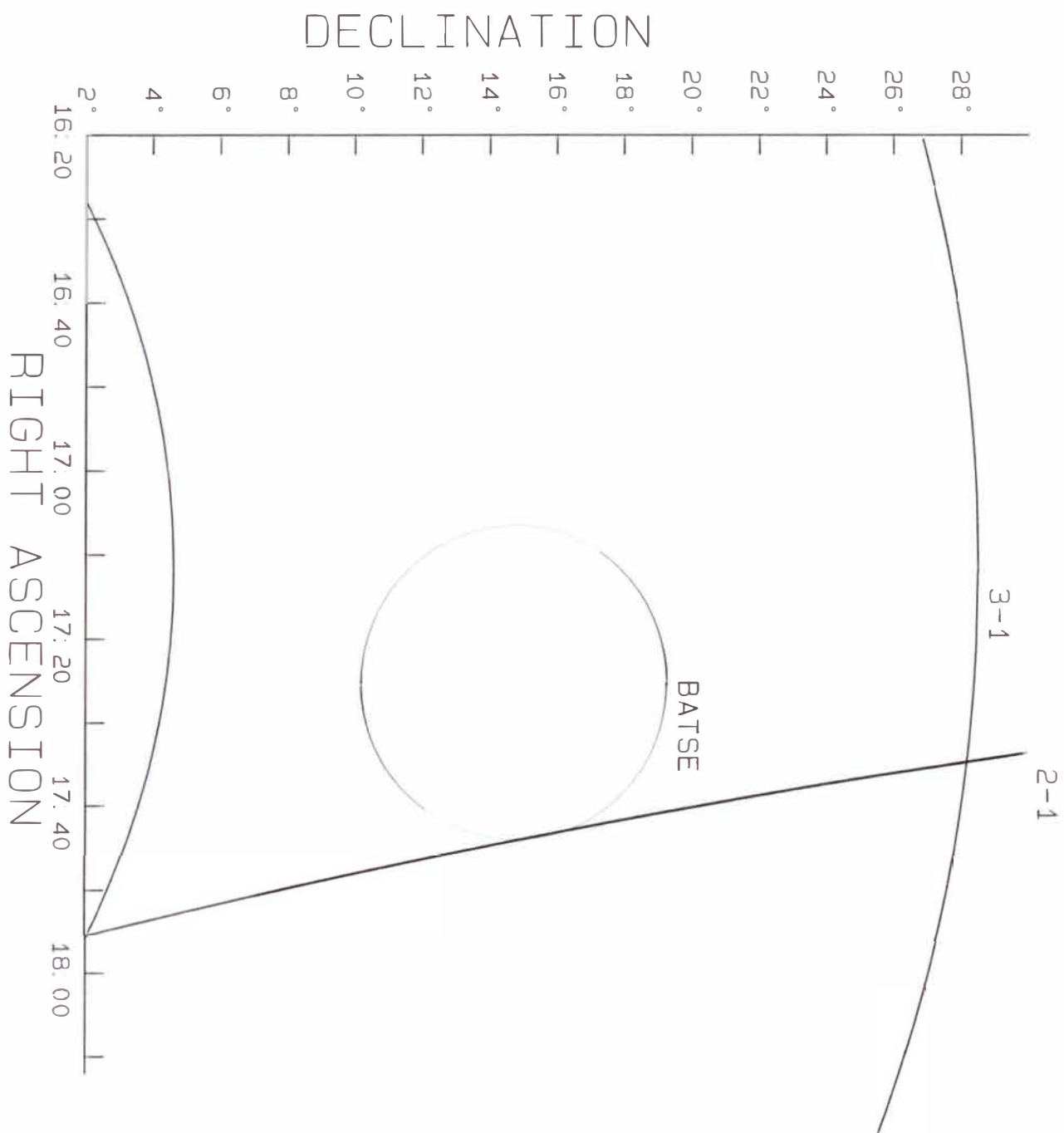
6/ 4/94



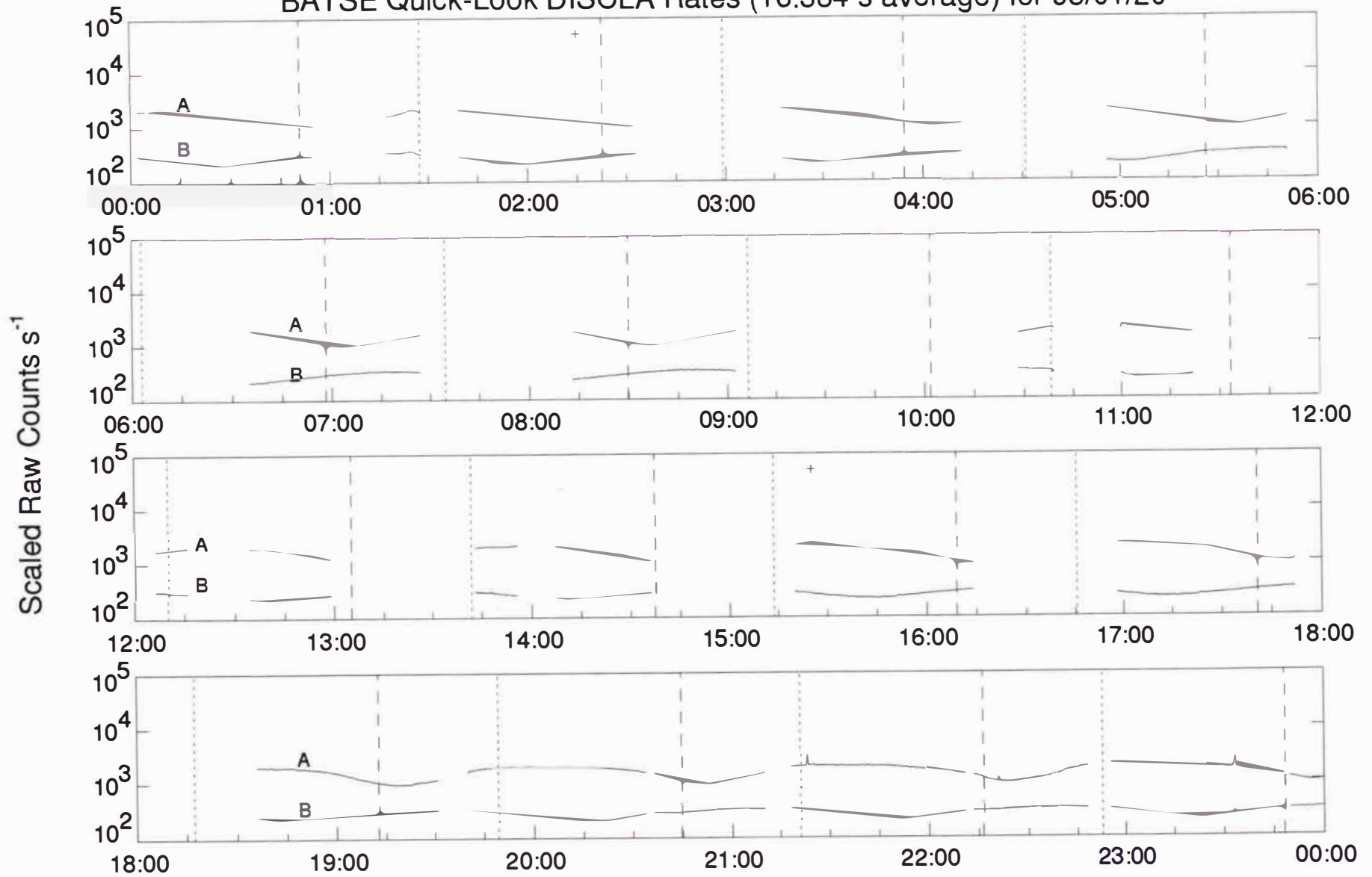
EARTH-N = EARTH AS SEEN FROM SATELLITE N
 S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
 1 BATSE 2 ULYSSES 3 MO

EVENT OF JAN 20, 1993 23:31

10/ 7/95



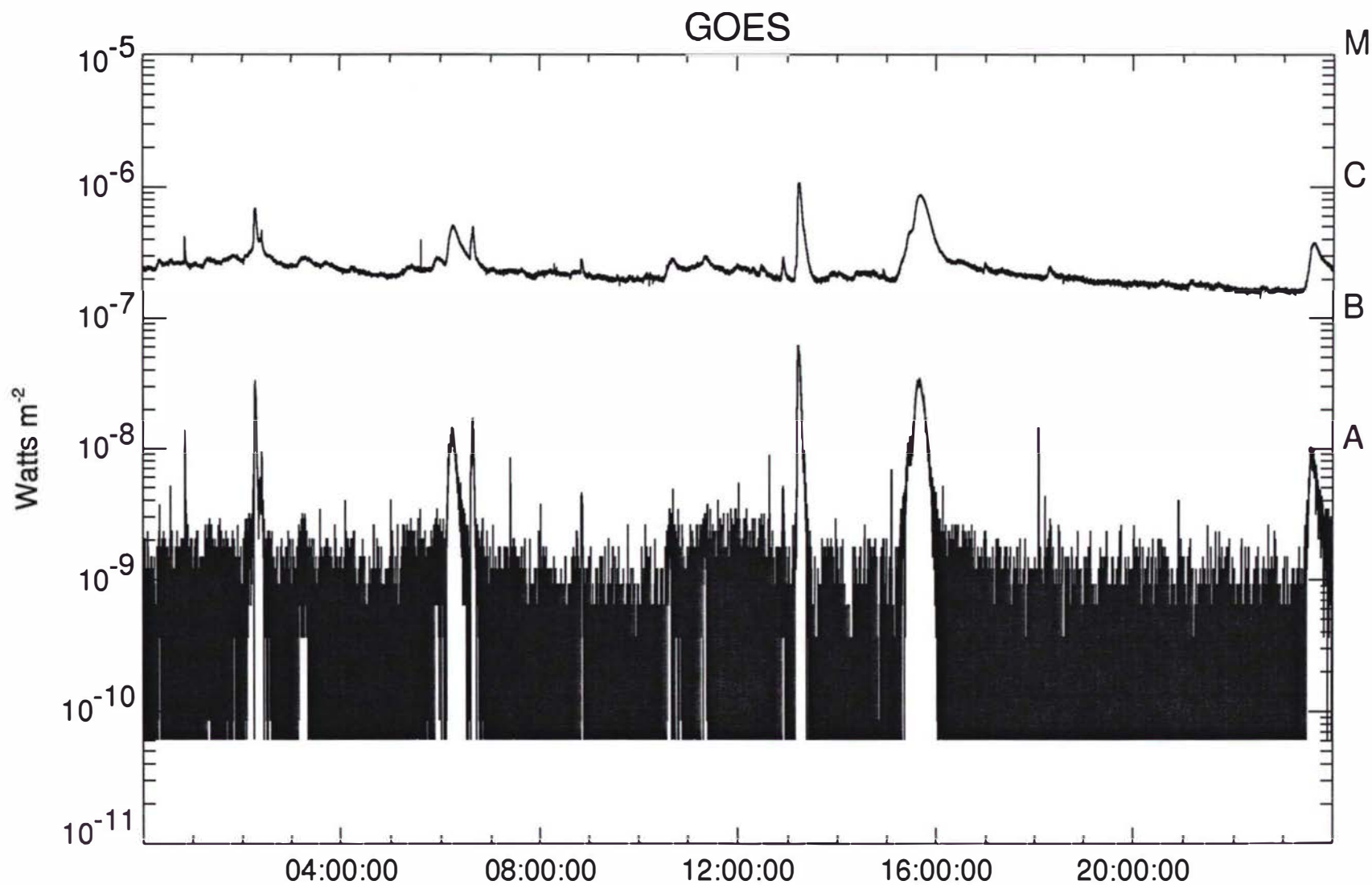
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/20



Current Time: 93/01/25, 2004 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



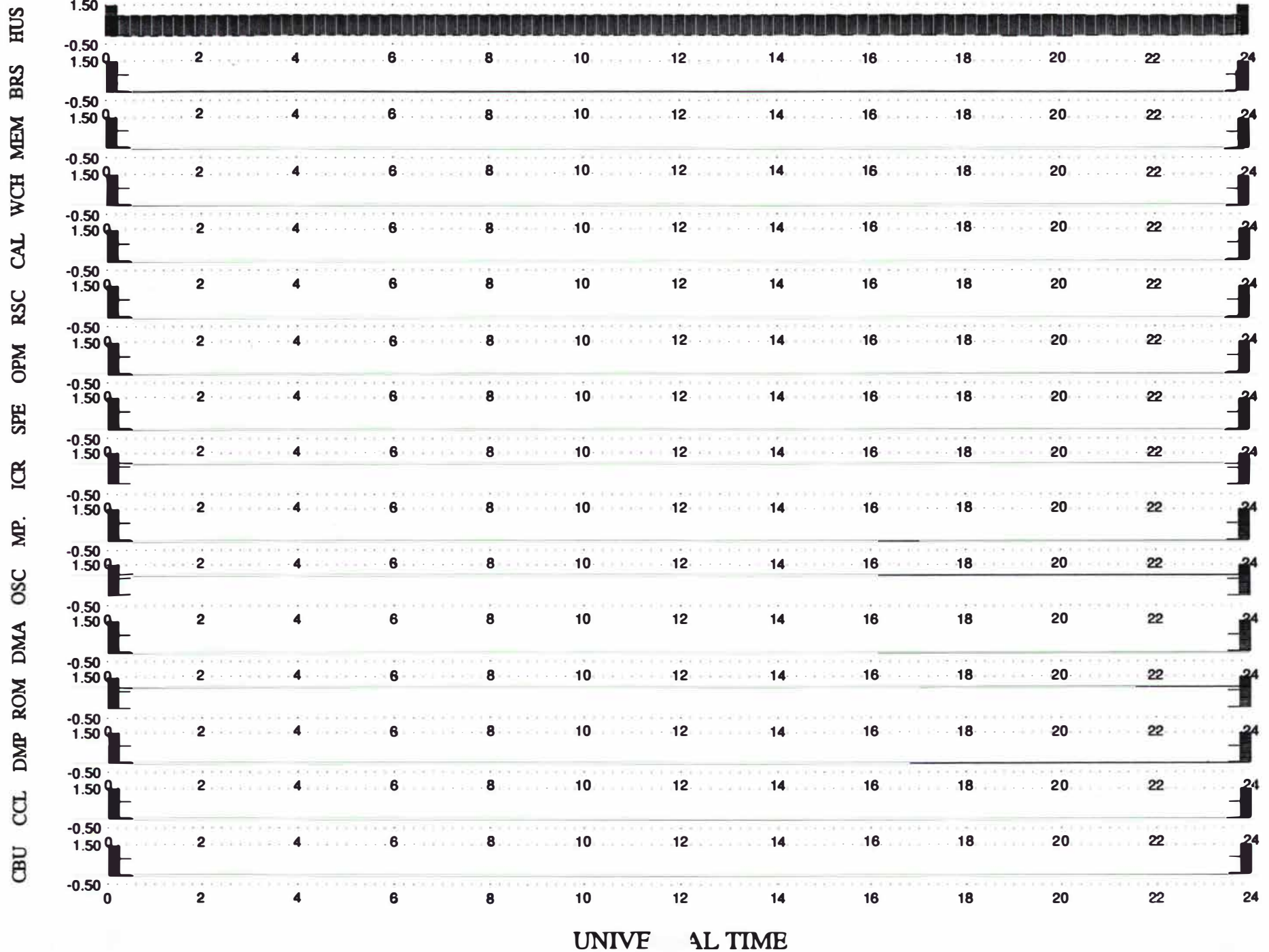
Data Start: 93/01/20, 0000:01

Plot created: 95/05/31, 2224

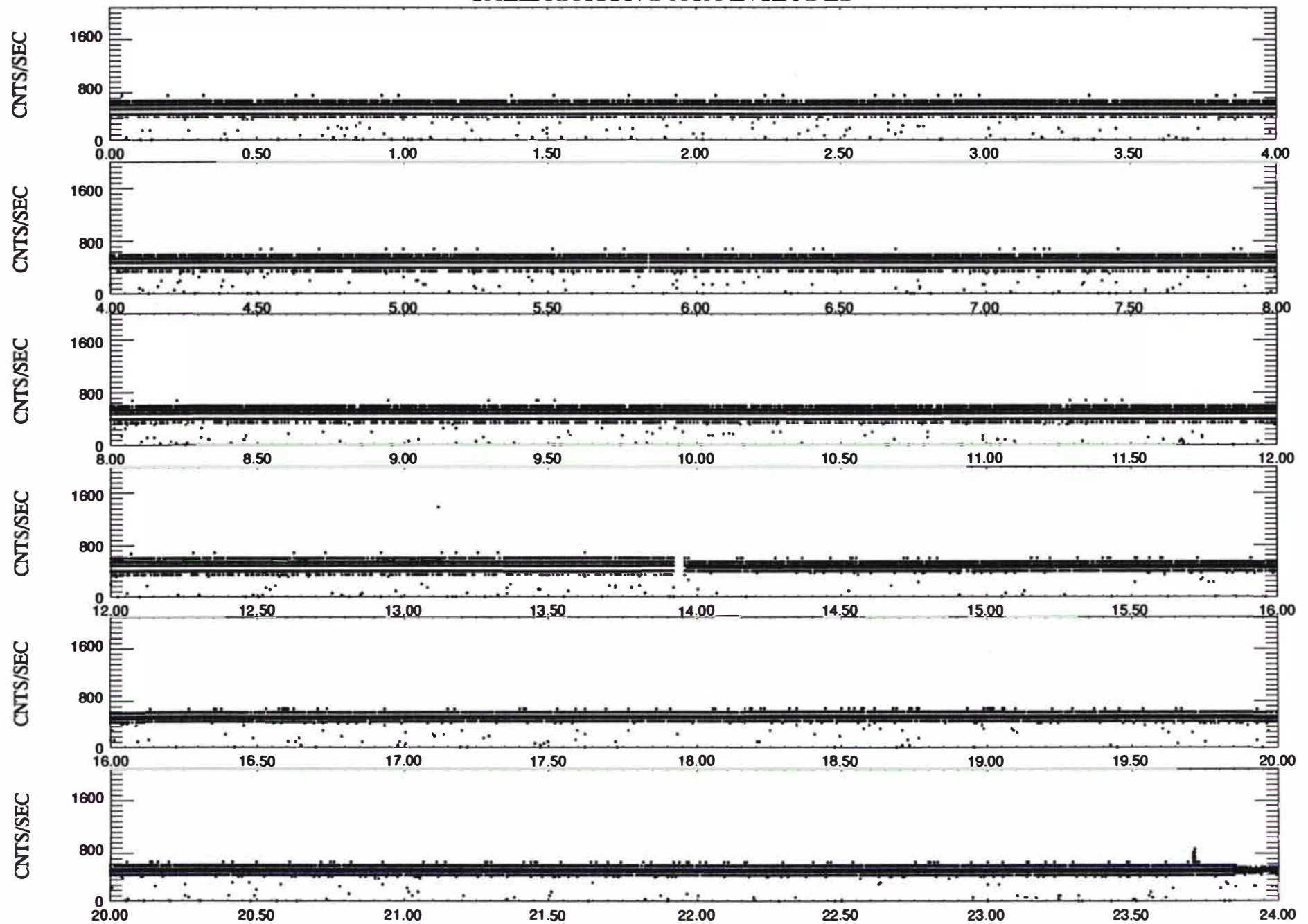
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

BURST NUMBER 13

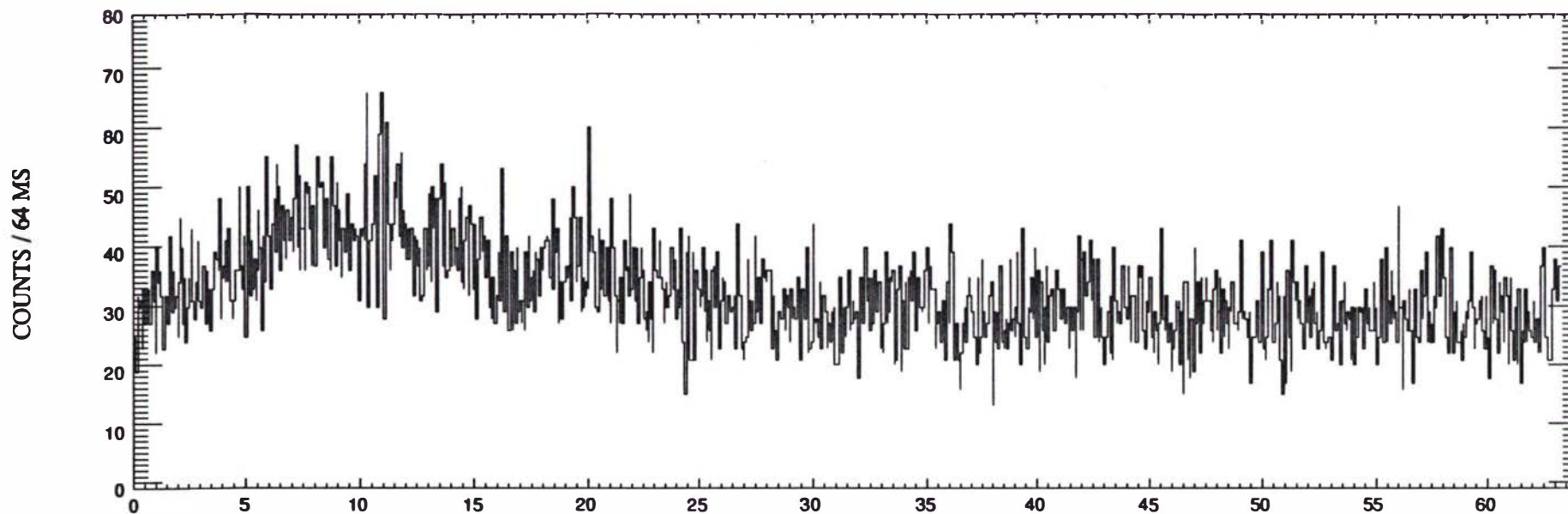


CALIBRATION DATA INCLUDED

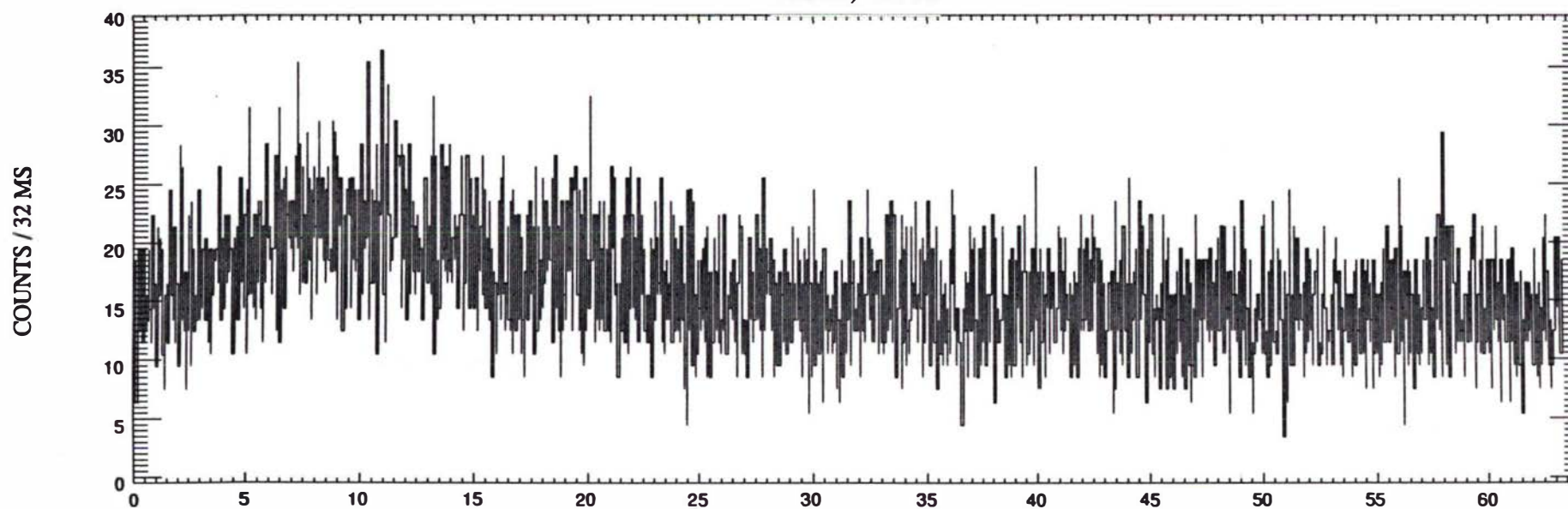


UNIVF AL TIME

Burst Counter 13 at UT=23.709087604947 h=85352.715 s 23:42:32.715

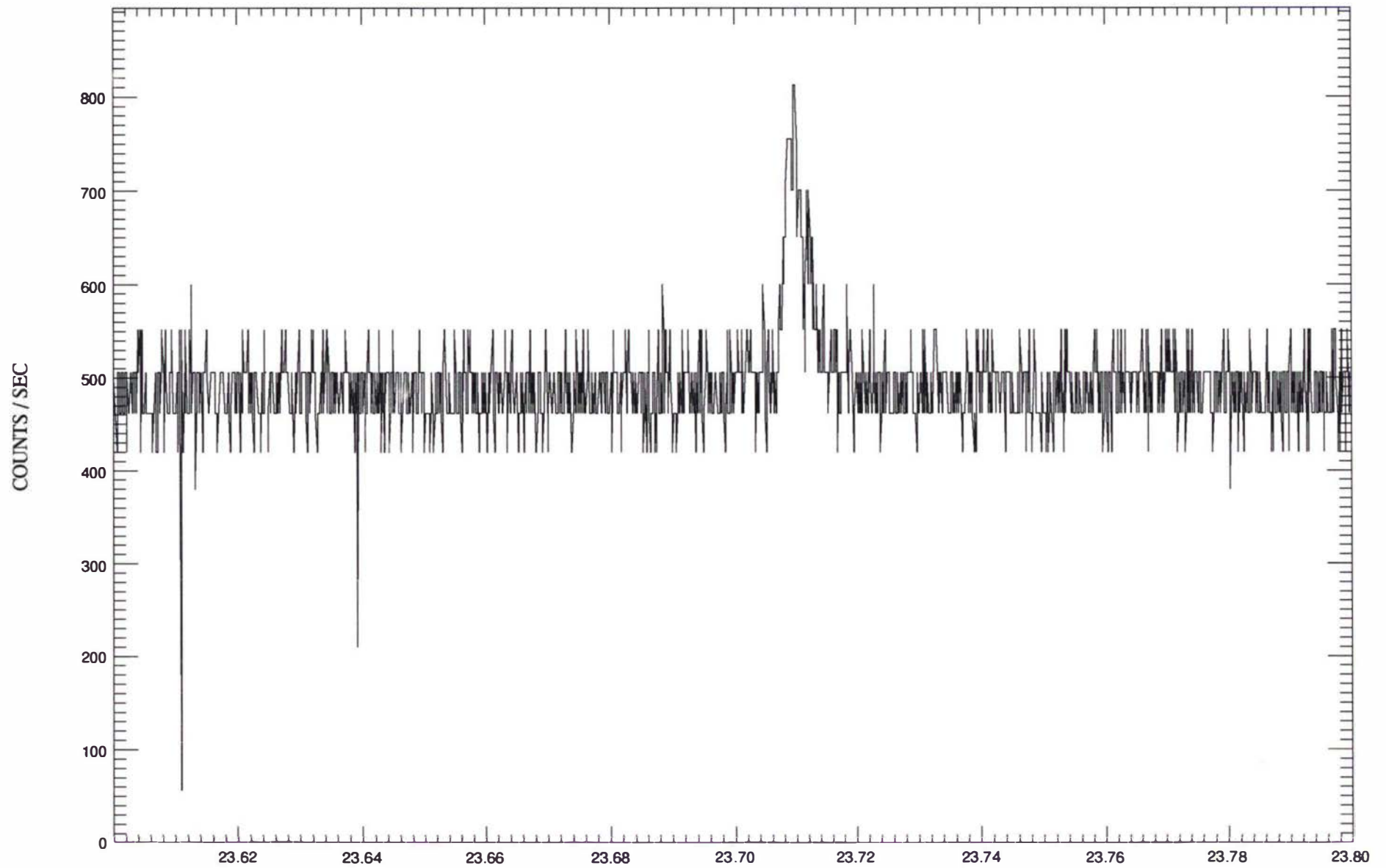


TIME, SECS



TIME, SECS

CALIBRATION DATA INCLUDED



For pitch-angle:

```
idl /disks/disk1/LAN_IDL_920630/hs_start
idl /disks/disk1/LAN_IDL_921006/idl/hs_start
```

```
FOR ASCII:-----
idl path:
idl /disks/disk1/EXE/lan/idl/hiscale/hs_start
chaizy
*micle39
TO CONVERT VMS TO SUN:
/disks/disk1/LAN_IDL_921006/hsio_22/hstrans
```

If you want sector plots spectra:

```
idl /disks/disk1/PRJ/lan/idl/devel/devel_6/hs_start
```

Specific replies:

```
-----
Enter sector number : 1
Enter sector number : 2
Enter sector number : 3
Enter sector number : 4
Enter sector number : 5
Enter sector number : 6
Enter sector number : 7
Enter sector number : 8
Offset factor for sector 1 <1.00000e+07> :_
Offset factor for sector 2 <1.00000e+06> :_
Offset factor for sector 3 <100000.> :_
Offset factor for sector 4 <10000.0> :_
Offset factor for sector 5 <1000.00> :_
Offset factor for sector 6 <100.000> :_
Offset factor for sector 7 <10.0000> :_
Offset factor for sector 8 <1.00000> :_
Logarithmic (1) or linear (0) plots? <1> :_
```

ALWAYS have one sector start at 1.000000 (log) or 0.0000 (linear)

when in idl:

if stopped and IDL> type .go

To run color spectrogram plots:

```
-----
from gammaray:
/disks/disk1/programs/for_JUPITER/SUNLAN_Hsio/lanspect
also a possibility: lanpi
```

To Convert ULA's

```
-----
/disks/gammaray/PRJ/lan/cvt
```

To get ULA's off exebyte and convert them....:

```
-----
/disks/telemachus/PRJ/lan/util/get_ula
```

To get them from exebyte and stick on optical....:

```
/disks/telemachus/PRJ/lan/util/get_ula_op
```

Tectronic Emulator

```
-----
c:\app\term\em4010
```

KEYS

```
-----
exit          Alt X
break         Alt B
GR mode       Alt G
GR setup      Alt F1
Hardcopy      Alt F4
Plotter       Alt F8
QUEUE         Alt F9
              F2 - enter files into queue
              F4 - start print
```

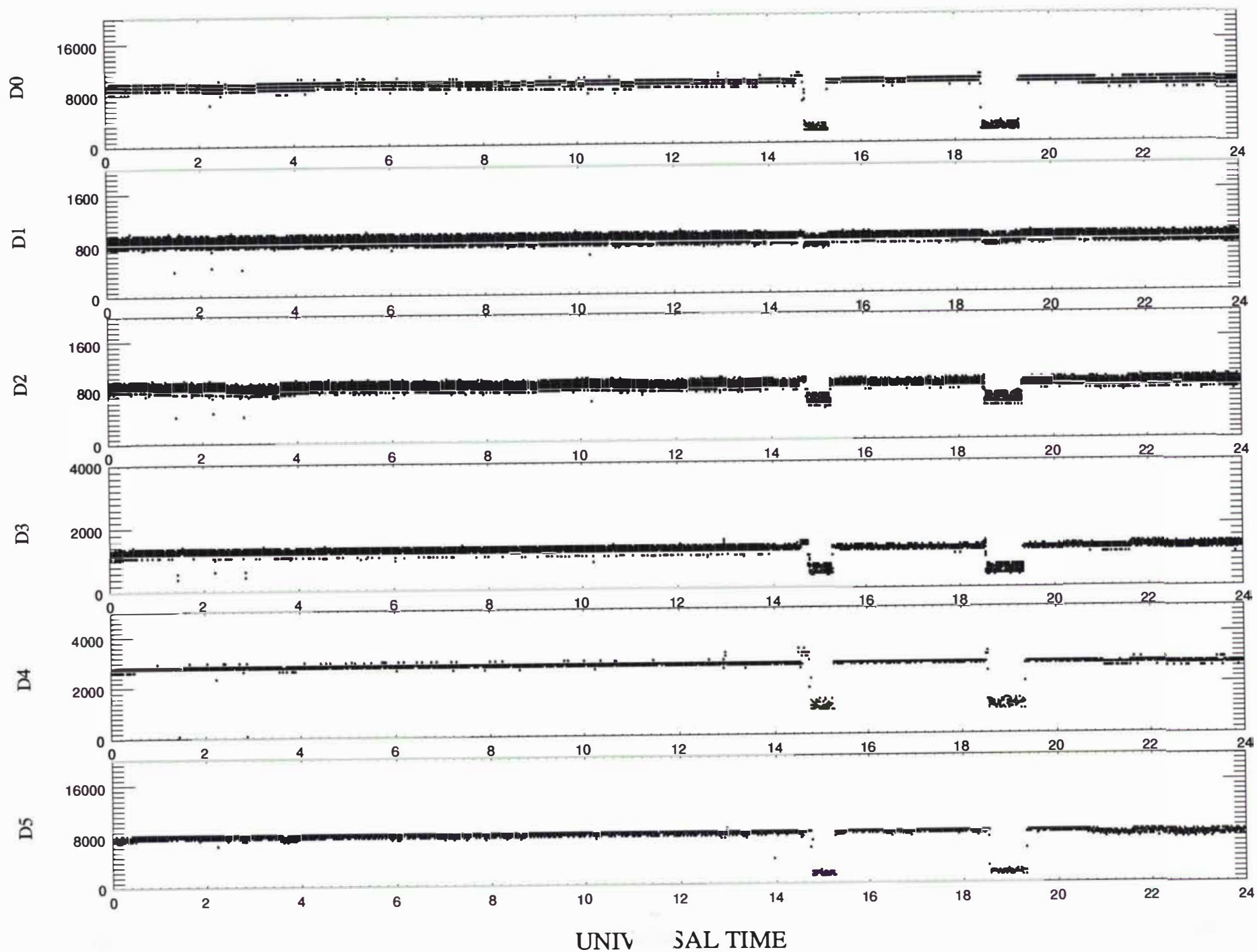
UCBSP - for mag data

```
-----
set def [.kuspac]
dir 7406::dkb200:[lan.umag]
copy 7406::dkb200:[lan.umag]
dir 7406::dkb0:[att_lan]lan360.tar
dir 7406::dkb0:[ulysses.plot_mag]
```

To run Hus Ascii Programs:

```
-----
For full 10 files:
```

```
2AB - run first and get burst time - 1 ascii file - get .ps file too
2AS - get 2 ascii files - 2AS and 2ABE - get .ps for 2AS
2A1 or 2A2 - get 1 ascii - RT data
sedr_burstinfo
/disks/gammaray/lt/sedr_reader/sedr_burstinfoT
HK data
```

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 22 12:36:05 1993
Date: Fri, 22 Jan 1993 14:34:36 -0600 (CST)
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.: 02139

TIME: TJD=9008 SECONDS=07175

TYPE: PARTICL SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:

PARTICLE EVENT

CATSEARCH PROGRAM

BATSE BURST # 2140
EVENT OF 1993 JAN 21 DAY OF YEAR= 22
EVENT CROSSING TIME AT BATSE : 33430. S. OR 09:17:10.1
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 7.300 -18.800
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 22/ 1/ 93 IS:
RA= 162.681 DEC= -13.810 DIST= 4.345 AU
BATSE-ULYSSES DISTANCE = 649982080. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 40.64 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1645.15 SECS.
CROSSING TIME AT ULYSSES IS 35075. S. OR 09:44:35.3 +/- 320.16 SECONDS

NO

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 22 12:43:18 1993
Date: Fri, 22 Jan 1993 14:42:08 -0600 (CST)
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: 1296

BATSE BURST TRIGGER

NO.: 02140

TIME: TJD=9008 SECONDS=33430

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=129.9 AZIMUTH=286.8 ERROR= DEGREES

COMMENTS:

BURST OF 35 SECONDS DURATION. FAST RISE, EXPONENTIAL DECAY, AND DOUBLE PEAK.
NOT SEEN ABOVE 300 KEV.

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 22 12:28:46 1993
Date: Fri, 22 Jan 1993 14:27:57 -0600 (CST)
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
2140	930121	9008	33430	3000	010	-18

23/ 1/93

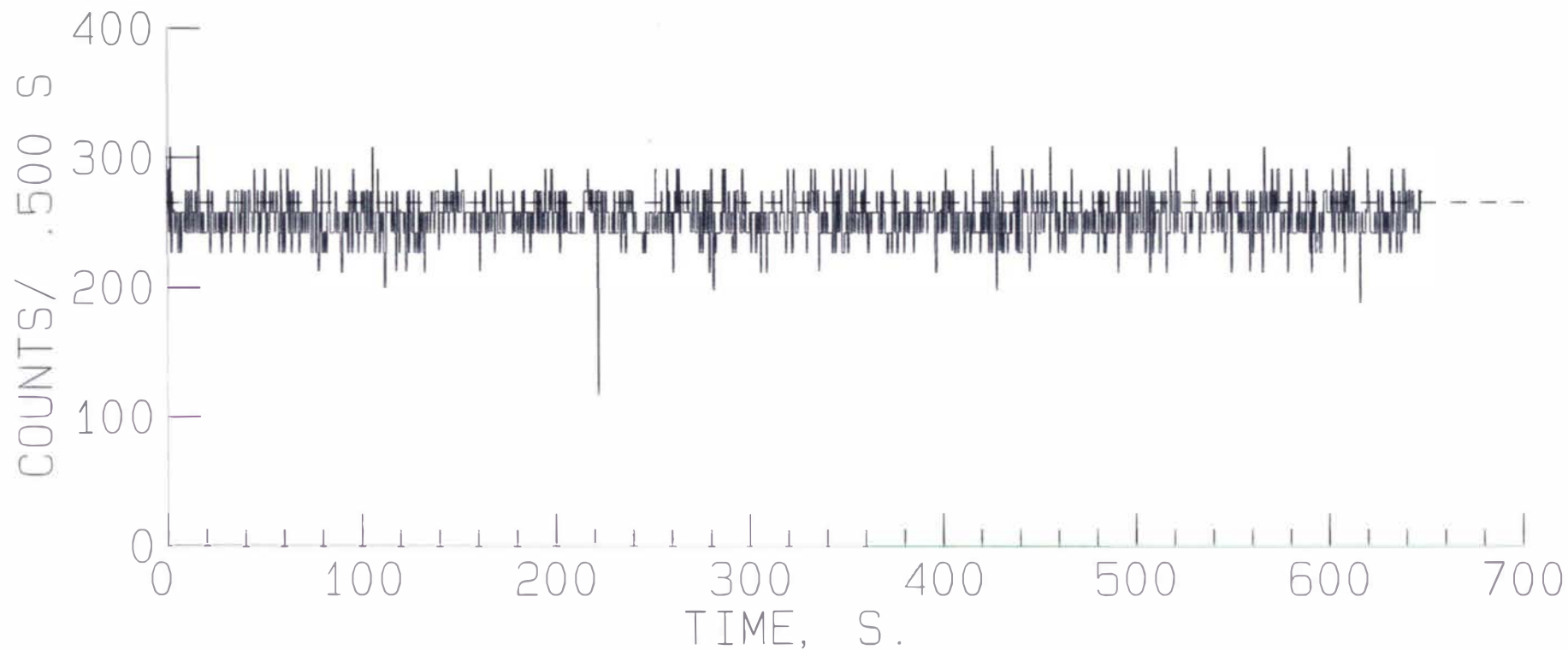
ULYSSES RT

21/ 1/93 34740.160 s

.250 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=70
>4.0 SIGMA FLUCTUATIONS



 CATSEARCH PROGRAM

BATSE BURST # 2141
 EVENT OF 1993 JAN 21 DAY OF YEAR= 21
 EVENT CROSSING TIME AT BATSE : 43932. S. OR 12:12:12.3
 COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 24.300 11.100
 BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
 POSITION OF ULYSSES ON 21/ 1/ 93 IS:
 RA= 162.856 DEC= -13.750 DIST= 4.359 AU
 BATSE-ULYSSES DISTANCE = 652106400. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 40.51 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1653.71 SECS.
 CROSSING TIME AT ULYSSES IS 45586. S. OR 12:39:46.0 +/- 320.44 SECONDS

NO

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 22 12:46:15 1993
 Date: Fri, 22 Jan 1993 14:45:14 -0600 (CST)
 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.: 02141

TIME: TJD=9008 SECONDS=43932

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=151.7 AZIMUTH=266.6 ERROR= DEGREES

COMMENTS:

SINGLE PEAKED BURST OF 20 SECONDS DURATION. NOT SEEN ABOVE 300 KEV.

From BRAINERD@ssl.msfc.nasa.gov Fri Jan 22 12:31:22 1993
 Date: Fri, 22 Jan 1993 14:30:28 -0600 (CST)
 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
2141	930121	9008	43932	1700	025	+02

9 / 6 / 94

ULYSSES RT

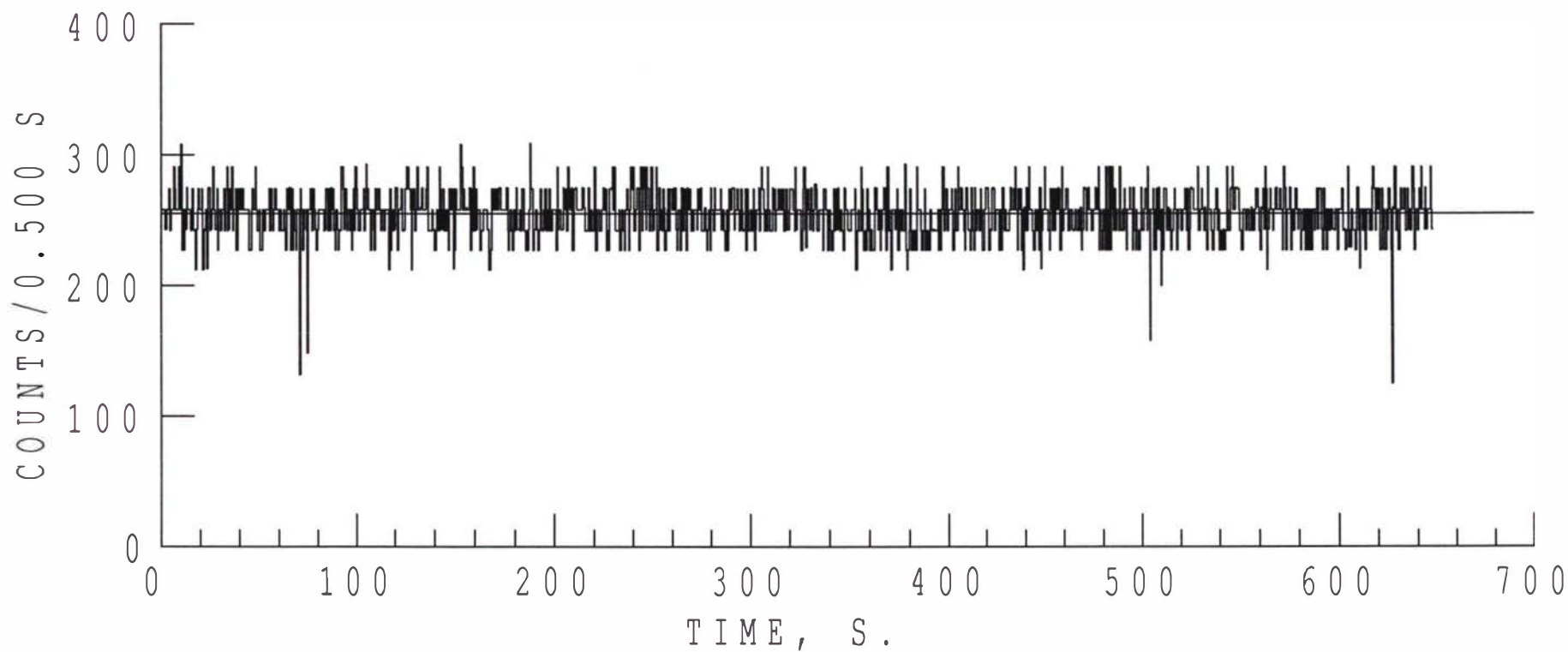
21 / 1 / 93 45252.074 s

0.250 S INTERVALS REGROUPED BY 2

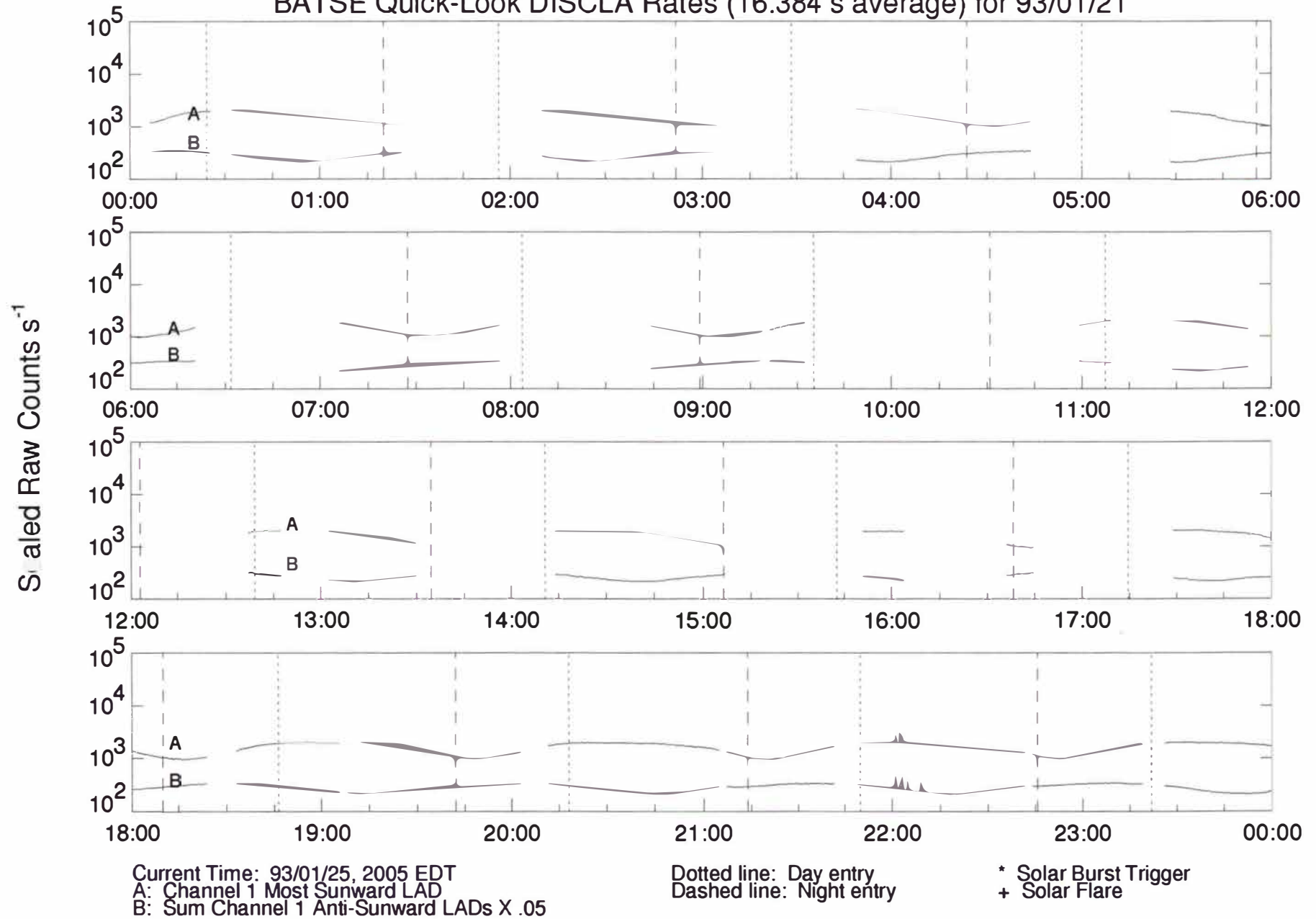
0 - 0 keV

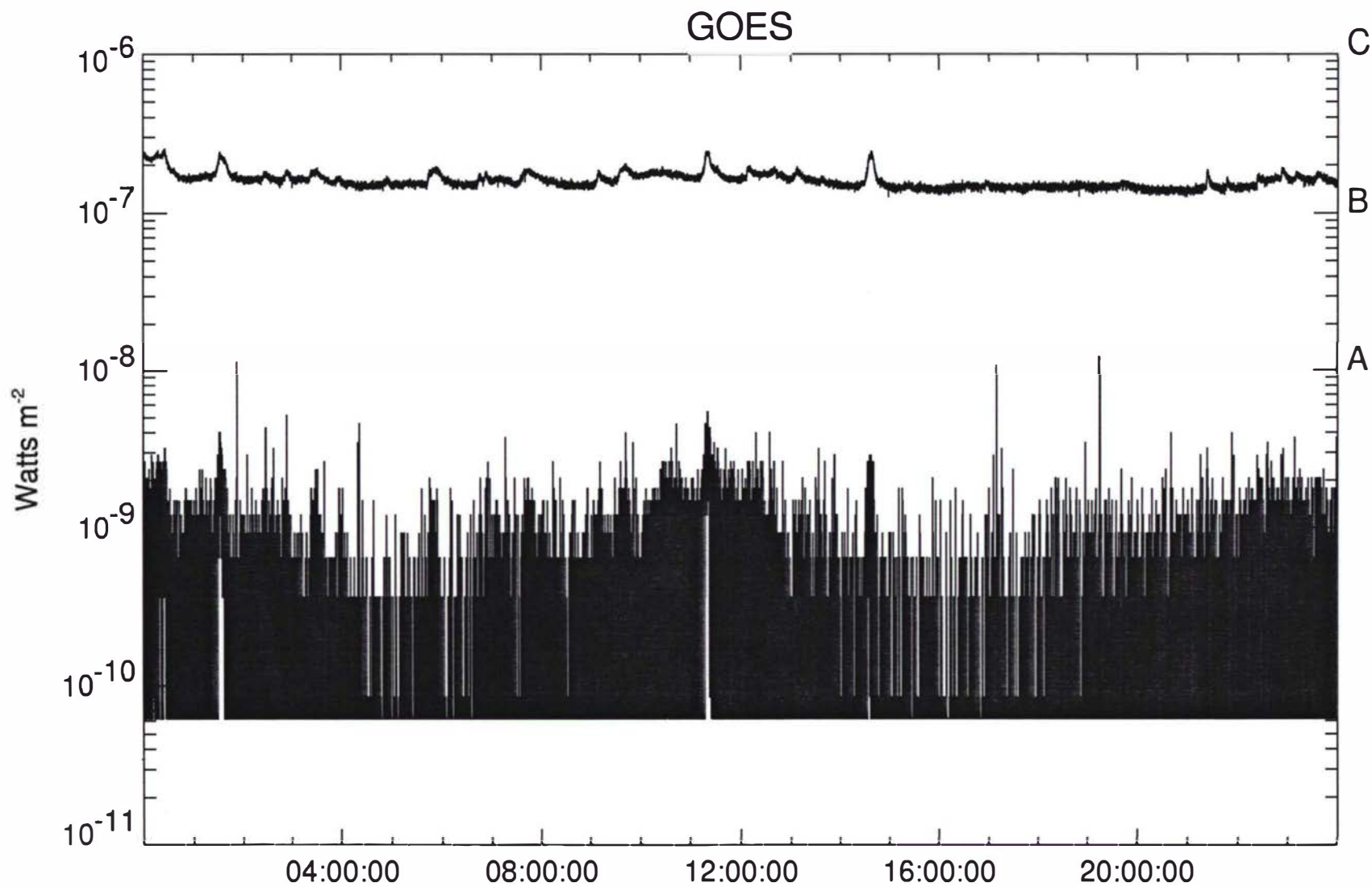
N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/21





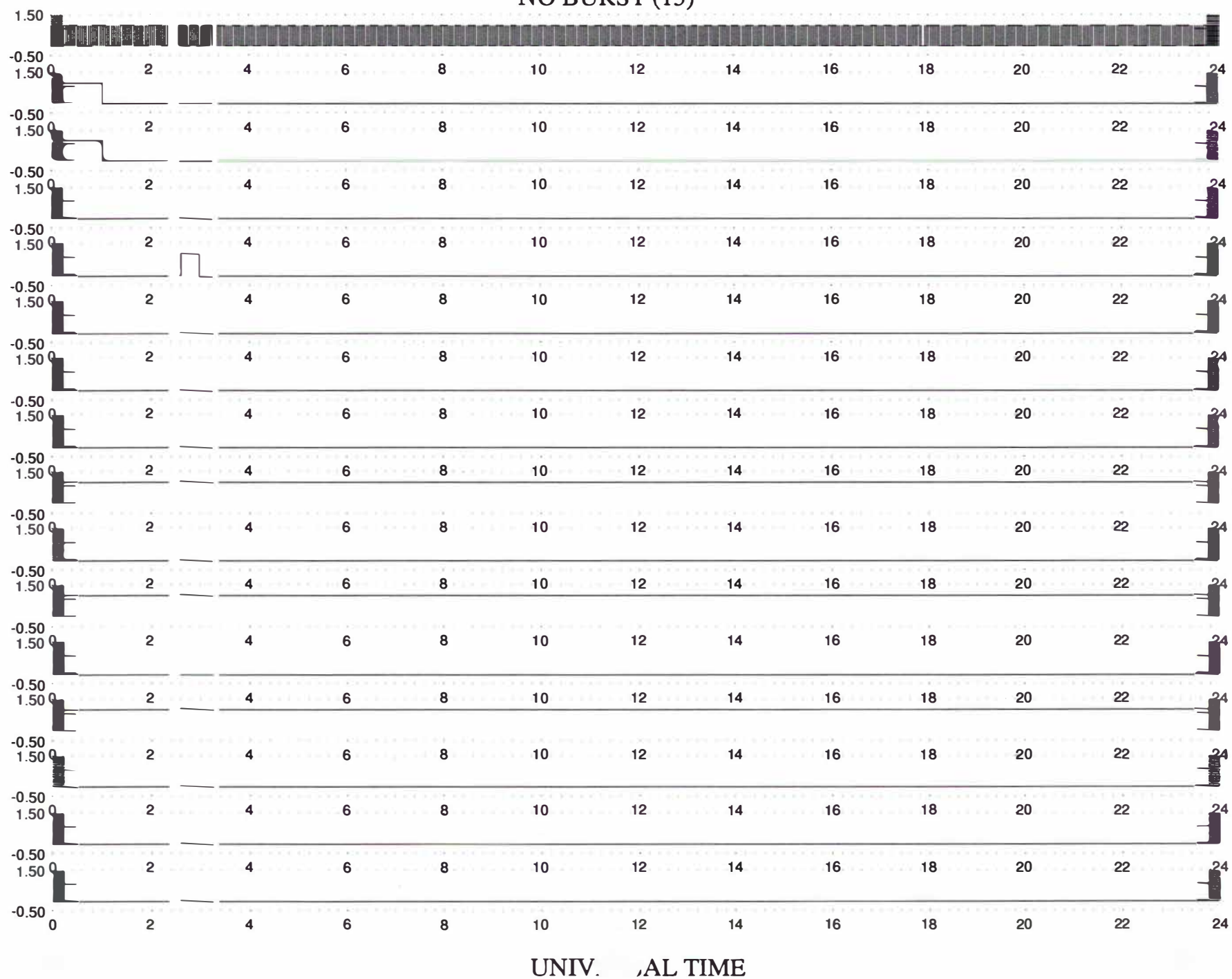
Data Start: 93/01/21, 0000:01

Plot created: 95/05/31, 2226

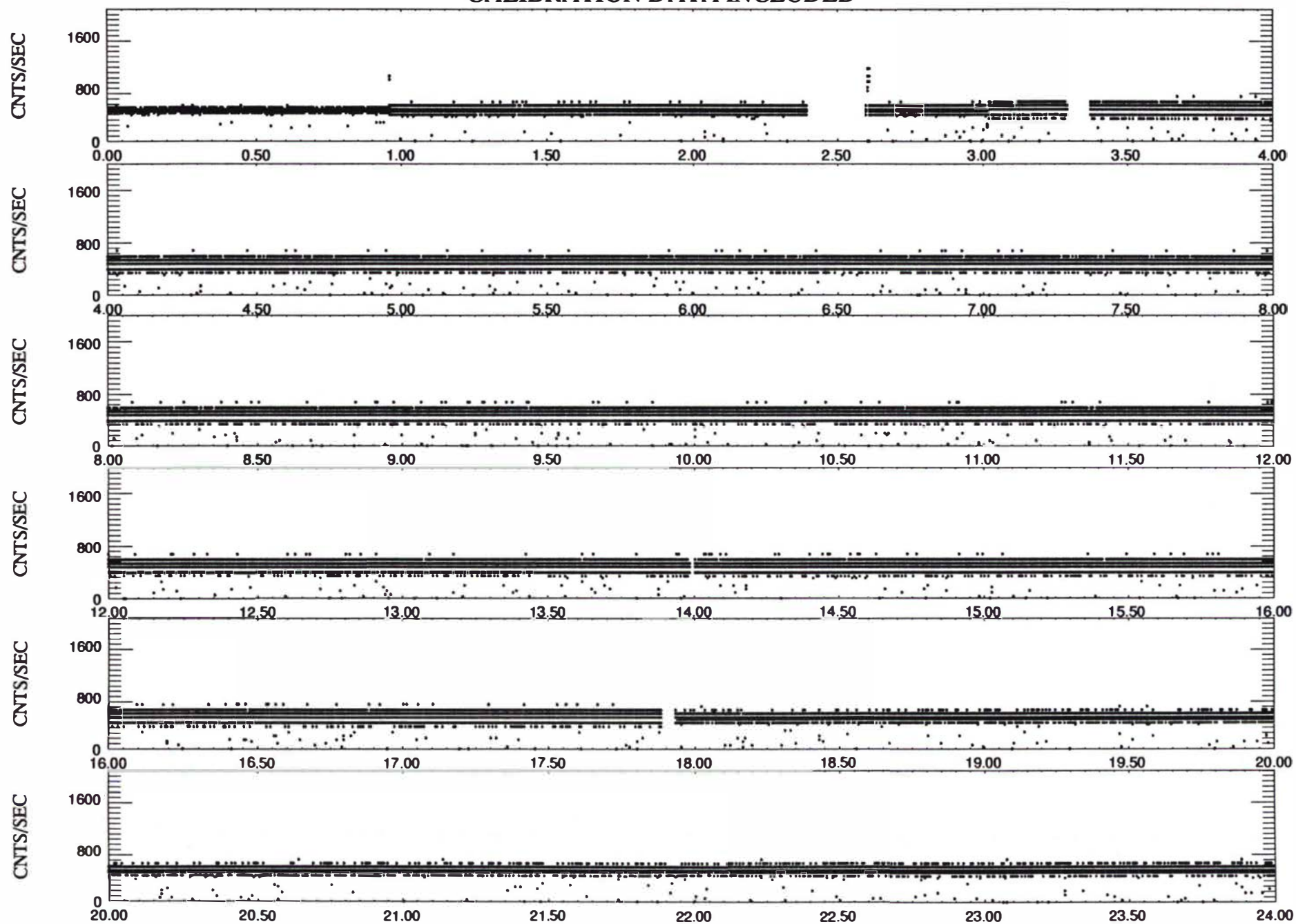
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

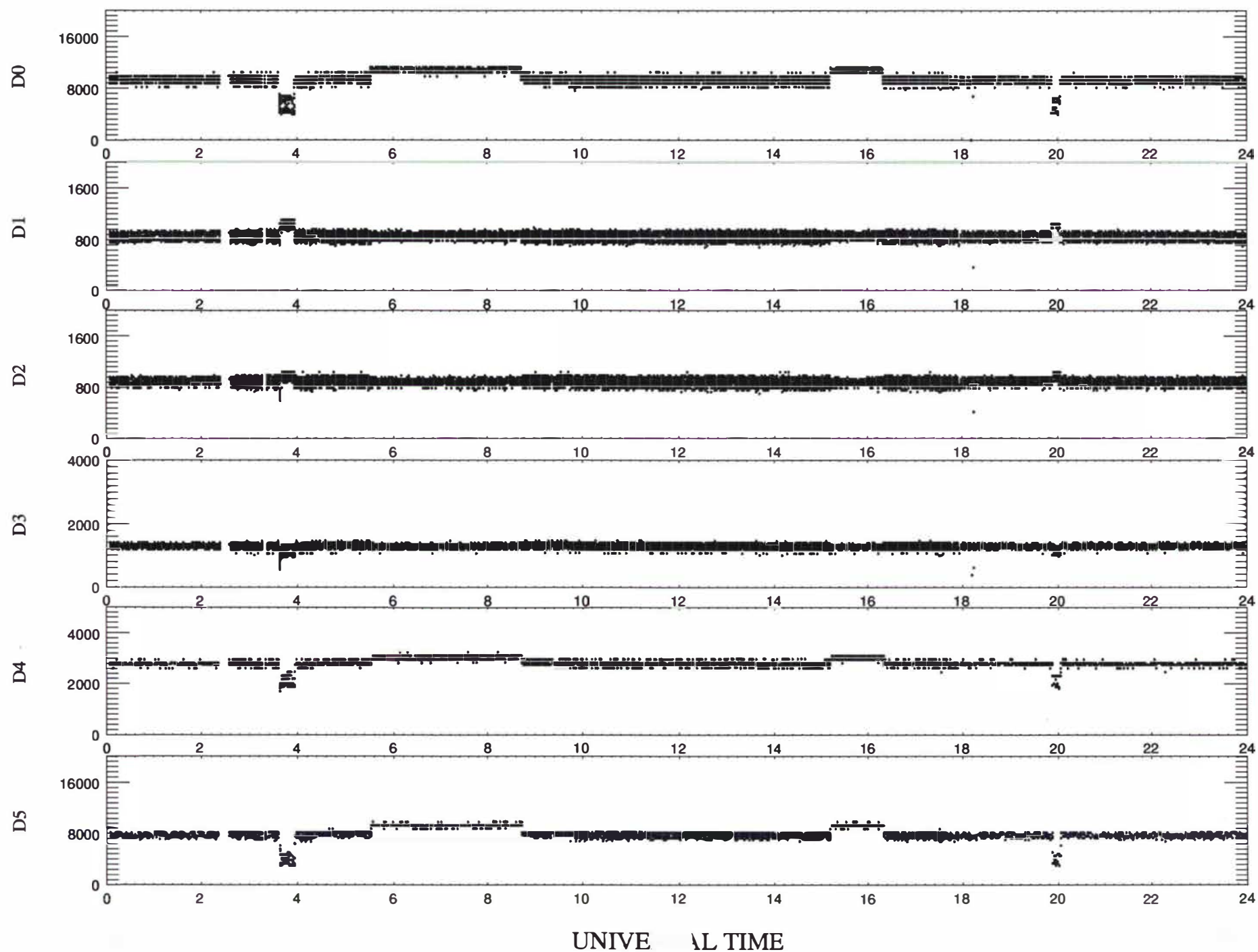
CBU	CCL	DMP	ROM	DMA	OSC	MP.	ICR	SPE	OPM	RSC	CAL	WCH	MEM	BRS	HUS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



CALIBRATION DATA INCLUDED



UNIV AL TIME



CATSEARCH PROGRAM

BATSE BURST # 2142
EVENT OF 1993 JAN 22 DAY OF YEAR= 22
EVENT CROSSING TIME AT BATSE : 44479. S. OR 12:21:18.8
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 59.100 -11.500
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 22/ 1/ 93 IS:
RA= 162.681 DEC= -13.810 DIST= 4.345 AU
BATSE-ULYSSES DISTANCE = 649982080. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 79.87 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 381.30 SECS.
CROSSING TIME AT ULYSSES IS 44860. S. OR 12:27:40.1 +/- 426.34 SECONDS

RI No - too weak

From KOUVELIOTOU@ssl.msfc.nasa.gov Mon Jan 25 15:06:35 1993
Date: Mon, 25 Jan 1993 17:05:33 -0600 (CST)
From: KOUVELIOTOU@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.: 02142

TIME: TJD=9009 SECONDS=44478

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=124.1 AZIMUTH=223.0 ERROR= DEGREES

COMMENTS:

SHORT EVENT, WITH SHARP RISE AND RATHER SHARP DECAY. TOTAL DURATION
IS ~ 2 S. SEEN ABOVE 300 KEV.

From KOUVELIOTOU@ssl.msfc.nasa.gov Mon Jan 25 15:10:34 1993
Date: Mon, 25 Jan 1993 17:09:53 -0600 (CST)
From: KOUVELIOTOU@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
2142	930122	9009	44478	4300	061	-12

ULYSSES RT

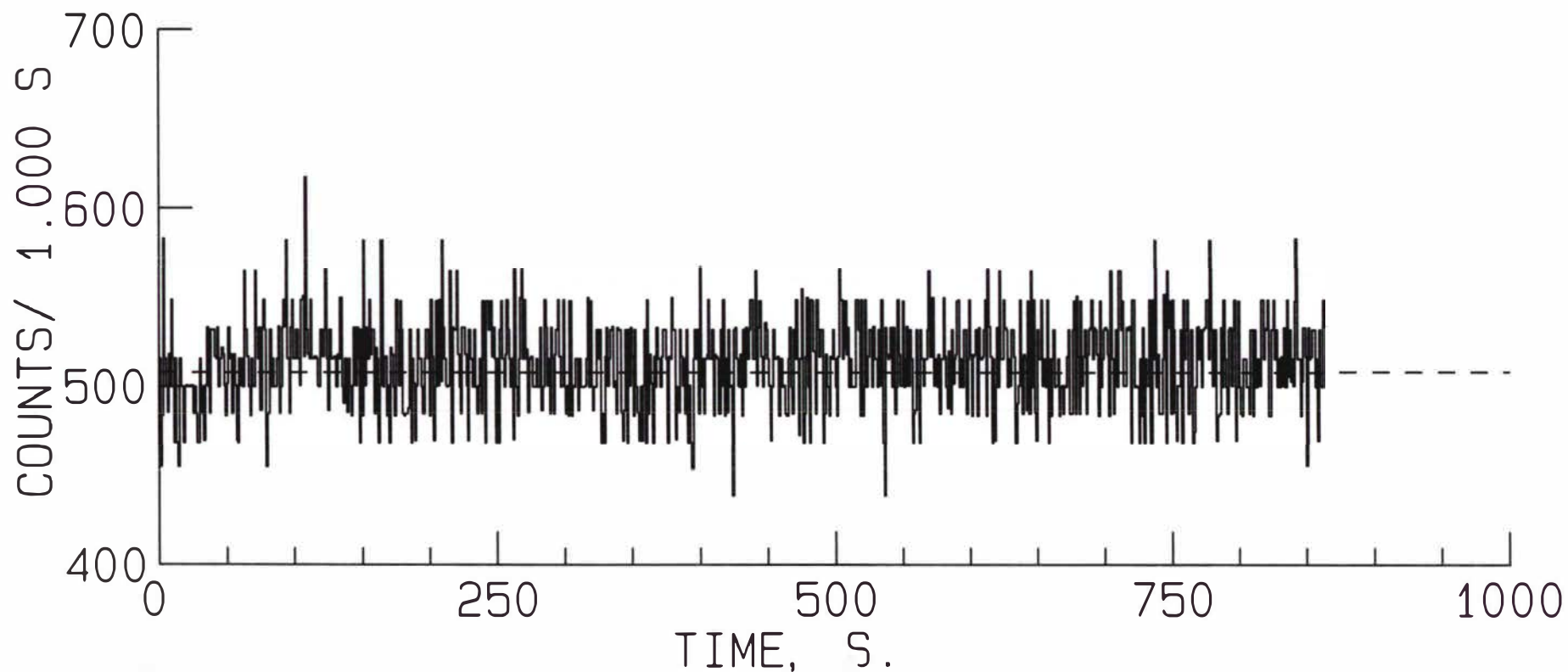
25 / 5 / 96

22 / 1 / 93 44352.166 s

0.250 S INTERVALS REGROUPED BY 4

22- 147 keV

N= 10 M= 1
>4.0 SIGMA FLUCTUATIONS



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/SMI)
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

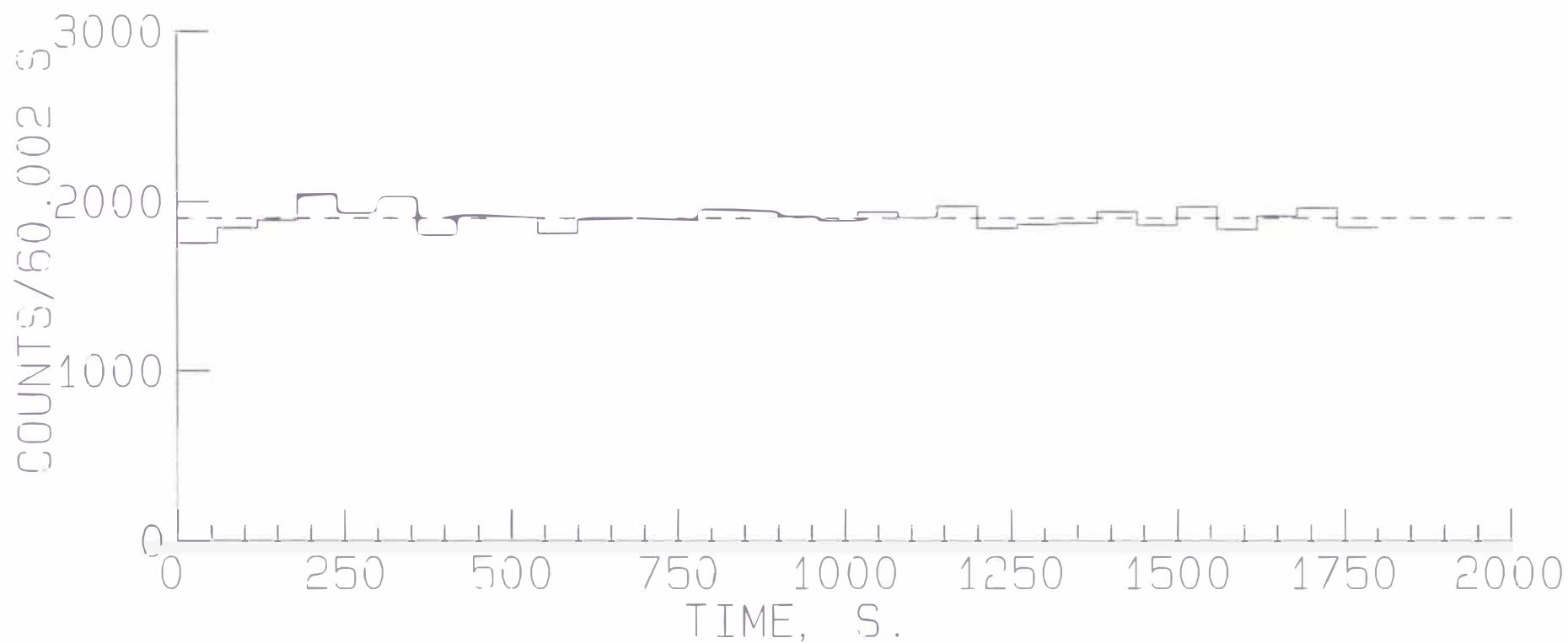
MO-RT

22 / 1 / 93

43424.286 s.

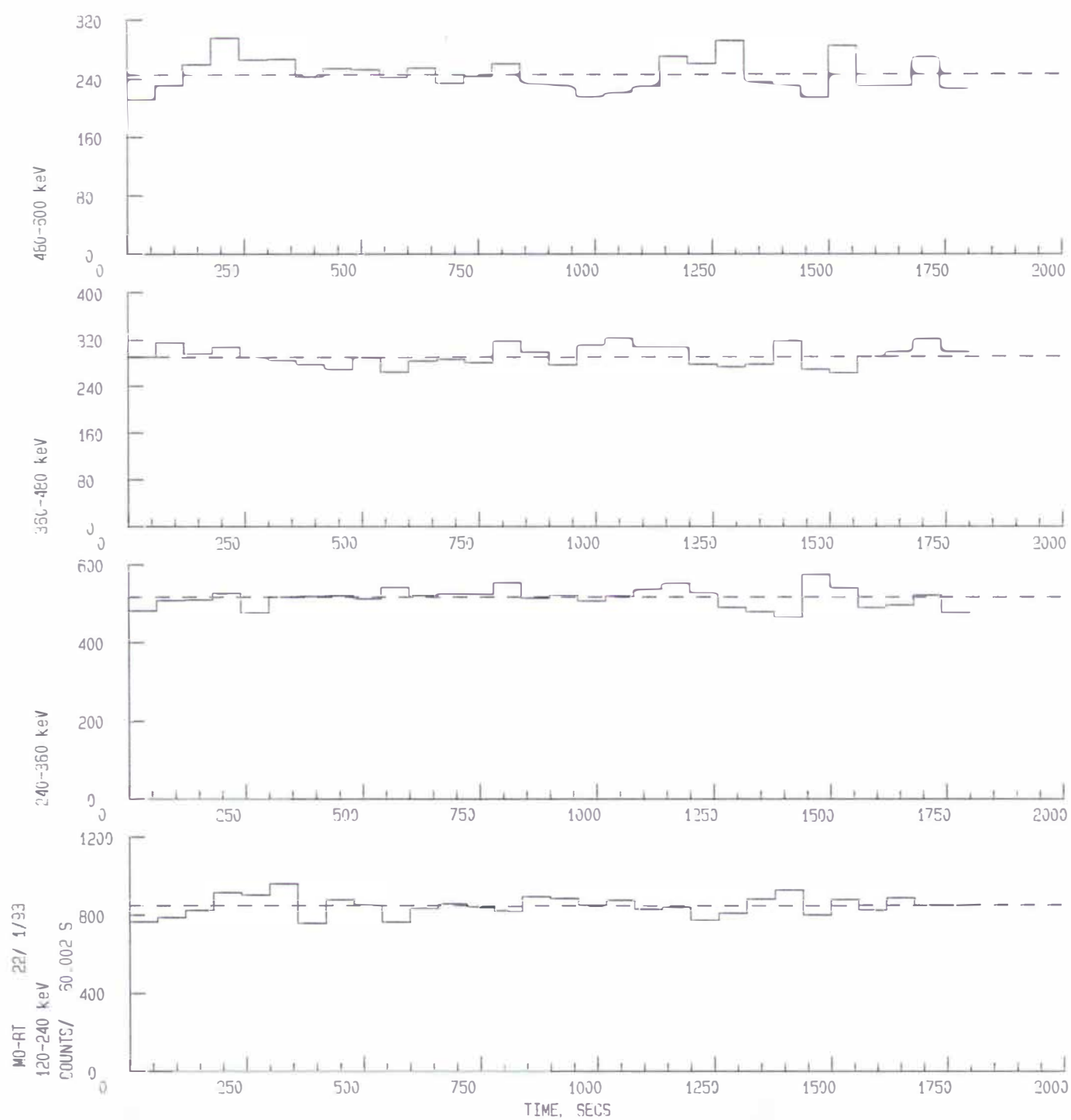
60.002 S. INTERVALS REGROUPED BY 1
120 - 600 keV

N= 10 M= 1
>3.0 SIGMA FLUCTUATIONS

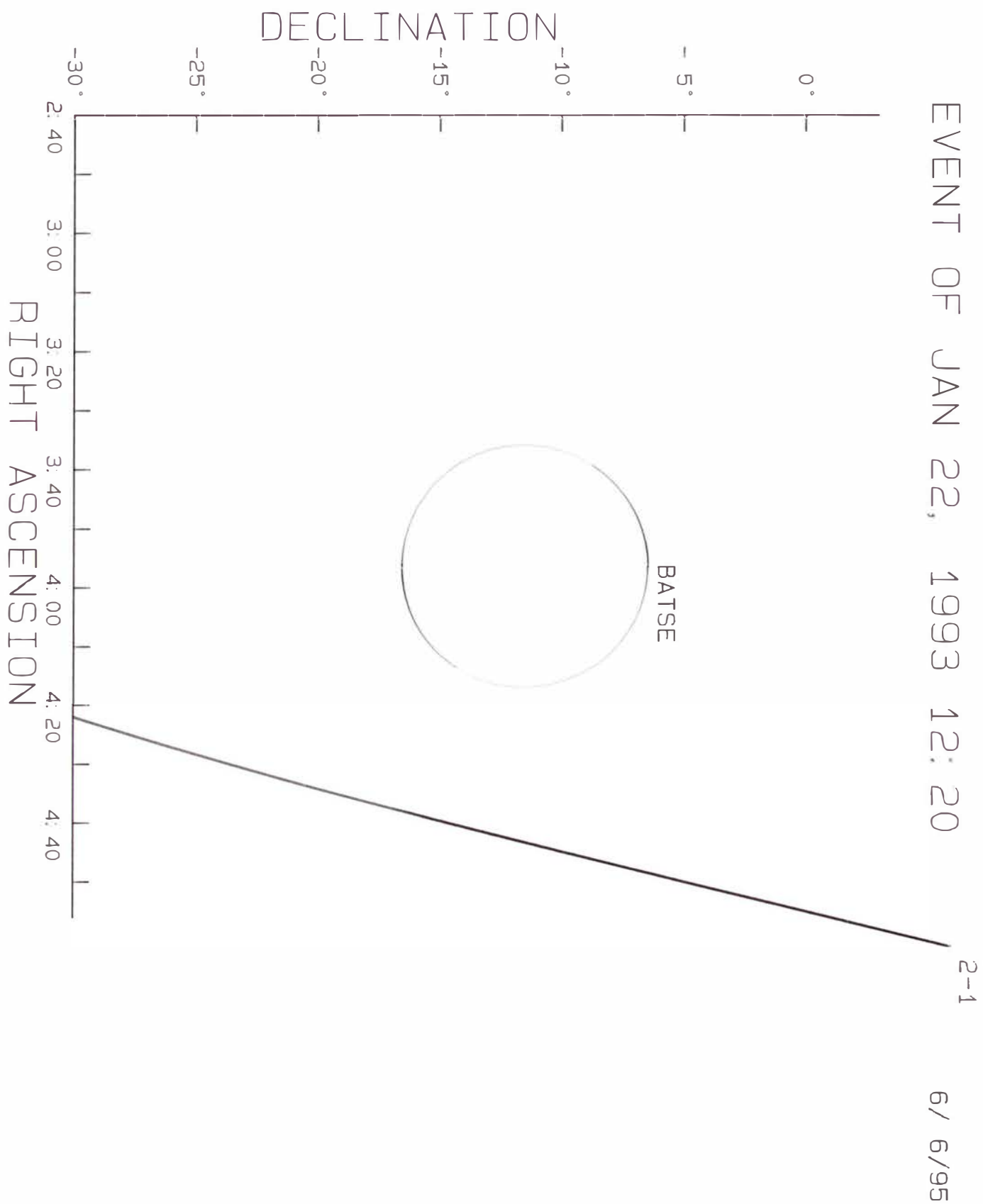


28/ 3/24

MO-RT 22/ 1/33



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



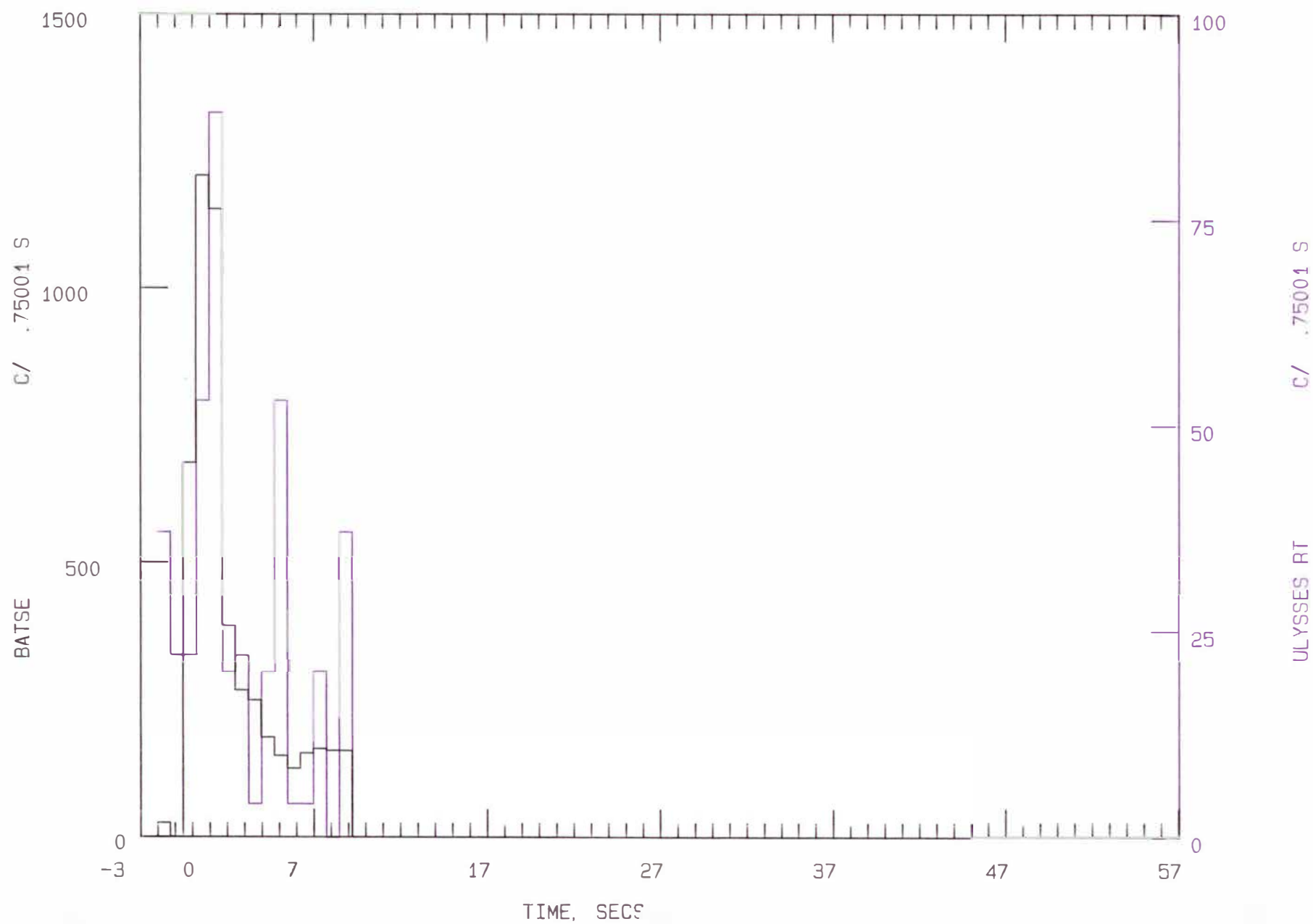
BATSE

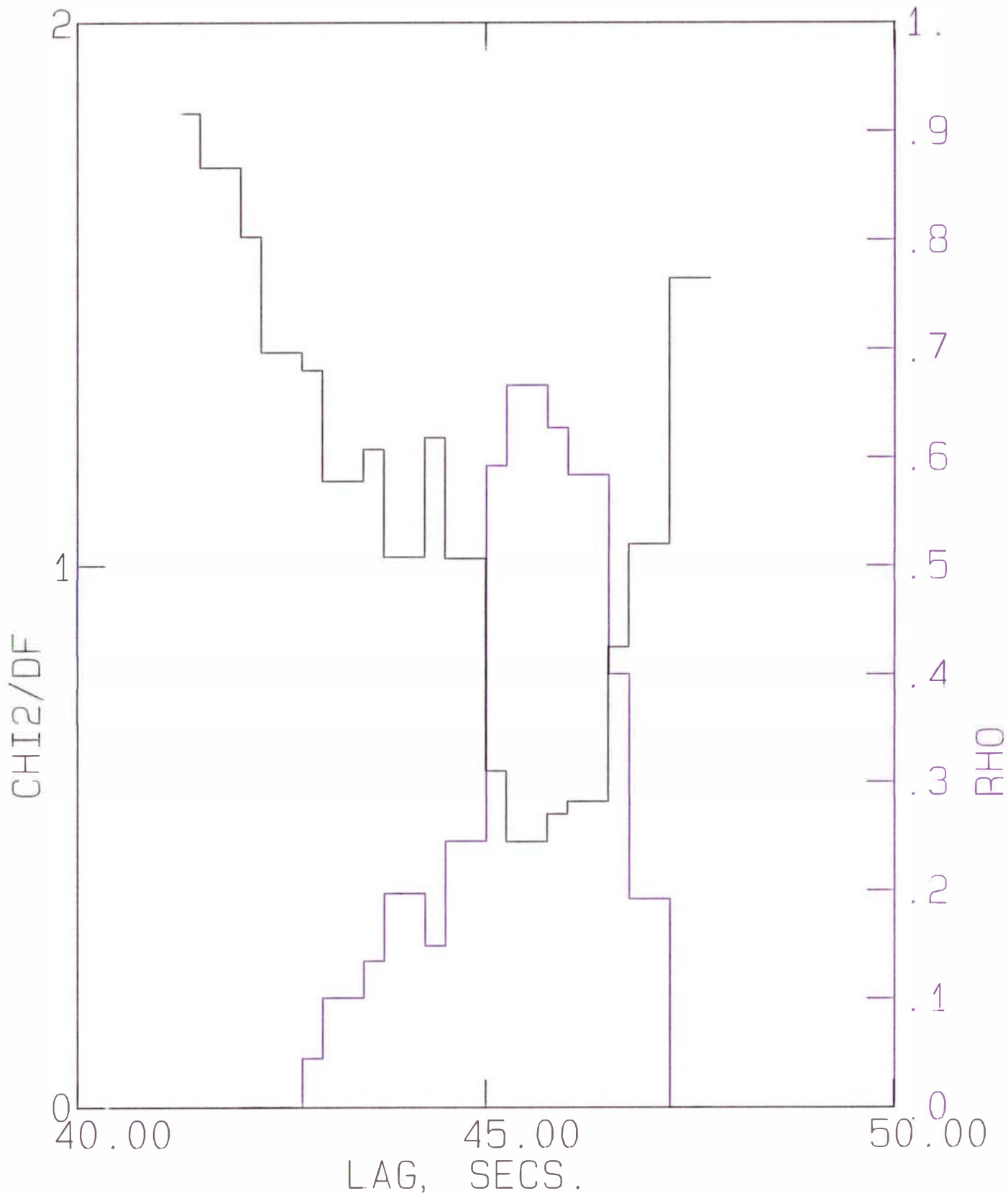
-ULYSSES RT CORRELATION

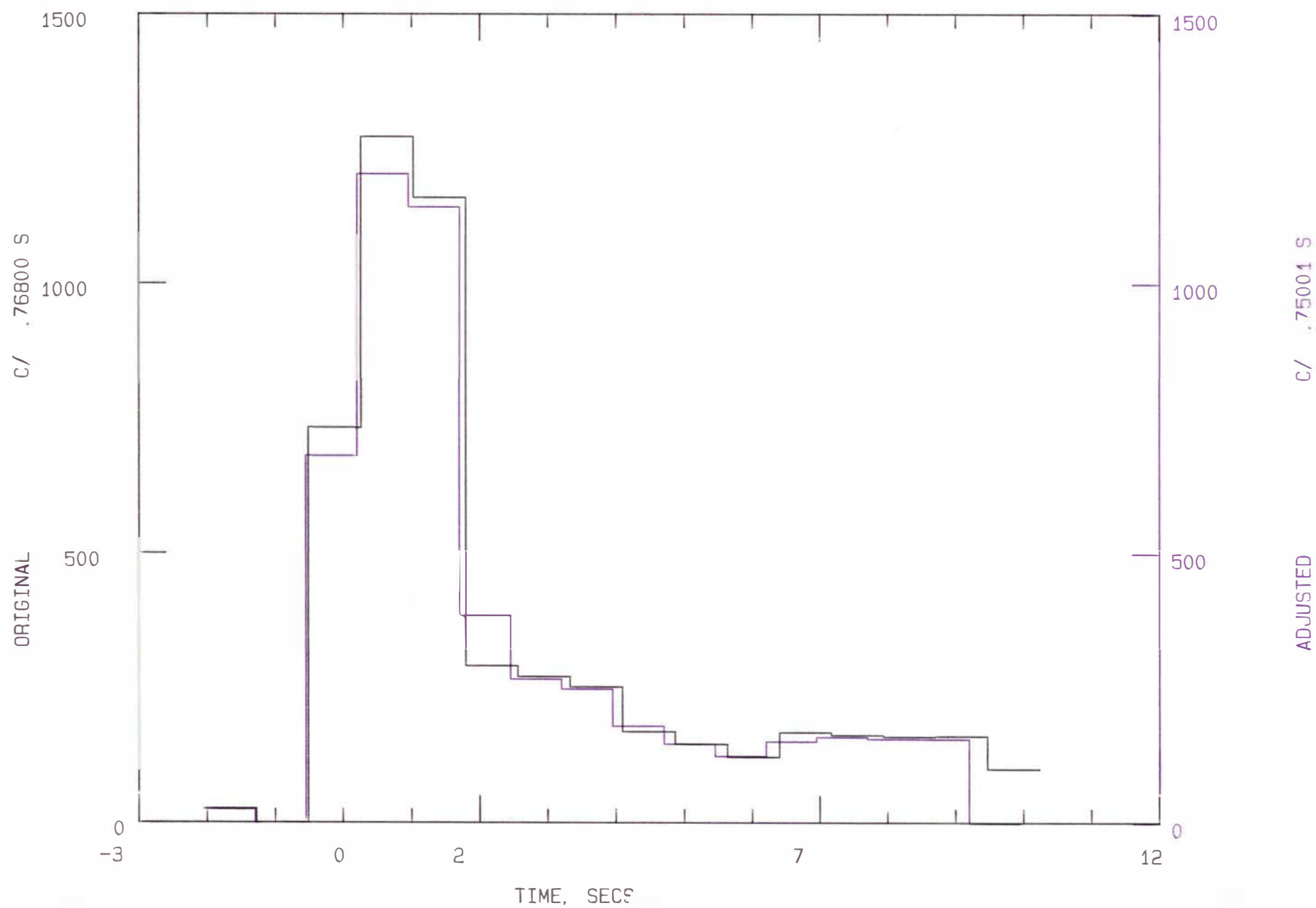
22/ 1/93

44478.850

6/ 6/95







ULYSSES RT

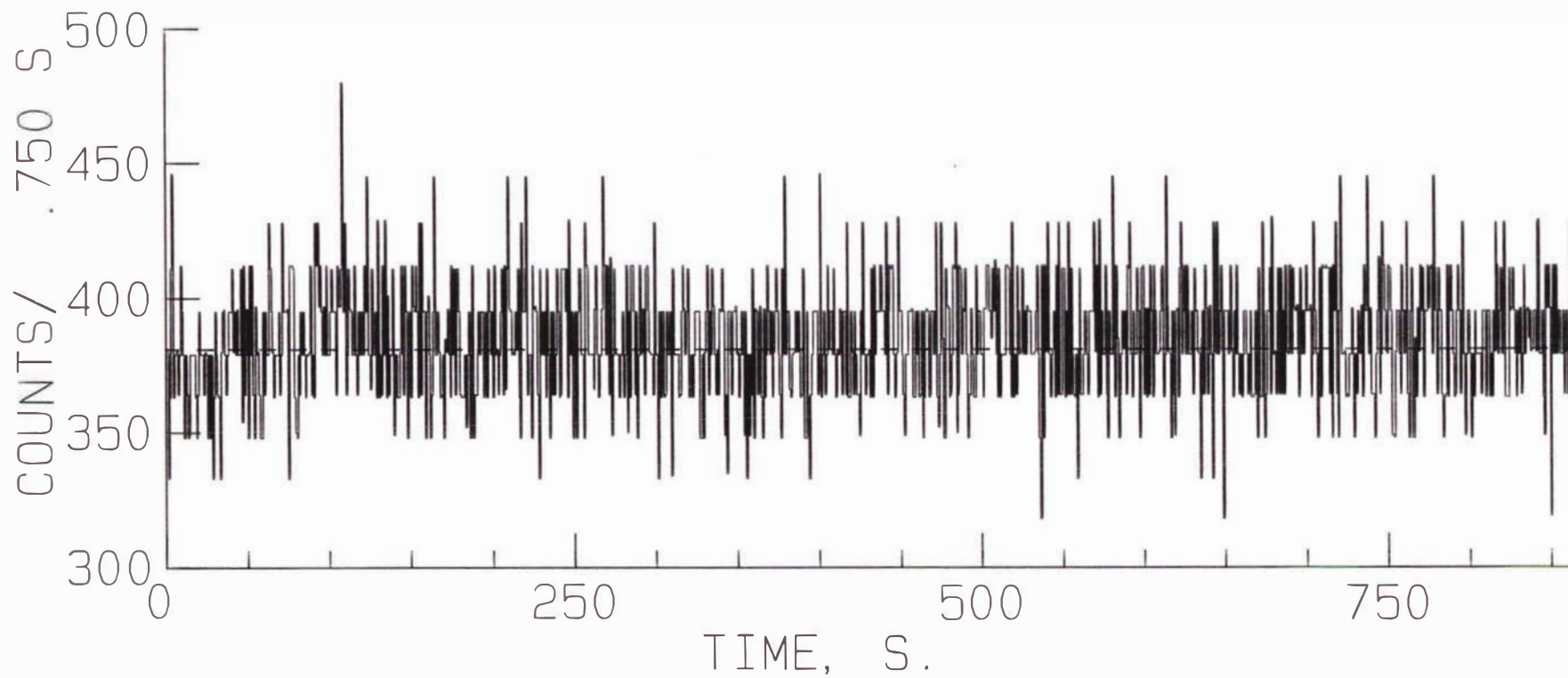
6 / 6 / 95

22 / 1 / 93 44352.168 s

.250 S INTERVALS REGROUPED BY 3

22- 147 keV

N= 10 M= 1
>3.0 SIGMA FLUCTUATIONS

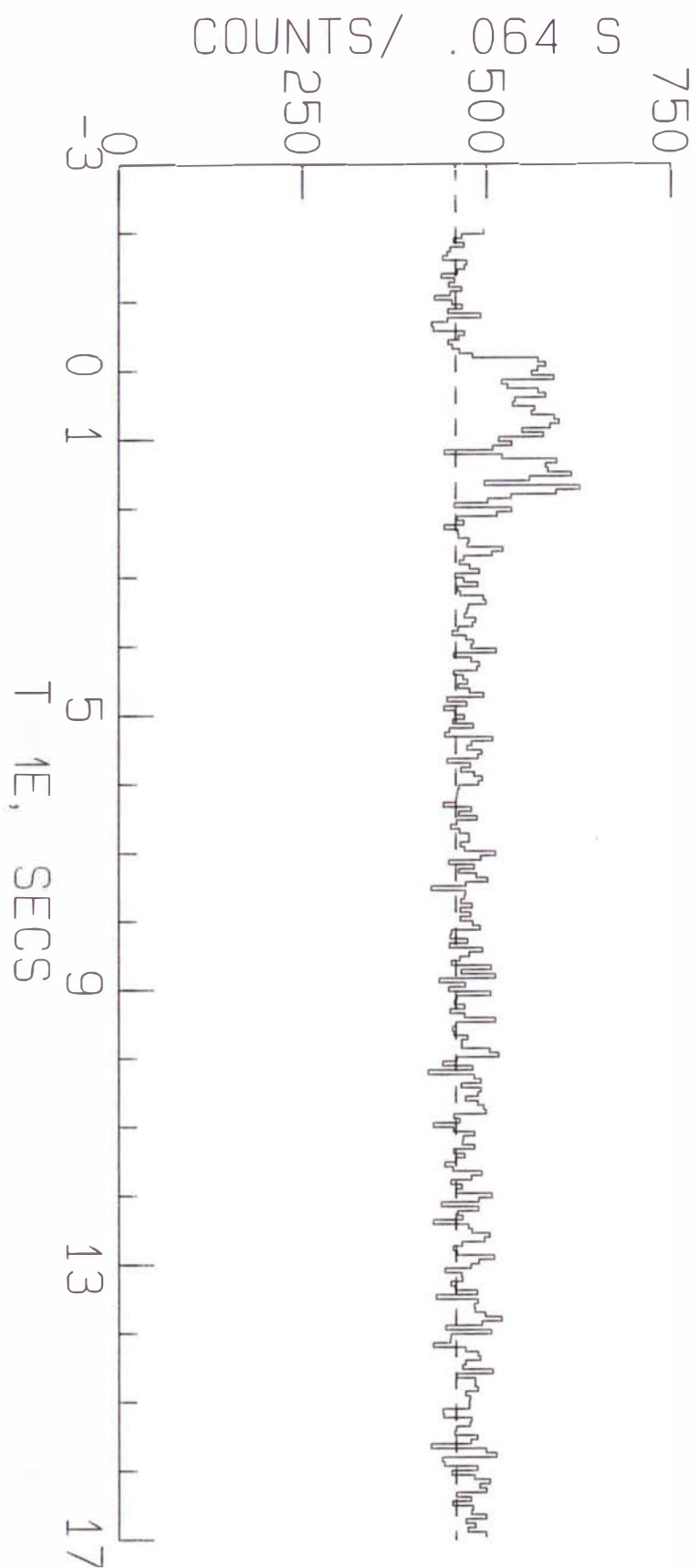


BATSE

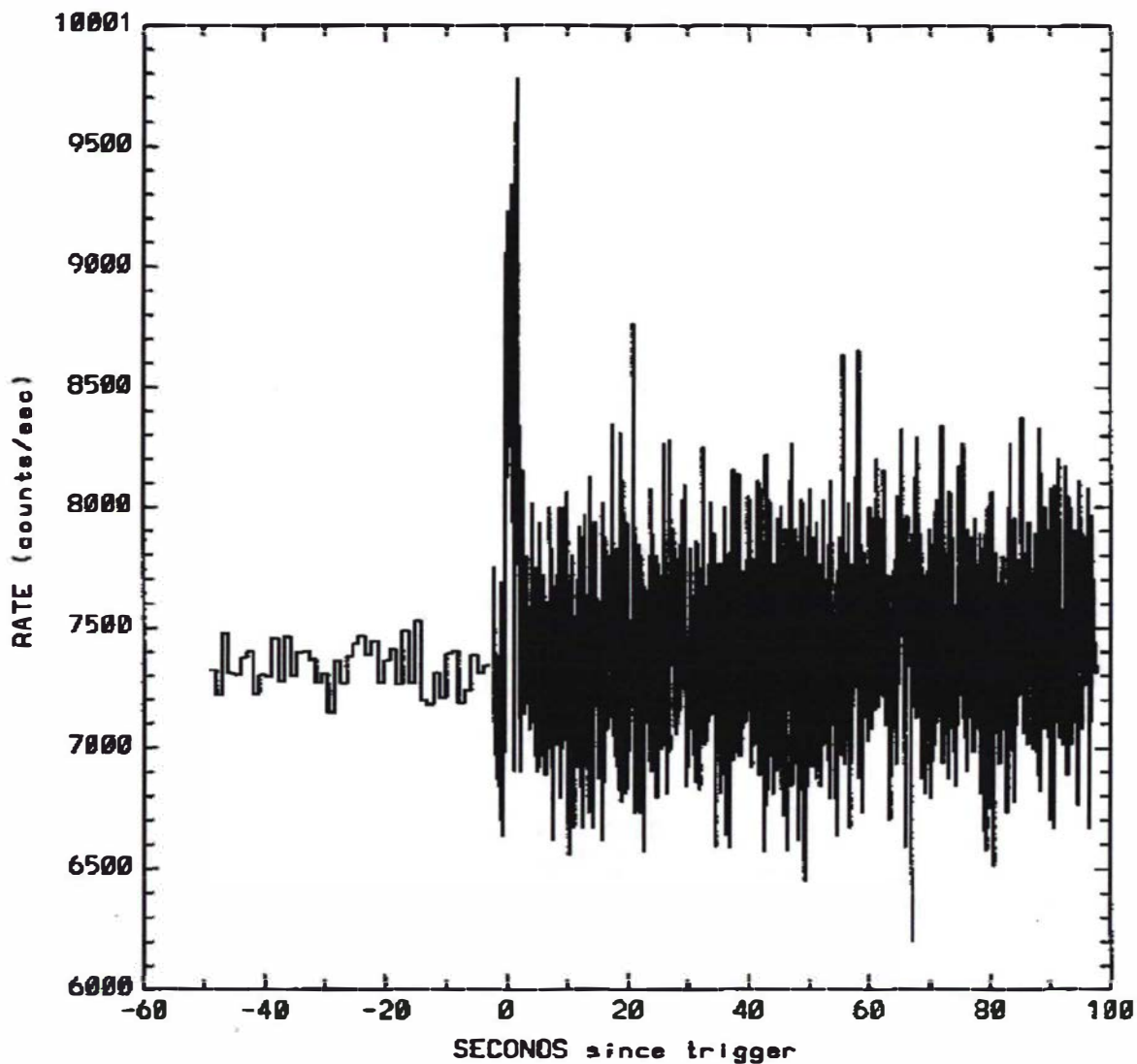
12/01/93

44478.850

25- 100 keV



DATA FOR K. HURLEY



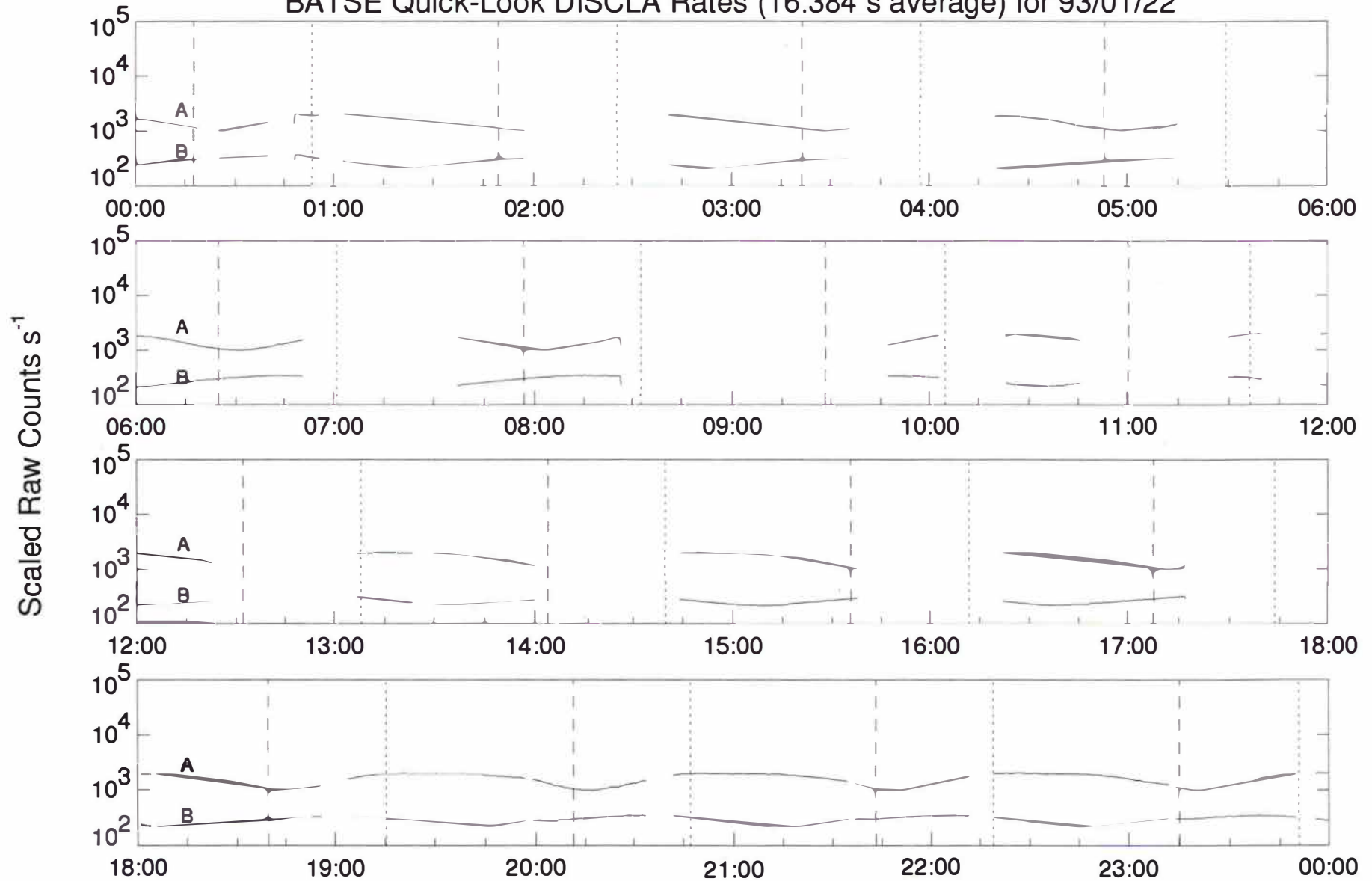
18-AUG-1993 17:07.42

Created by HOPS 80
(Burst Display)
Version 2.19

Trigger # : 2142

Trigger Time:
9809 / 44478.850Burst Data Type:
DISCSCDeadtime
Corrected: NBackground Data
Type: PREB + DISCLAMinimum Integ. Time:
8.864 secondsDetectors [7..8]:
11100000Discriminators:
(1, 2)Quality Mask:
BDISP1

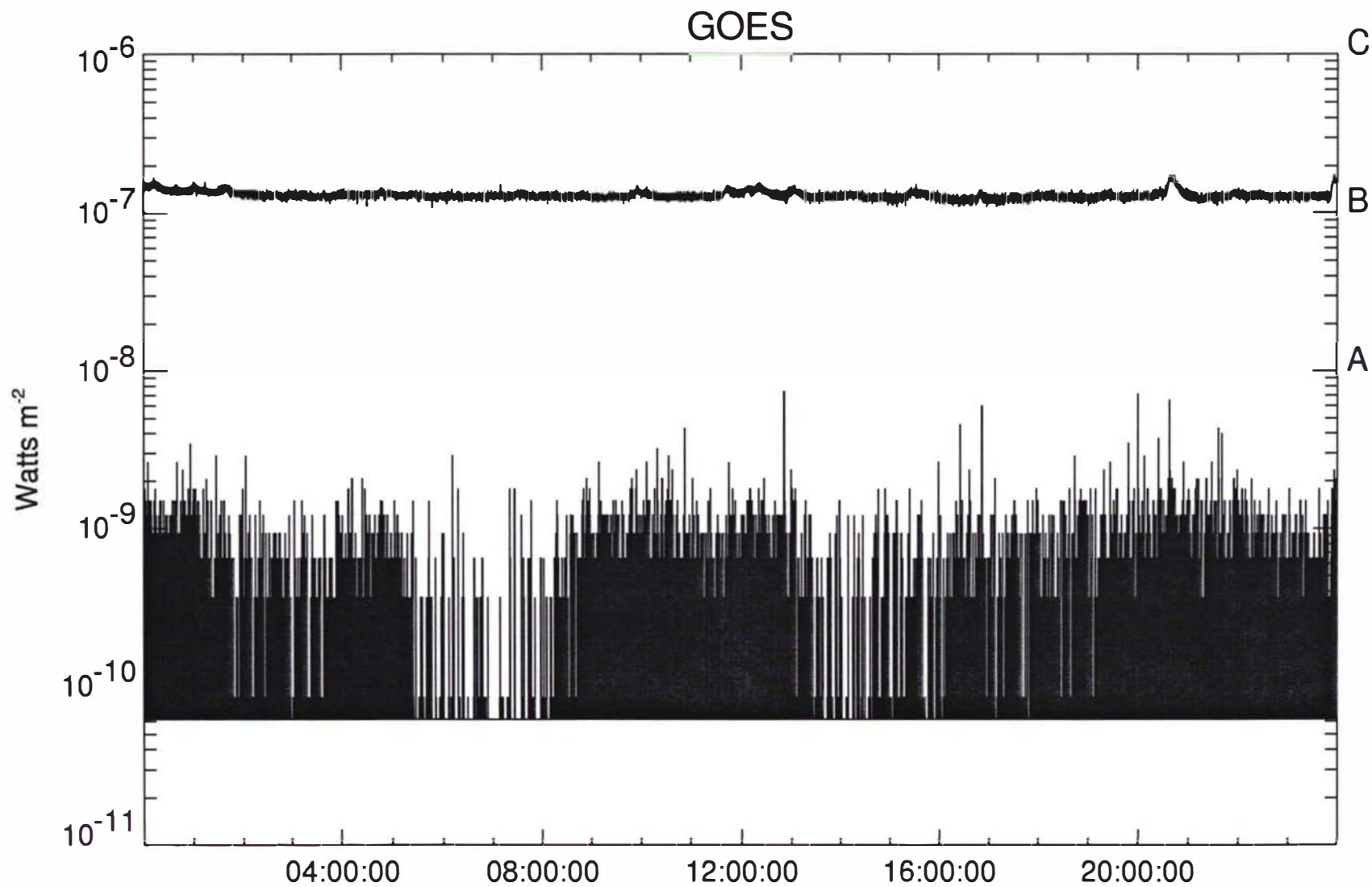
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/22



Current Time: 93/01/25, 2006 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



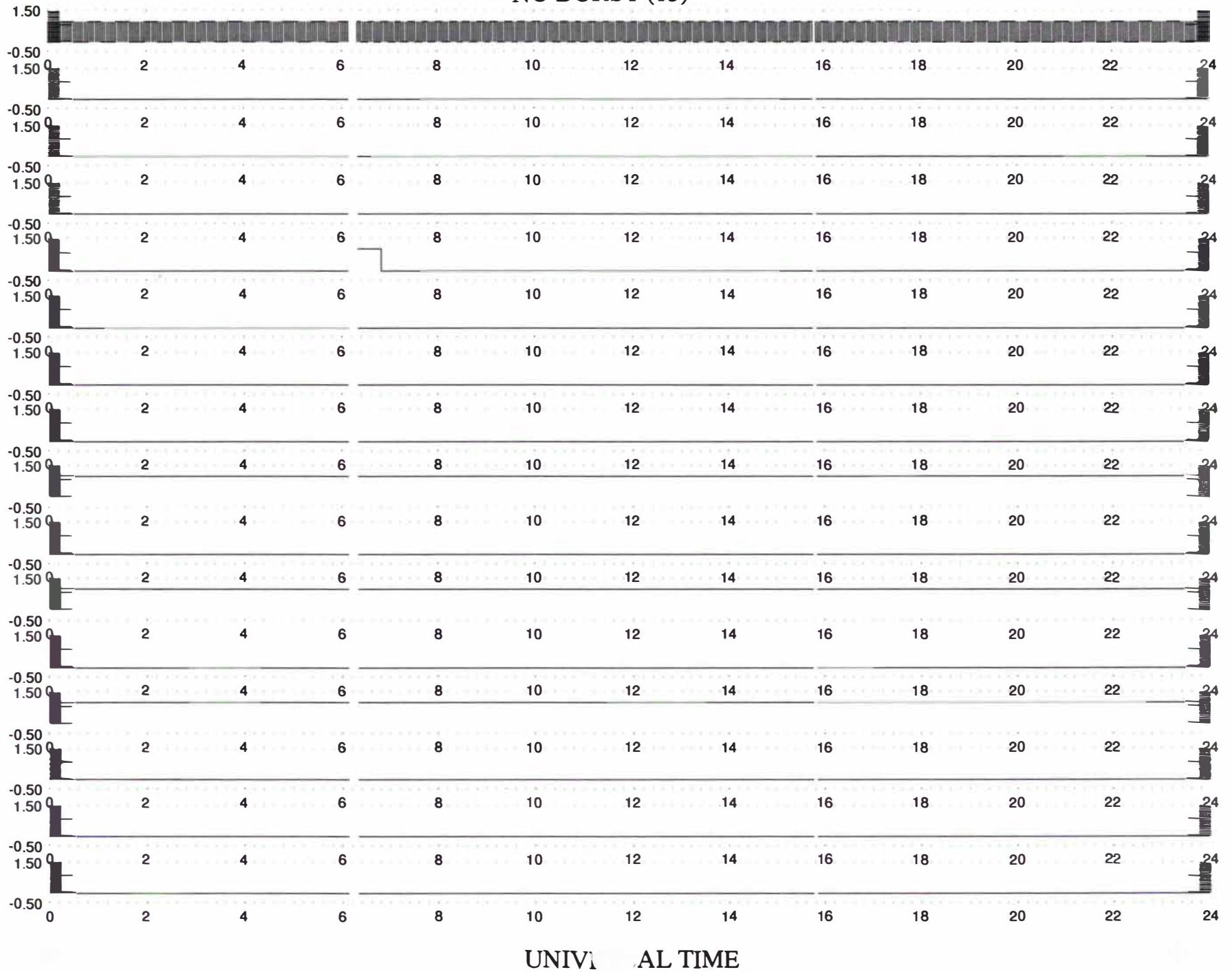
Data Start: 93/01/22, 0000:00

Plot created: 95/05/31, 2229

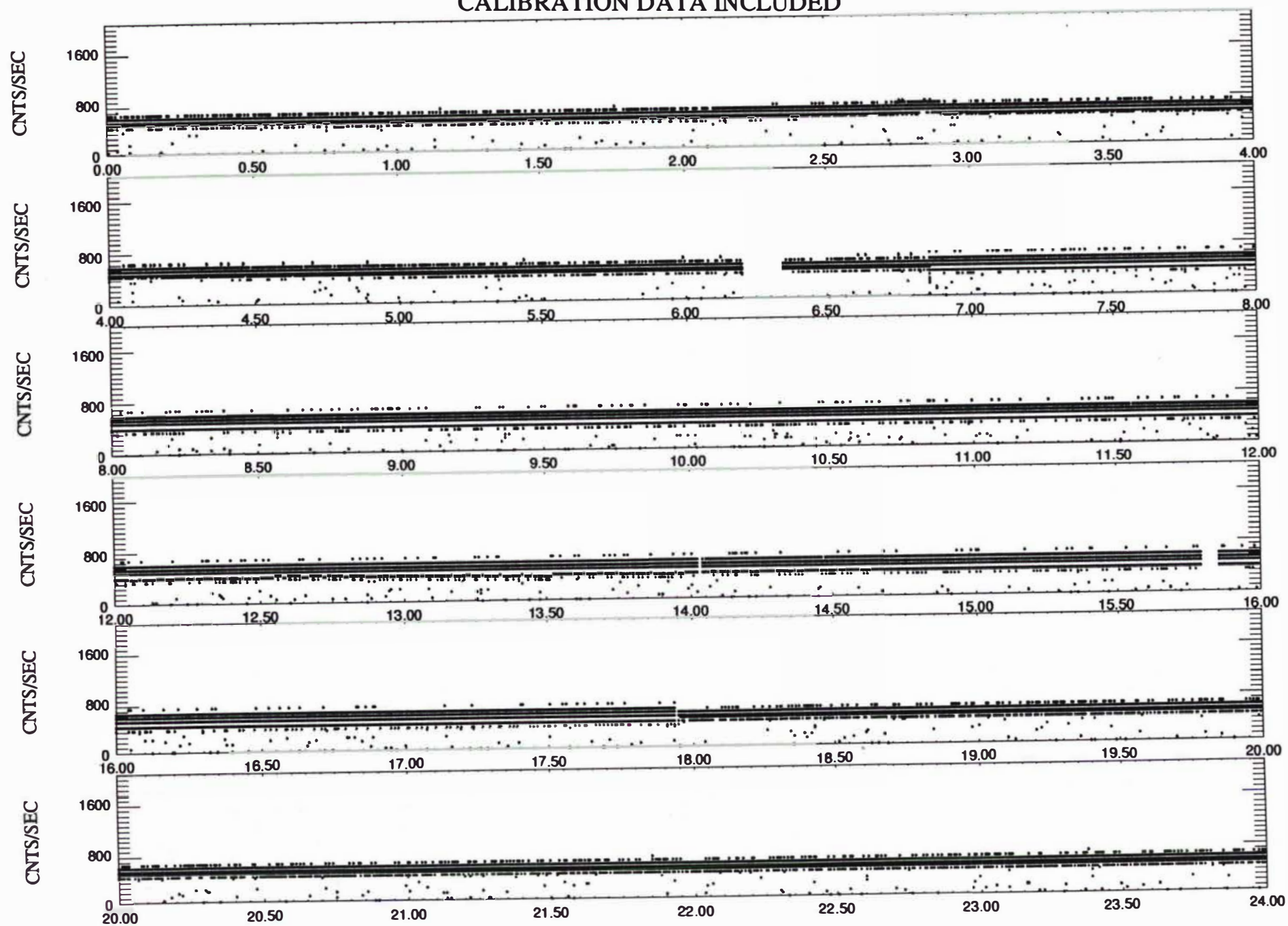
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

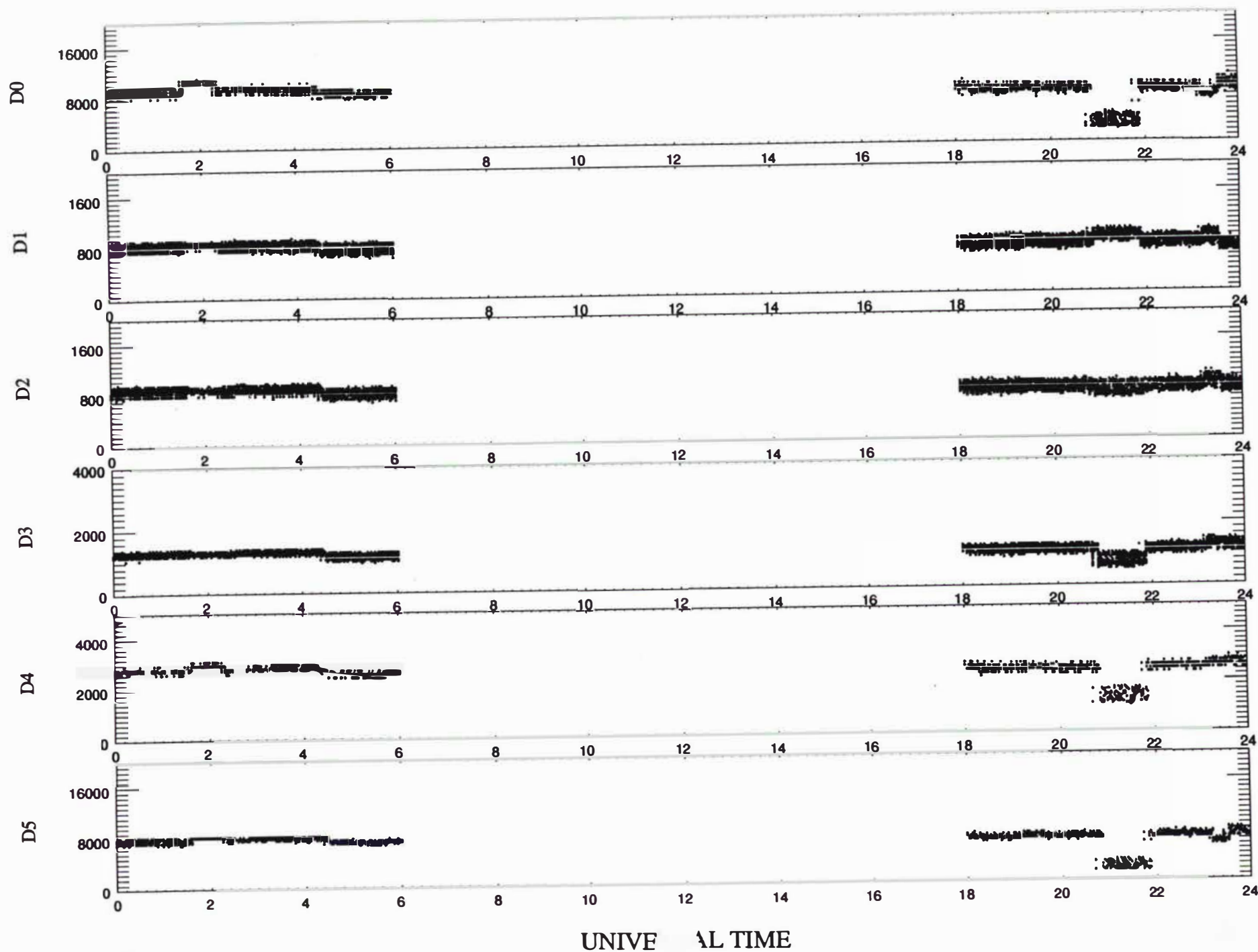
CBU CCL DMP ROM DMA OSC MP. ICR SPE OPM RSC CAL WCH MEM BRS HUS



CALIBRATION DATA INCLUDED



UNIVE AL TIME



CATSEARCH PROGRAM

BATSE BURST # 2143
EVENT OF 1993 JAN 23 DAY OF YEAR= 23
EVENT CROSSING TIME AT BATSE : 67521. S. OR 18:45:21.1
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 61.400 38.200
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 23/ 1/ 93 IS:
RA= 162.503 DEC= -13.869 DIST= 4.331 AU
BATSE-ULYSSES DISTANCE = 647887680. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 72.83 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 637.87 SECS.
CROSSING TIME AT ULYSSES IS 68159. S. OR 18:55:59.0 +/- 418.18 SECONDS

NO

From SHARIFF@ssl.msfc.nasa.gov Mon Jan 25 11:38:53 1993
Date: Mon, 25 Jan 1993 13:38:10 -0600 (CST)
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
2143	930123	9010	67521	3000	067	+36

9 / 6 / 94

ULYSSES RT

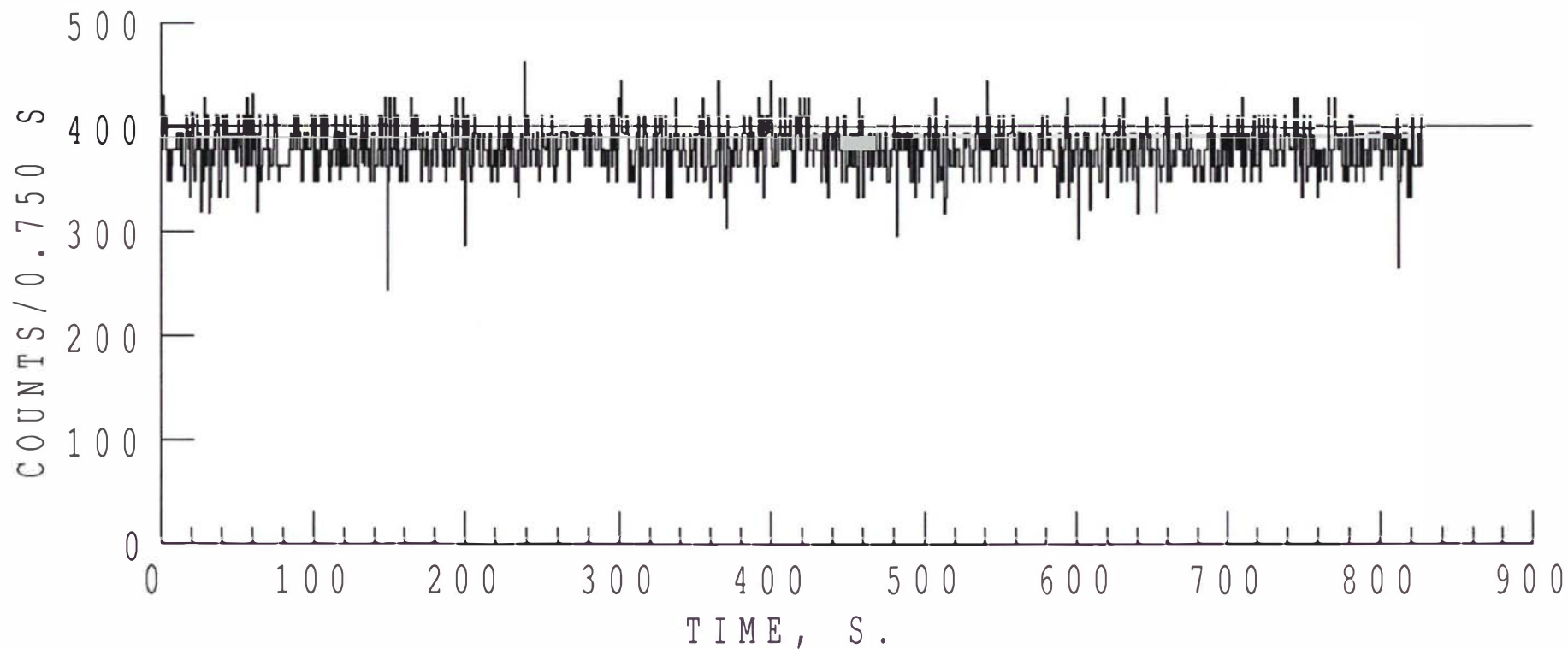
23 / 1 / 93 67752.133 s

0.250 S INTERVALS REGROUPED BY 3

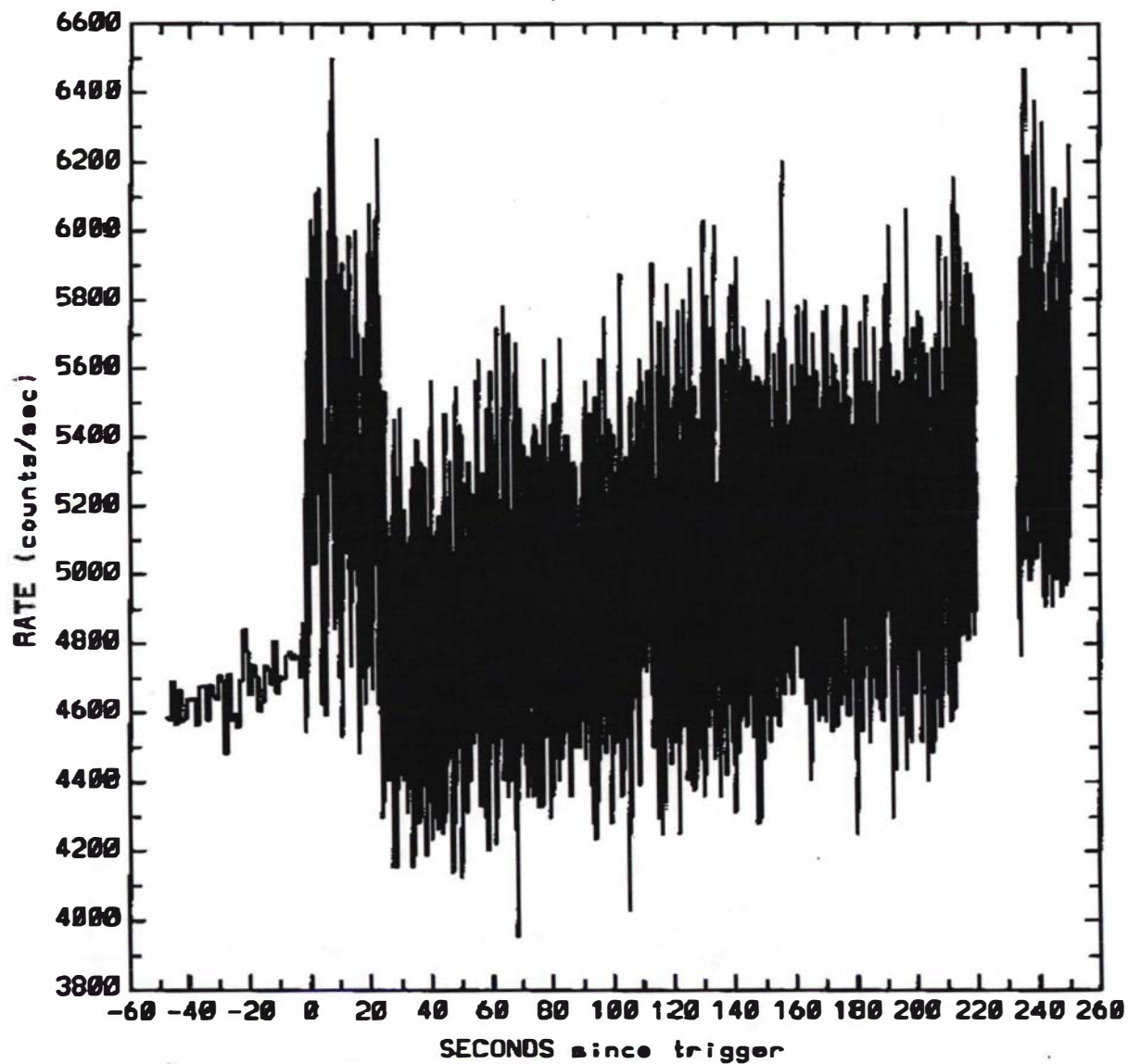
0 - 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



Data for K. Hurley



25-MAR-1993 09:00:23

Created by NOPS 80
(Burst Display)
Version 2.18

Trigger * : 2143

Trigger Time:
9818 / 67521.154

Burst Data Type:
DISCSC

Deadtime
Corrected: N

Background Data
Type: PREB + DISCLA

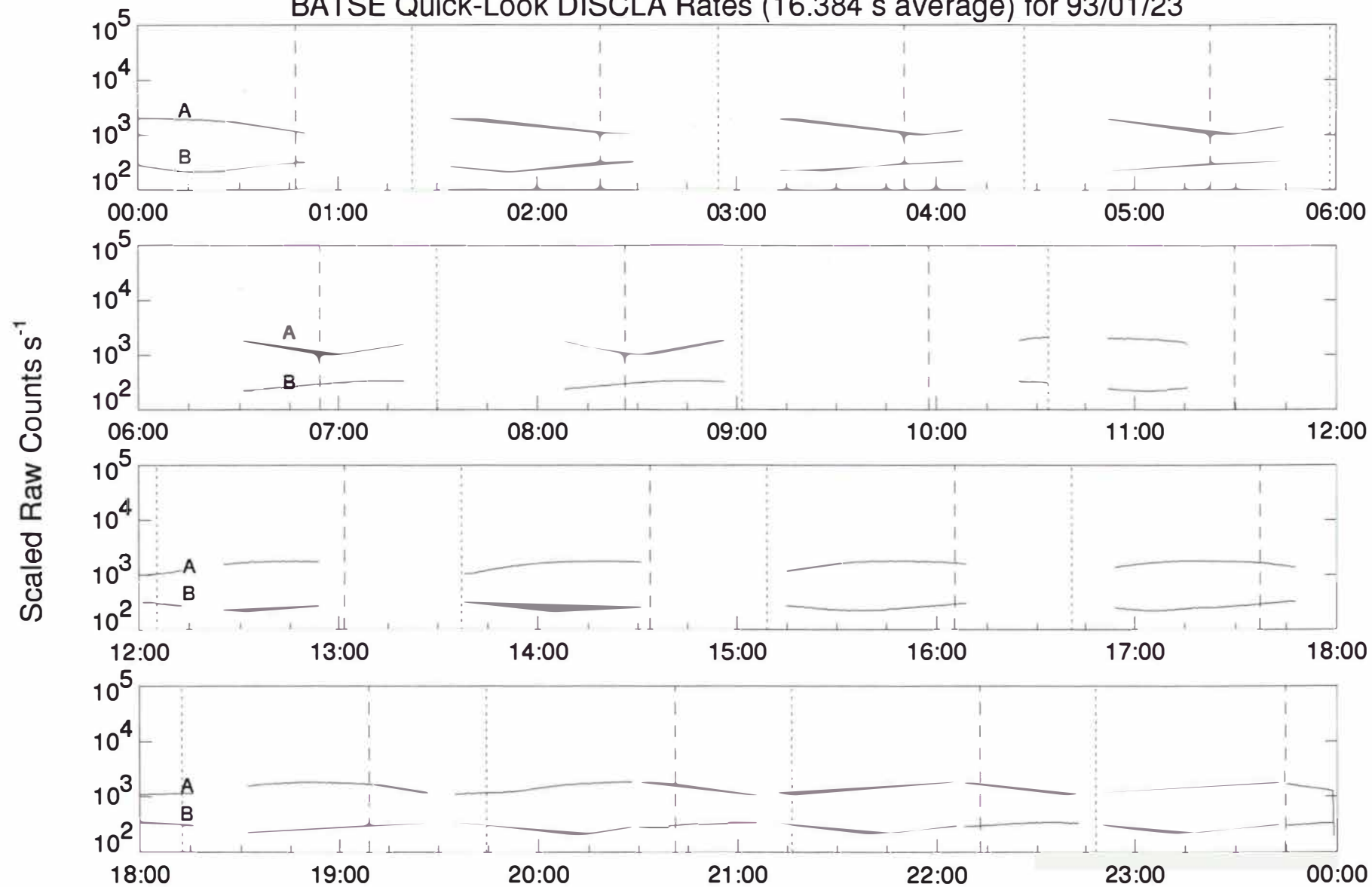
Minimum Integ. Time:
0.064 seconds

Detectors (7.0):
10100000

Discriminators:
1 1. 21

Quality Mask:
001SP1

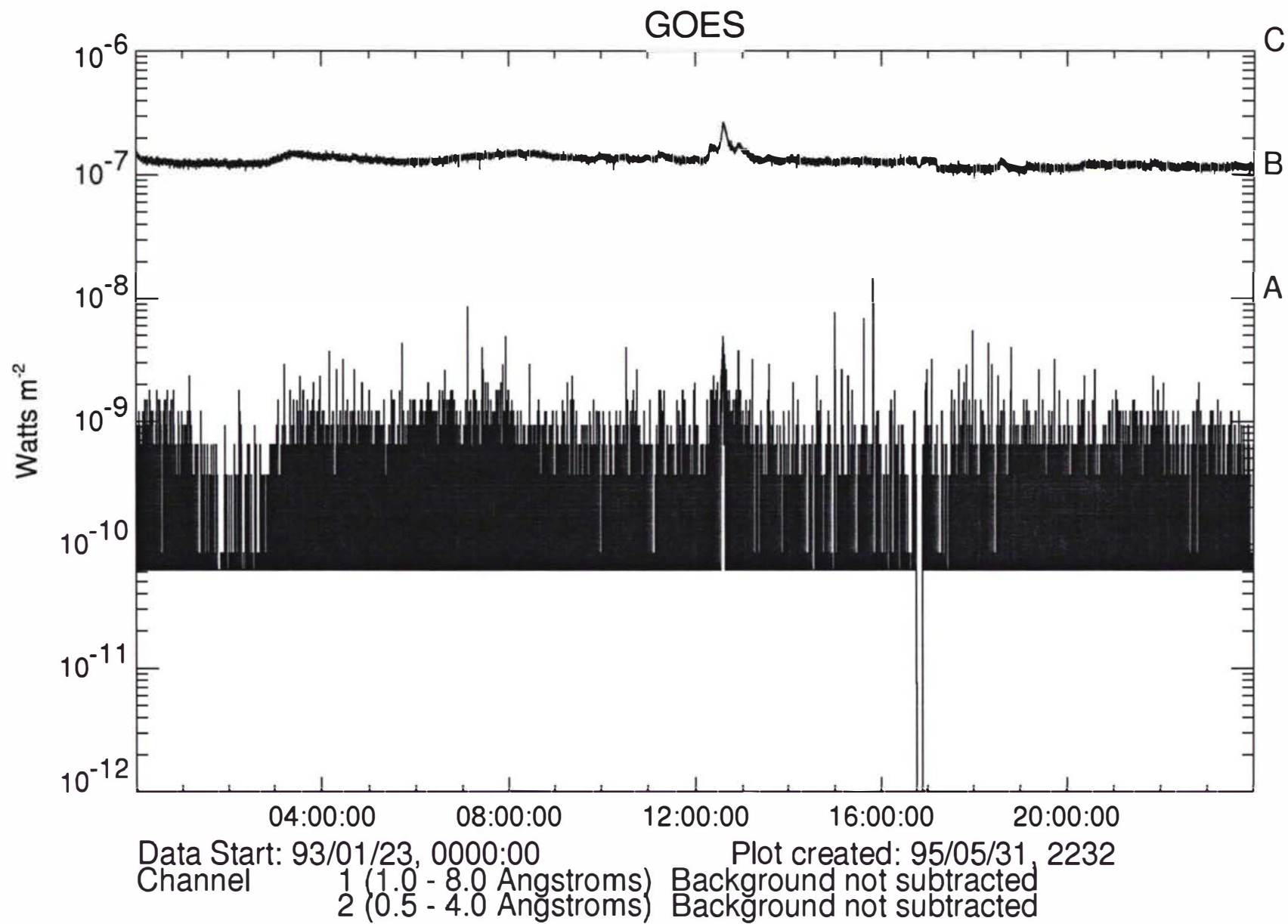
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/23



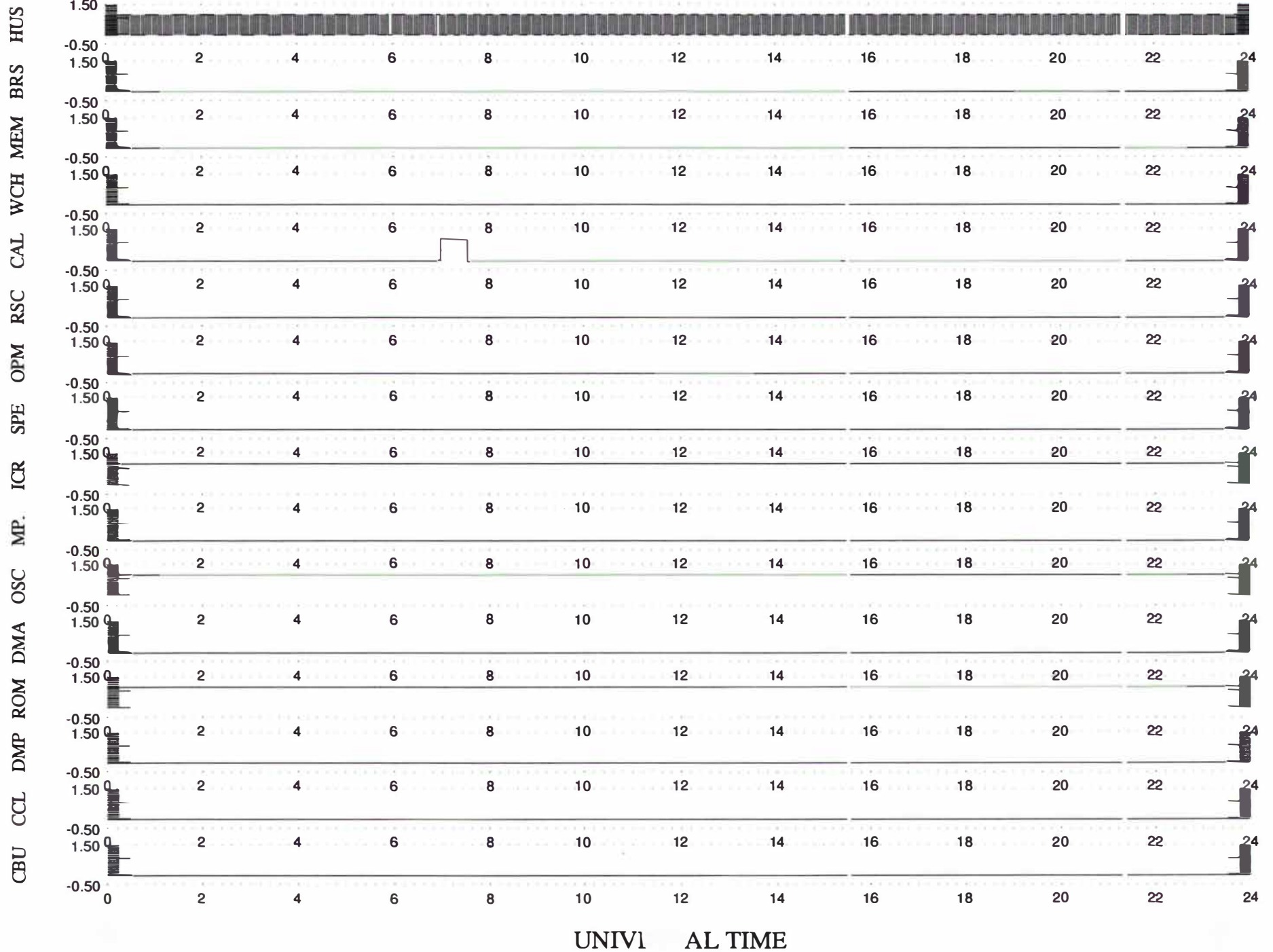
Current Time: 93/01/25, 2006 EDT
A: Channel 1 Most Sunward LAD
B: Sum Channel 1 Anti-Sunward LADs X .05

Dotted line: Day entry
Dashed line: Night entry

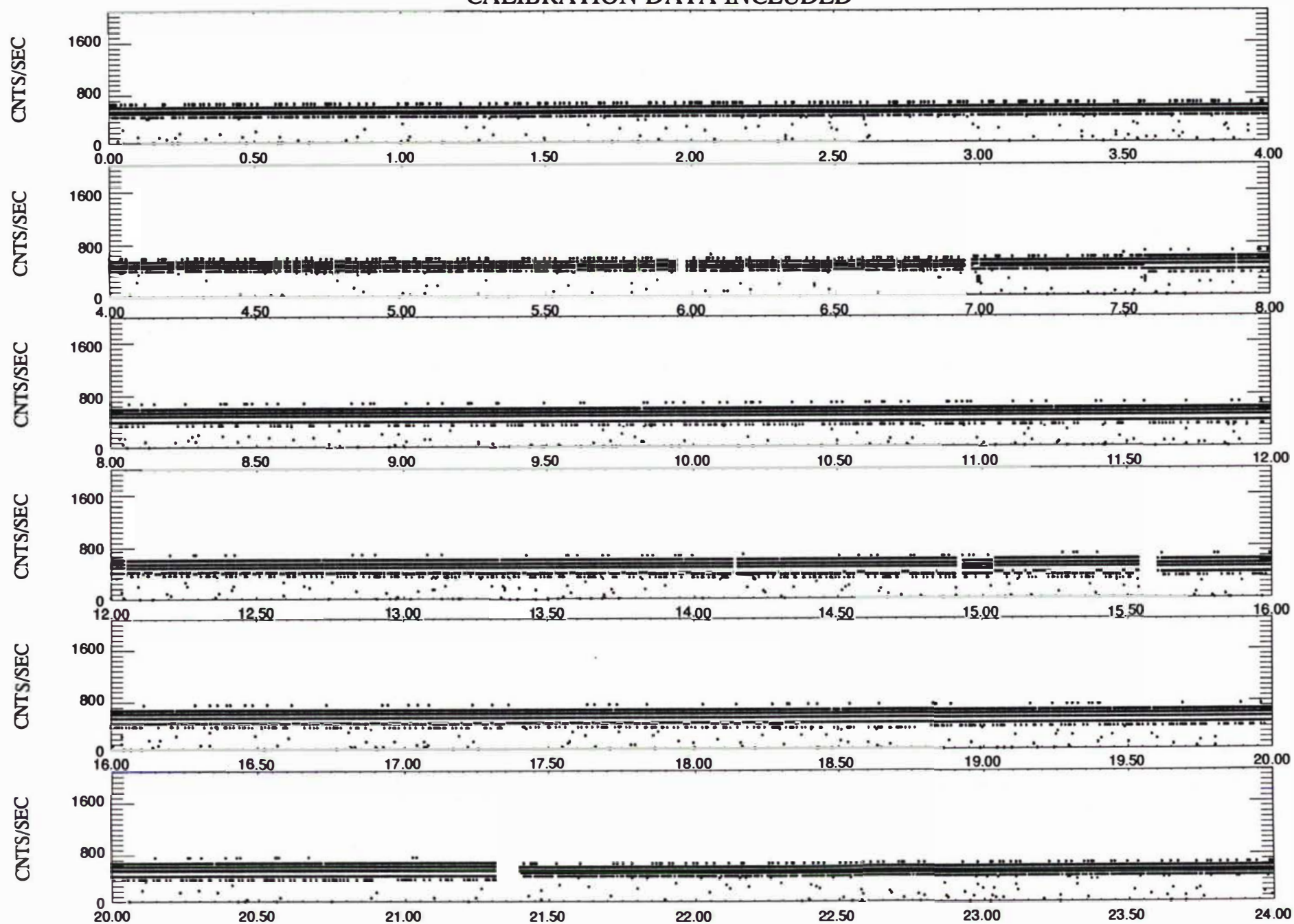
* Solar Burst Trigger
+ Solar Flare



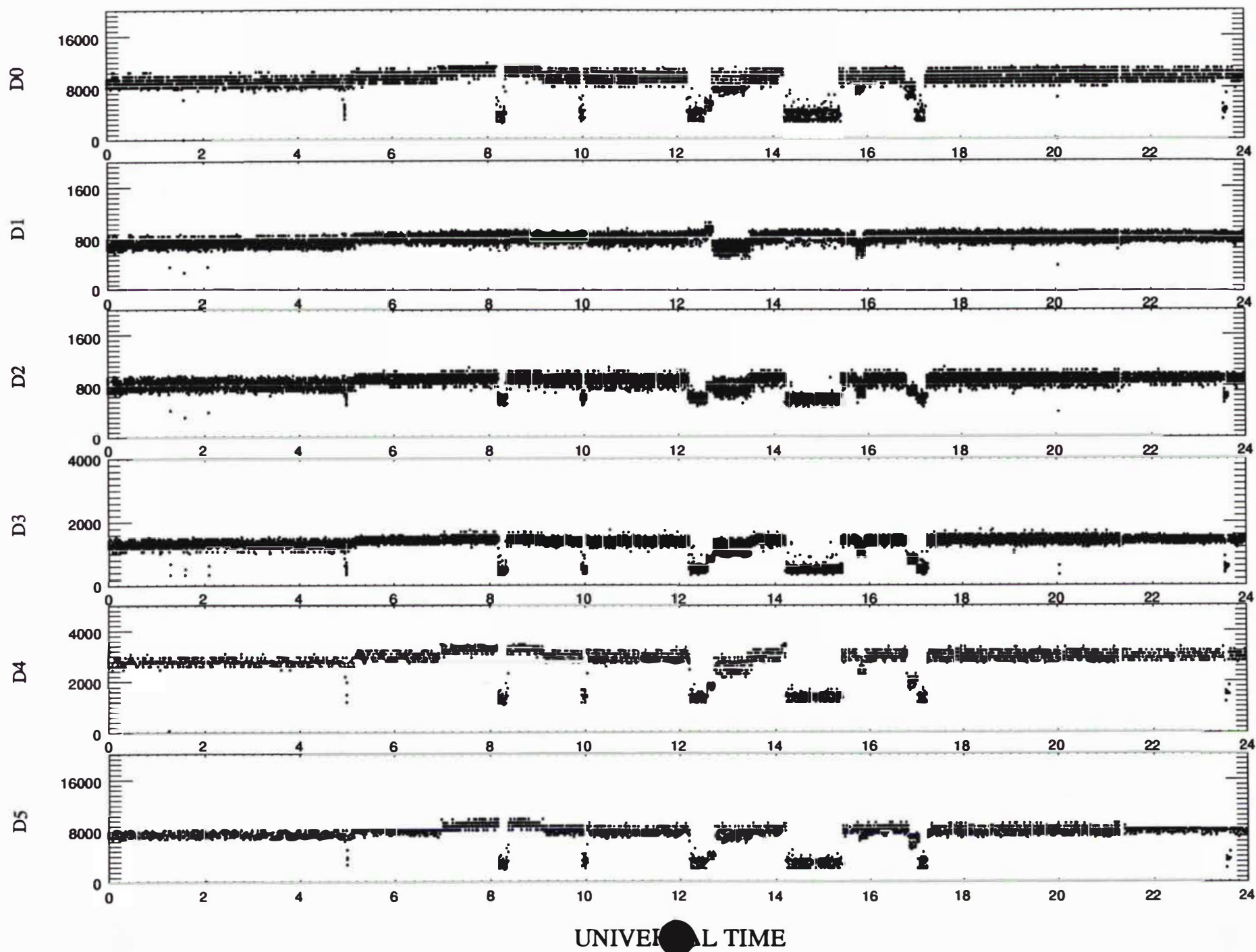
NO BURST (13)



CALIBRATION DATA INCLUDED



UNIV AL TIME



From KOSHUT@ssl.msfc.nasa.gov Wed Jan 27 07:25:28 1993
Date: Wed, 27 Jan 1993 9:24:10 -0600 (CST)
From: KOSHUT@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: 1456

BATSE BURST TRIGGER

NO.: 02144

TIME: TJD=9011 SECONDS=54533

TYPE: UNKNOWN SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:

THIS EVENT IS NOT A BURST. THE ANGLE BETWEEN THE EARTH'S GEOCENTER AND THE
COMPUTED LOCATION IS 45 DEGREES, WHICH PUTS IT WELL BELOW THE EARTH'S HORIZON.
THE EVENT HAS A SHORT DURATION (< 1 MS), IS VERY INTENSE, AND IS OBSERVED ABOVE
300 KEV.

CATSEARCH PROGRAM

BATSE BURST # 2145
EVENT OF 1993 JAN 24 DAY OF YEAR= 24
EVENT CROSSING TIME AT BATSE : 65818. S. OR 18:16:58.2
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 202.200 -55.900
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 24/ 1/ 93 IS:
RA= 162.322 DEC= -13.925 DIST= 4.317 AU
BATSE-ULYSSES DISTANCE = 645823200. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=128.09 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1328.88 SECS.
CROSSING TIME AT ULYSSES IS 64489. S. OR 17:54:49.3 +/- 324.19 SECONDS

NO

From KOSHUT@ssl.msfc.nasa.gov Tue Jan 26 07:25:28 1993
Date: Tue, 26 Jan 1993 9:24:23 -0600 (CST)
From: KOSHUT@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
2145	930124	9011	65818	3500	194	-65

CATSEARCH PROGRAM

BATSE BURST # 2145
EVENT OF 1993 JAN 24 DAY OF YEAR= 24
EVENT CROSSING TIME AT BATSE : 65818. S. OR 18:16:58.2
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 287.290 -79.450
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 24/ 1/ 93 IS:
RA= 162.322 DEC= -13.925 DIST= 4.317 AU
BATSE-ULYSSES DISTANCE = 645824696. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 97.74 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -290.24 SECS.
CROSSING TIME AT ULYSSES IS 65528. S. OR 18:12:08.0 +/- 416.19 SECONDS

9 / 11 / 95

ULYSSES RT

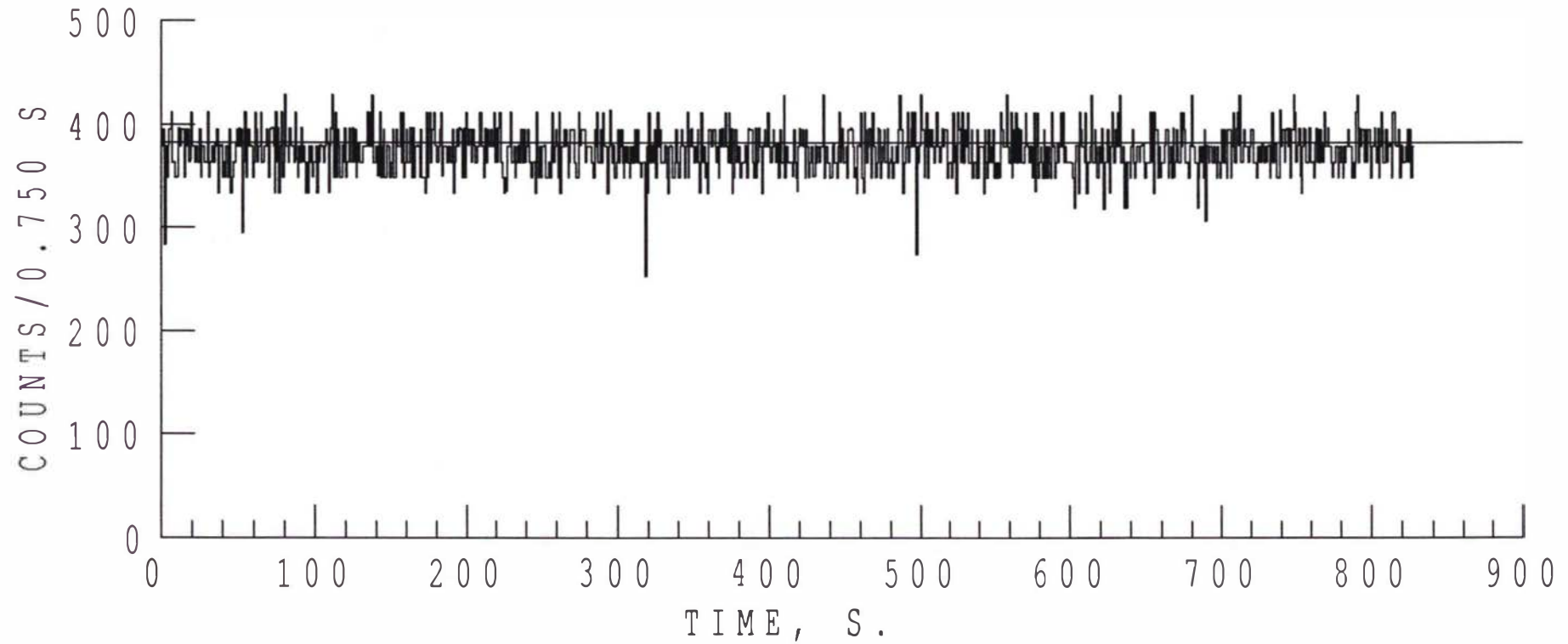
24 / 1 / 93 65124.191 s

0.250 S INTERVALS REGROUPED BY 3

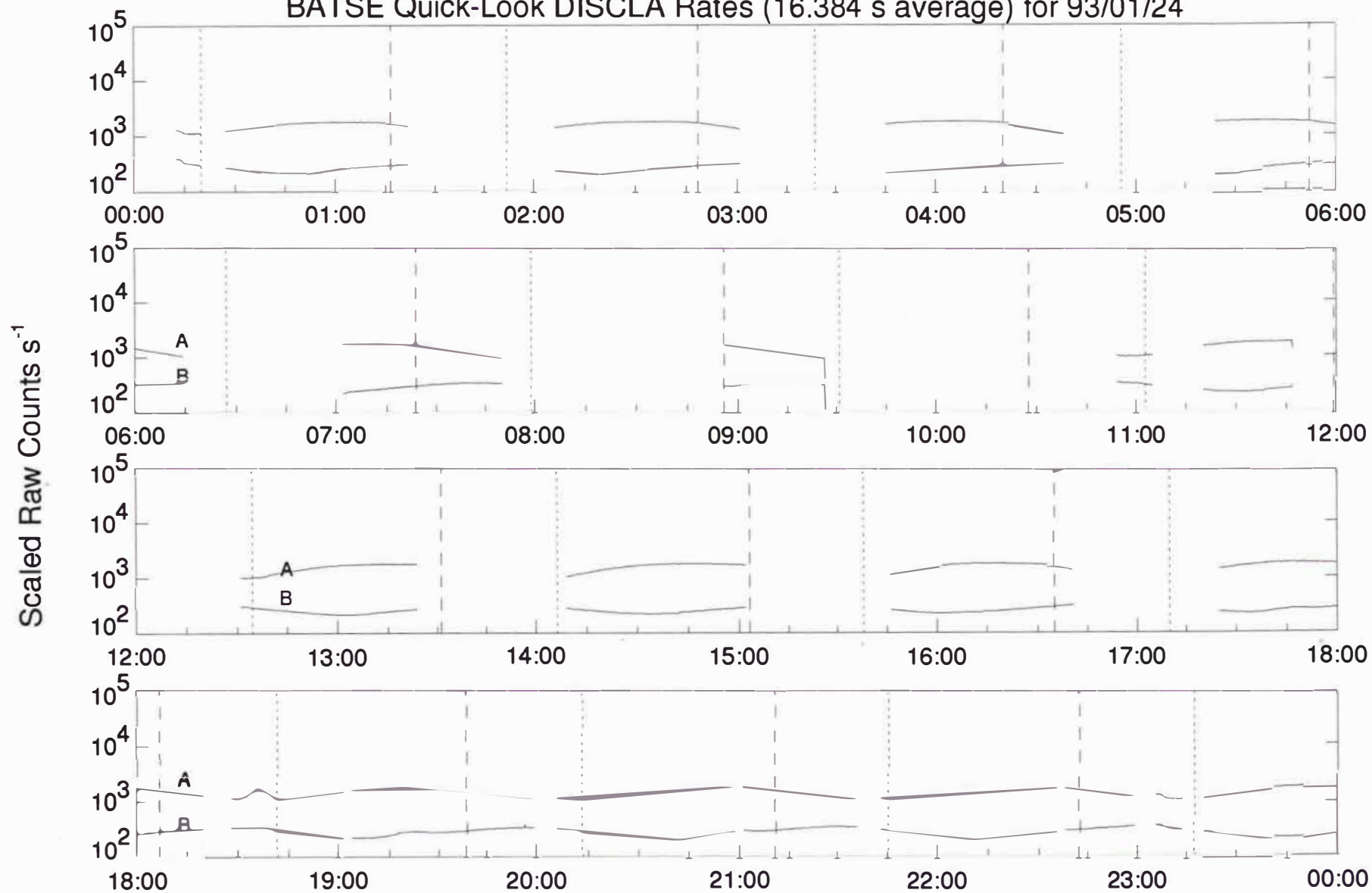
0 - 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



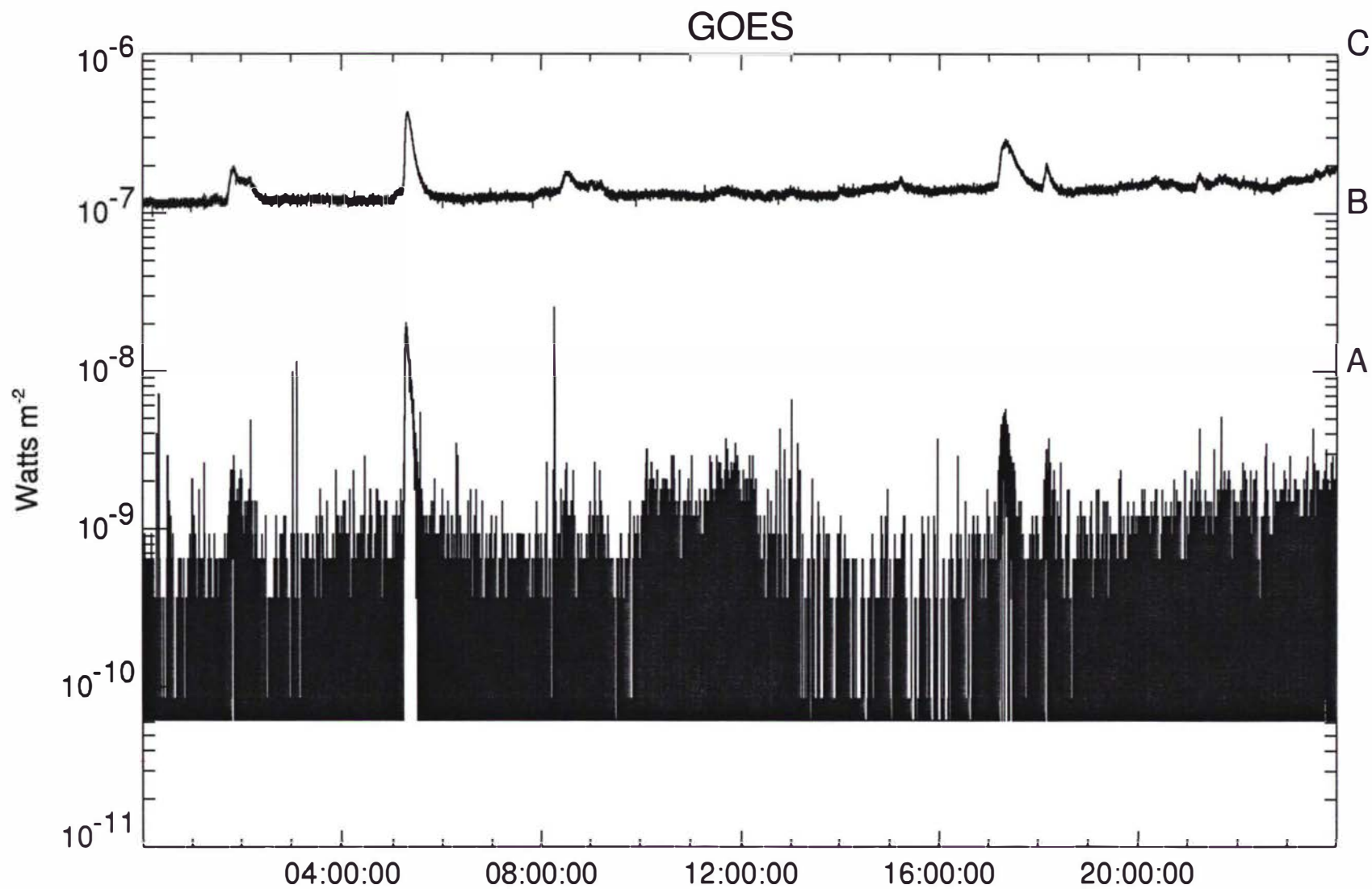
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/24



Current Time: 93/01/25, 2007 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



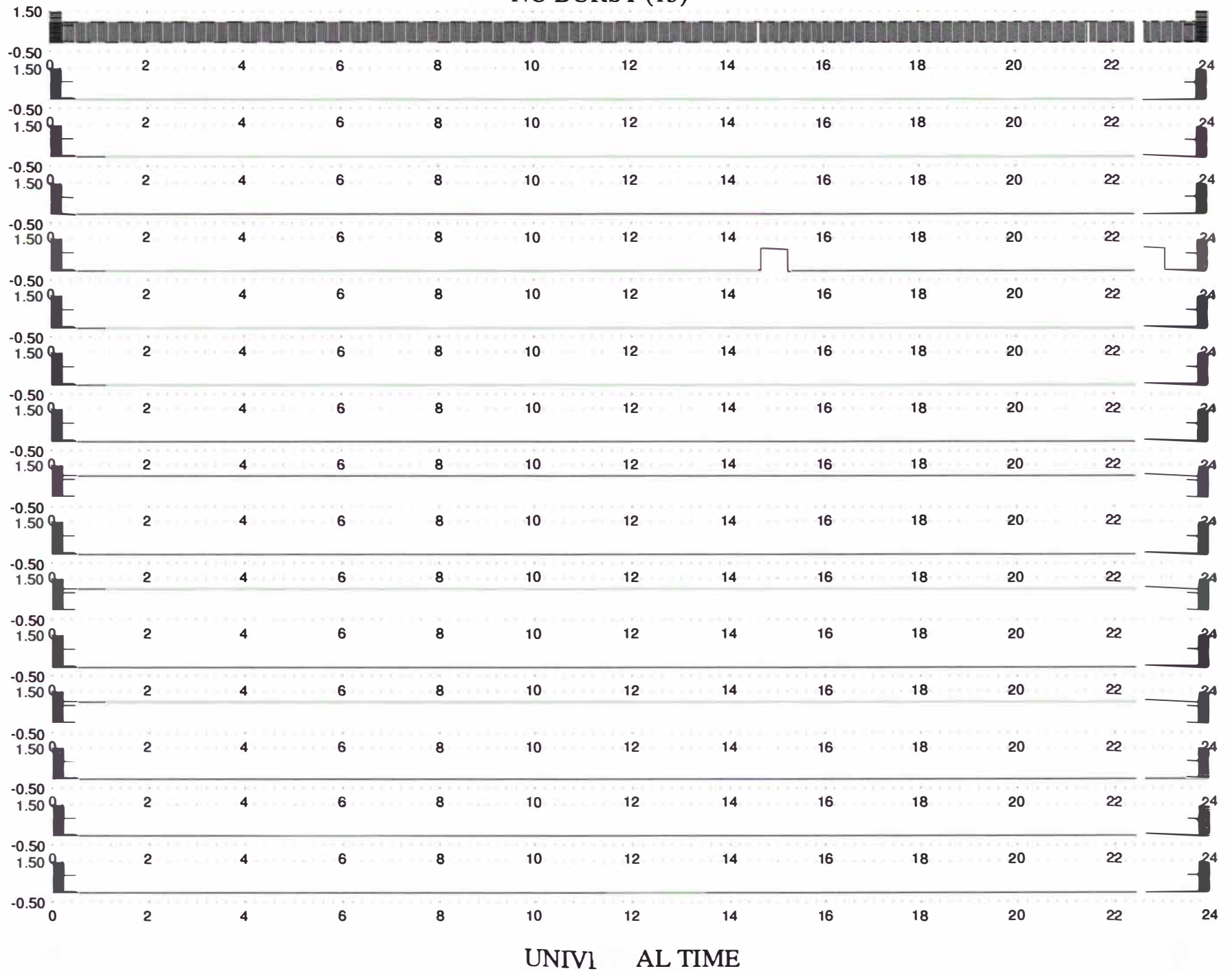
Data Start: 93/01/24, 0000:00

Plot created: 95/05/31, 2234

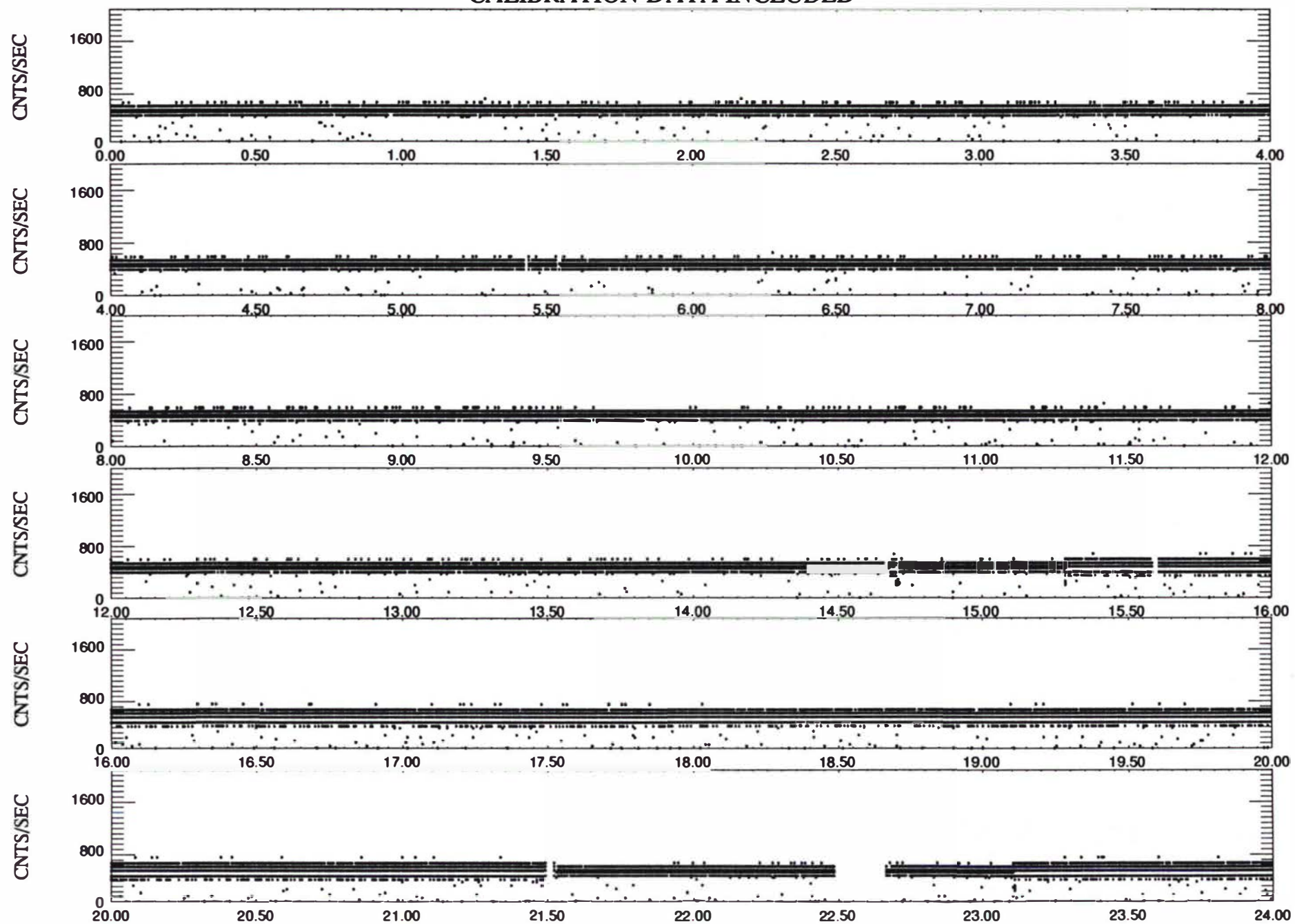
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

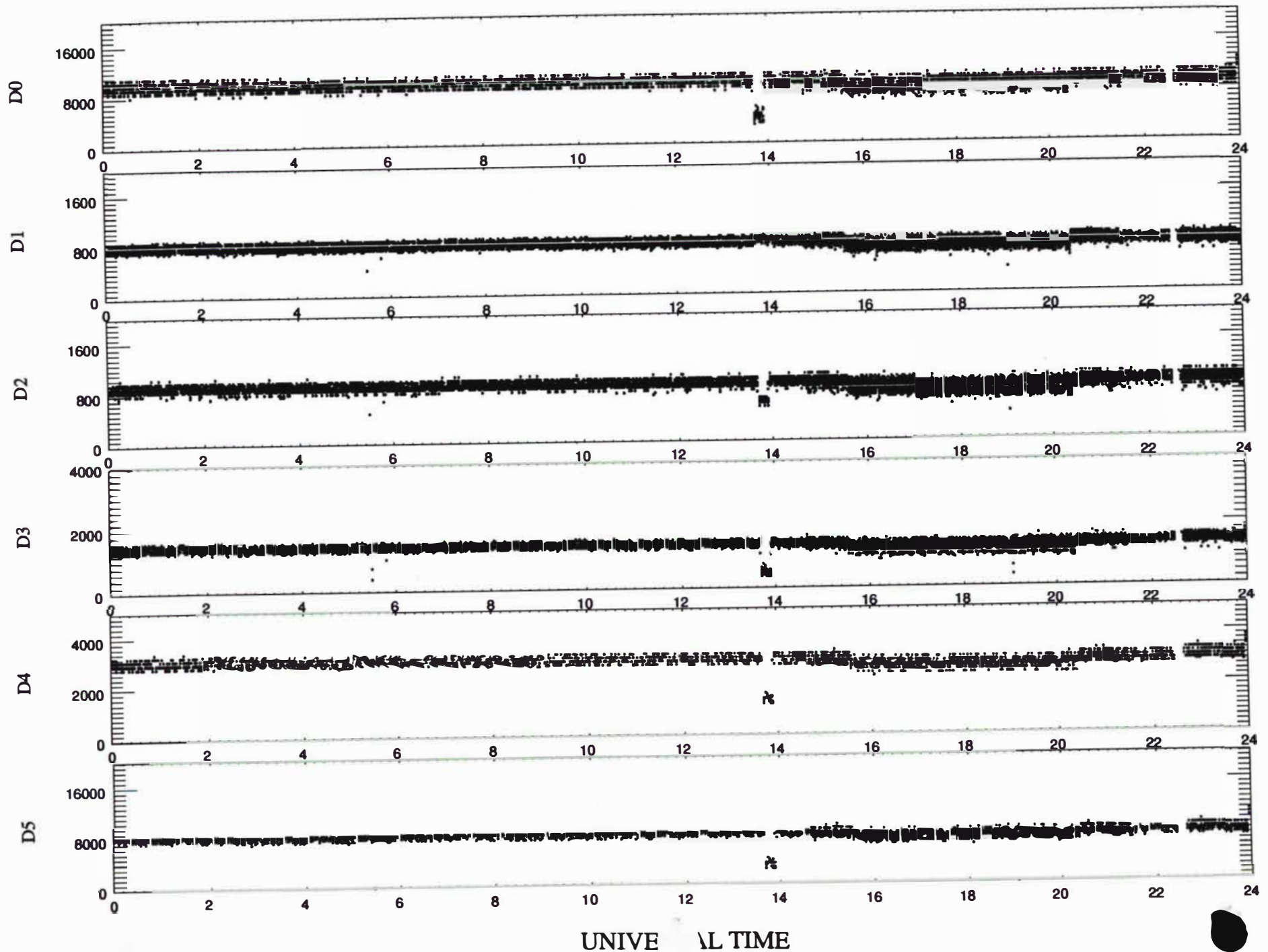
CBU CCL DMP ROM DMA OSC MP. ICR SPE OPM RSC CAL WCH MEM BRS HUS



CALIBRATION DATA INCLUDED



UNIVERSE TIME



CATSEARCH PROGRAM

BATSE BURST # 2146
EVENT OF 1993 JAN 25 DAY OF YEAR= 25
EVENT CROSSING TIME AT BATSE : 74741. S. OR 20:45:40.9
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 138.300 -54.200
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 25/ 1/ 93 IS:
RA= 162.137 DEC= -13.980 DIST= 4.303 AU
BATSE-ULYSSES DISTANCE = 643788640. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=135.66 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1535.75 SECS.
CROSSING TIME AT ULYSSES IS 73205. S. OR 20:20:05.2 +/- 287.28 SECONDS

1.0

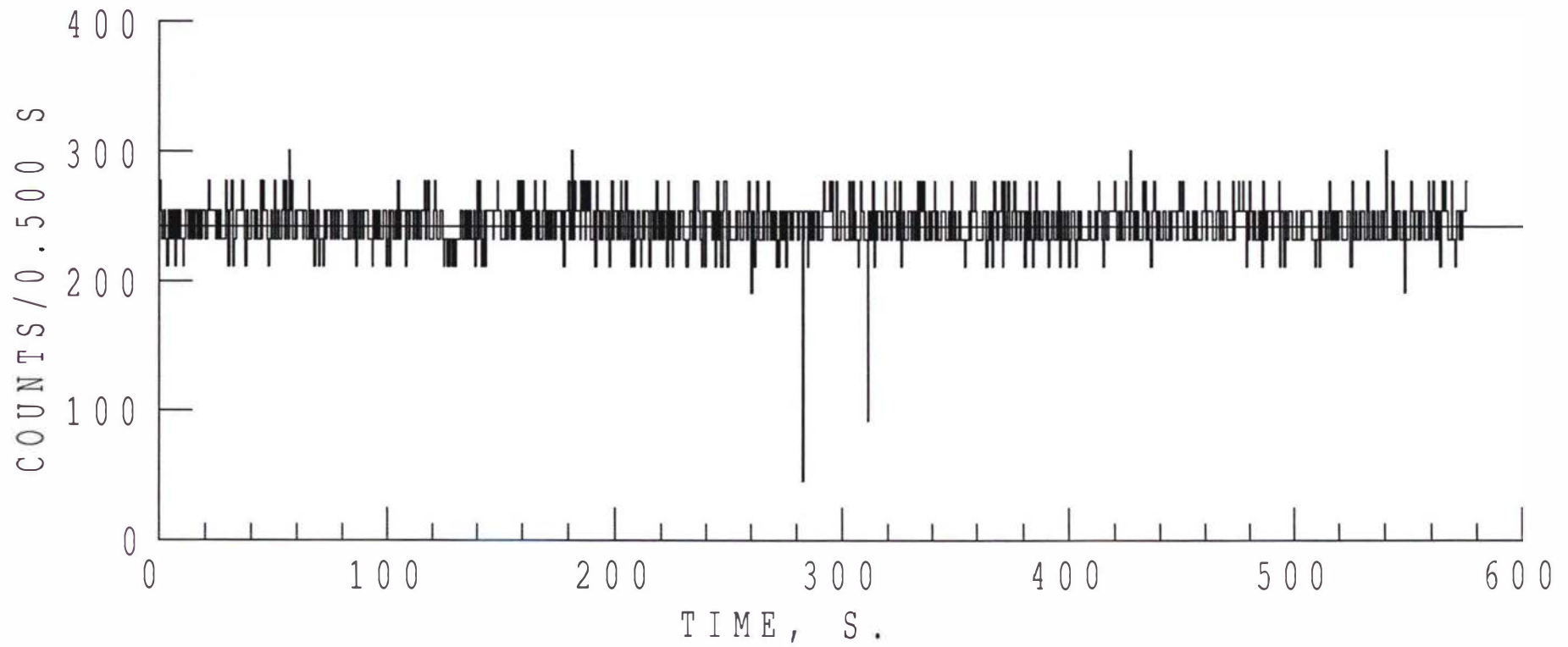
From BHAT@ssl.msfc.nasa.gov Tue Jan 26 11:11:39 1993
Date: Tue, 26 Jan 1993 13:10:59 -0600 (CST)
From: BHAT@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2146	930125	9012	74740	5500	143	-52

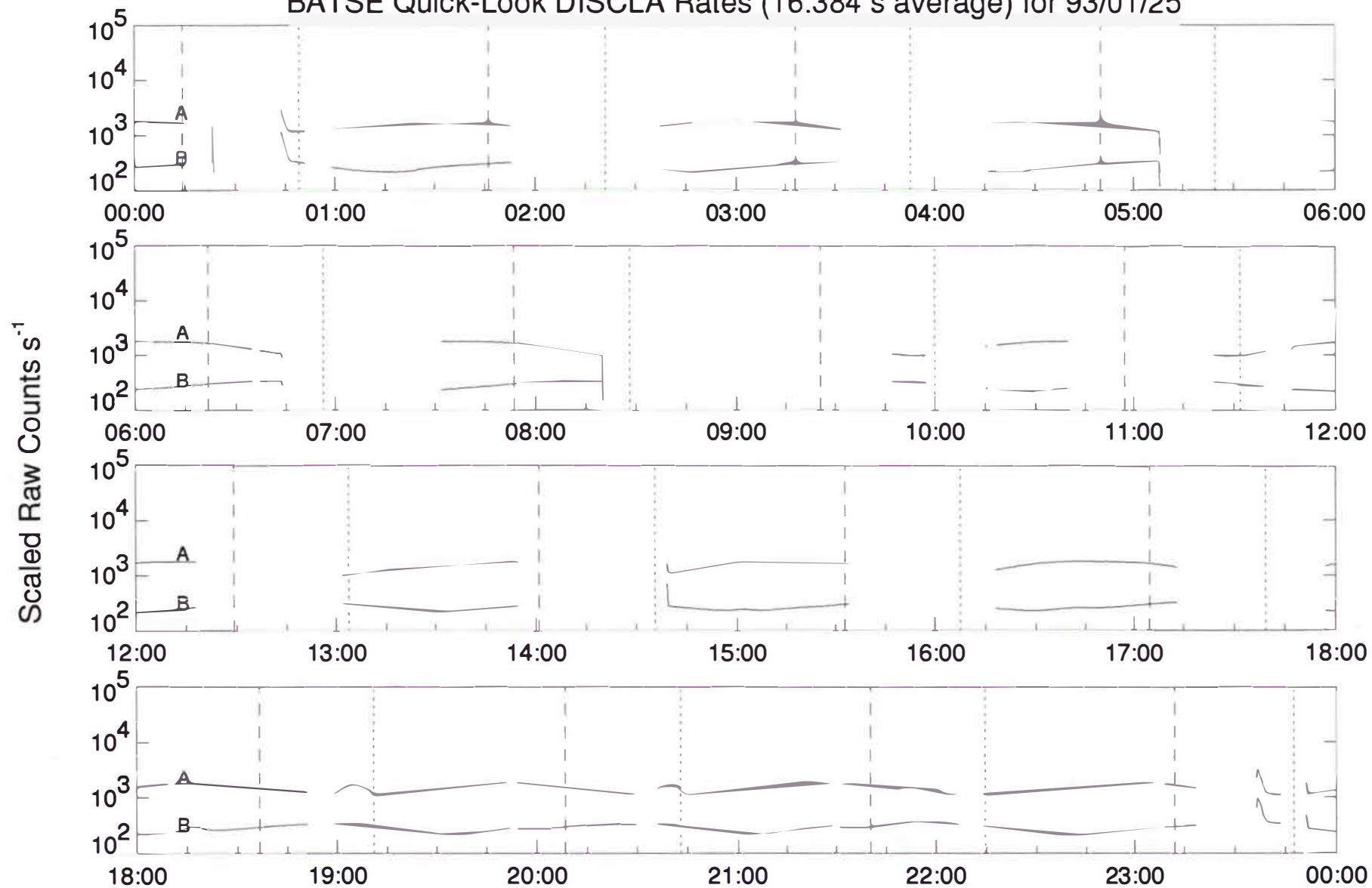
9 / 6 / 94

ULYSSES RT
25 / 1 / 93 72900.125 s
0 - 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



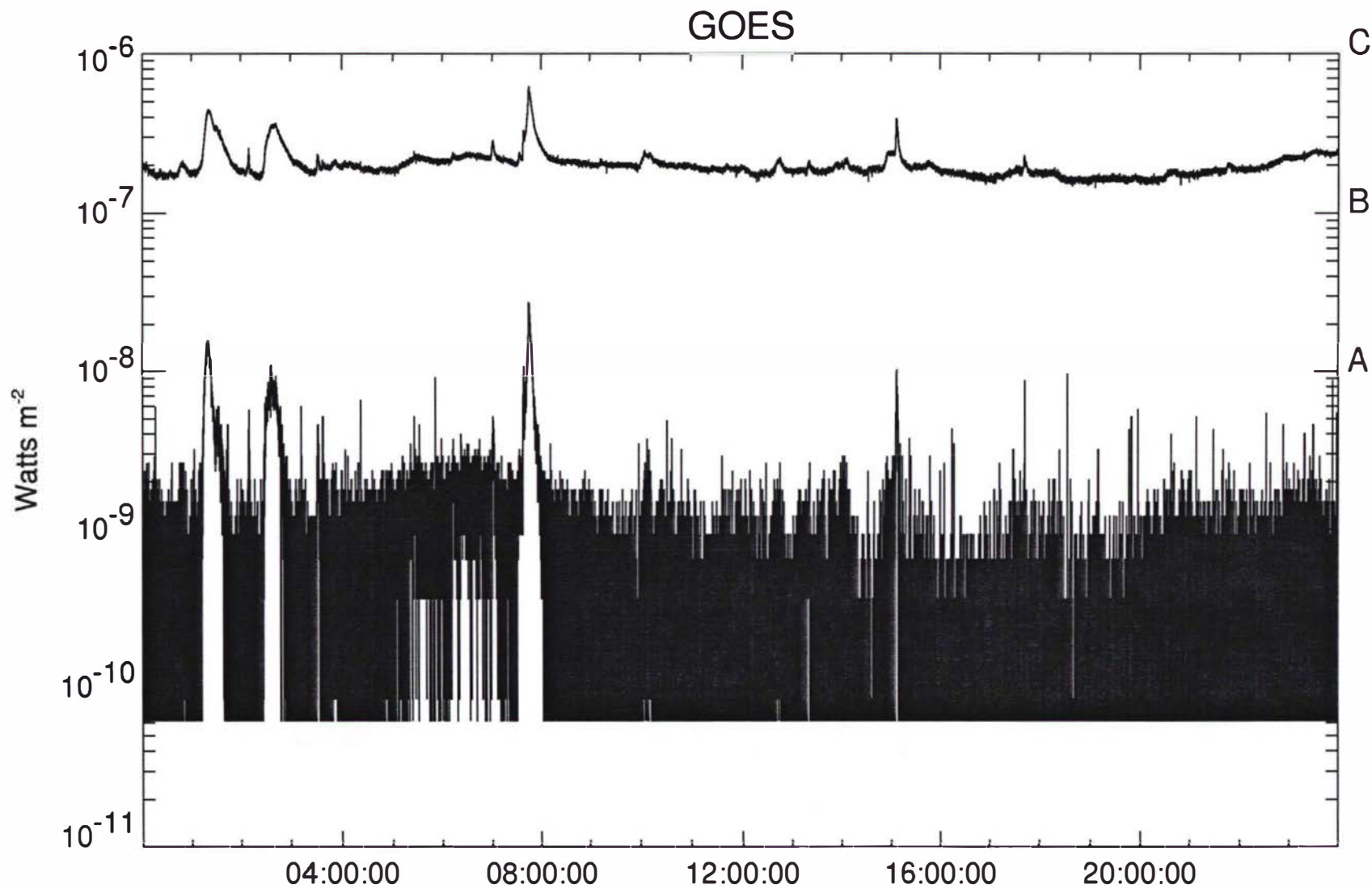
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/25



Current Time: 93/01/28, 1519 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



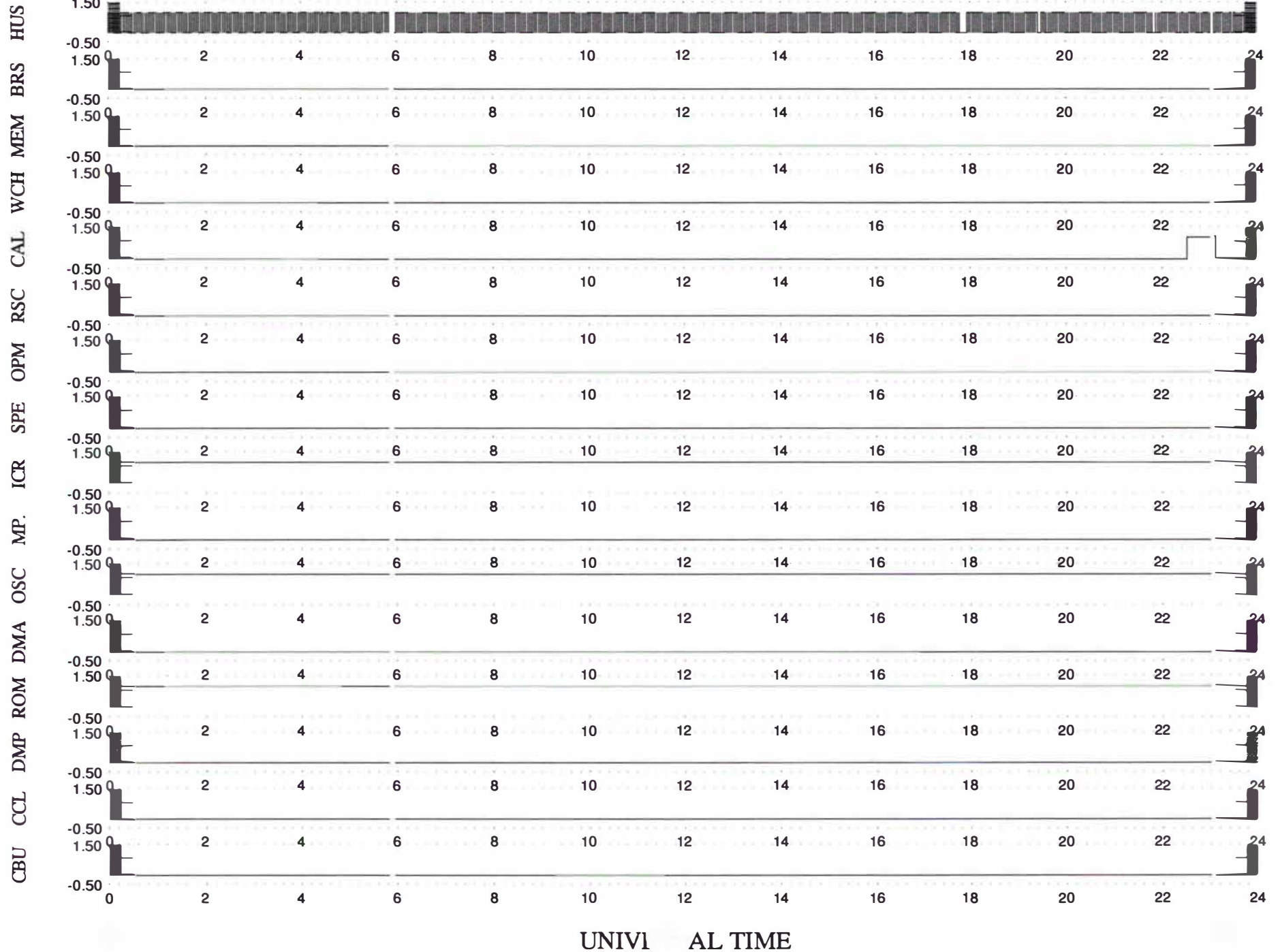
Data Start: 93/01/25, 0000:00

Plot created: 95/05/31, 2237

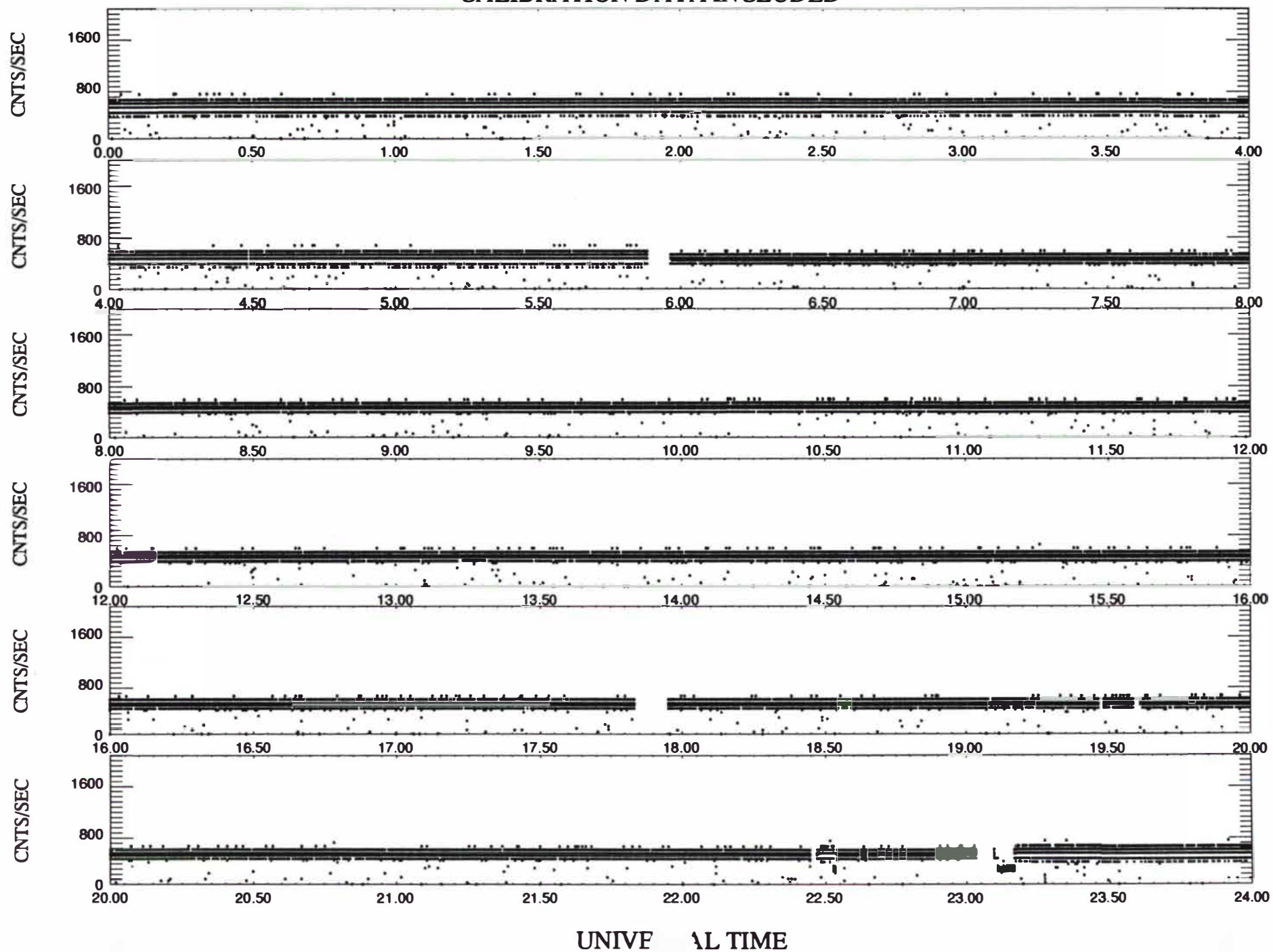
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

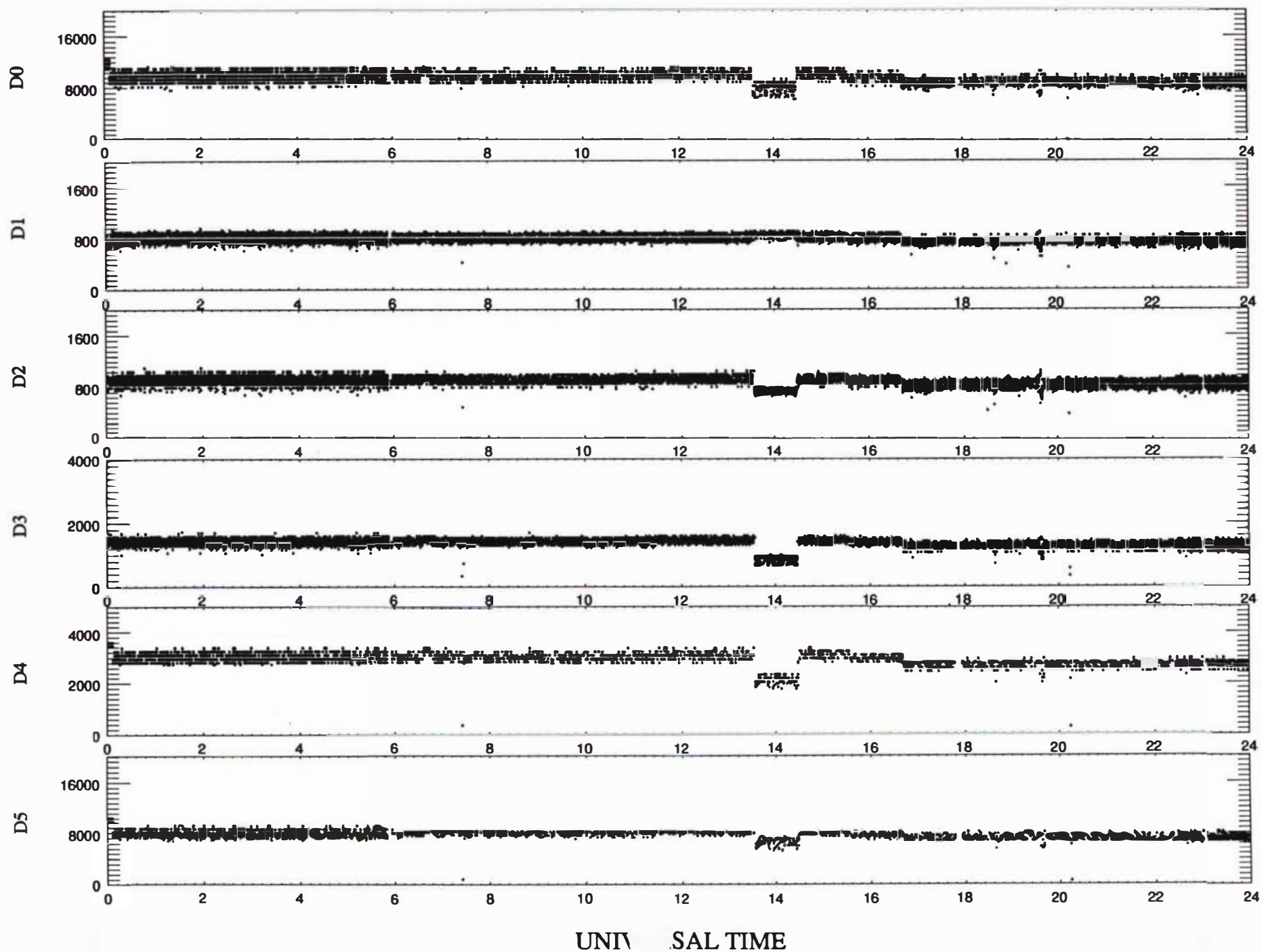
2 (0.5 - 4.0 Angstroms) Background not subtracted

NO BURST (13)



CALIBRATION DATA INCLUDED





CATSEARCH PROGRAM

BATSE BURST # 2147
EVENT OF 1993 JAN 26 DAY OF YEAR= 26
EVENT CROSSING TIME AT BATSE : 40962. S. OR 11:22:41.6
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 351.000 51.800
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 26/ 1/ 93 IS:
RA= 161.948 DEC= -14.033 DIST= 4.290 AU
BATSE-ULYSSES DISTANCE = 641798960. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 38.46 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1676.34 SECS.
CROSSING TIME AT ULYSSES IS 42638. S. OR 11:50:38.0 +/- 306.63 SECONDS

NO

From COLE@ssl.msfc.nasa.gov Fri Jan 29 08:30:12 1993
Date: Fri, 29 Jan 1993 10:28:52 -0600 (CST)
From: COLE@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.: 2147

TIME: TJD=9013 SECONDS=40961

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=159.3 AZIMUTH=50.2 ERROR= DEGREES

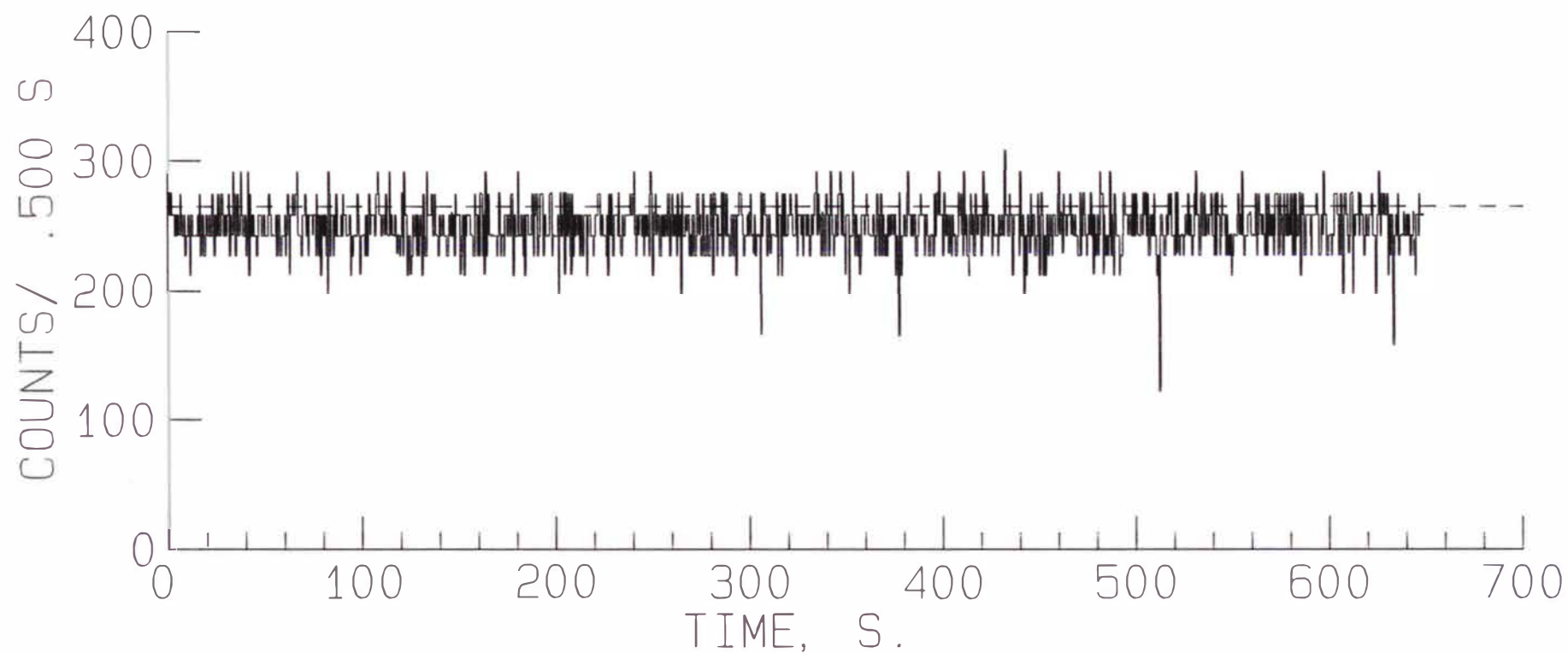
COMMENTS:

COSMIC BURST. SHORT BURST LASTING ~5S. NO DISCSC DATA. NO SUBSTRUCTURE.

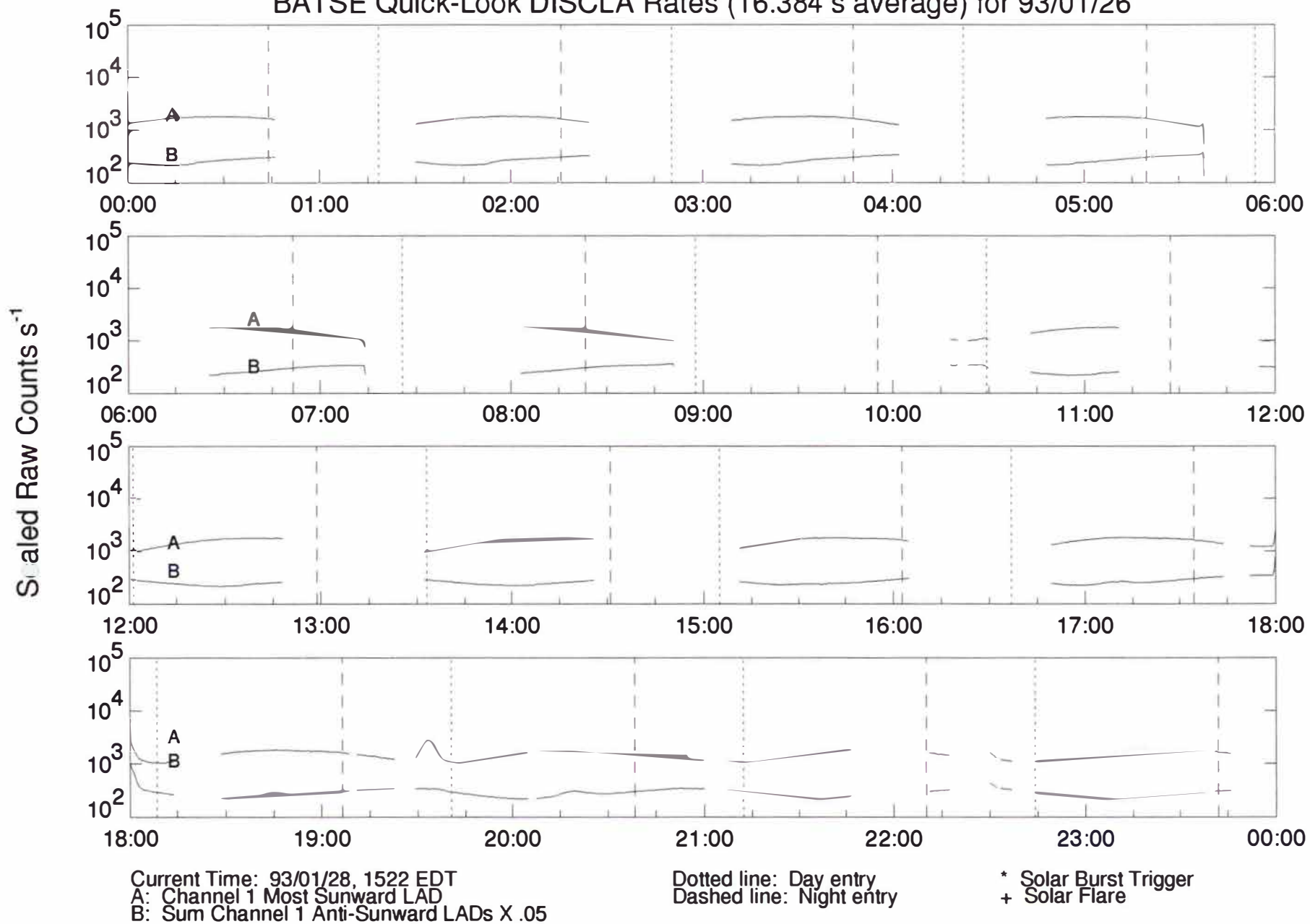
From COLE@ssl.msfc.nasa.gov Thu Jan 28 11:22:49 1993
Date: Thu, 28 Jan 1993 13:22:19 -0600 (CST)
From: COLE@ssl.msfc.nasa.gov
Subject: BATSE burst
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU
Content-Length: 108

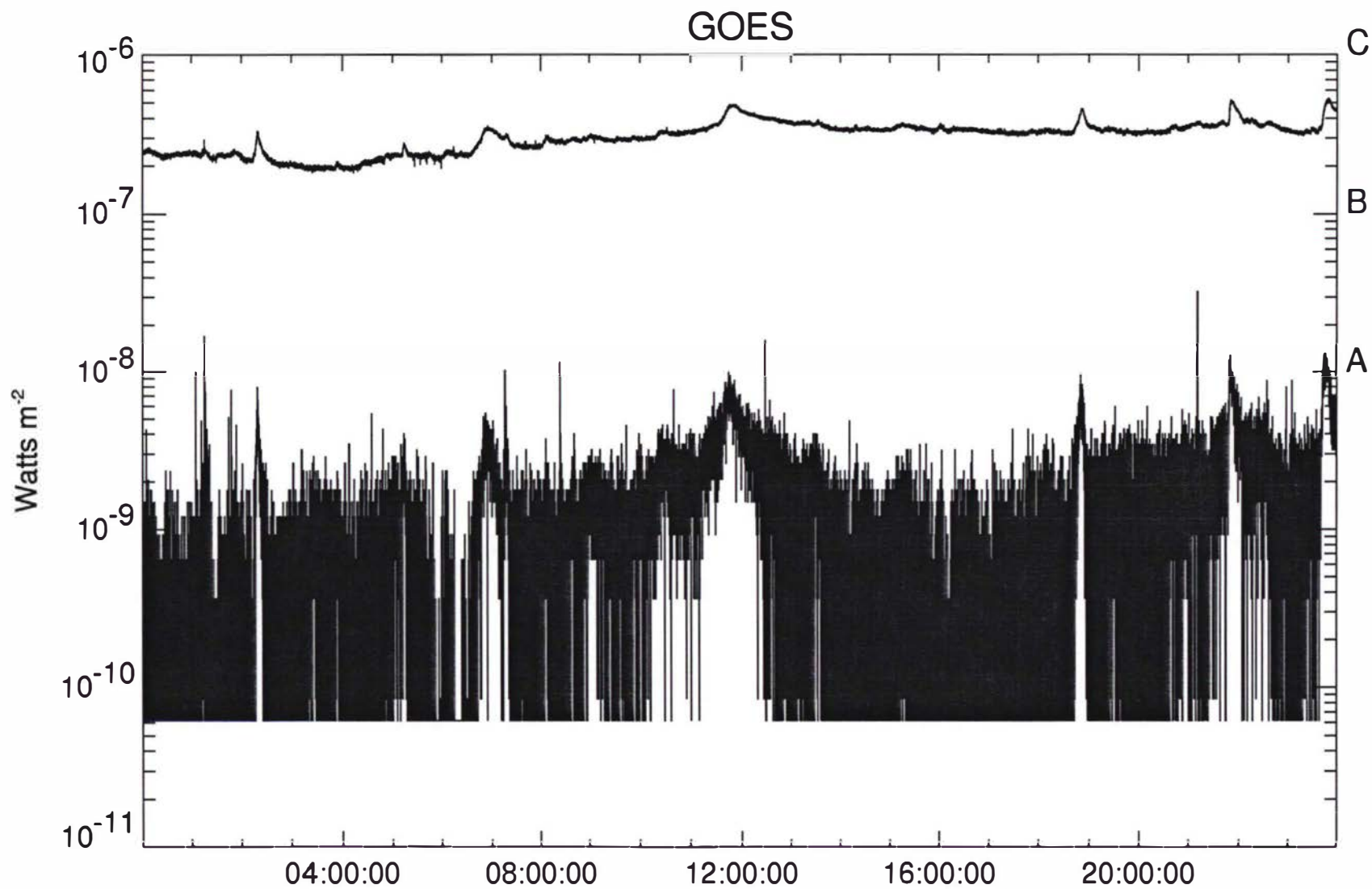
BATSE #	Date	TJD	sec	Max ct/s	RA	Dec
2147	930126	9013	40961	1900	351	+52

ULYSSES RT
26/ 1/93 42300.004 s
.250 S INTERVALS REGROUPED BY 2
0- 0 keV



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/26





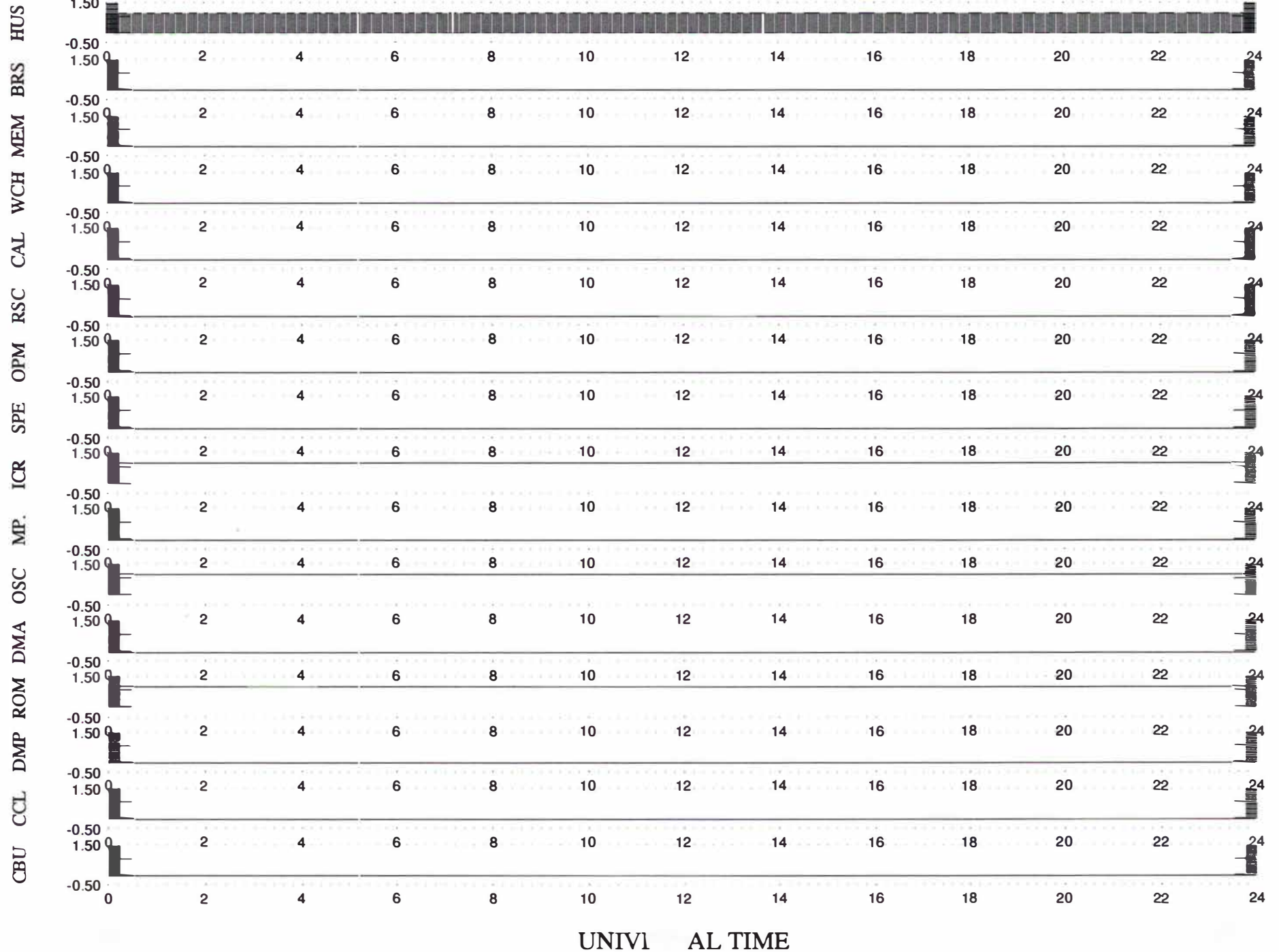
Data Start: 93/01/26, 0000:00

Plot created: 95/05/31, 2239

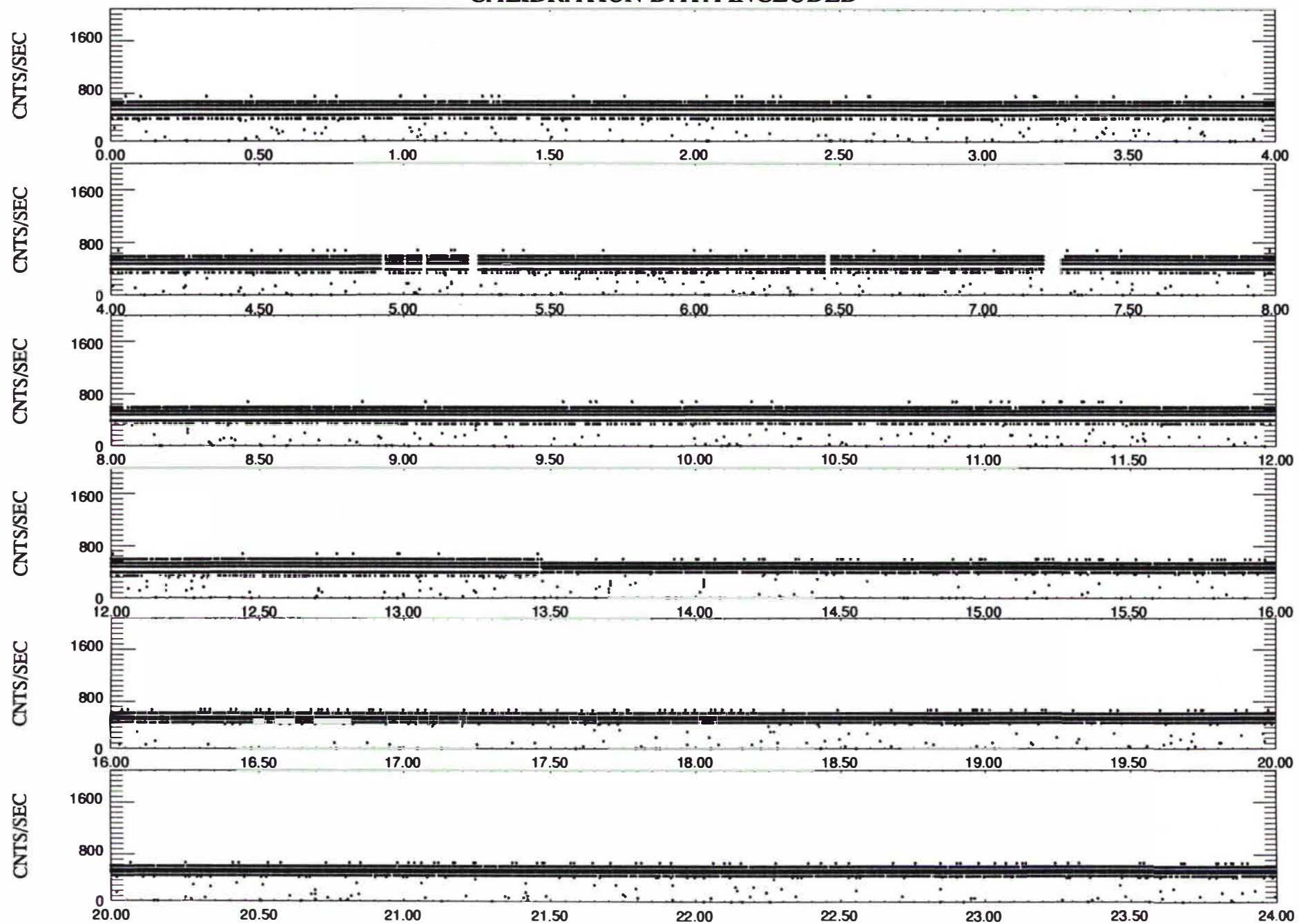
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

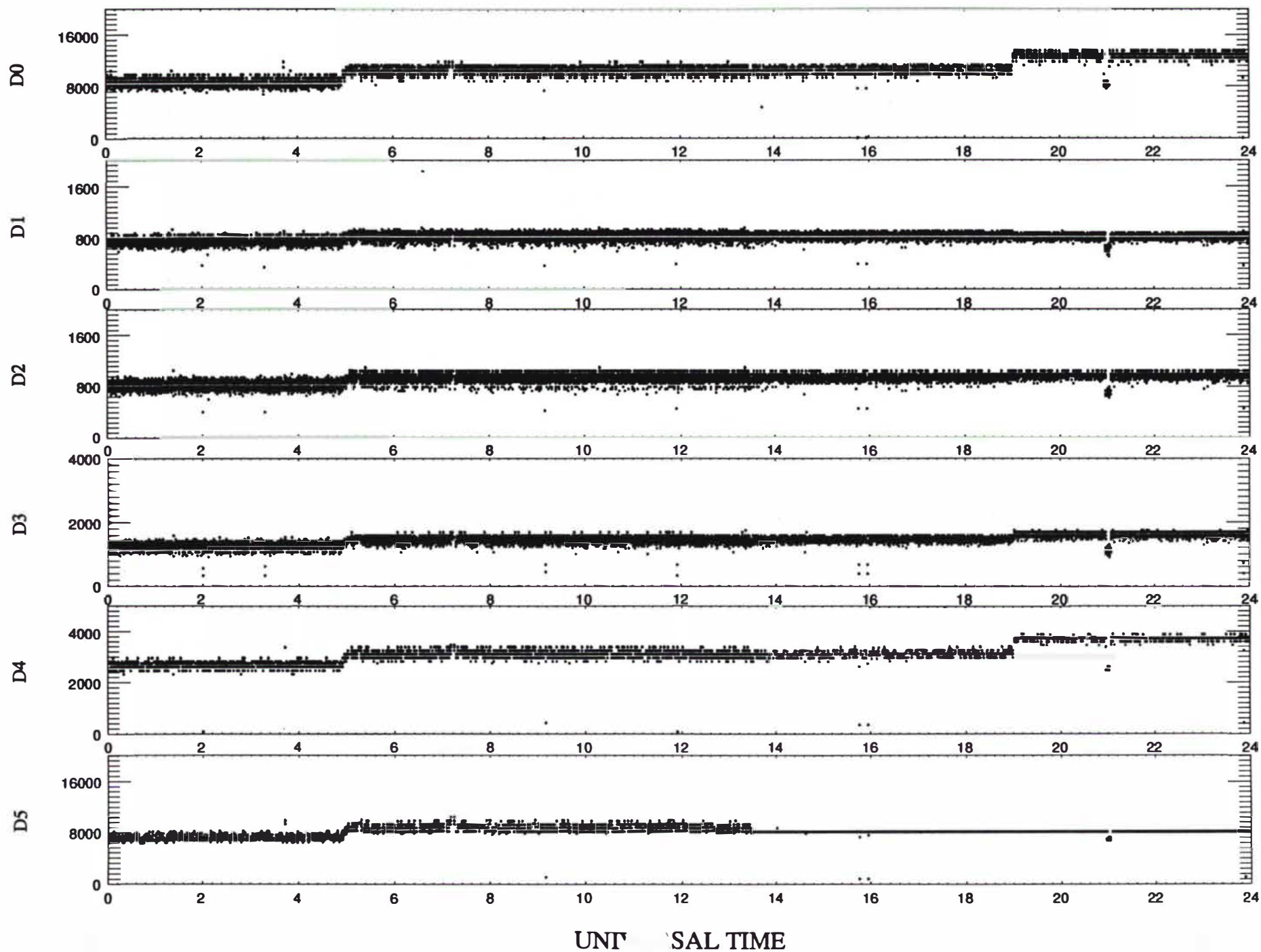
NO BURST (13)



CALIBRATION DATA INCLUDED



UNIVERSAL TIME



From springer@pop.jpl.nasa.gov Tue Nov 19 09:43 PST 1996
 Return-Path: <springer@pop.jpl.nasa.gov>
 Received: from pop.jpl.nasa.gov by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
 id JAA13354; Tue, 19 Nov 1996 09:43:20 -0800
 Received: from billevans (billevans.jpl.nasa.gov [137.78.252.52]) by pop.jpl.nasa.gov (8.7.5/8.7)
 Message-Id: <3.0.32.19961119094312.00942100@pop.jpl.nasa.gov>
 X-Sender: springer@pop.jpl.nasa.gov
 X-Mailer: Windows Eudora Pro Version 3.0 (32)
 Date: Tue, 19 Nov 1996 09:43:13 -0800
 To: khurley@sunspot.ssl.berkeley.edu
 From: Joe Springer <springer@pop.jpl.nasa.gov>
 Subject: validation of 1993 data points
 Mime-Version: 1.0
 X-Lines: 26
 Status: RO

Kevin,

As requested Thursday, I have checked the following
 eleven data points and found no timing errors. Specifically,
 we checked as follows:

Type	Date	Sec/Day	Validation Results:
ULYSSES	1/20/93	85352.726	no errors - 10 before to 60 after
ULYSSES RT	1/27/93	59477.129	no errors - 10 before to 10 after
ULYSSES RT	6/12/93	1558.242	no errors - 10 before to 10 after
YSESSES RT	6/12/93	34201.245	no errors - 10 before to 10 after
YSESSES RT	7/4/93	60210.297	no errors - 10 before to 10 after
ULYSSES	7/6/93 20282.957		no errors - 10 before to 60 after
ULYSSES RT	7/20/93	54122.35	no errors - 10 before to 10 after
ULYSSES RT	7/24/93	60281.23	no errors - 10 before to 10 after
ULYSSES RT	7/31/93	10688.221	no errors - 10 before to 10 after
ULYSSES RT	7/31/93	22050.147	no errors - 10 before to 10 after
ULYSSES RT	8/1/93	9752.522	no errors - 10 before to 10 after

NO events

Regards,

Joe

From springer@pop.jpl.nasa.gov Tue Nov 19 12:59 PST 1996
 Return-Path: <springer@pop.jpl.nasa.gov>
 Received: from pop.jpl.nasa.gov by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
 id MAA15048; Tue, 19 Nov 1996 12:59:55 -0800
 Received: from billevans (billevans.jpl.nasa.gov [137.78.252.52]) by pop.jpl.nasa.gov (8.7.5/8.7)
 Message-Id: <3.0.32.19961119125948.00953bf0@pop.jpl.nasa.gov>
 X-Sender: springer@pop.jpl.nasa.gov
 X-Mailer: Windows Eudora Pro Version 3.0 (32)
 Date: Tue, 19 Nov 1996 12:59:48 -0800
 To: khurley@sunspot.ssl.berkeley.edu (Kevin Hurley)
 From: Joe Springer <springer@pop.jpl.nasa.gov>
 Subject: Re: validation of 1993 data points
 Mime-Version: 1.0
 X-Lines: 19
 Status: RO

Kevin,

CATSEARCH PROGRAM

BATSE BURST # 2148
EVENT OF 1993 JAN 27 DAY OF YEAR= 27
EVENT CROSSING TIME AT BATSE : 1723. S. OR 00:28:43.0
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 243.900 -21.800
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 27/ 1/ 93 IS:
RA= 161.756 DEC= -14.083 DIST= 4.277 AU
BATSE-ULYSSES DISTANCE = 639839200. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=102.33 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -455.58 SECS.
CROSSING TIME AT ULYSSES IS 1267. S. OR 00:21:07.4 +/- 405.08 SECONDS

110

From MALLOZZI@ssl.msfc.nasa.gov Thu Jan 28 09:44:58 1993
Date: Thu, 28 Jan 1993 11:43:21 -0600 (CST)
From: MALLOZZI@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: 1377

BATSE BURST TRIGGER

NO.: 02148

TIME: TJD=9014 SECONDS=01723

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=041.4 AZIMUTH=002.9 ERROR= DEGREES

COMMENTS:

INITIAL EMISSION FOR APPROX. 20SEC FOLLOWED BY RETURN TO BACKGROUND
FOR APPROX. 30SEC, THEN APPROX. 12SEC PULSE.
POSSIBLE SLIGHT EMISSION ABOVE 300KEV.

From MALLOZZI@ssl.msfc.nasa.gov Thu Jan 28 09:48:05 1993
Date: Thu, 28 Jan 1993 11:47:33 -0600 (CST)
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
2148	930127	9014	01723	5600	248	-20

9 / 6 / 94

ULYSSES RT

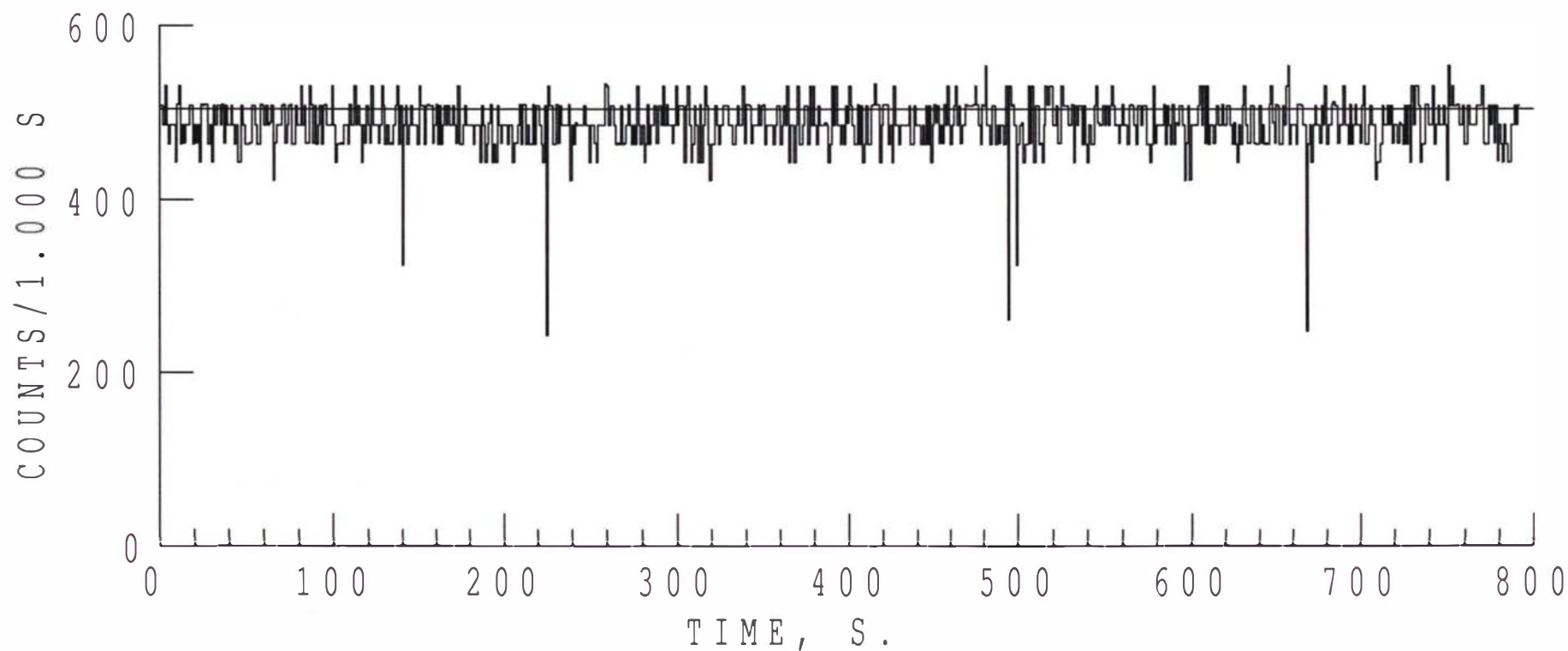
27 / 1 / 93 864.203 s

0.500 S INTERVALS REGROUPED BY 2

0 - 0 keV

N= 10 M= 2

>4.0 SIGMA FLUCTUATIONS



CATSEARCH PROGRAM

BATSE BURST # 2149
EVENT OF 1993 JAN 27 DAY OF YEAR= 27
EVENT CROSSING TIME AT BATSE : 58466. S. OR 16:14:25.9
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 311.600 -40.100
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 27/ 1/ 93 IS:
RA= 161.756 DEC= -14.083 DIST= 4.277 AU
BATSE-ULYSSES DISTANCE = 639839200. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 61.00 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1034.67 SECS.
CROSSING TIME AT ULYSSES IS 59501. S. OR 16:31:40.6 +/- 389.80 SECONDS

RT

From MALLOZZI@ssl.msfc.nasa.gov Mon Feb 1 08:05:34 1993
Date: Mon, 1 Feb 1993 10:04:44 -0600 (CST)
From: MALLOZZI@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.: 02149

TIME: TJD=9014 SECONDS=58465

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=83.3 AZIMUTH=316.6 ERROR= DEGREES

COMMENTS:

LONG DURATION BURST; APPROX. 110SEC WITH TWO MAIN PULSES.
EVENT NOT OBSERVED ABOVE 300 KEV.

From MALLOZZI@ssl.msfc.nasa.gov Mon Feb 1 08:07:11 1993
Date: Mon, 1 Feb 1993 10:06:55 -0600 (CST)
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
2149	930127	9014	58465	6200	312	-40

Helo corr removed

Date: Dec 15 '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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

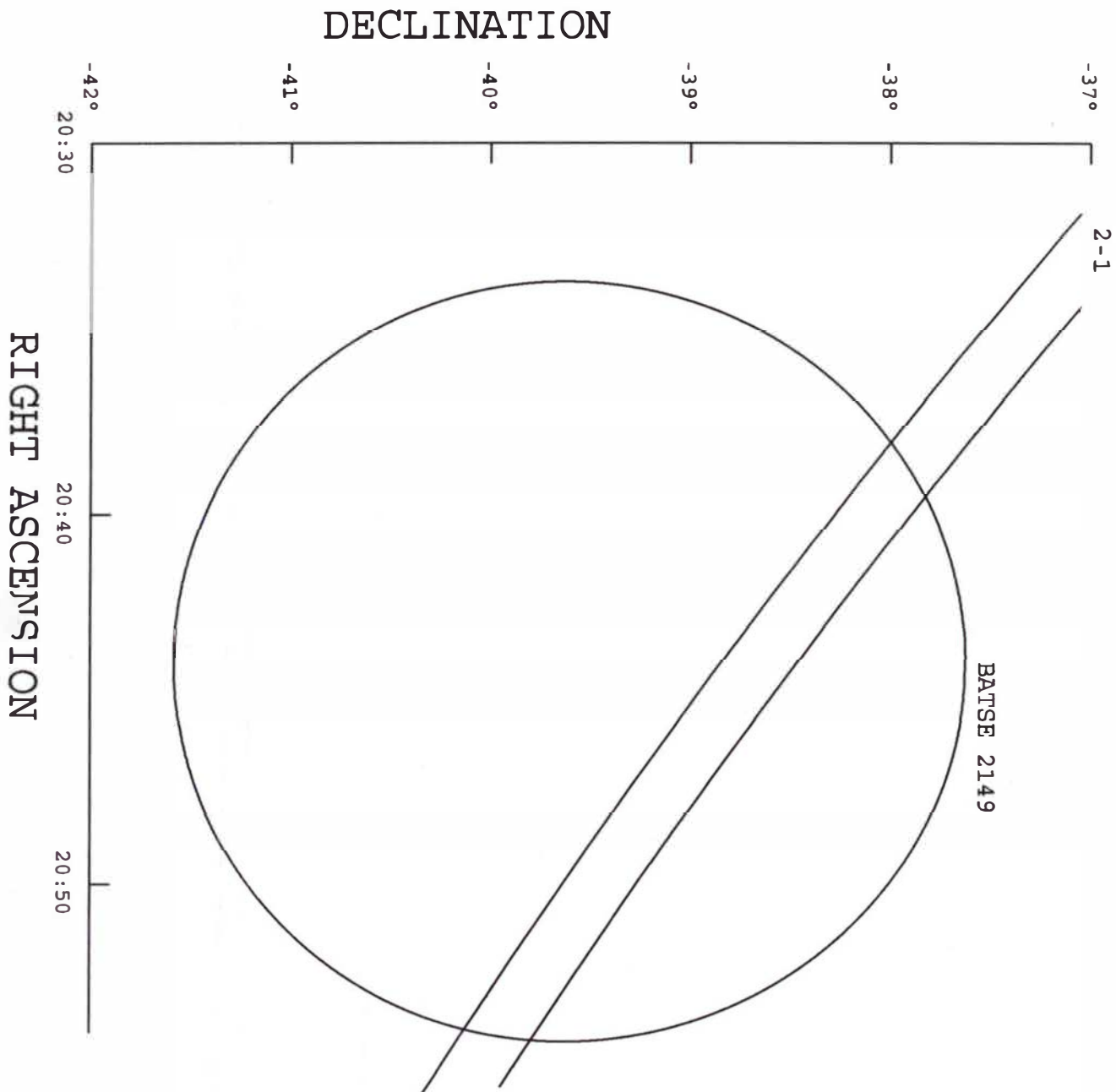
G=GALACTIC EQUATOR

1 ULYSSES

2 BATSE

EVENT OF JAN 27, 1993 16:31

15/12/97



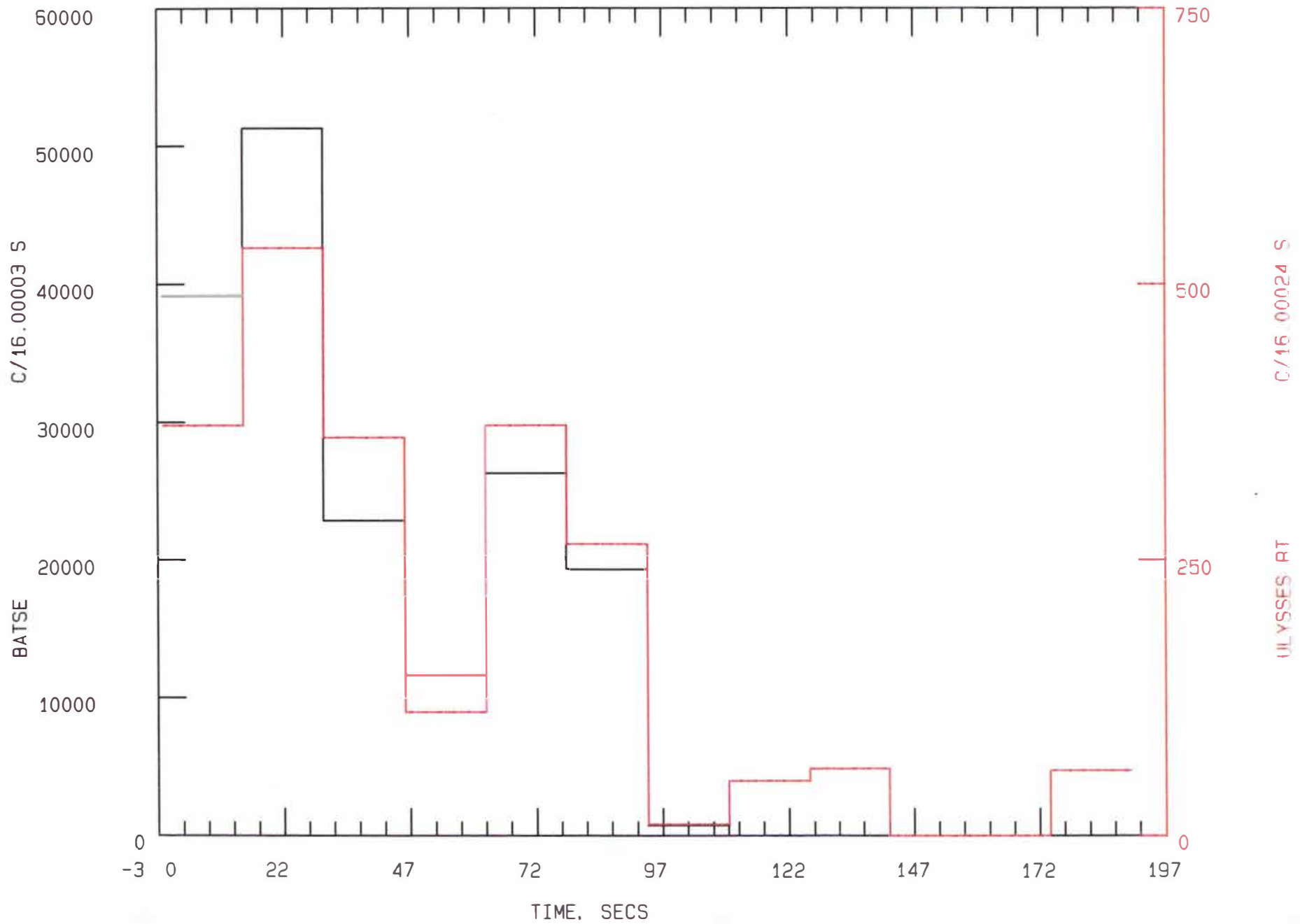
BATSE

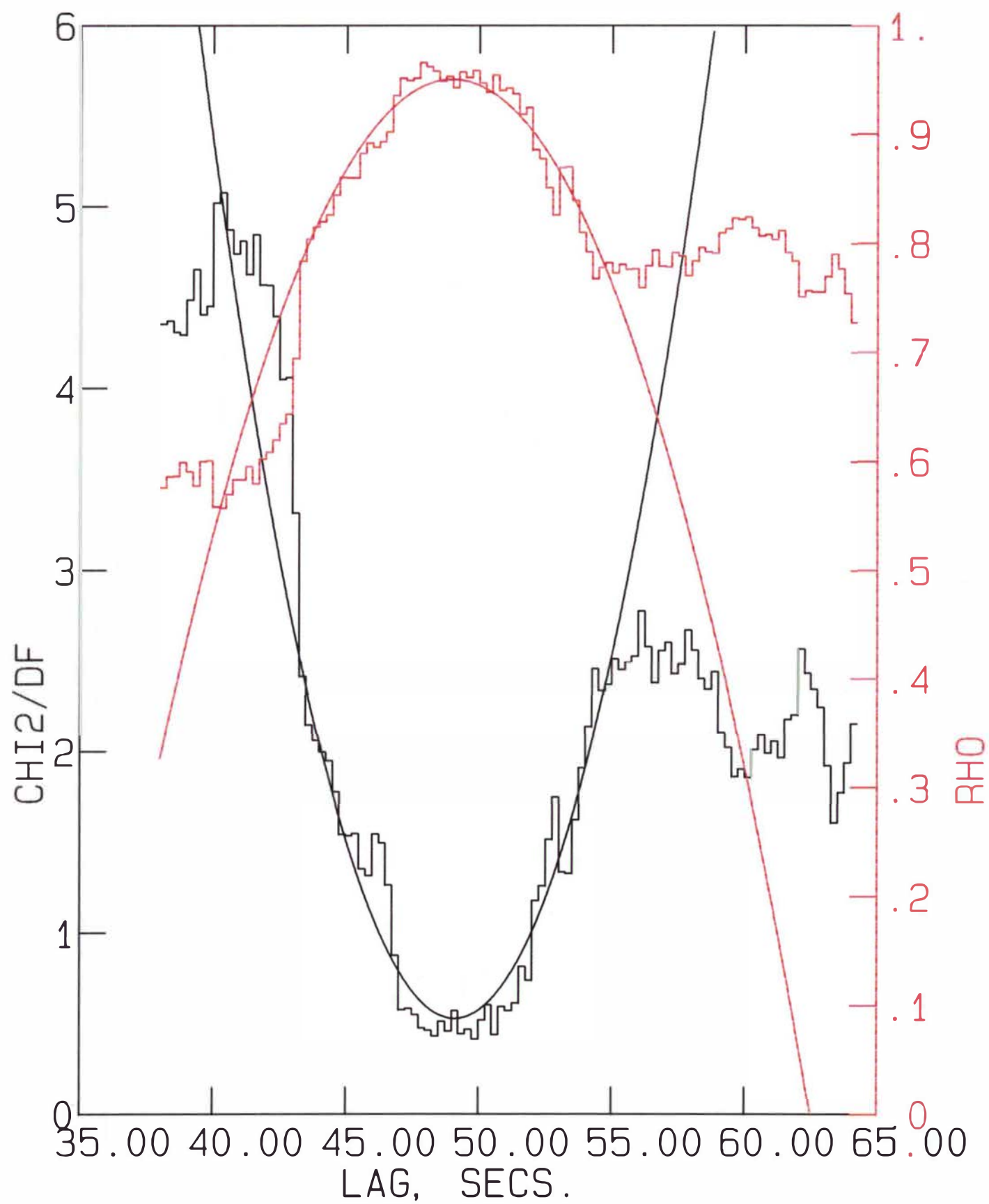
-ULYSSES RT CORRELATION

27/ 1/93

58465.922

15/12/97





ULYSSES RT

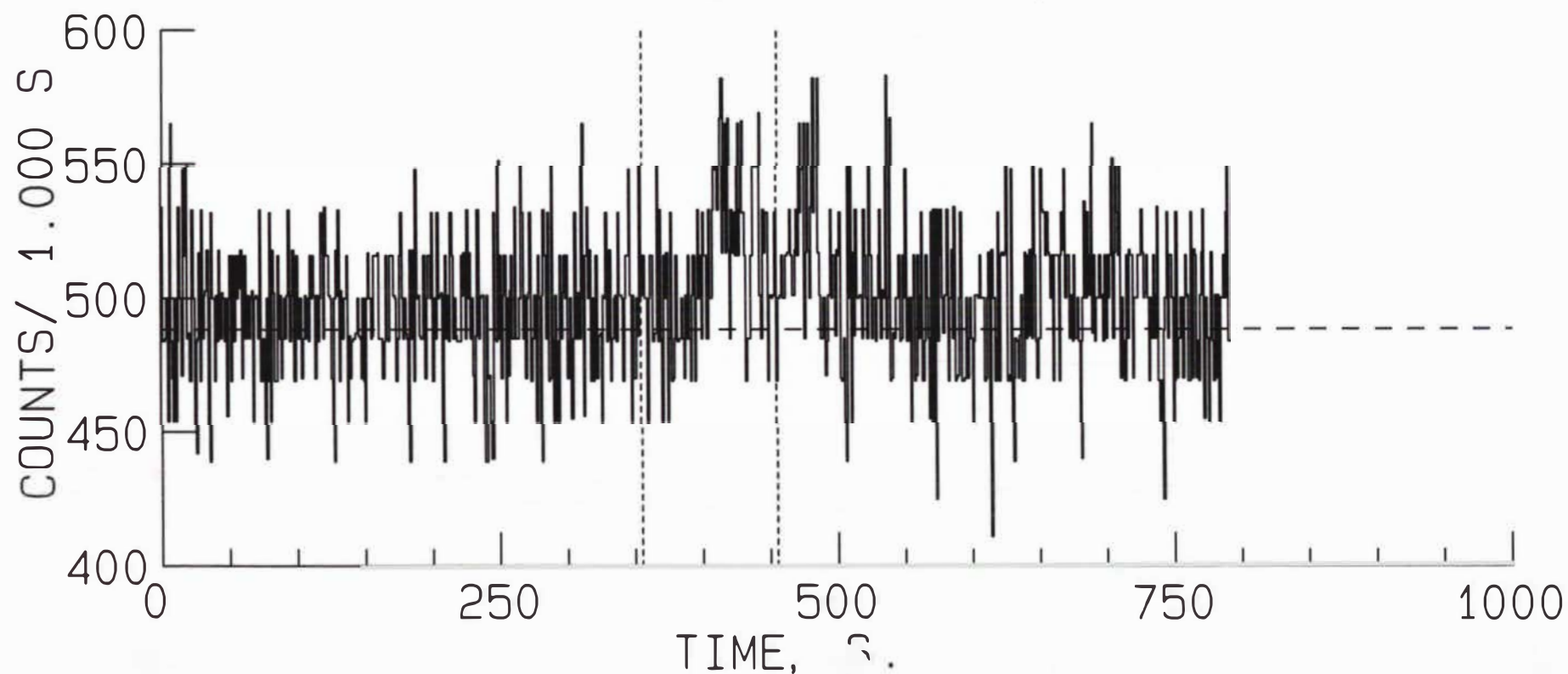
15/12/97

27/ 1/93 59112.121 s

0.250 S INTERVALS REGROUPED BY 4

22- 147 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS



From springer@pop.jpl.nasa.gov Tue Nov 19 09:43 PST 1996
Return-Path: <springer@pop.jpl.nasa.gov>
Received: from pop.jpl.nasa.gov by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA13354; Tue, 19 Nov 1996 09:43:20 -0800
Received: from billevans (billevans.jpl.nasa.gov [137.78.252.52]) by pop.jpl.nasa.gov (8.7.5/8.7)
Message-Id: <3.0.32.19961119094312.00942100@pop.jpl.nasa.gov>
X-Sender: springer@pop.jpl.nasa.gov
X-Mailer: Windows Eudora Pro Version 3.0 (32)
Date: Tue, 19 Nov 1996 09:43:13 -0800
To: khurley@sunspot.ssl.berkeley.edu
From: Joe Springer <springer@pop.jpl.nasa.gov>
Subject: validation of 1993 data points
Mime-Version: 1.0
X-Lines: 26
Status: RO

Kevin,

As requested Thursday, I have checked the following
eleven data points and found no timing errors. Specifically,
we checked as follows:

Type	Date	Sec/Day	Validation Results:
ULYSSES	1/20/93	85352.726	no errors - 10 before to 60 after
ULYSSES RT	1/27/93	59477.129	no errors - 10 before to 10 after
ULYSSES RT	6/12/93	1558.242	no errors - 10 before to 10 after
YSSSES RT	6/12/93	34201.245	no errors - 10 before to 10 after
YSSSES RT	7/4/93	60210.297	no errors - 10 before to 10 after
ULYSSES	7/6/93	20282.957	no errors - 10 before to 60 after
ULYSSES RT	7/20/93	54122.35	no errors - 10 before to 10 after
ULYSSES RT	7/24/93	60281.23	no errors - 10 before to 10 after
ULYSSES RT	7/31/93	10688.221	no errors - 10 before to 10 after
ULYSSES RT	7/31/93	22050.147	no errors - 10 before to 10 after
ULYSSES RT	8/1/93	9752.522	no errors - 10 before to 10 after

Regards,

Joe
Kevin,

Roger suggested that the appropriate data to examine
for a trigger was ten minutes before and 60 minutes
after the event time, while ten minutes before and after
the other times was sufficient.

Joe

At 12:58 PM 11/19/96 -0800, you wrote:

>Dear Joe,

>

>Thanks. Can you tell me what units 10 and 60 are? Minutes? Headers?

>

Kevin

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/SMI)
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

MO-RT

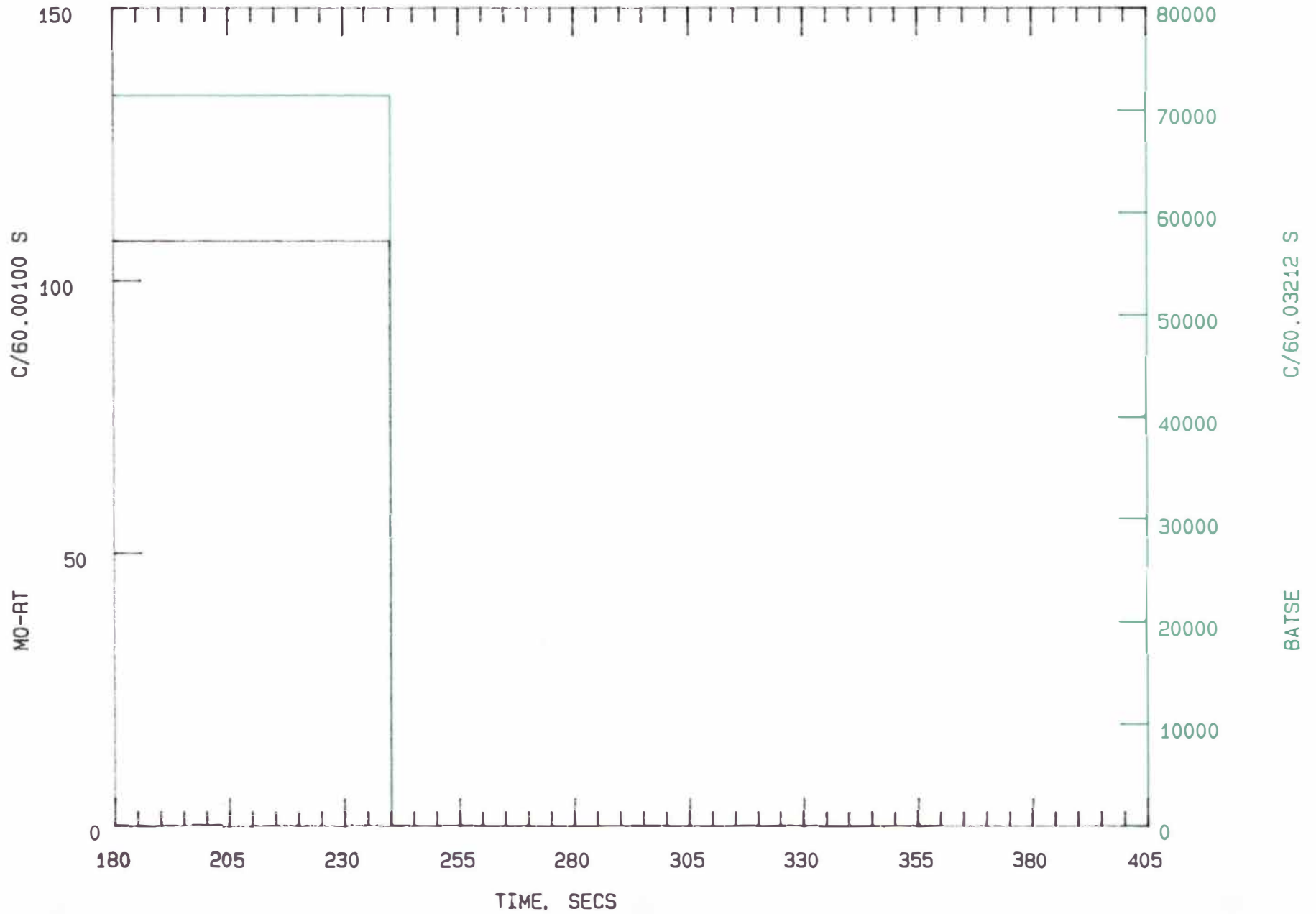
-BATSE

CORRELATION

27/ 1/93

58493.868

13/ 7/95



13/ 7/95

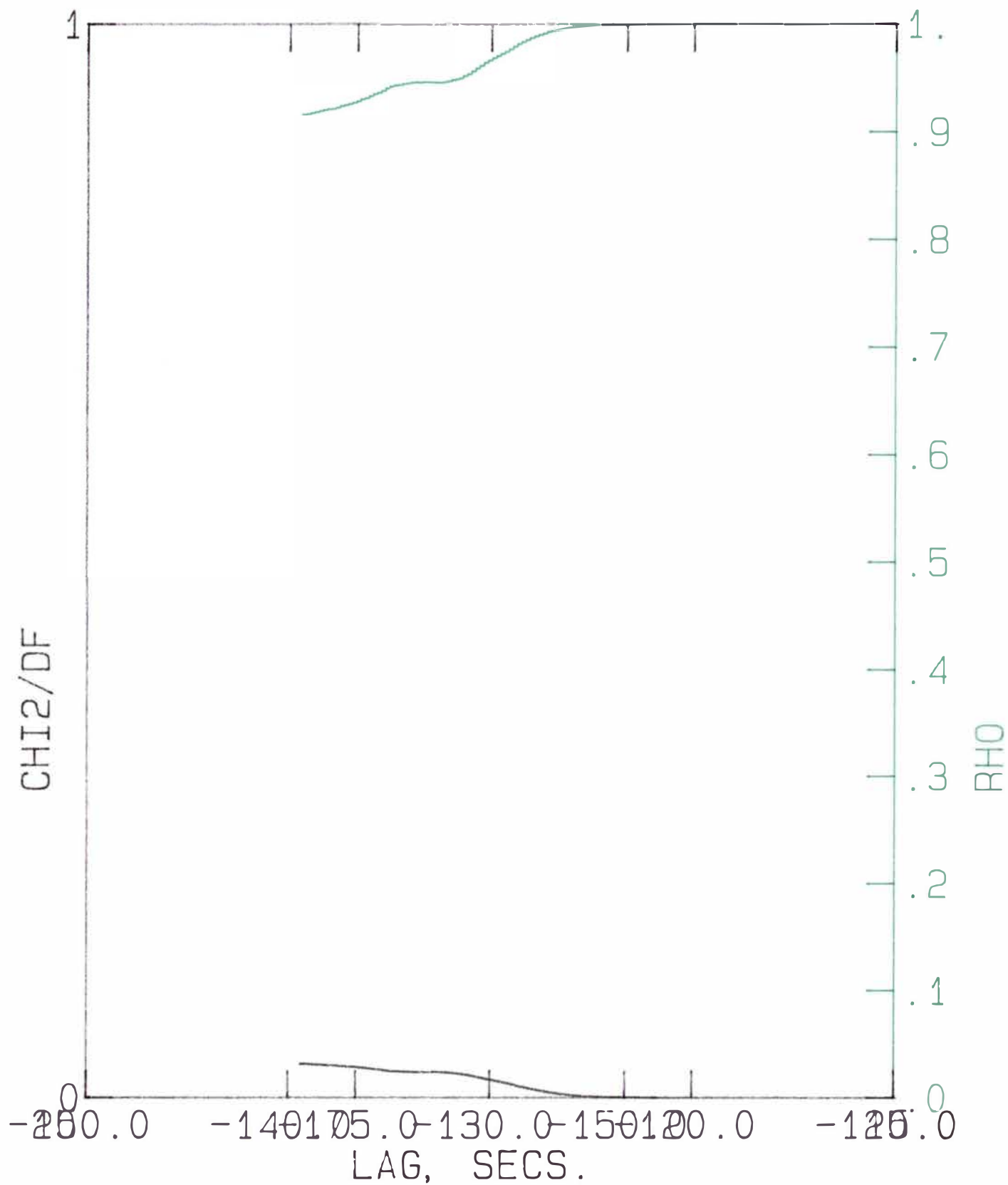
MO-RT

-BATSE

CORRELATION

27/ 1/93

58493.868



MO-RT

13/ 7/95

27/ 1/93

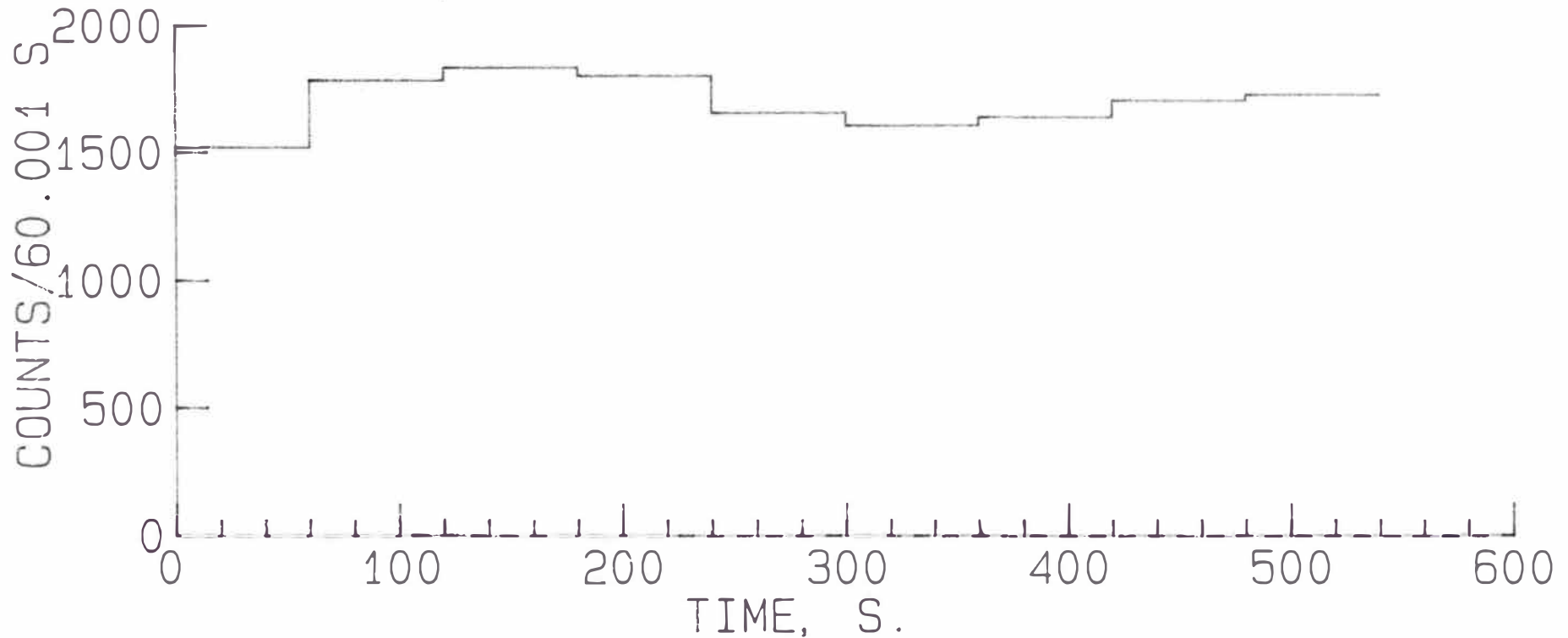
58493.868 s.

*Revised data; cut to
eliminate gaps. Earlier event*

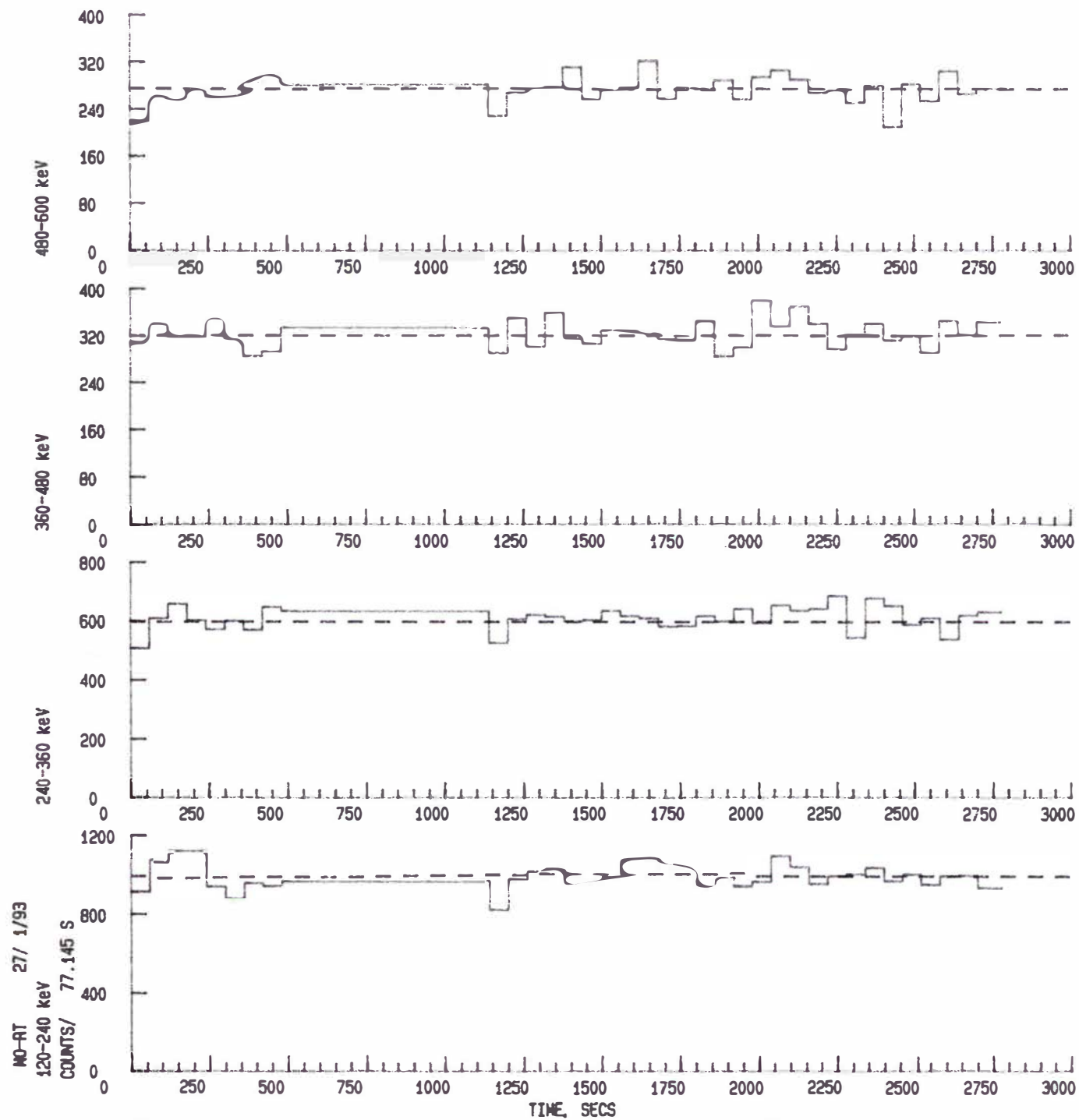
60.001 S. INTERVALS REGROUPED BY 1

0- 0 keV

N= 2 M= 2
>3.0 SIGMA FLUCTUATIONS



13/ 7/95



From jlaros@LPL.Arizona.EDU Wed Jul 12 10:50 PDT 1995
Date: Wed, 12 Jul 1995 10:53:05 -0700
From: jlaros@LPL.Arizona.EDU (John Laros)
To: khurley@sunspot.ssl.berkeley.edu
Subject: Re: MO ephemeris

Kevin,

According to my calculation, the expected MO time is 16:16:50. BATSE data indicate that the event is long and soft, which agrees with the probable MO response seen at the expected time. So, I think you have the necessary MO ephemeris data.

John

> From khurley@sunspot.ssl.berkeley.edu Tue Jul 11 15:00 MST 1995
> Date: Tue, 11 Jul 1995 14:48:10 -0700
> From: khurley@sunspot.ssl.berkeley.edu (Kevin Hurley)
> To: jlaros@LPL.Arizona.EDU, khurley@sunspot.ssl.berkeley.edu
> Subject: MO ephemeris
>
> Dear John,
>
> My MO ephemeris file is incomplete for 930127; I need something that
> goes beyond 16:49, but what I have only goes to 16:23.
>
> Kevin
>

M0-RT

11 / 7 / 95

27 / 1 / 93

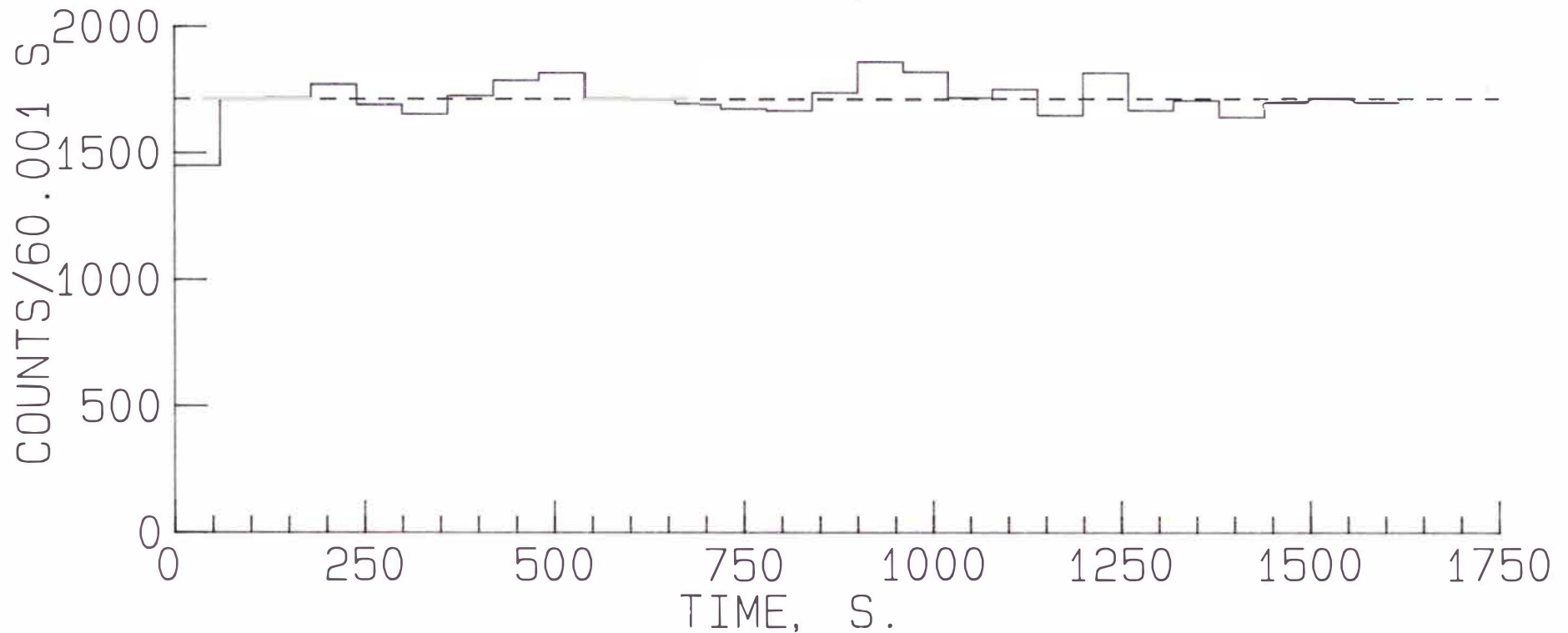
59633.894 s.

*Revised data; cut to
eliminate gaps. Later event*

60.001 S. INTERVALS REGROUPED BY 1

100- 600 keV

N= 10 M= 1
>3.0 SIGMA FLUCTUATIONS



11/ 7/95

MO-RT 27/ 1/93

120-240 keV

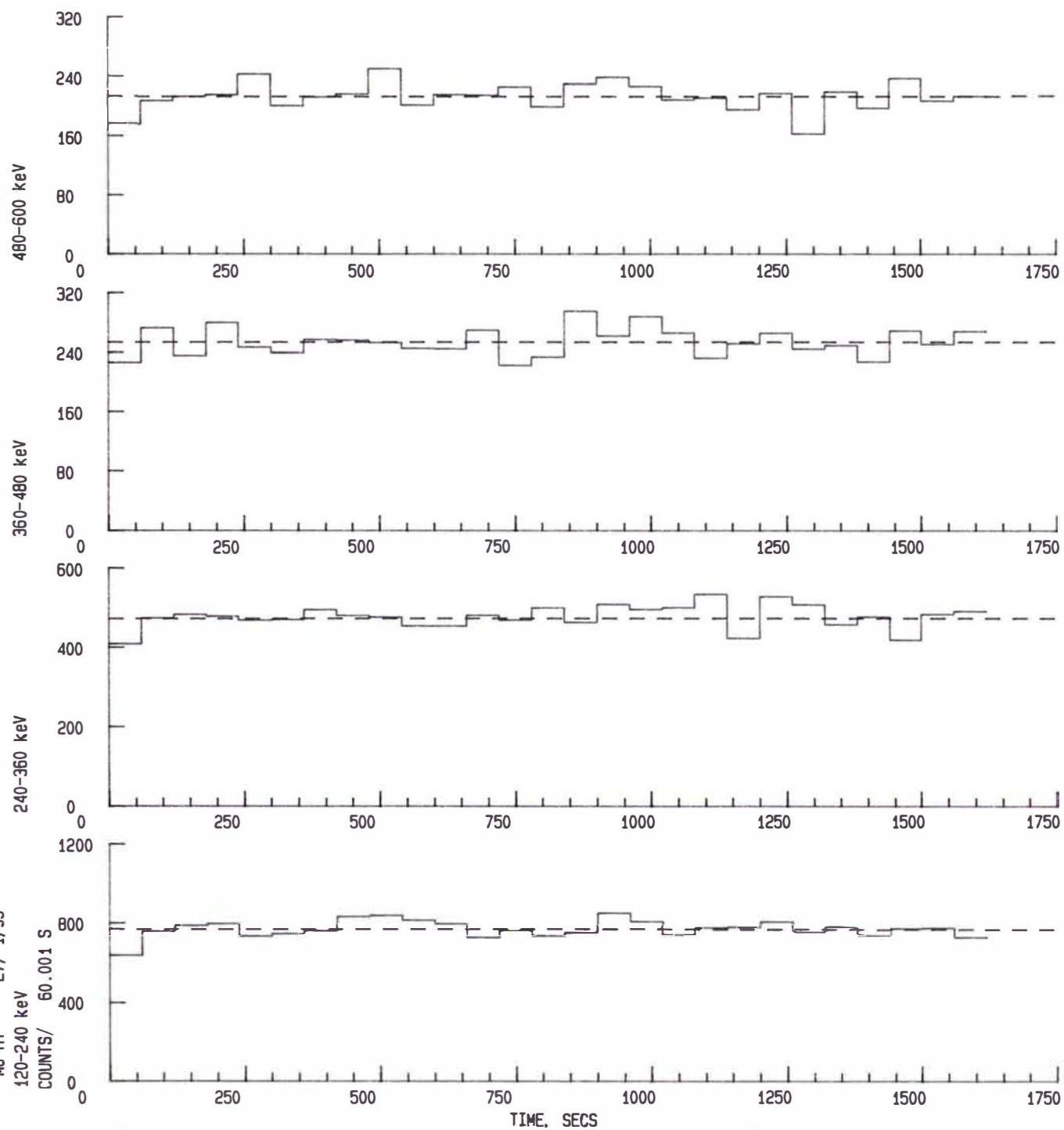
COUNTS/ 60.001 S

240-360 keV

360-480 keV

480-600 keV

TIME, SECS



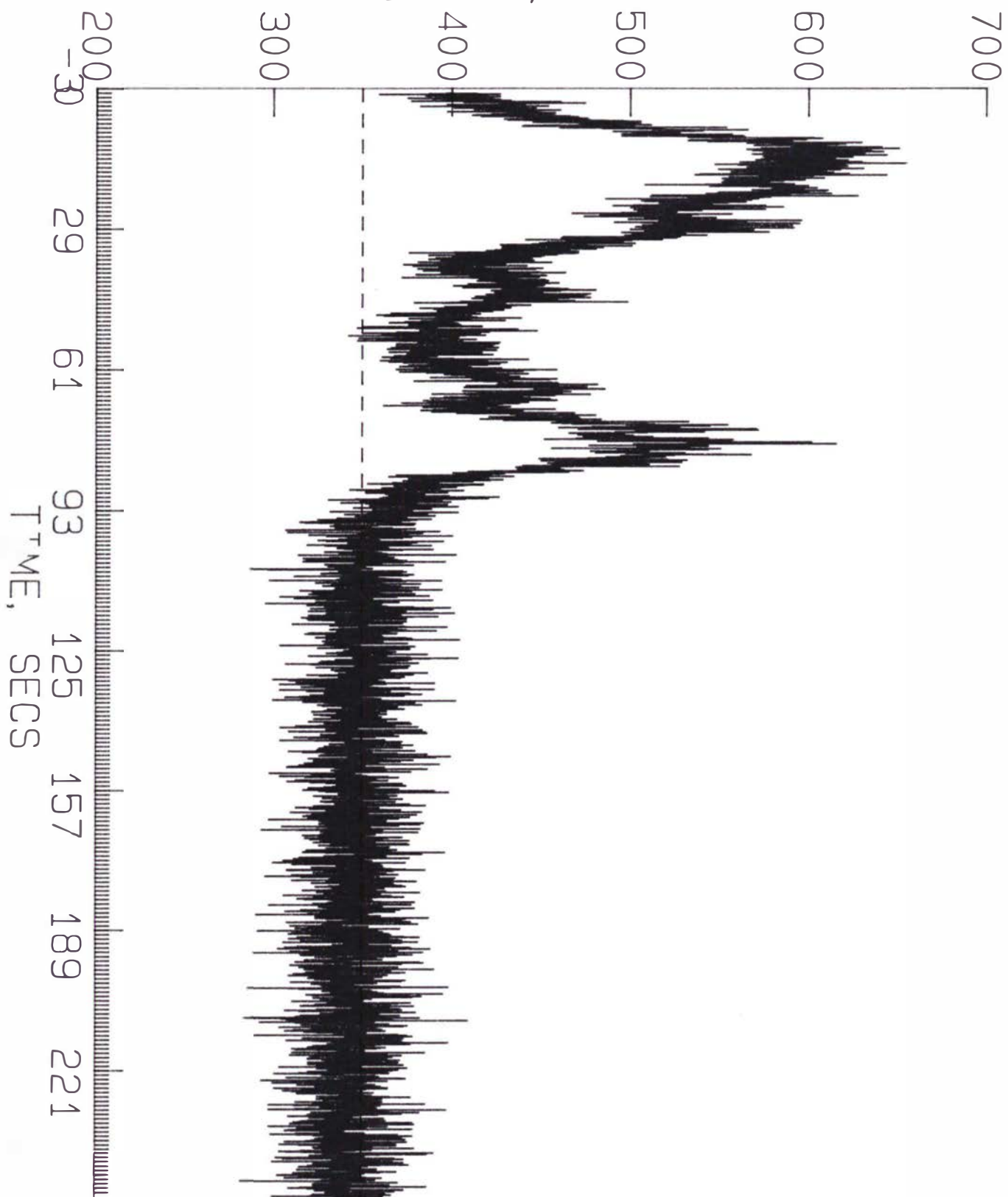
BATSE

27/01/93

58465.922

25- 100 keV

COUNTS/ .064 S



MO-RT

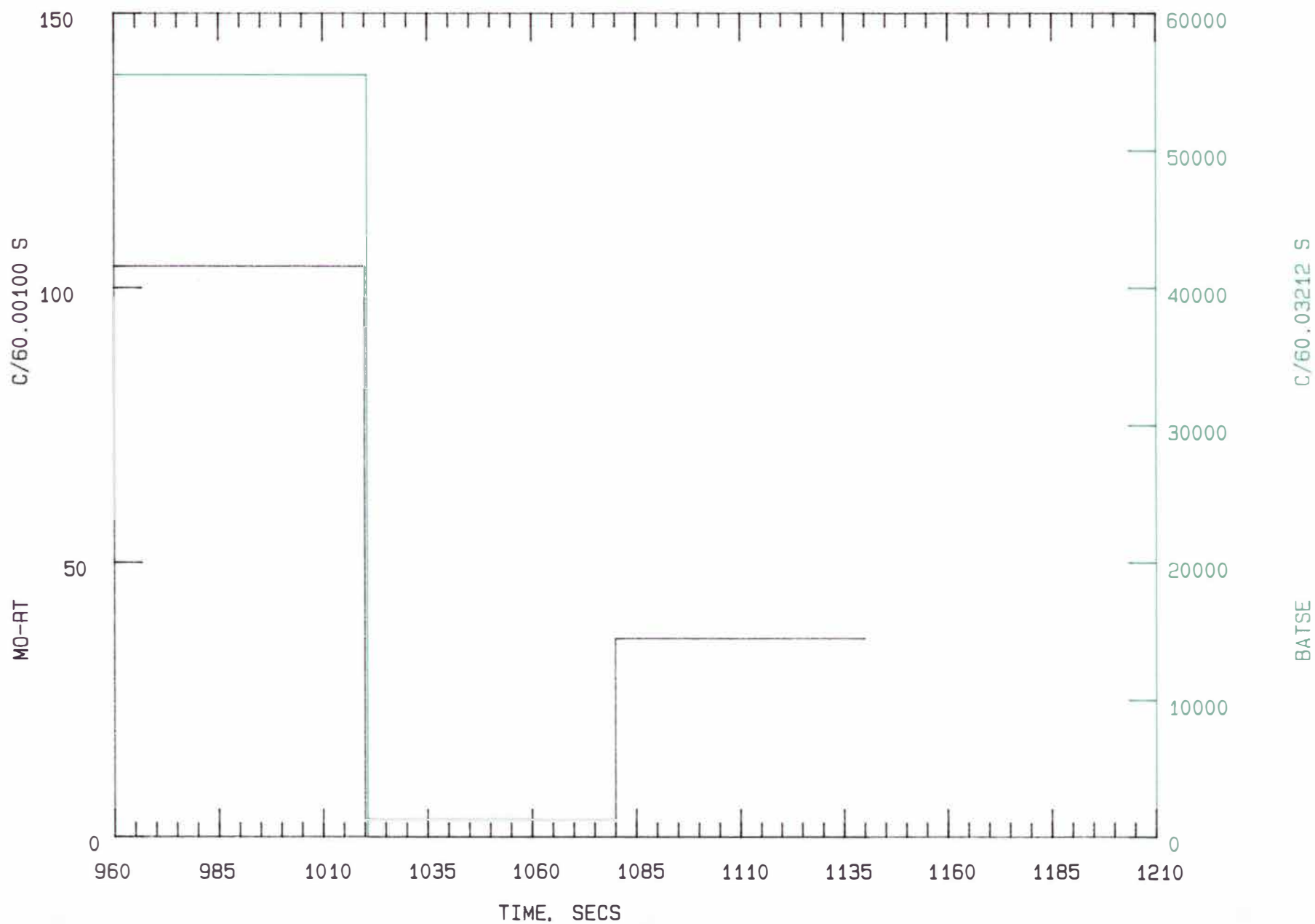
-BATSE

CORRELATION

27/ 1/93

59633.894

11/ 7/95



MO-RT

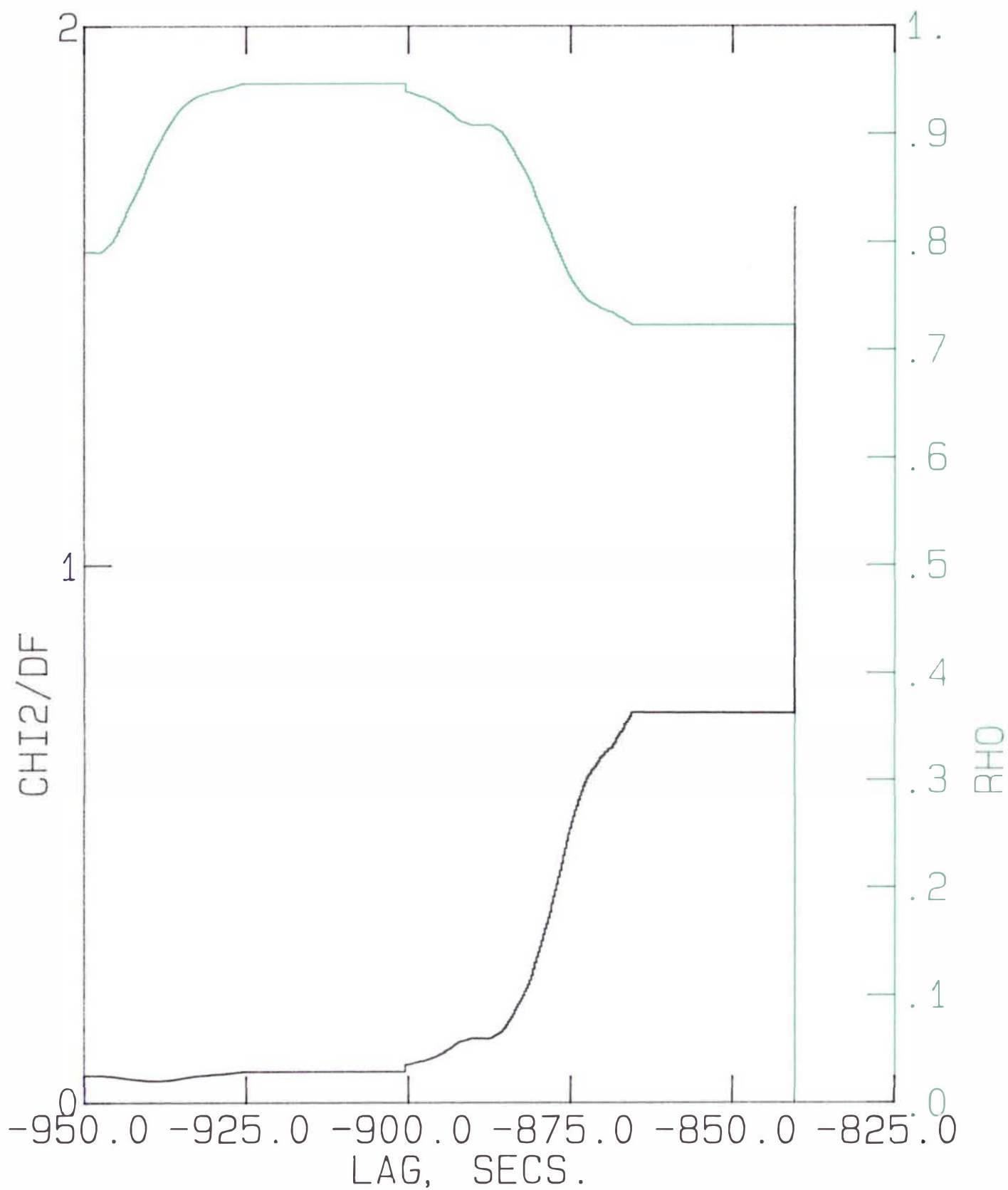
-BATSE

CORRELATION

27/ 1/93

59633.894

11/ 7/95



MO-RT

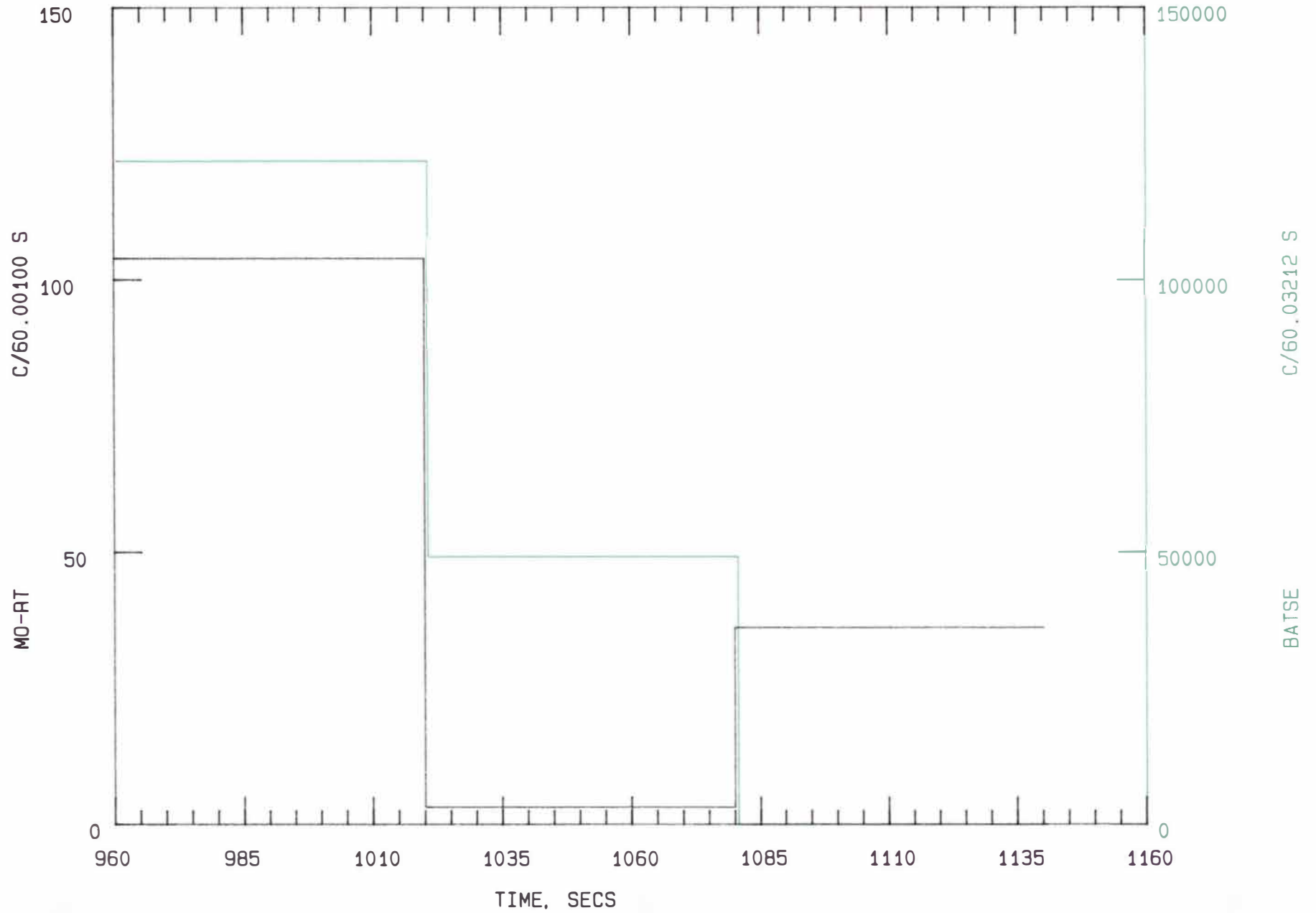
-BATSE

CORRELATION

27/ 1/93

59633.894

11/ 7/95



28 / 3 / 94

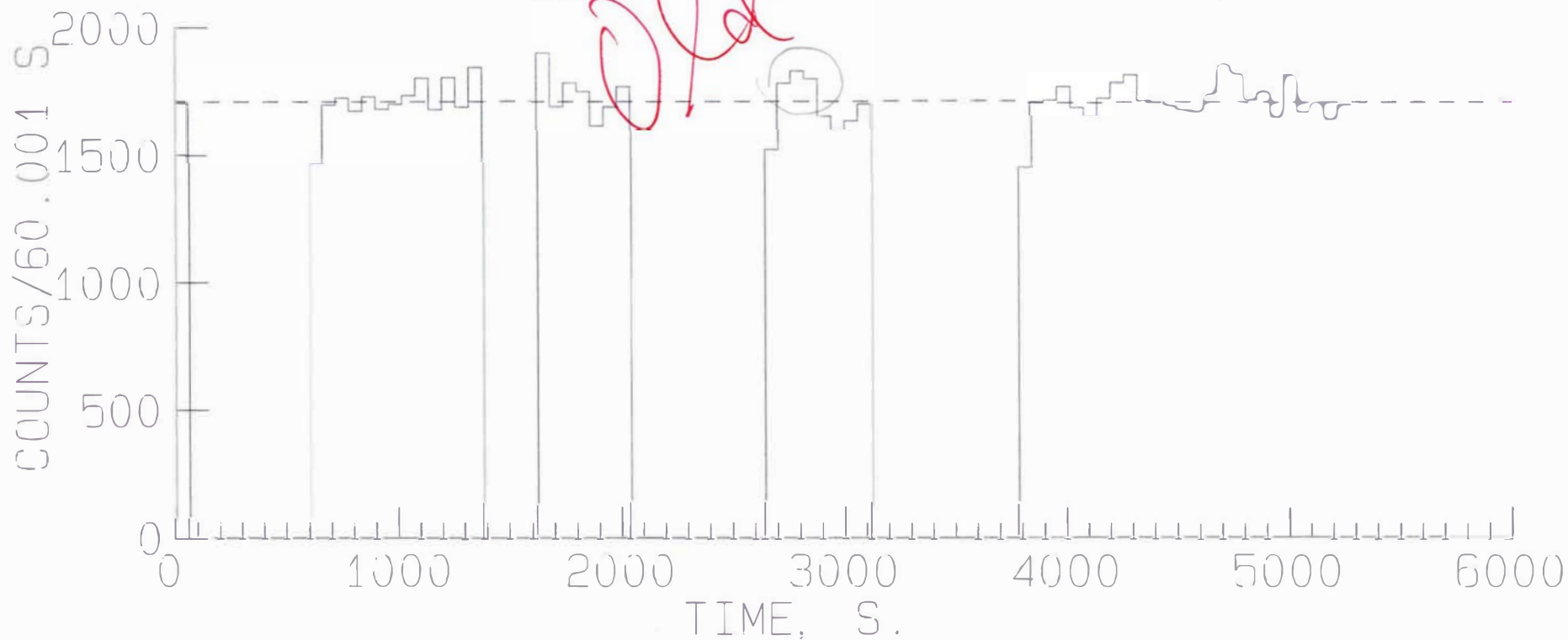
MO-RT

27 / 1 / 93

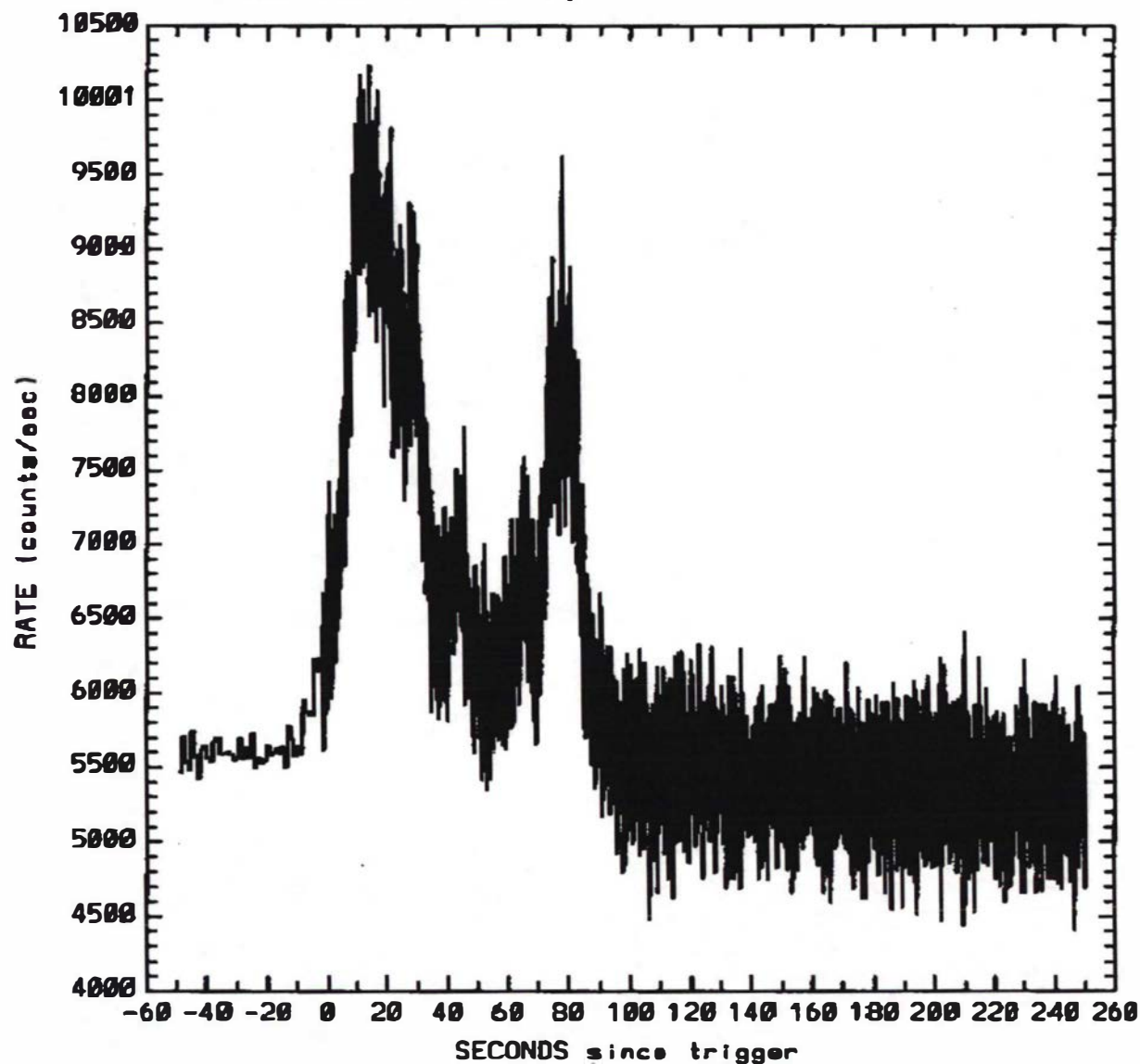
55853.850 s.

60.001 S. INTERVALS REGROUPED BY 1
120- 600 keV

N= 10 M= 1
>3.0 SIGMA FLUCTUATIONS



Data for K. Hurley



25-MAR-1993 09.12.15

Created by MOPS 80
(Burst Display)
Version 2.18

Trigger # : 2149

Trigger Time:
9814 / 58465.922

Burst Data Type:
DISCSC

Deadtime
Corrected: N

Background Data
Type: PREB + DISCLA

Minimum Integ. Time:
0.064 seconds

Detectors (7..8):
00001100

Discriminators:
(1. 2)

Quality Mask:
B0ISP1

BATSE

27/01/93

58465.922

25- 100 keV

COUNTS/ .064 S

750
500
250
0

-3

0 1

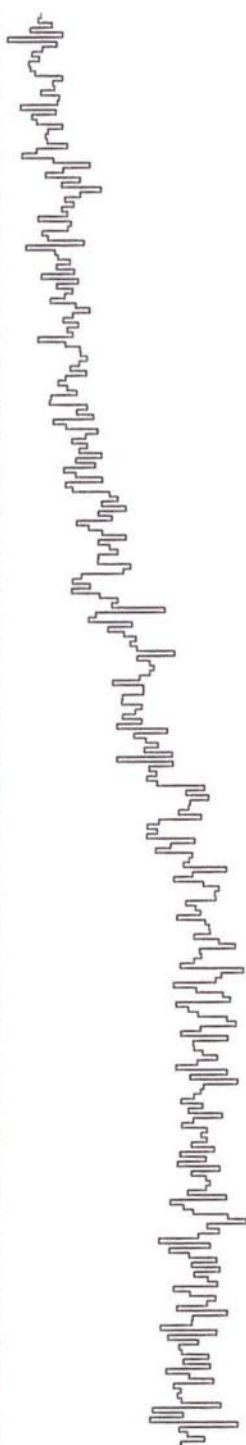
5

9

13

17

TIME, SECS

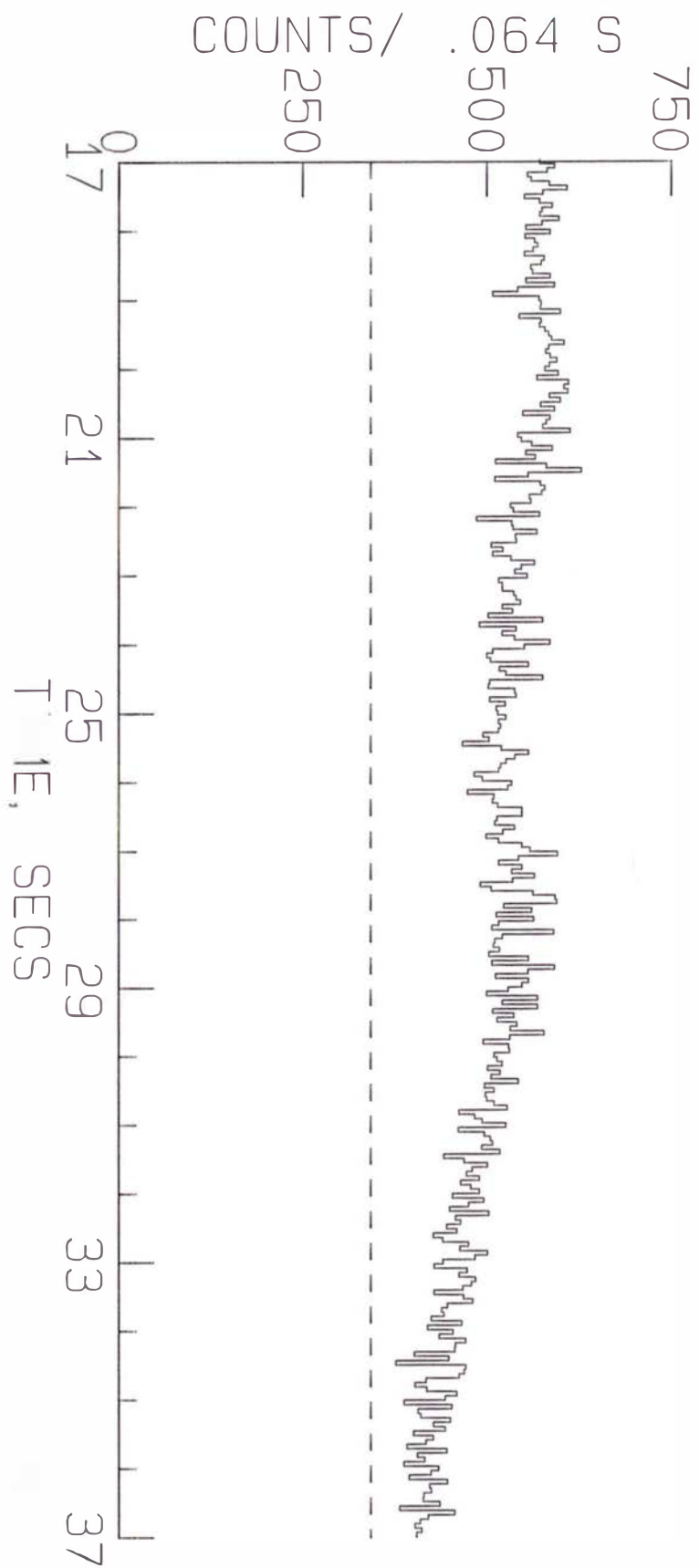


BATSE

27/01/93

58465.922

25- 100 keV



BATSE

27/01/93

58465.922

25- 100 keV

COUNTS/ .064 S

750
500
250

37

41

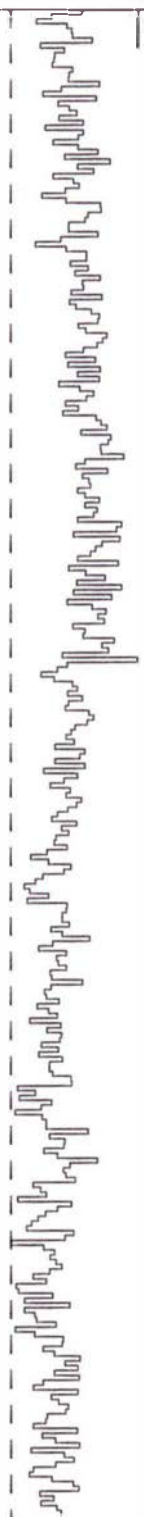
45

49

53

57

T. IE, SECS



BATSE

27/01/93

58465.922

25- 100 keV

COUNTS/ .064 S

750
500
250

57

61

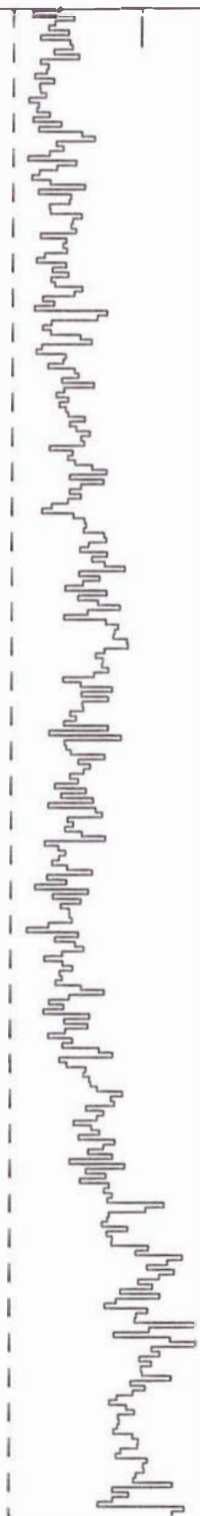
65

69

73

77

TIME, SECS

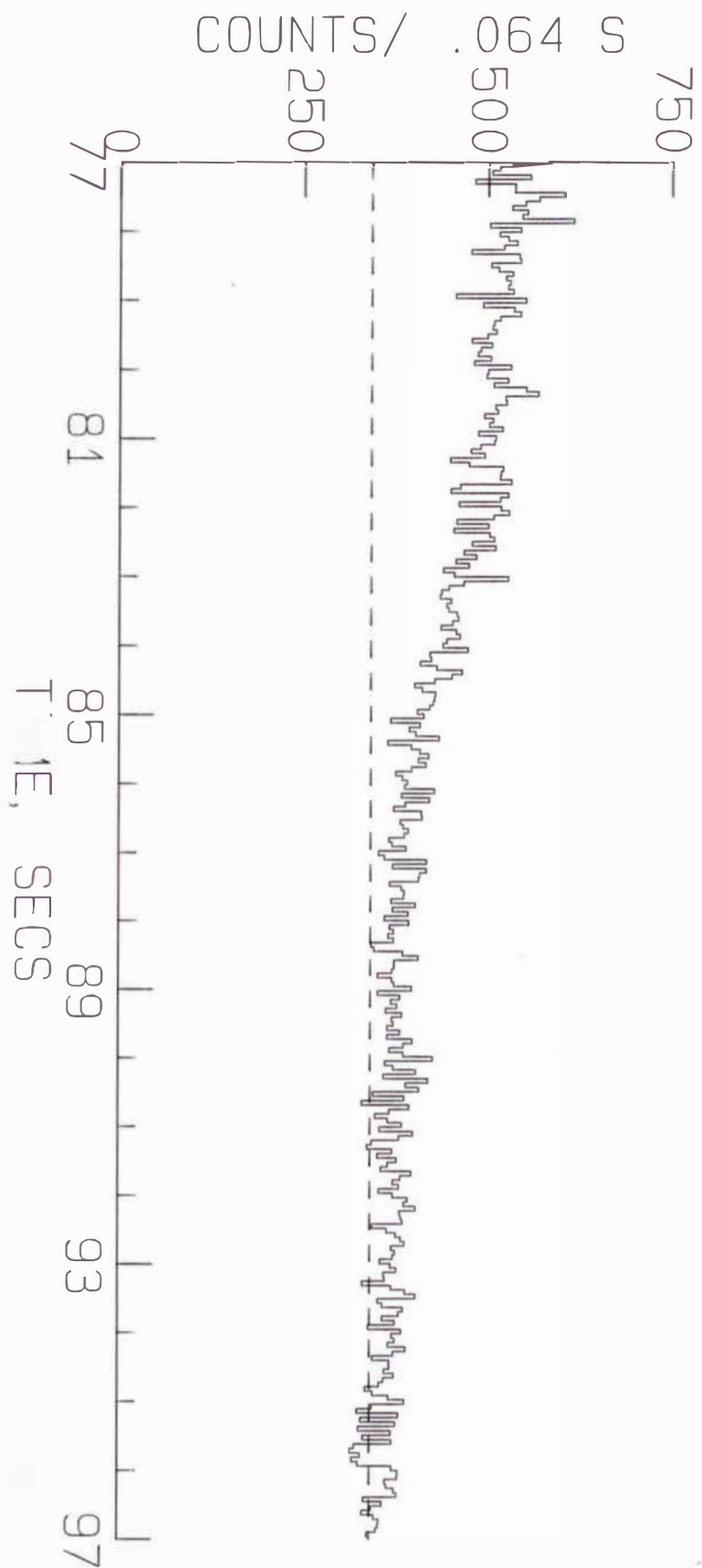


BATSE

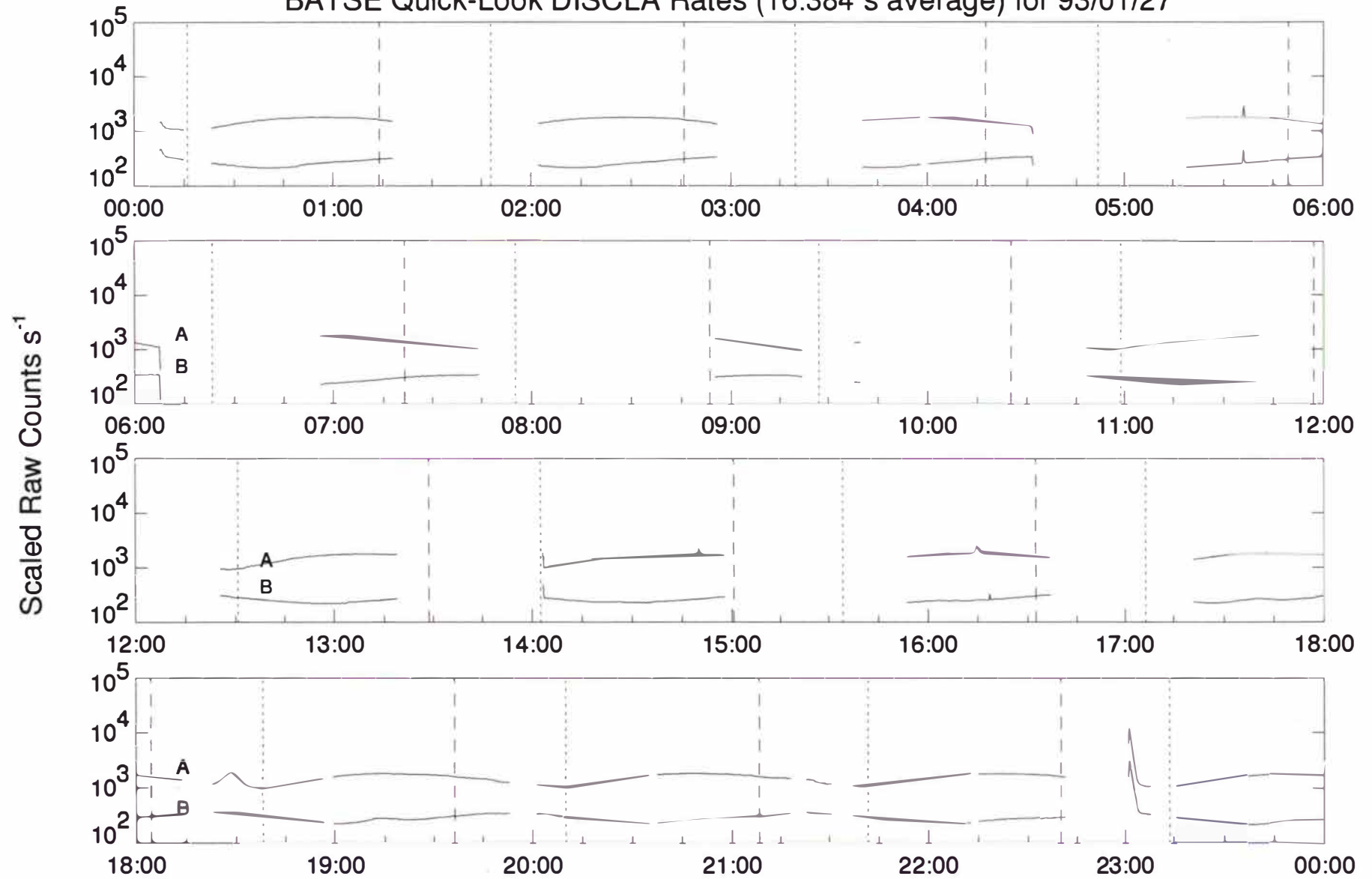
27/01/93

58465.922

25- 100 keV



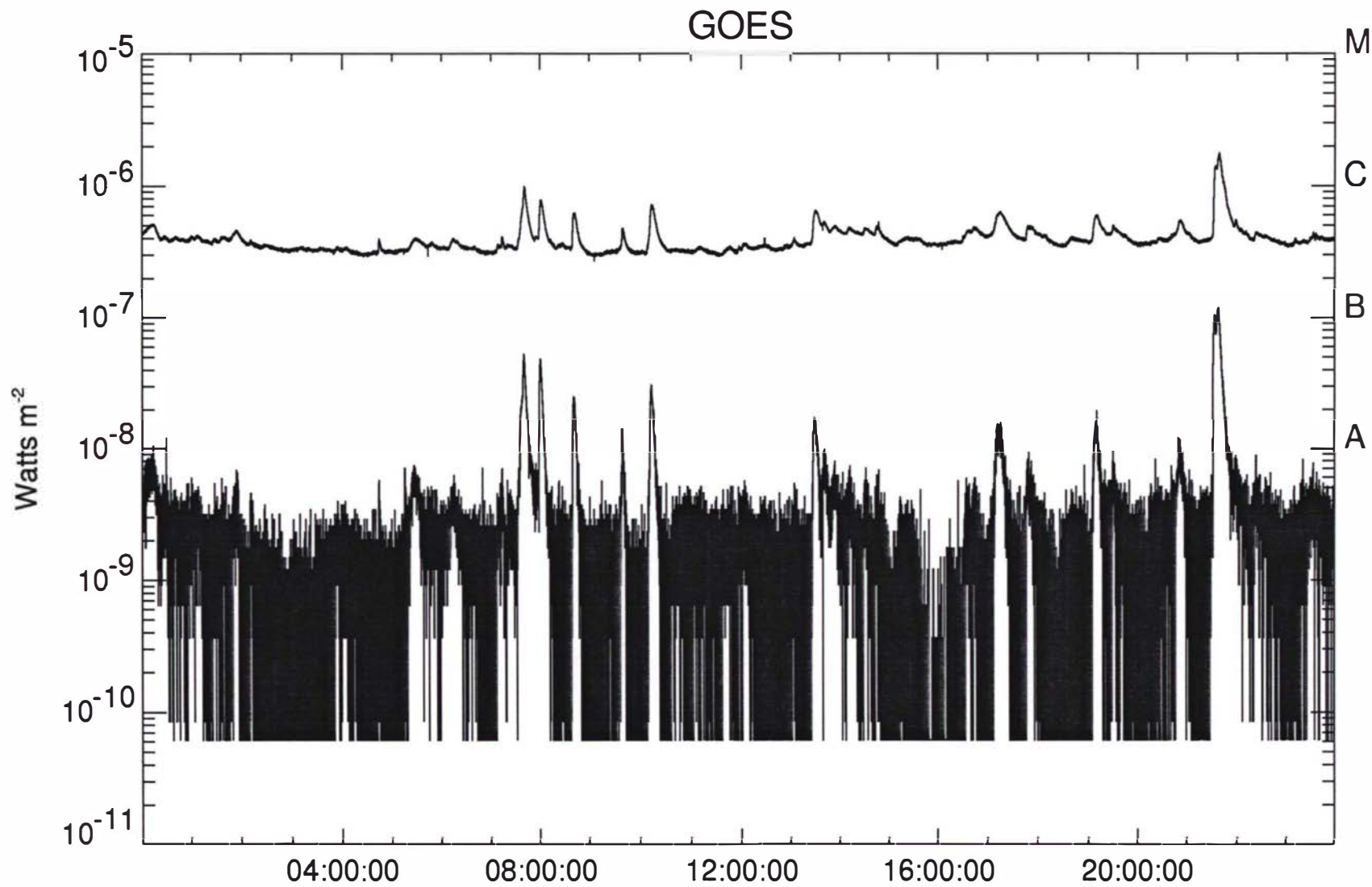
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/27



Current Time: 93/02/16, 1527 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



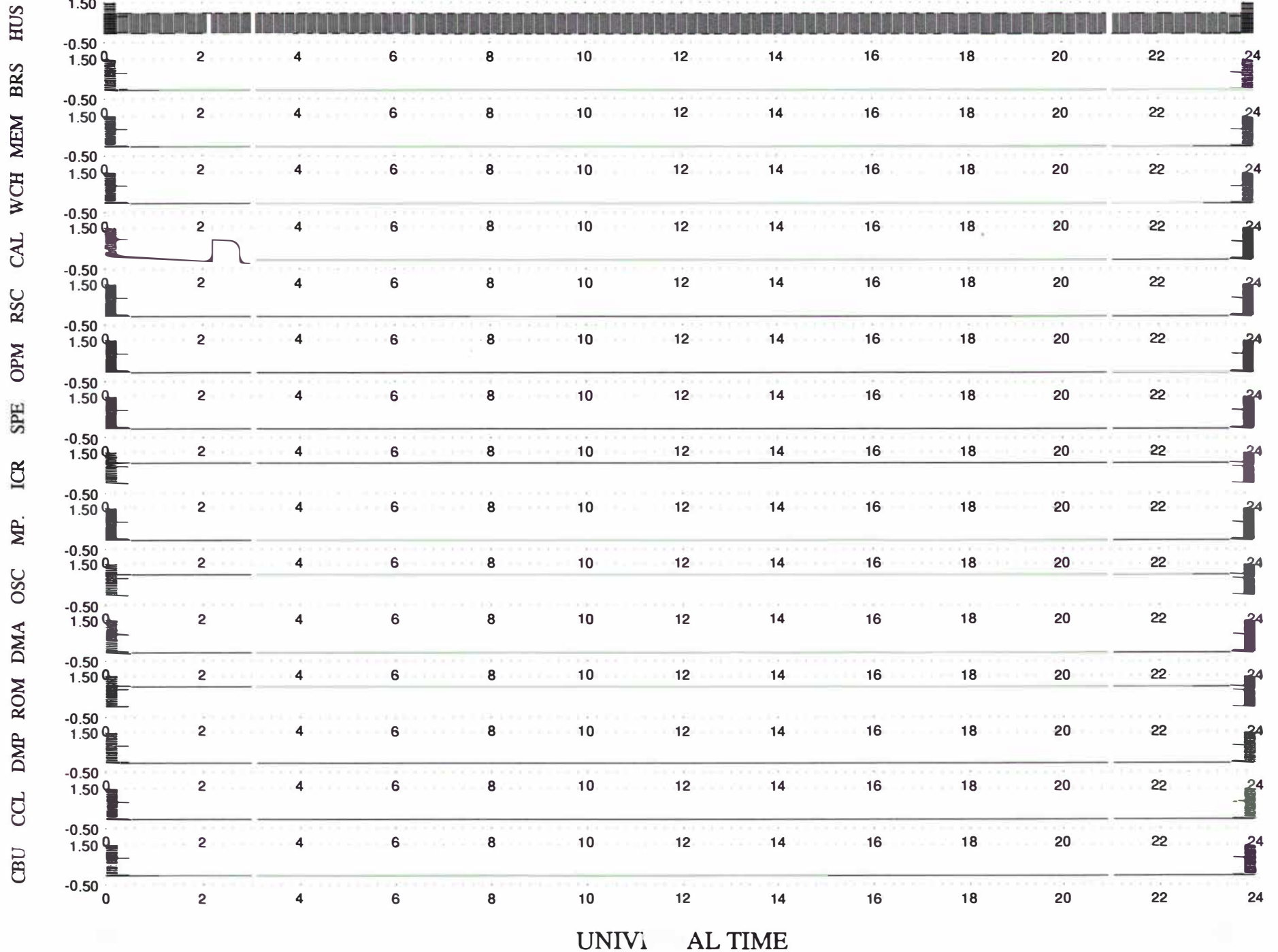
Data Start: 93/01/27, 0000:00

Plot created: 95/05/31, 2242

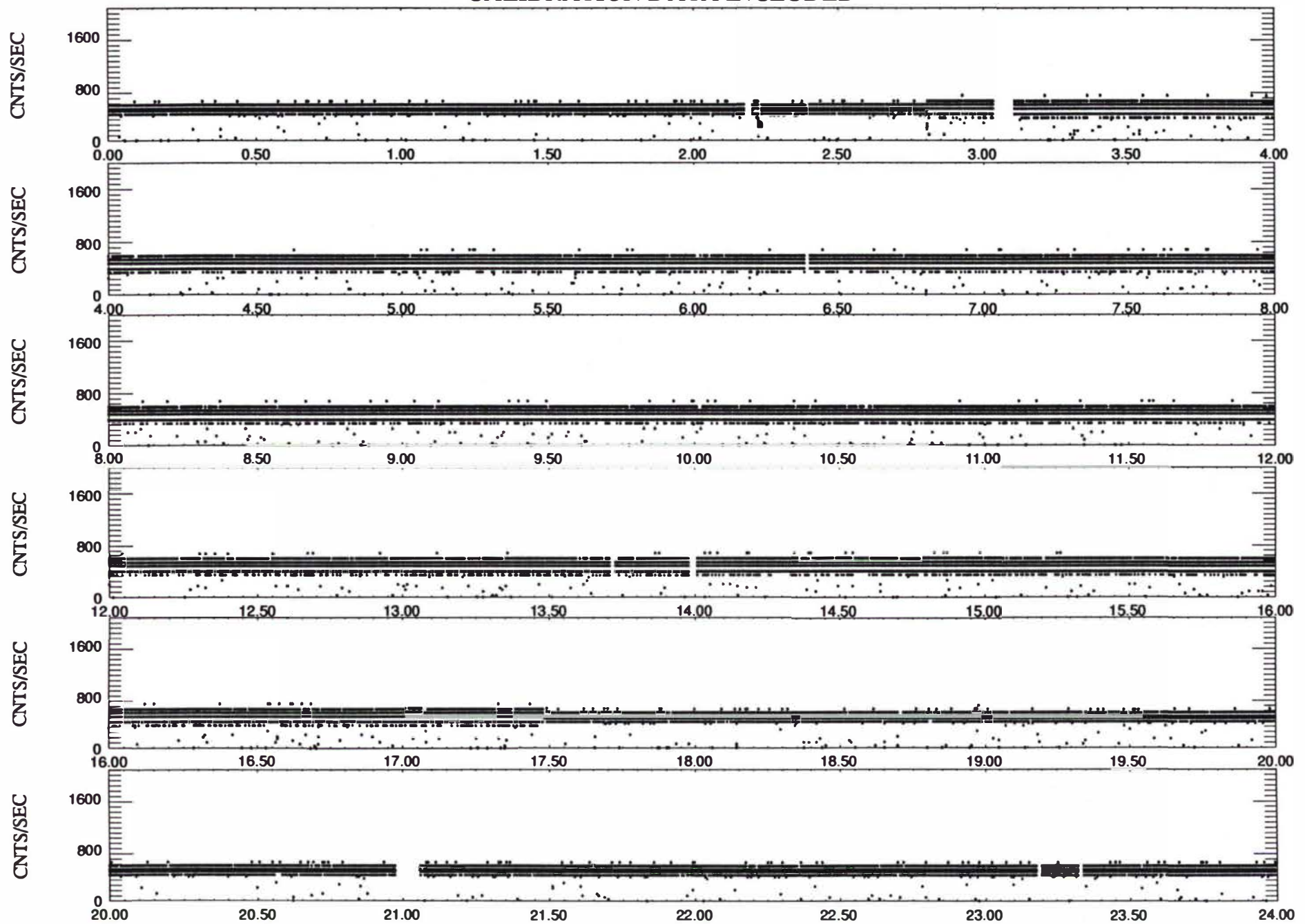
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

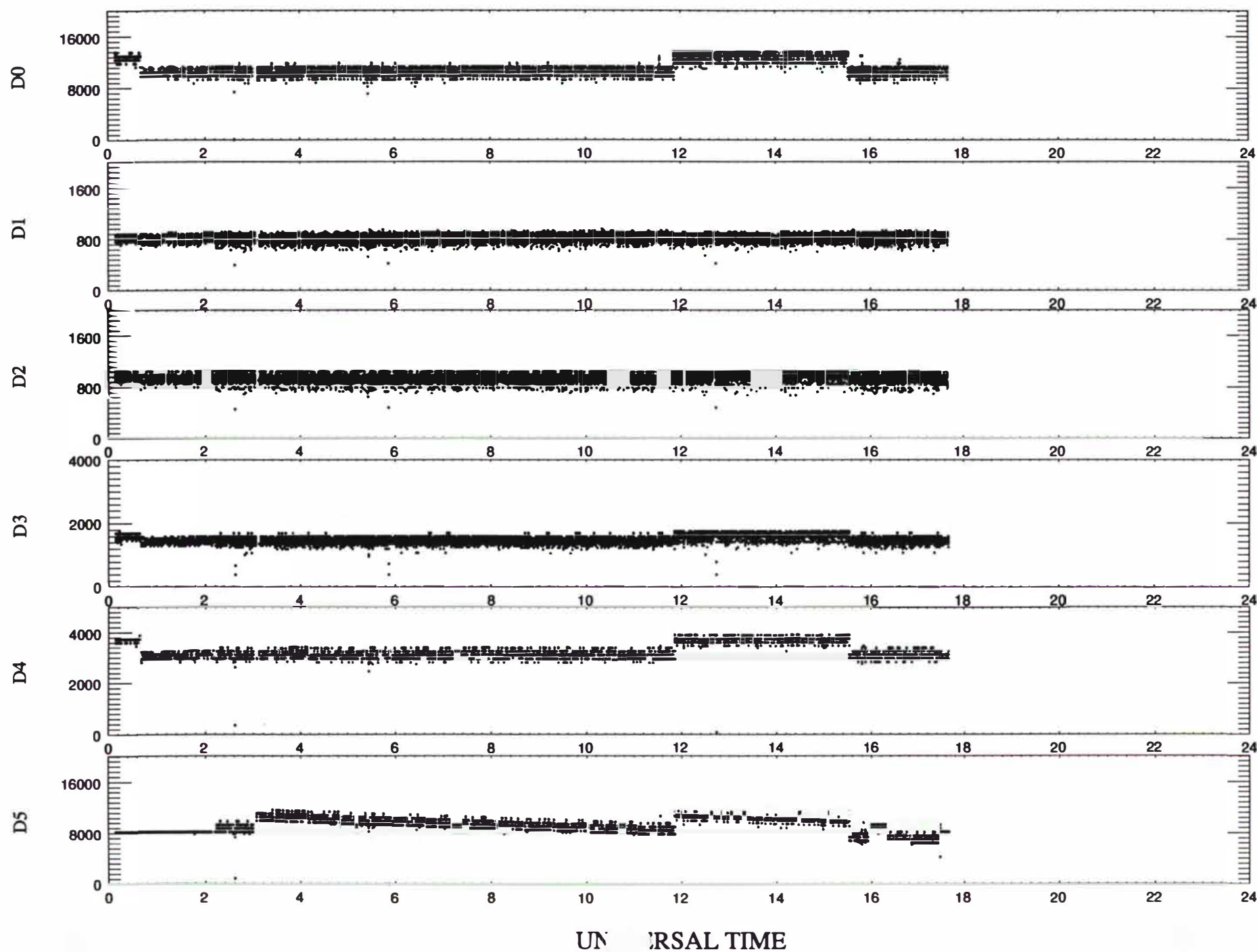
NO BURST (13)



CALIBRATION DATA INCLUDED



UNIVE AL TIME



CATSEARCH PROGRAM

BATSE BURST # 2150
EVENT OF 1993 JAN 28 DAY OF YEAR= 28
EVENT CROSSING TIME AT BATSE : 39724. S. OR 11:02:03.9
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 13.600 -11.400
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 28/ 1/ 93 IS:
RA= 161.560 DEC= -14.133 DIST= 4.264 AU
BATSE-ULYSSES DISTANCE = 637924320. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 40.75 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1611.96 SECS.
CROSSING TIME AT ULYSSES IS 41336. S. OR 11:28:55.8 +/- 315.64 SECONDS

^o

From BRAINERD@ssl.msfc.nasa.gov Tue Feb 2 12:12:10 1993
Date: Tue, 2 Feb 1993 14:11:21 -0600 (CST)
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: 1296

BATSE BURST TRIGGER

NO.: 02150

TIME: TJD=9015 SECONDS=39723

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=137.1 AZIMUTH=283.9 ERROR= DEGREES

COMMENTS:

WEAK SINGLE PEAKED GAMMA-RAY BURST OF 4 SECONDS DURATION. NOT SEEN
ABOVE 300 KEV.

From BRAINERD@ssl.msfc.nasa.gov Tue Feb 2 13:02:38 1993
Date: Tue, 2 Feb 1993 15:01:52 -0600 (CST)
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
2150	930128	9015	39723	2500	013	-11

13/ 2/93

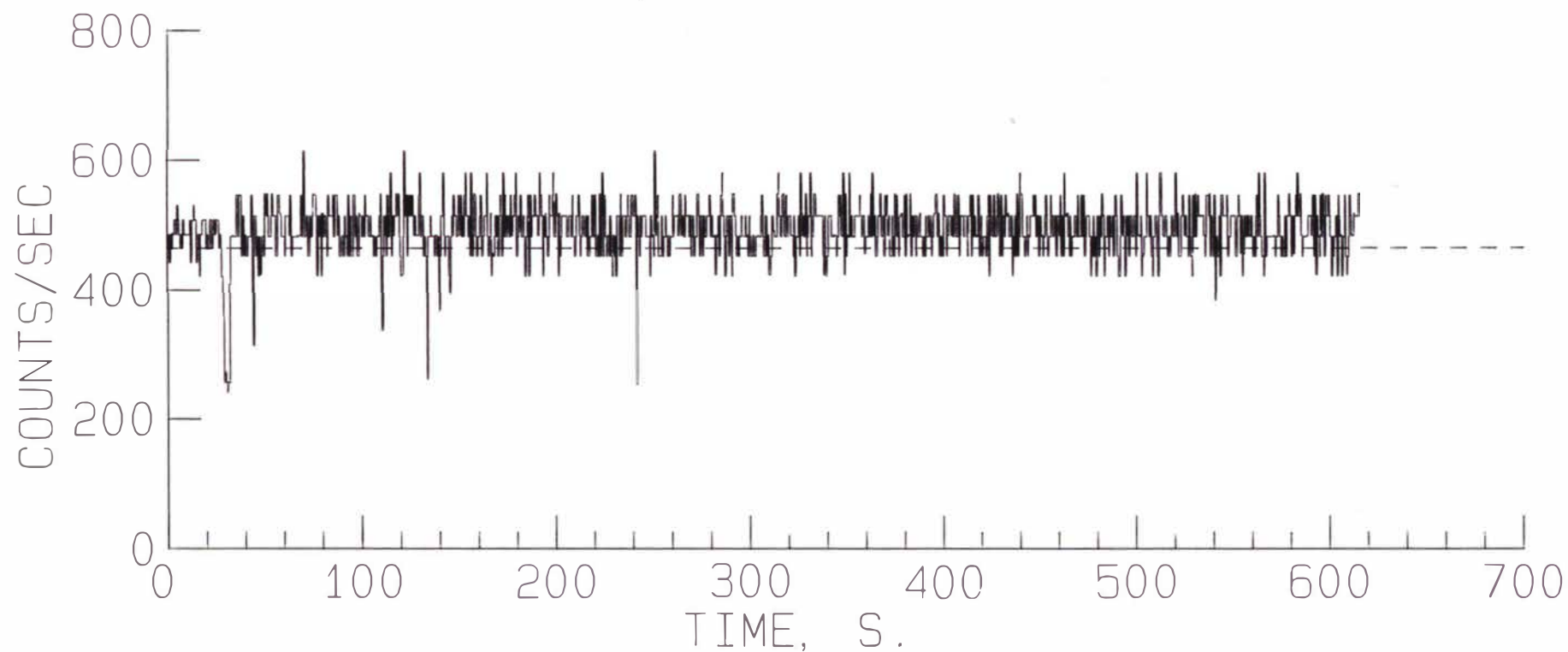
ULYSSES RT

28/ 1/93 41004.191 s

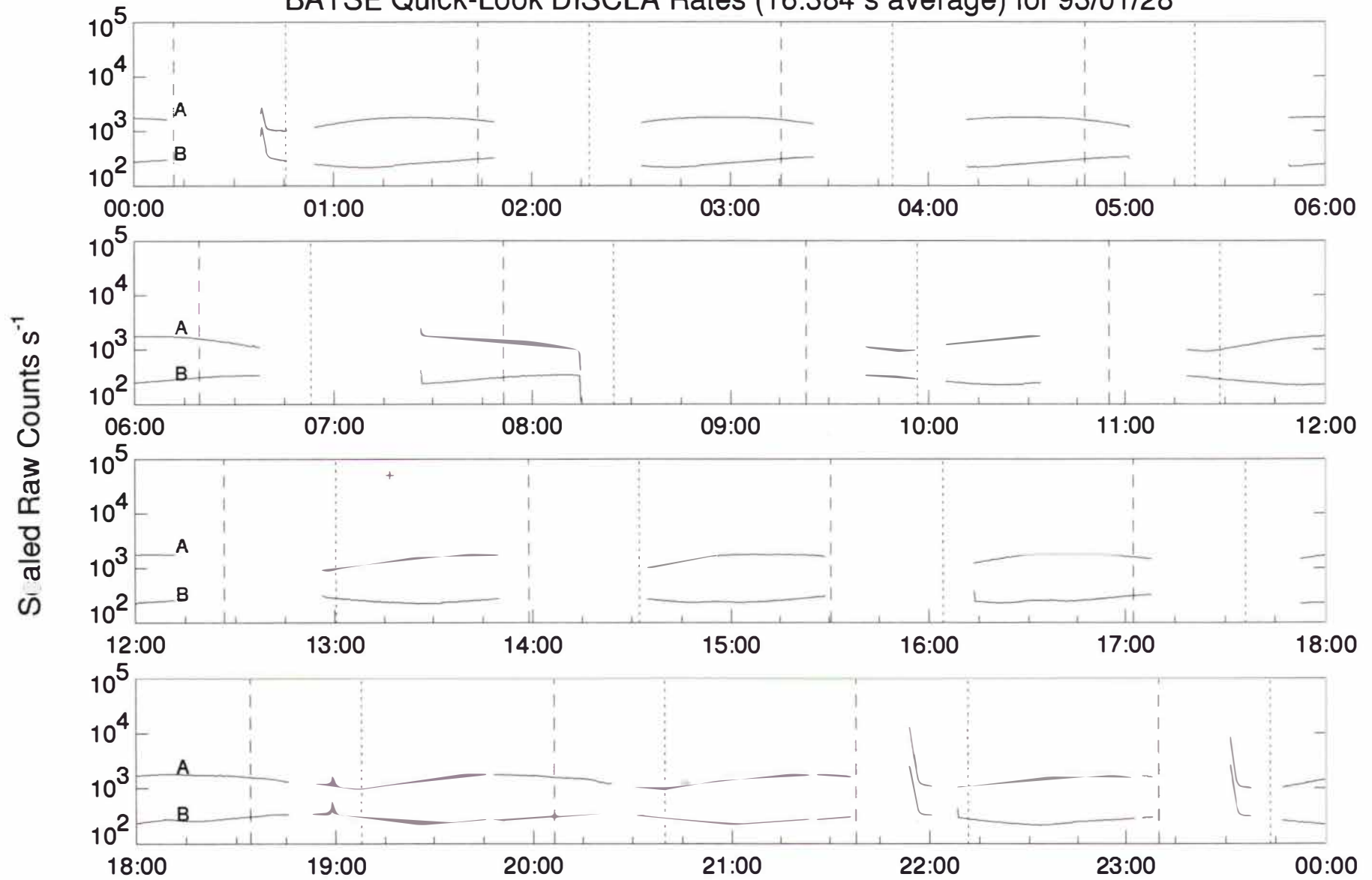
.250 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



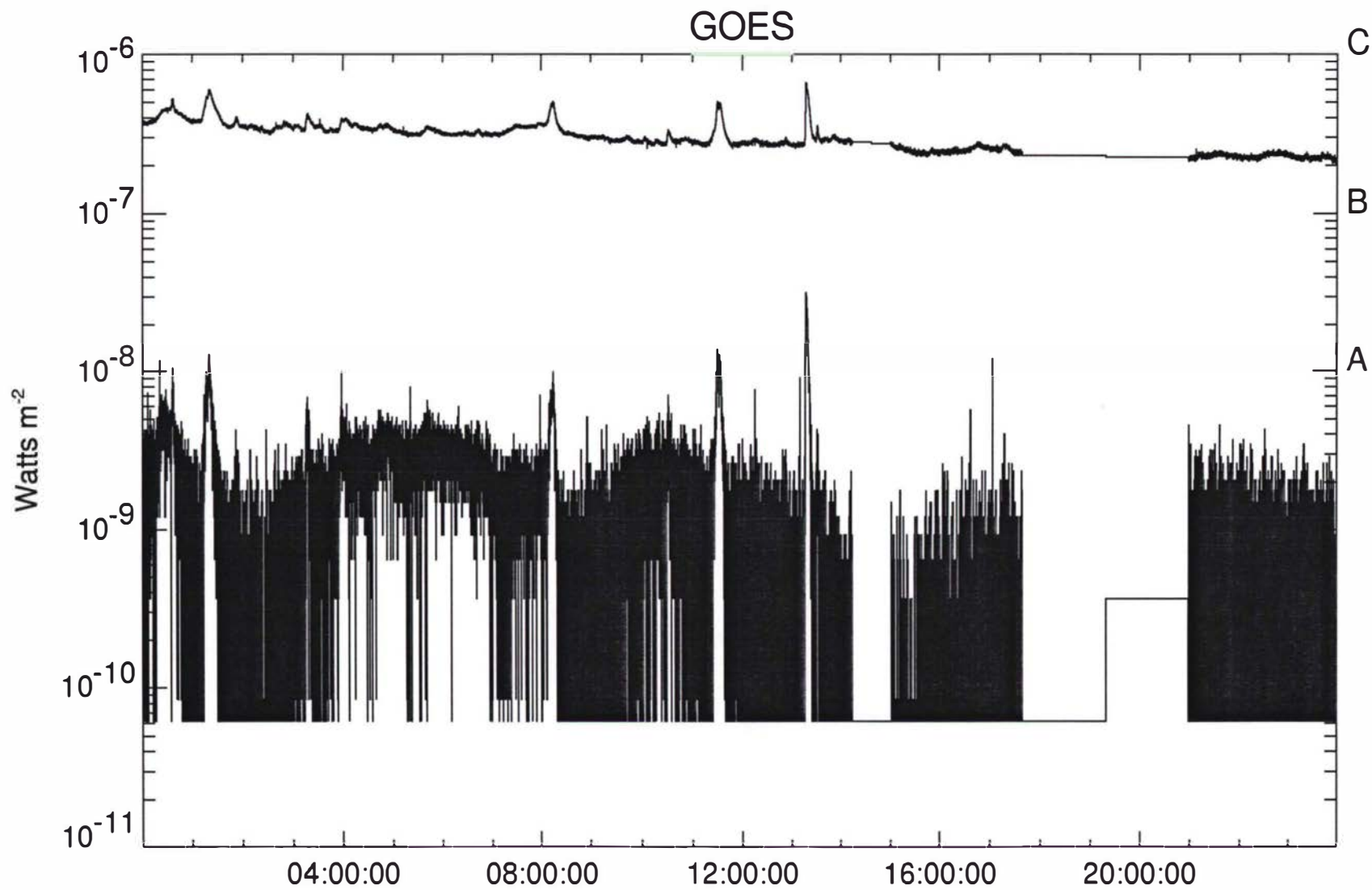
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/28



Current Time: 93/02/16, 1528 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



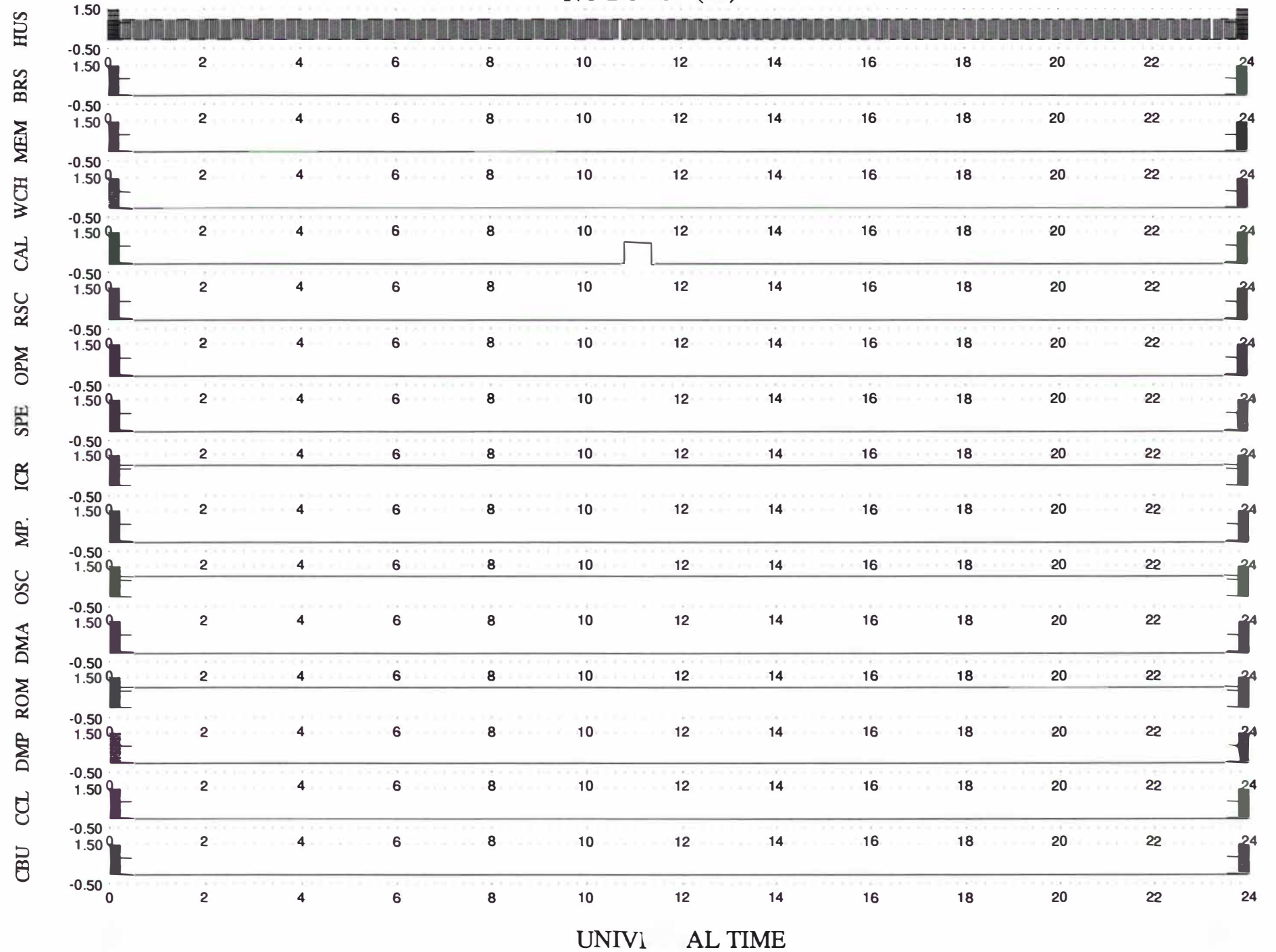
Data Start: 93/01/28, 0000:00

Plot created: 95/05/31, 2245

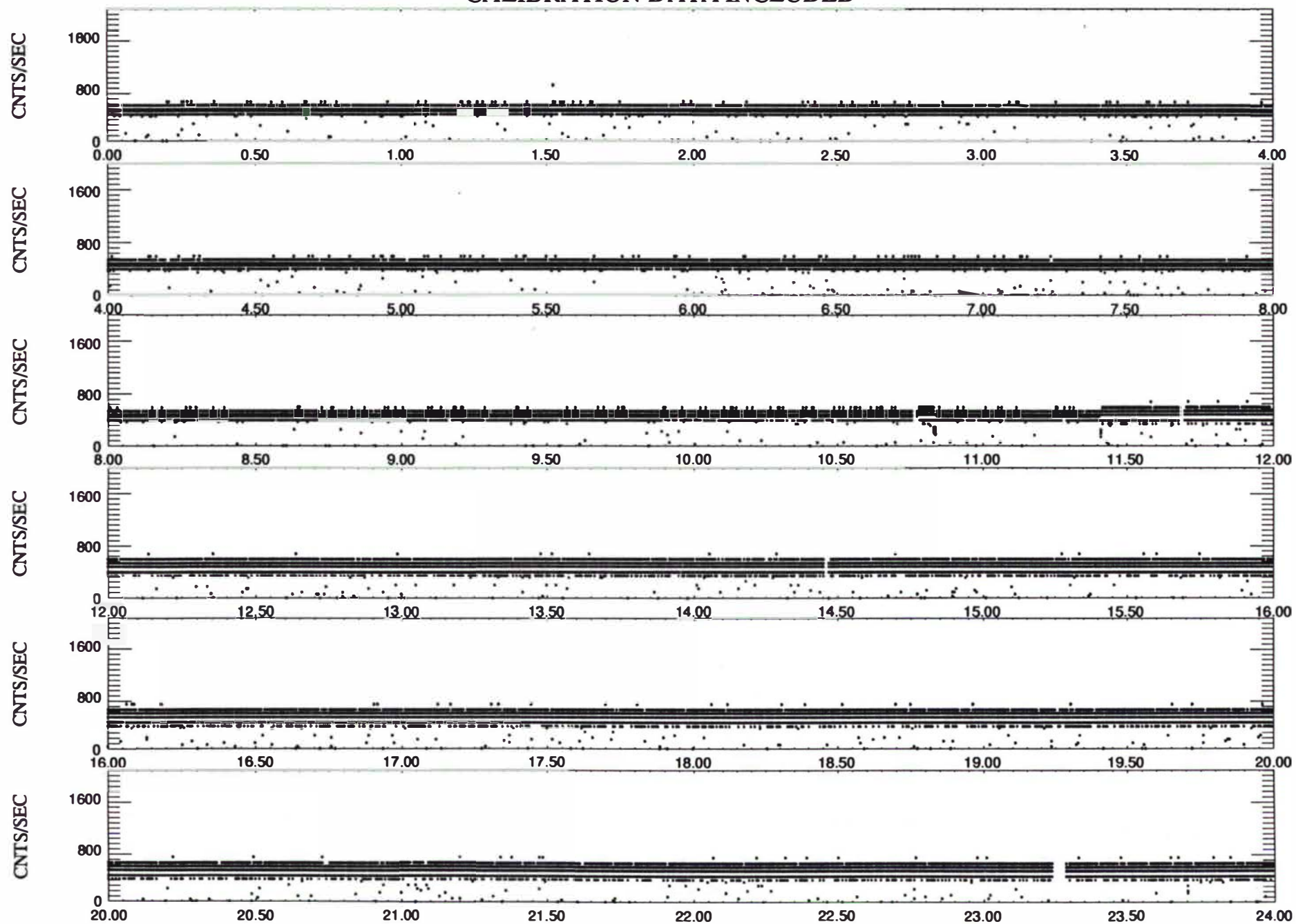
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

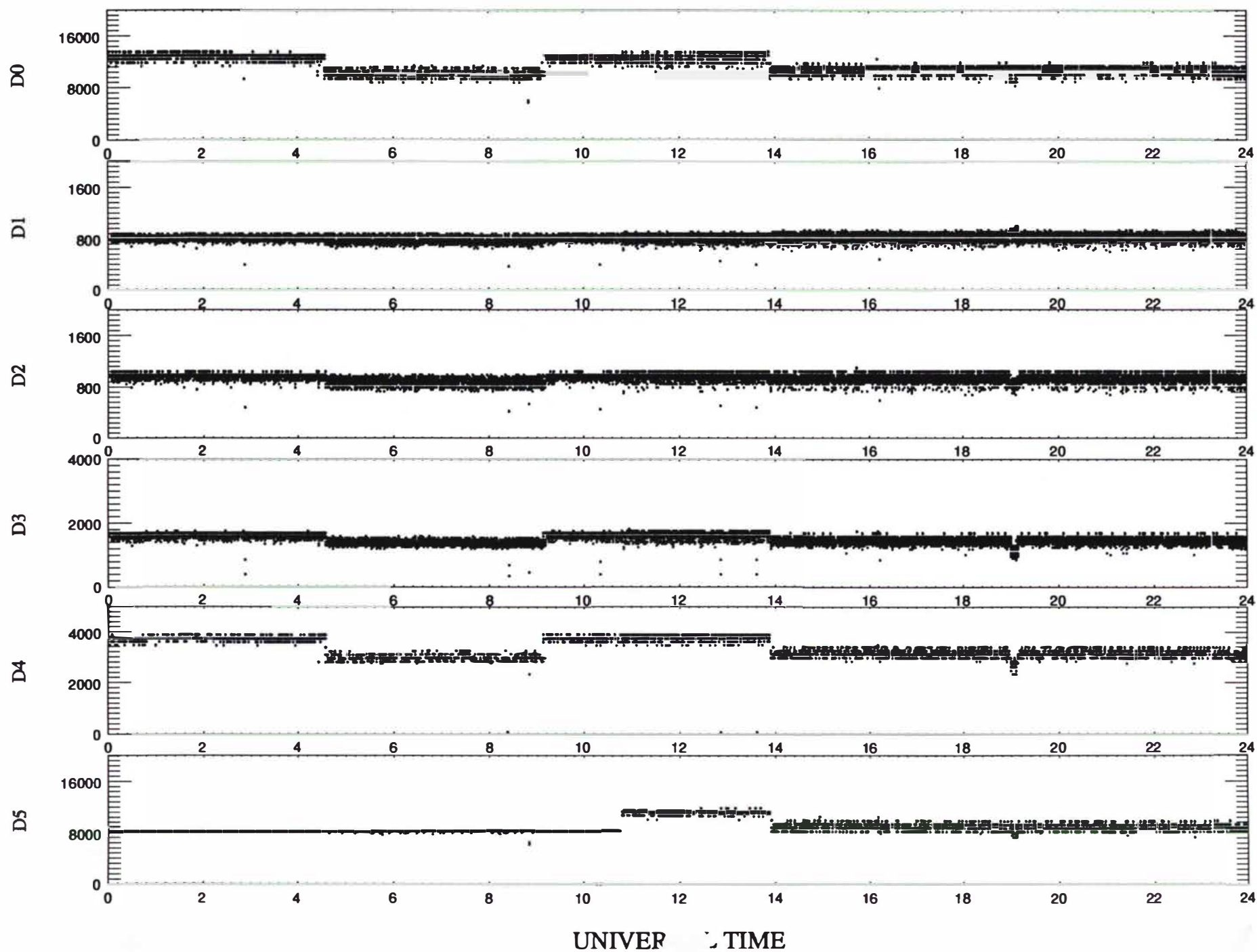
NO BURST (13)



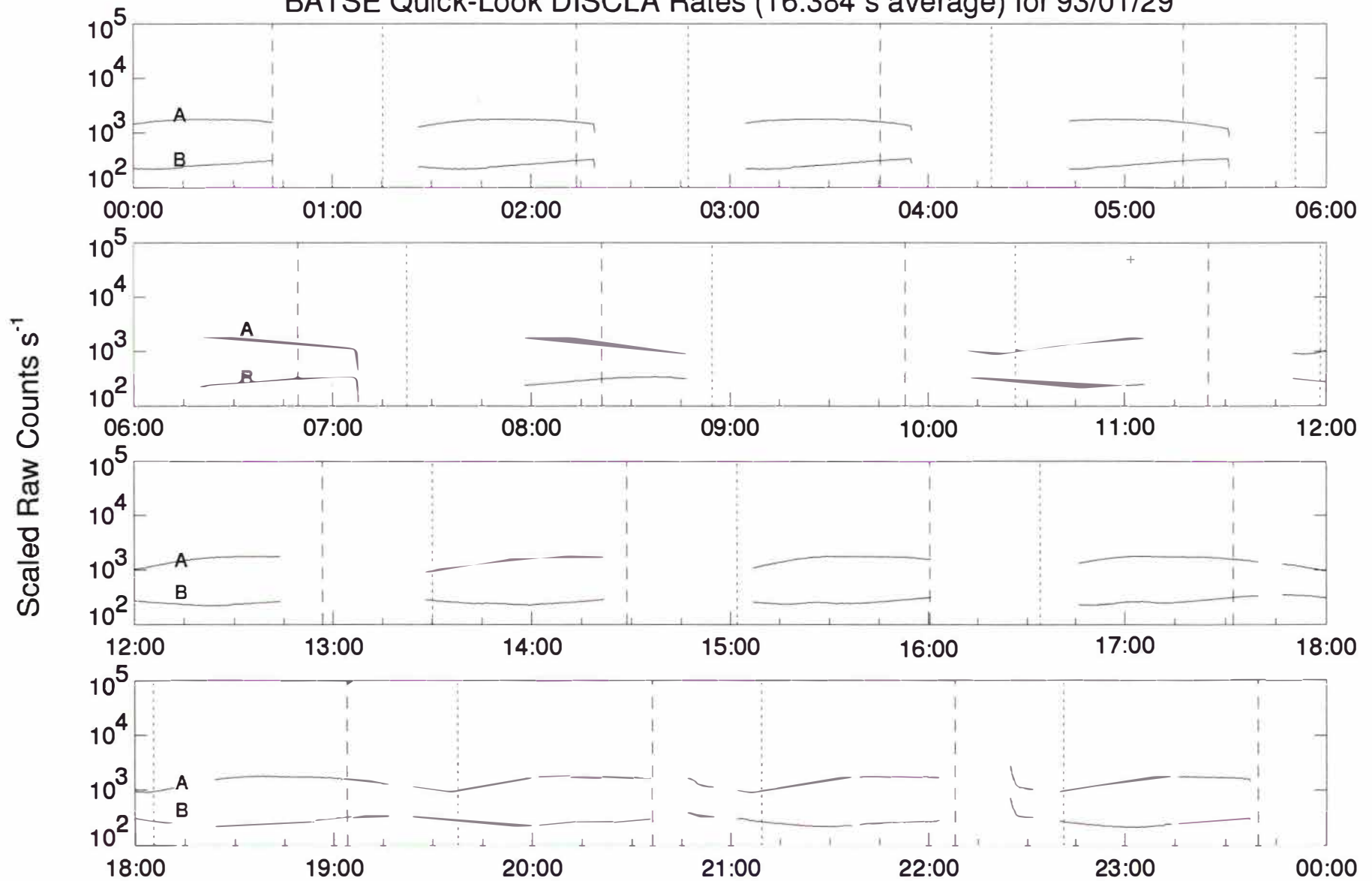
CALIBRATION DATA INCLUDED



UNIVT AL TIME



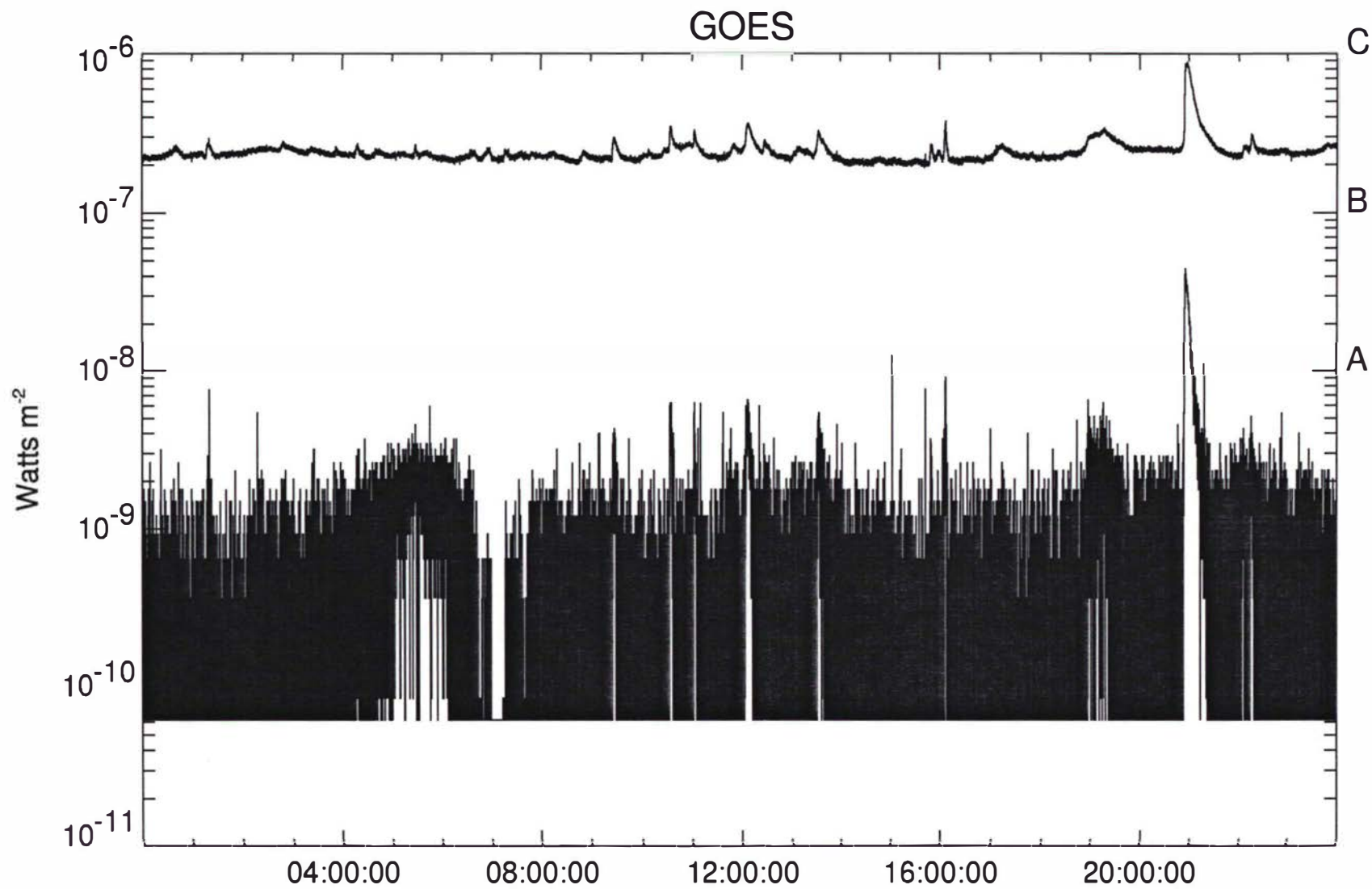
BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/29



Current Time: 93/02/16, 1529 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



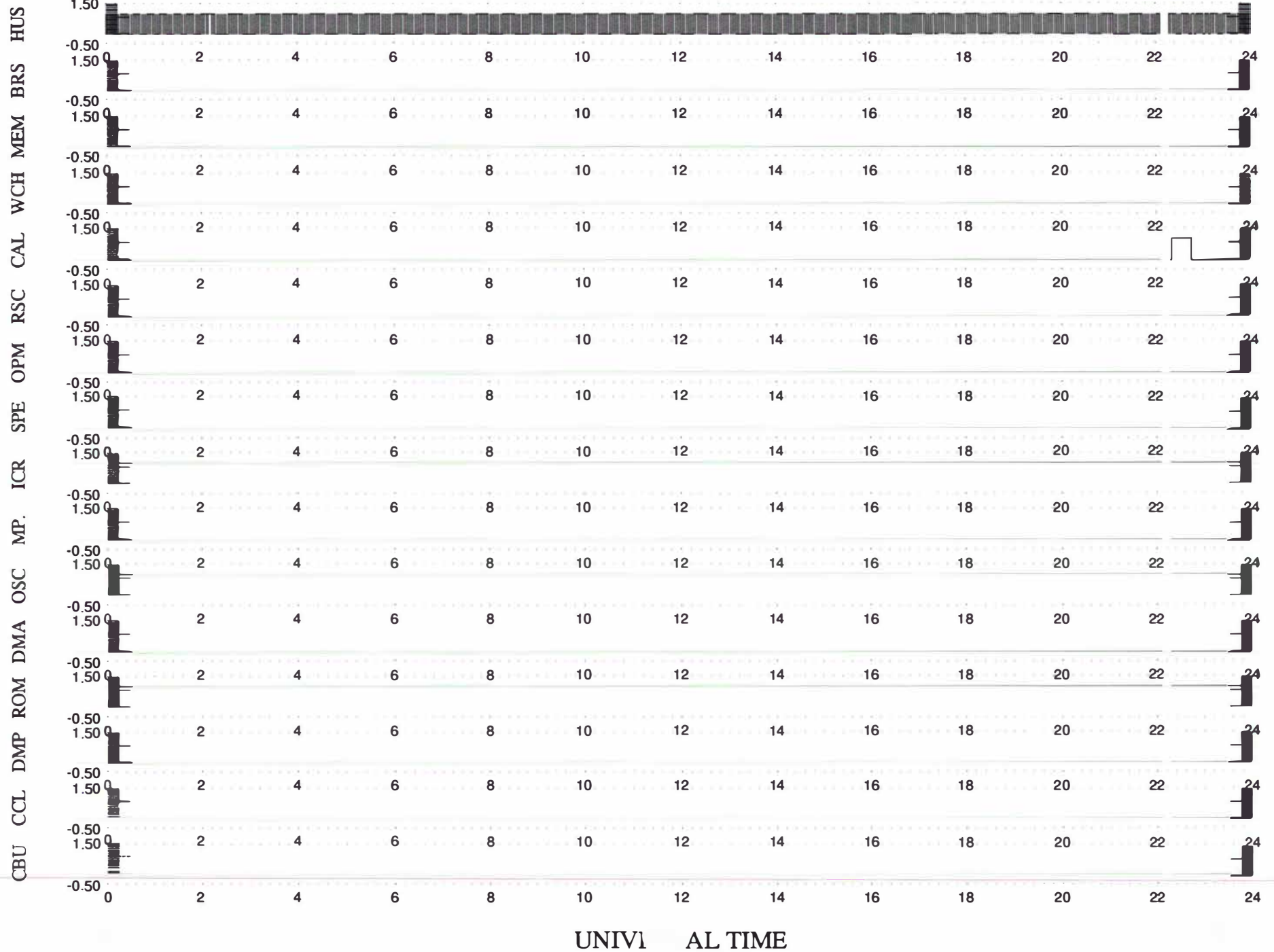
Data Start: 93/01/29, 0000:02

Plot created: 95/05/31, 2247

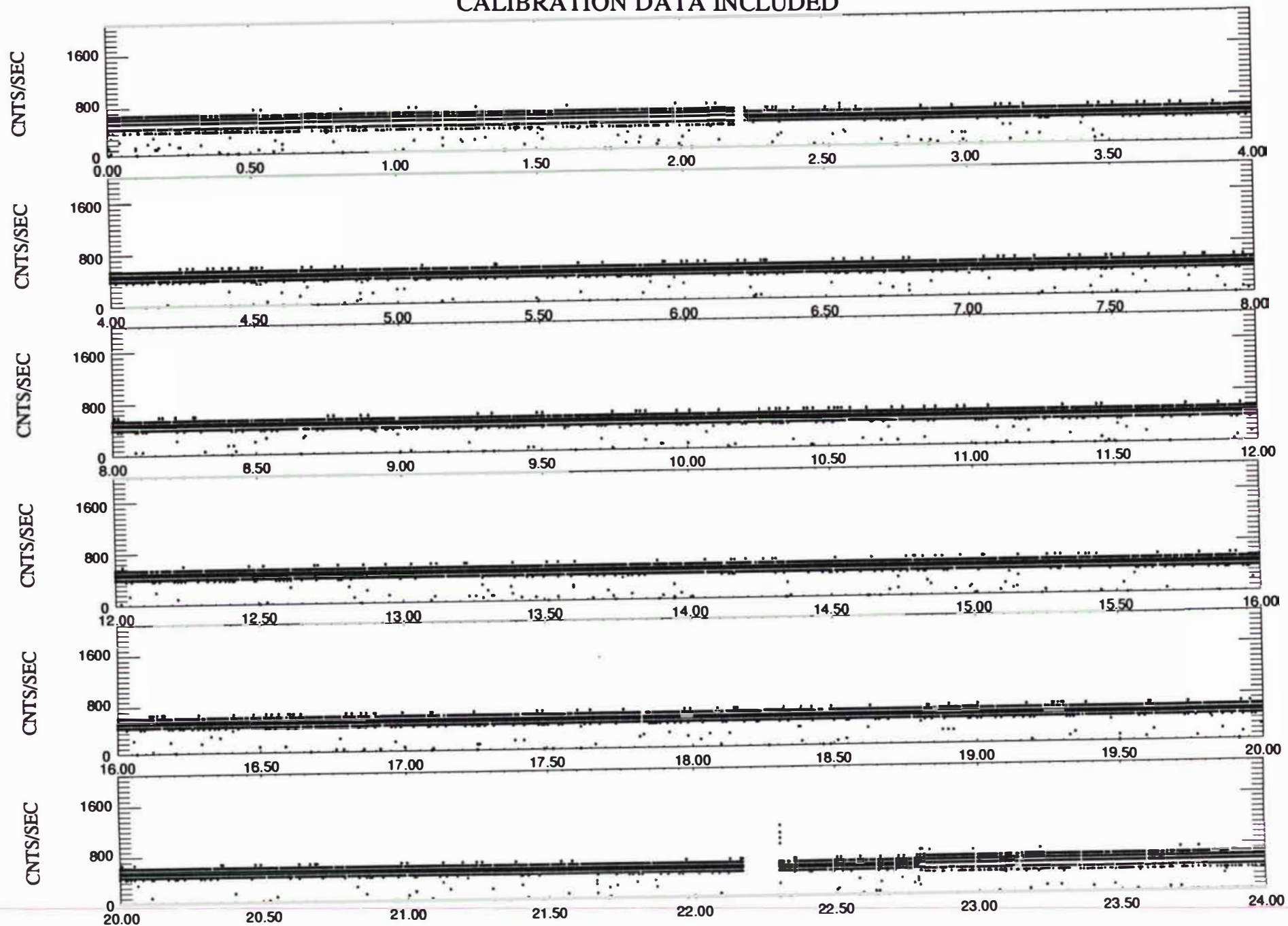
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

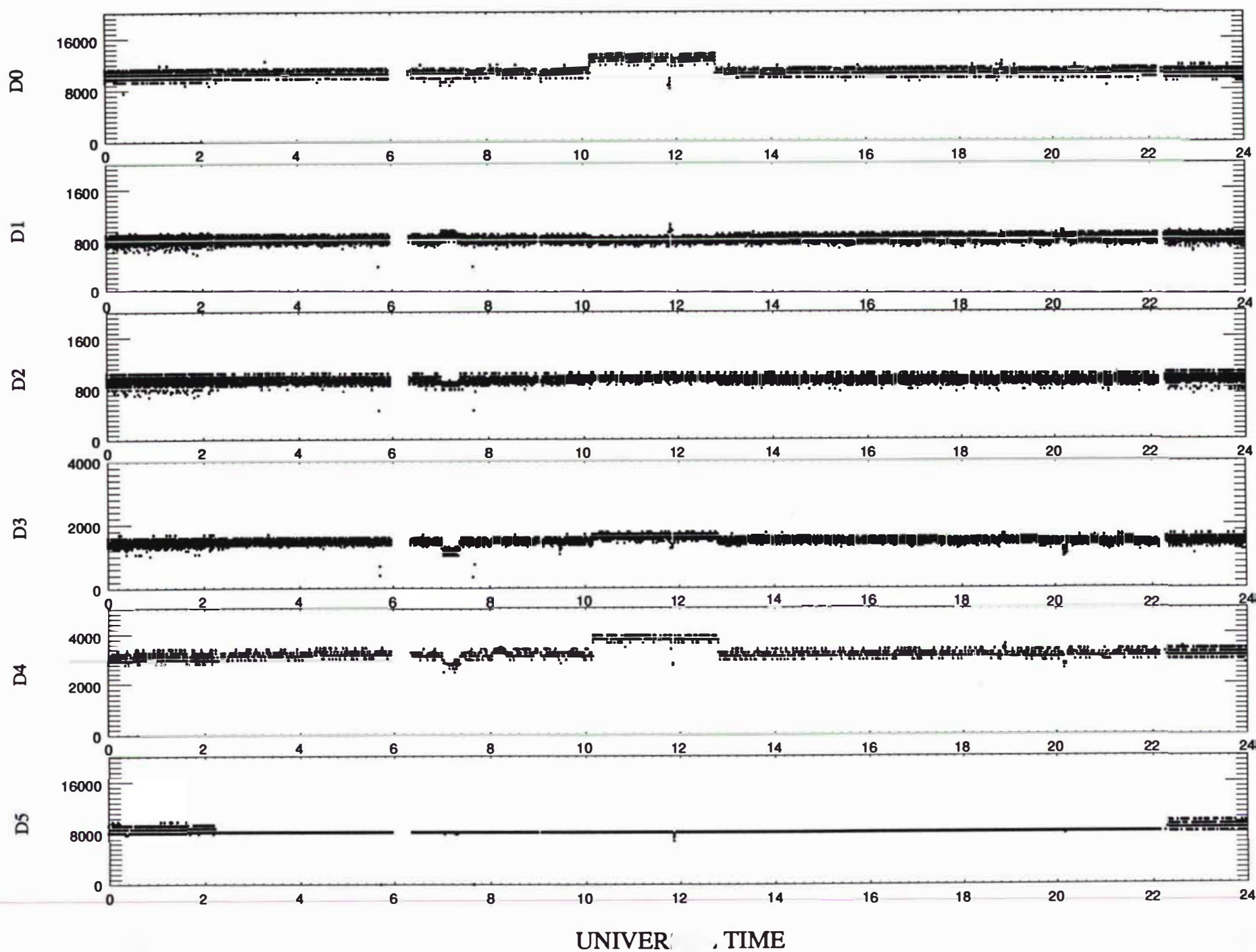
NO BURST (13)



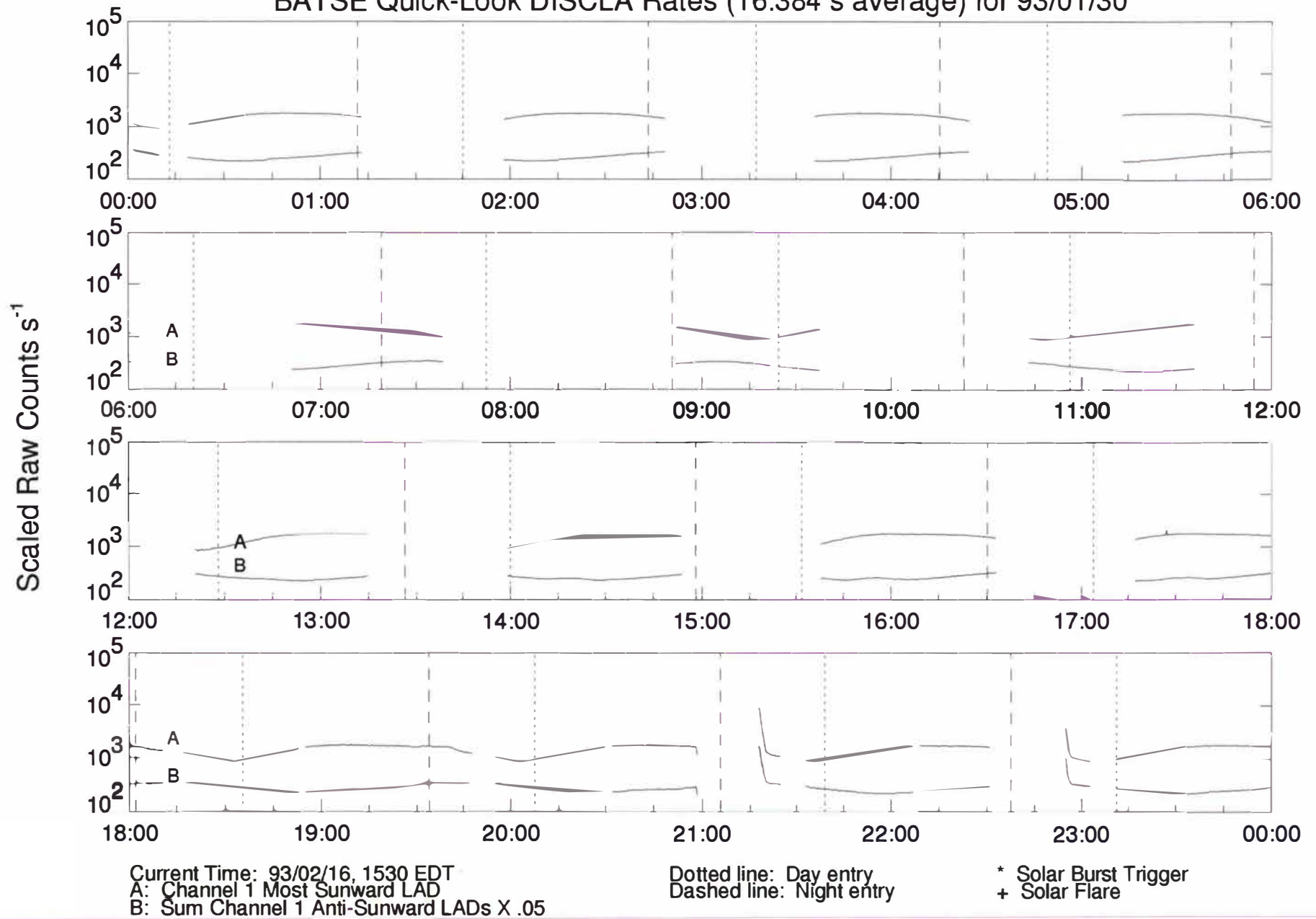
CALIBRATION DATA INCLUDED

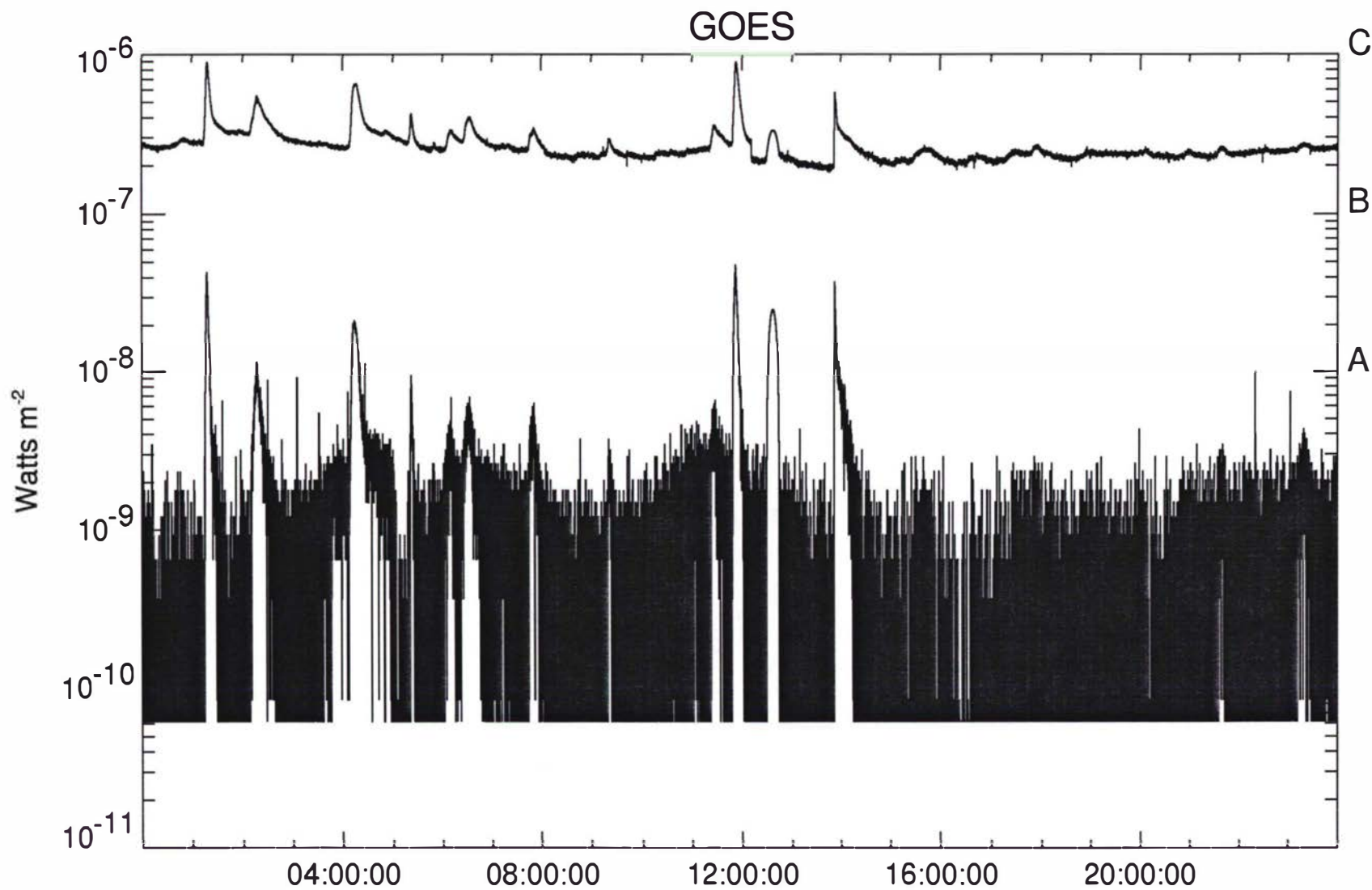


UNIVERSAL TIME



BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/30





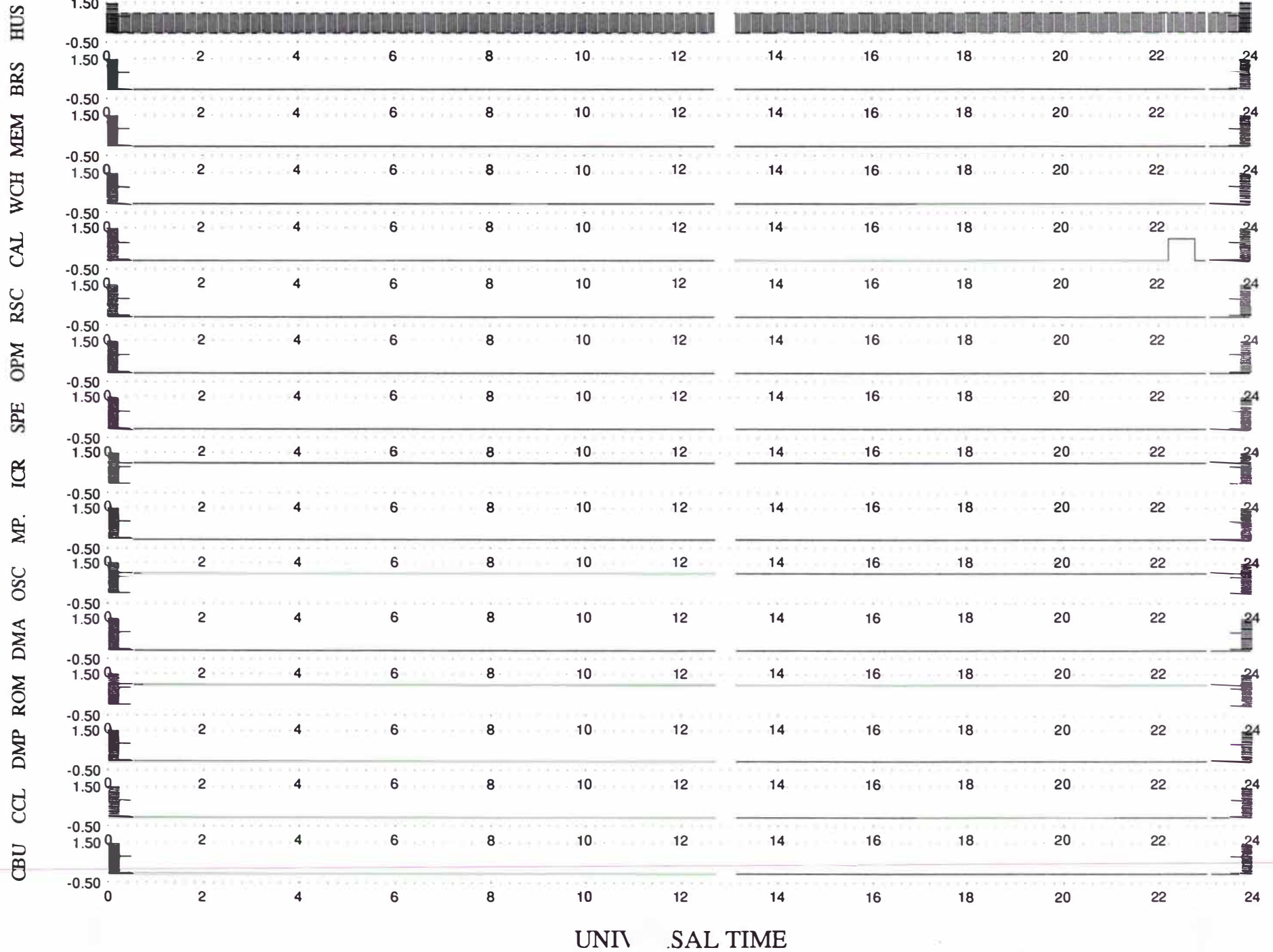
Data Start: 93/01/30, 0000:02

Plot created: 95/05/31, 2250

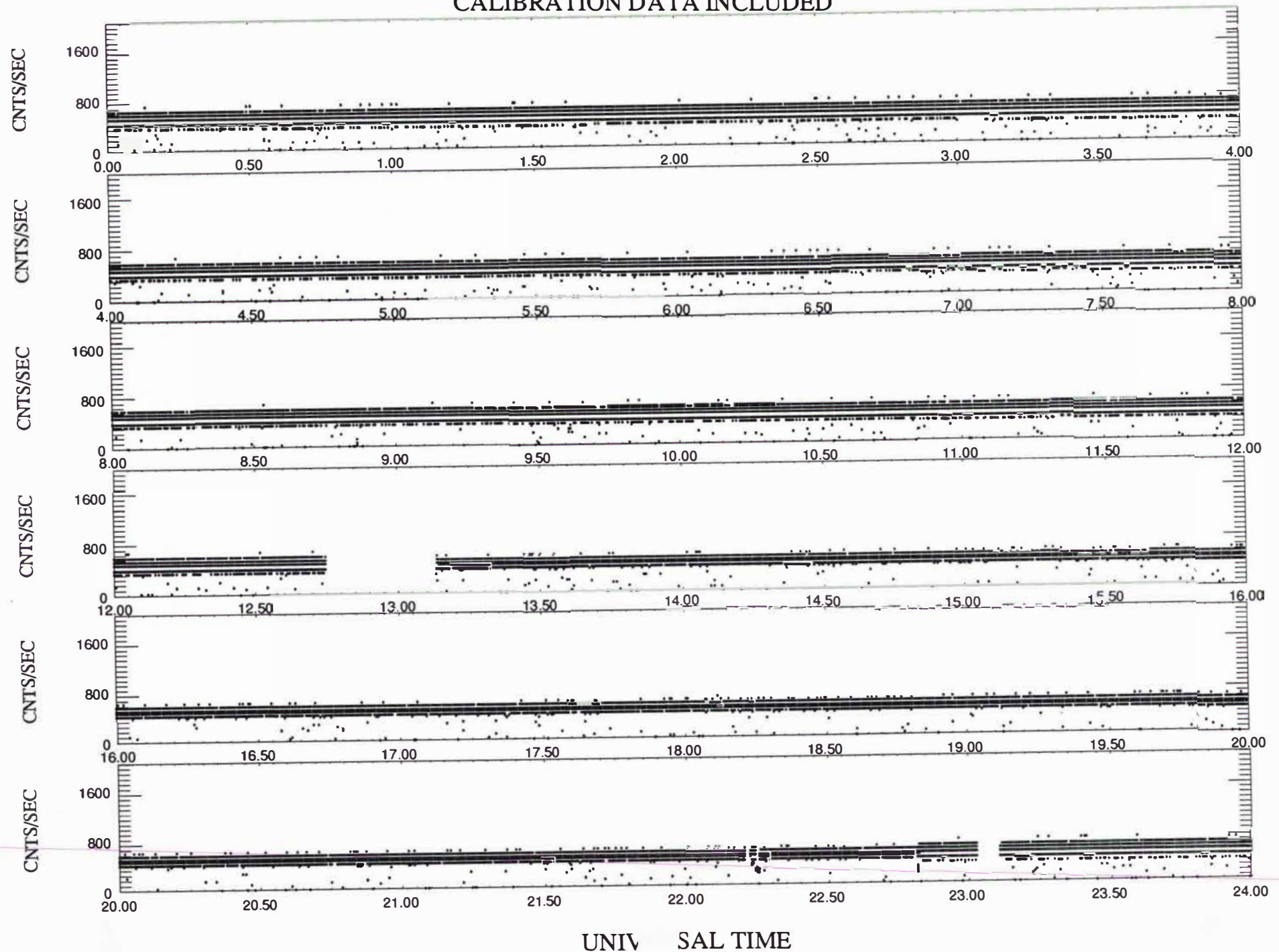
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

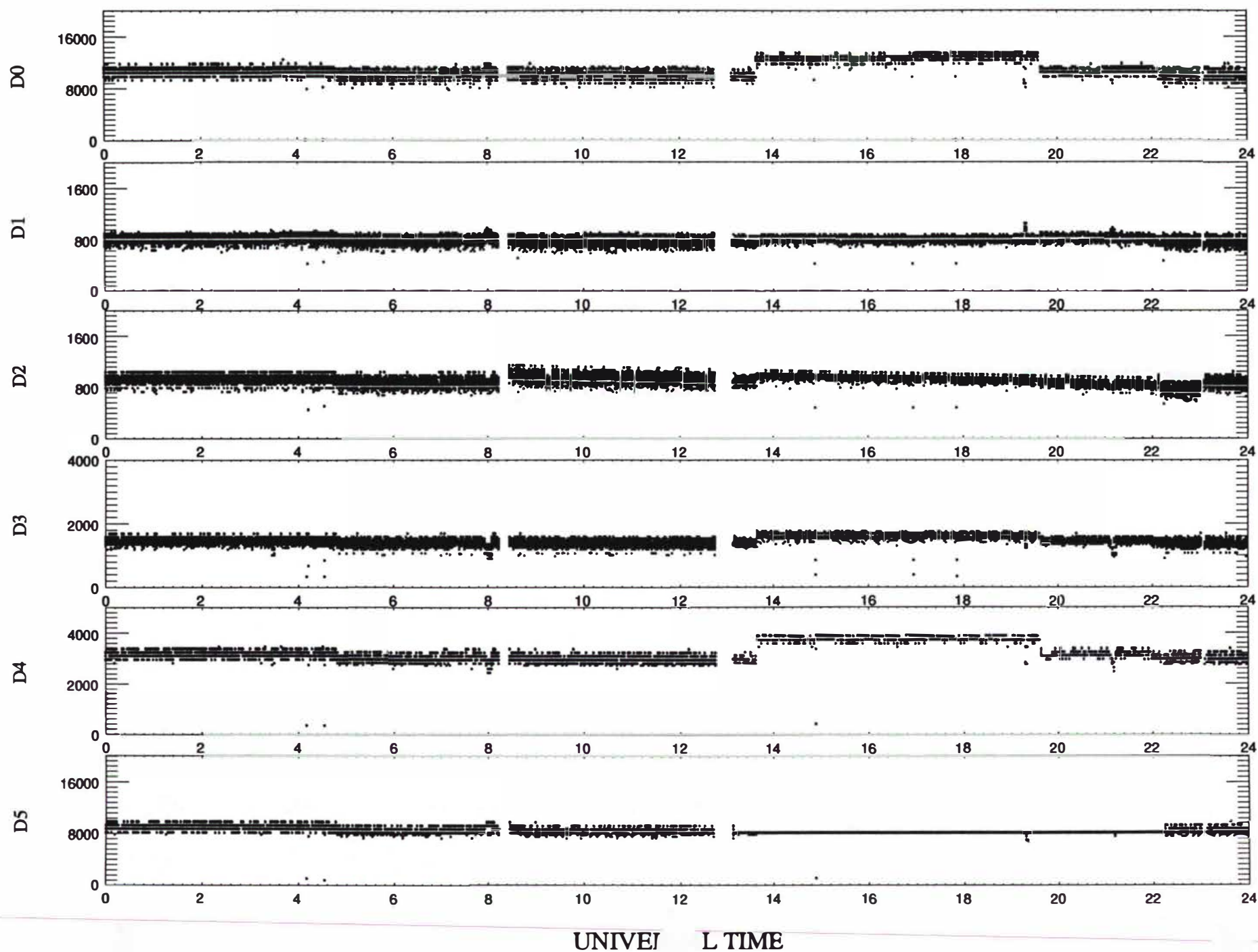
Channel 2 (0.5 - 4.0 Angstroms) Background not subtracted

NO BURST (13)



CALIBRATION DATA INCLUDED





CATSEARCH PROGRAM

BATSE BURST # 2151
EVENT OF 1993 JAN 31 DAY OF YEAR= 31
EVENT CROSSING TIME AT BATSE : 68232. S. OR 18:57:11.7
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 184.300 -10.900
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
POSITION OF ULYSSES ON 31/ 1/ 93 IS:
RA= 160.953 DEC= -14.268 DIST= 4.227 AU
BATSE-ULYSSES DISTANCE = 632389120. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=156.98 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1941.41 SECS.
CROSSING TIME AT ULYSSES IS 66290. S. OR 18:24:50.3 +/- 163.75 SECONDS

Trigger

From PREECE@ssl.msfc.nasa.gov Mon Feb 1 13:21:47 1993
Date: Mon, 1 Feb 1993 14:42:34 -0600 (CST)
From: PREECE@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: 1458

BATSE BURST TRIGGER

NO.: 02151

TIME: TJD=9018 SECONDS=68231

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=031.9 AZIMUTH=135.5 ERROR= DEGREES

COMMENTS:

PROBABLY THE BRIGHTEST BATSE BURST EVER! TWO SHORT PEAKS, SEPARATED BY 1 SEC.
VERY HARD, LOTS OF COUNTS ABOVE 300 KEV. LIES W/IN COMPTTEL FOV, SEEN BY COMPTTEL
ABOVE 1 MEV. FIRST PEAK HAS SOME SUB-STRUCTURE, POSSIBLE ON THE MILLISECOND
TIMESCALE.

From PREECE@ssl.msfc.nasa.gov Mon Feb 1 12:51:55 1993
Date: Mon, 1 Feb 1993 14:51:30 -0600 (CST)
From: PREECE@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
2151	930131	9018	68231	730000	181	-07

Date: Dec 15 '97 *Helio corr removed*

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?

N-M = CORRELATION BETWEEN SATELLITES N AND M

EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN

E=ECLIPTIC

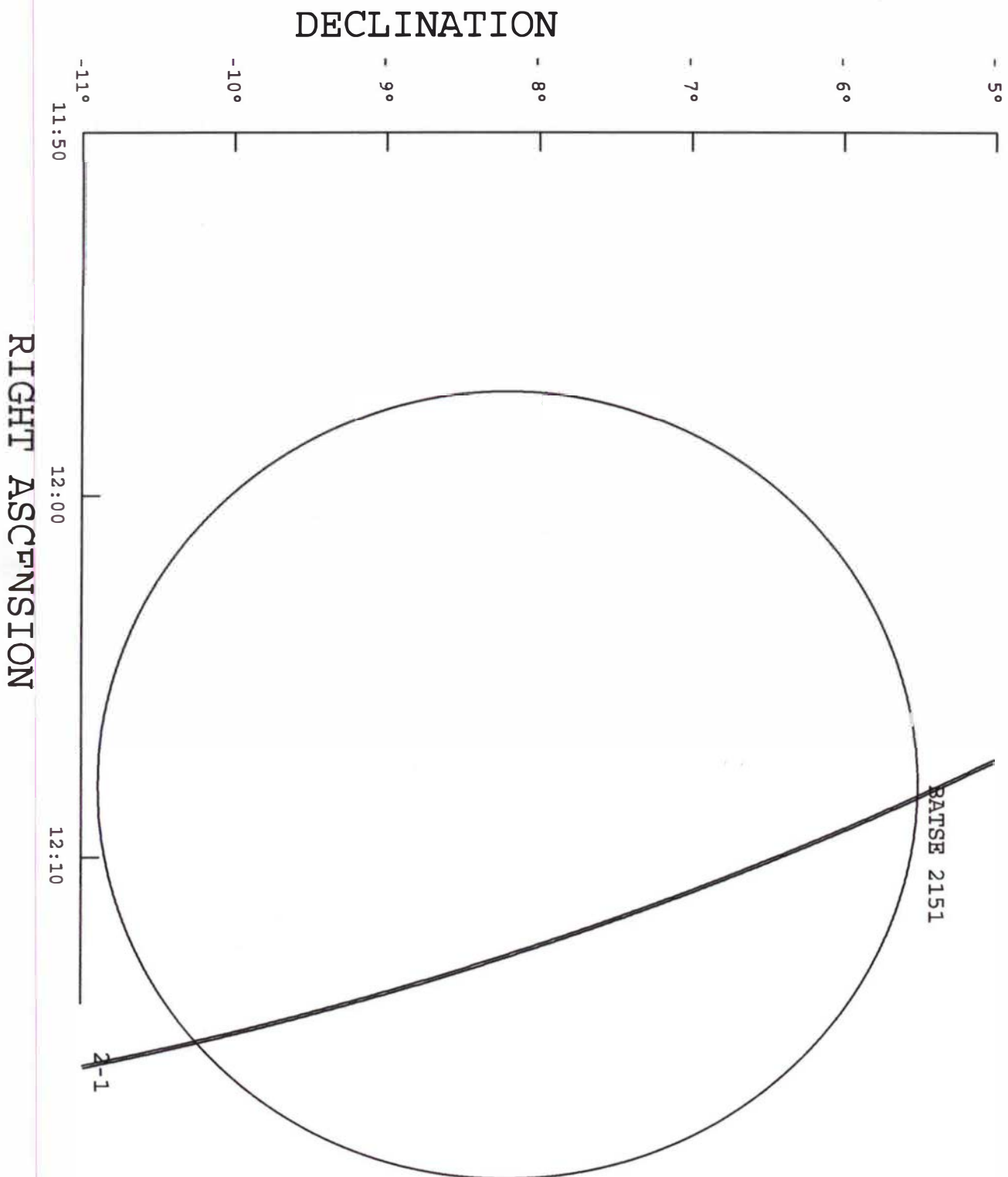
G=GALACTIC EQUATOR

1 ULYSSES

2 BATSE

EVENT OF JAN 31, 1993 18:24

15/12/97



BATSE

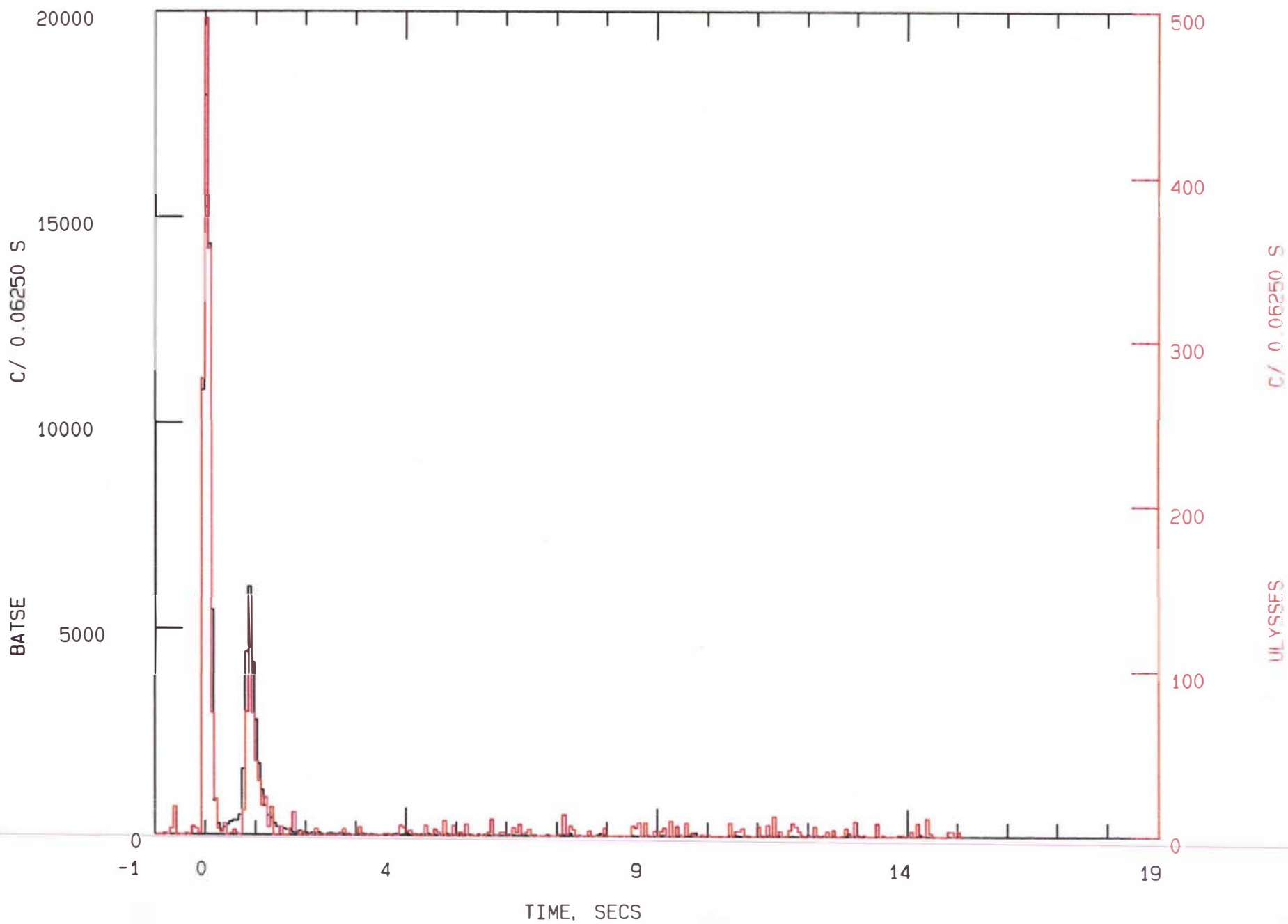
-ULYSSES

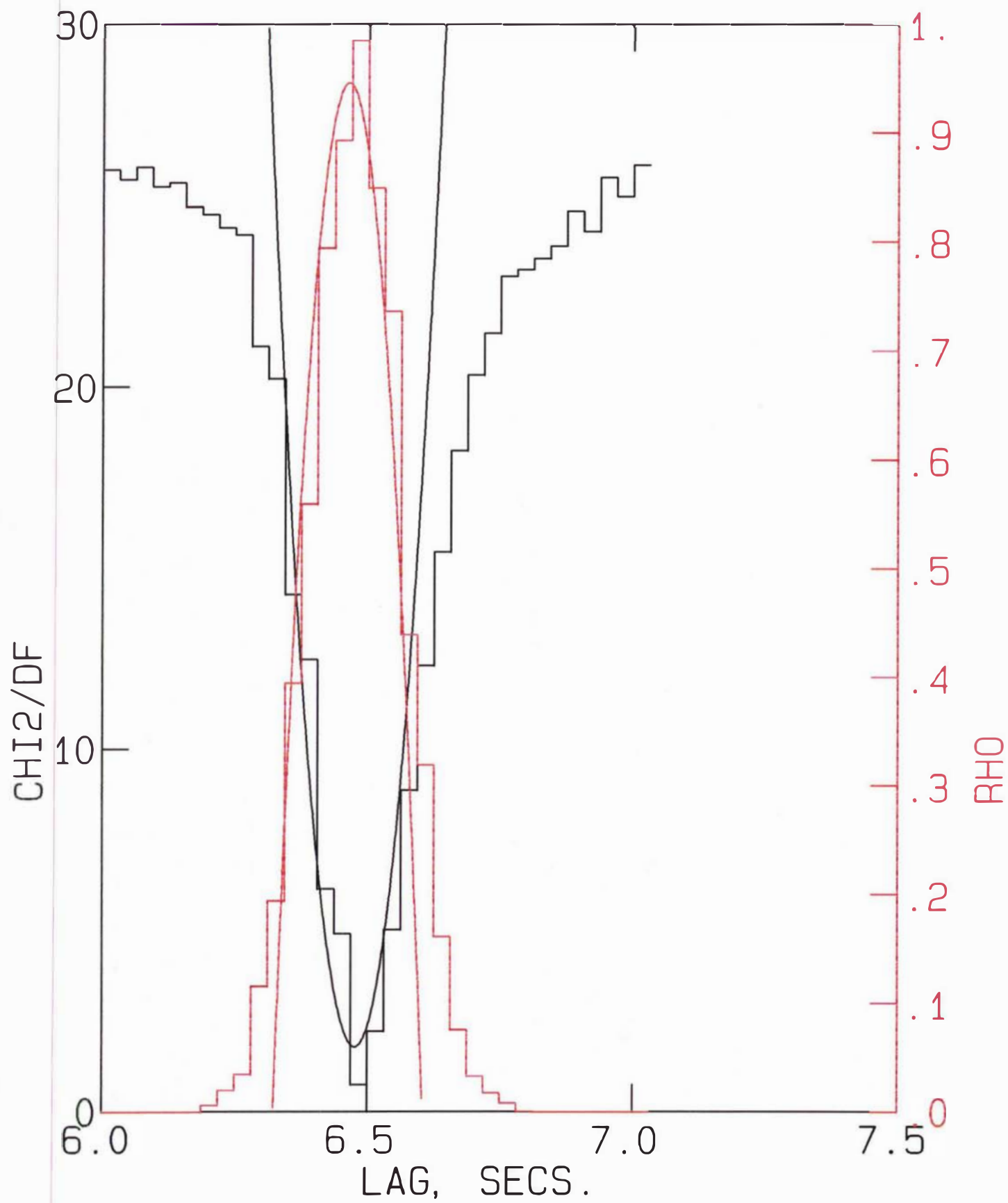
CORRELATION

31/ 1/93

68231.682

15/12/97





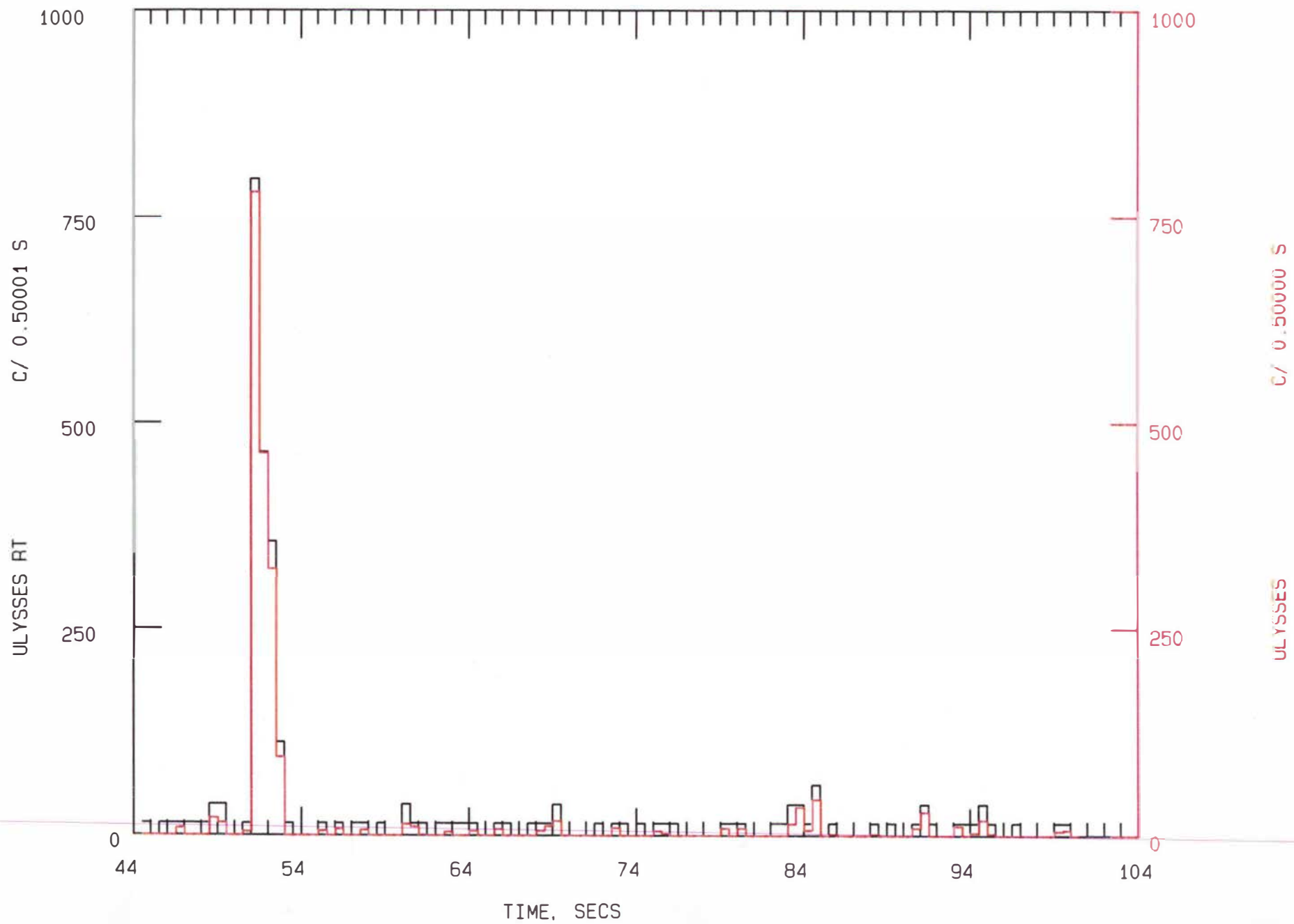
ULYSSES RT-ULYSSES

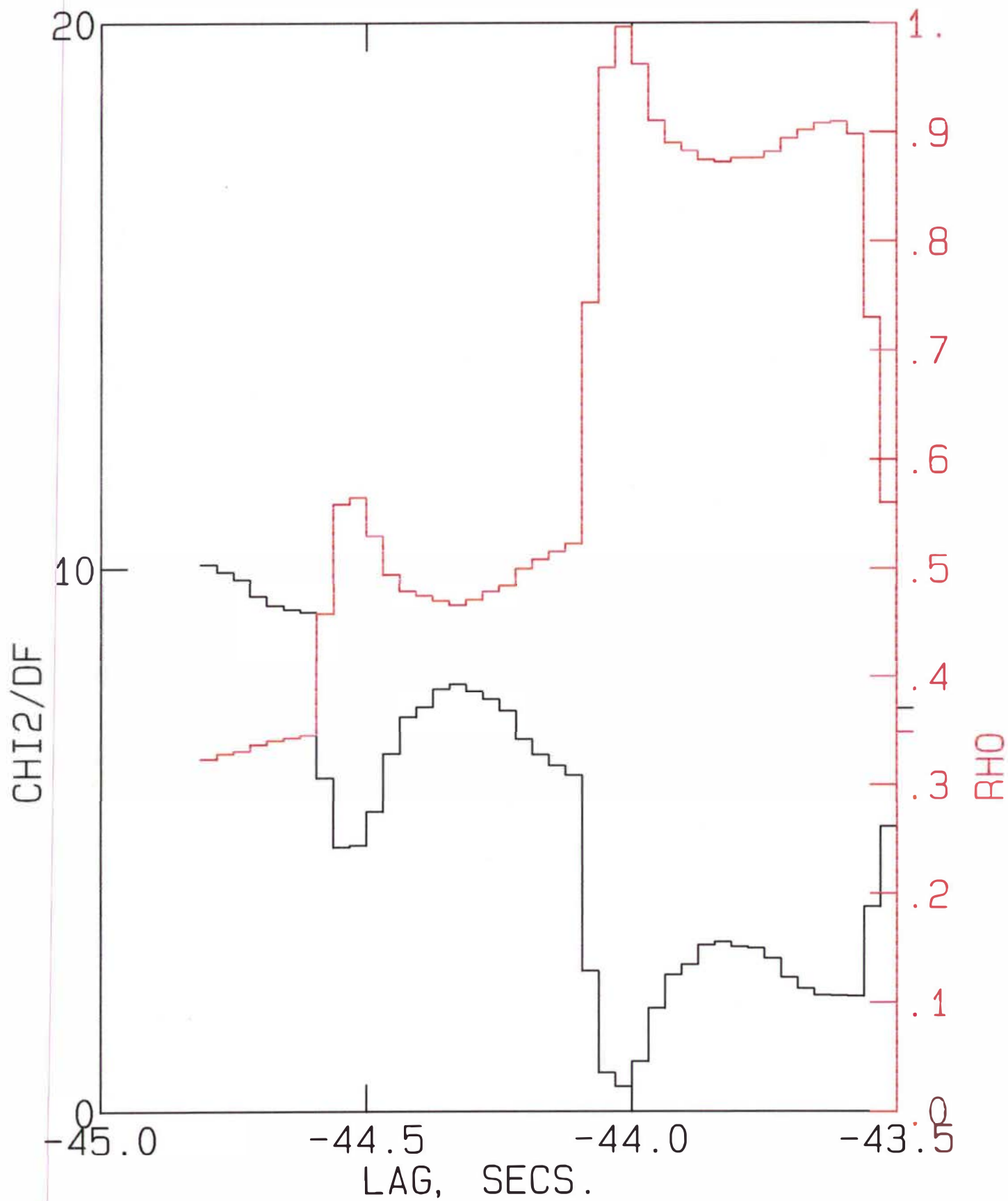
CORRELATION

31/ 1/93

66232.230

15/12/97

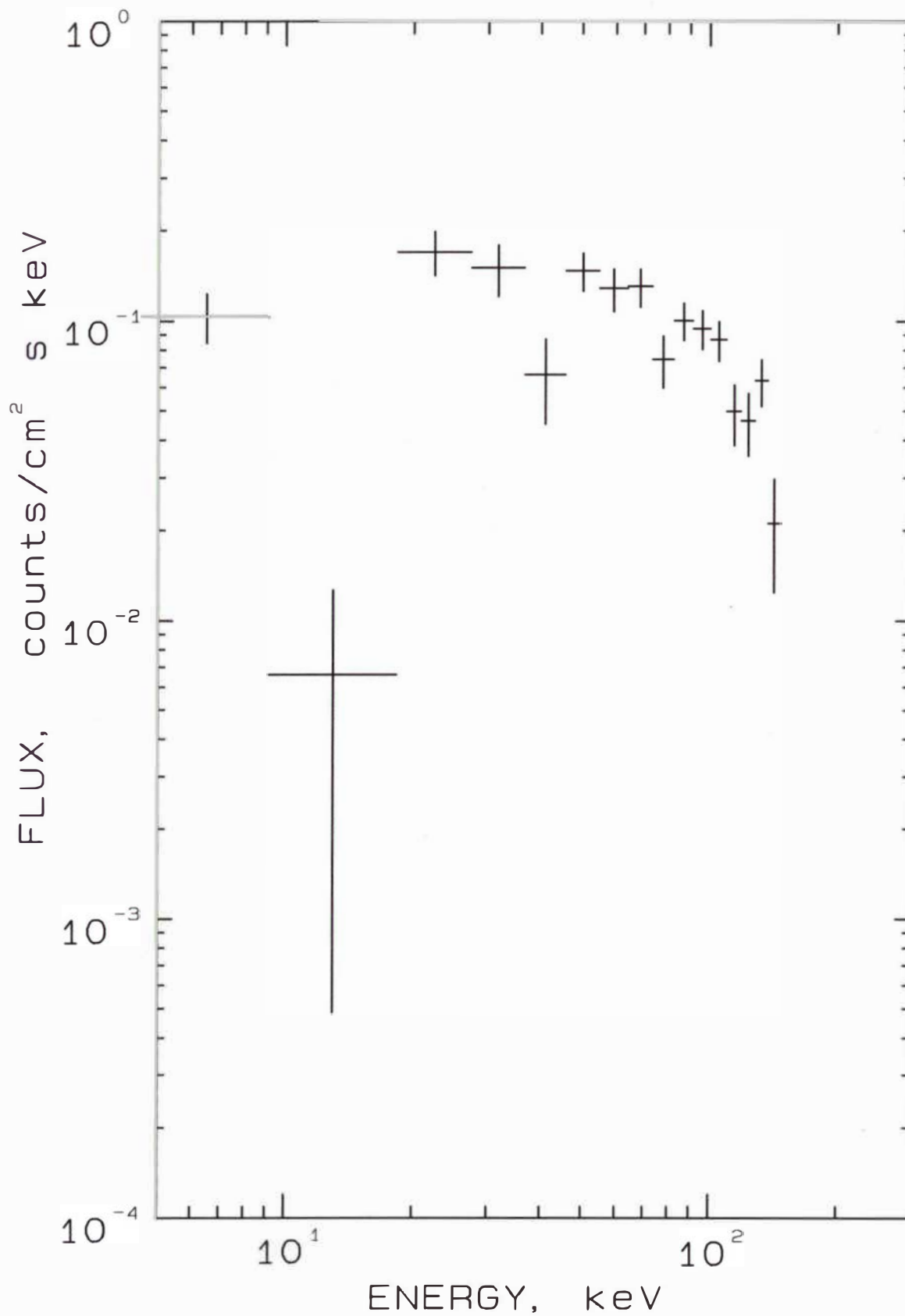




ULYSSES 31/01/93 66283.532

15/12/97

SPECTRUM INTEGRATED OVER 5.6 SECONDS, INTERVALS 2 TO 8



128-147 keV

101-128 keV

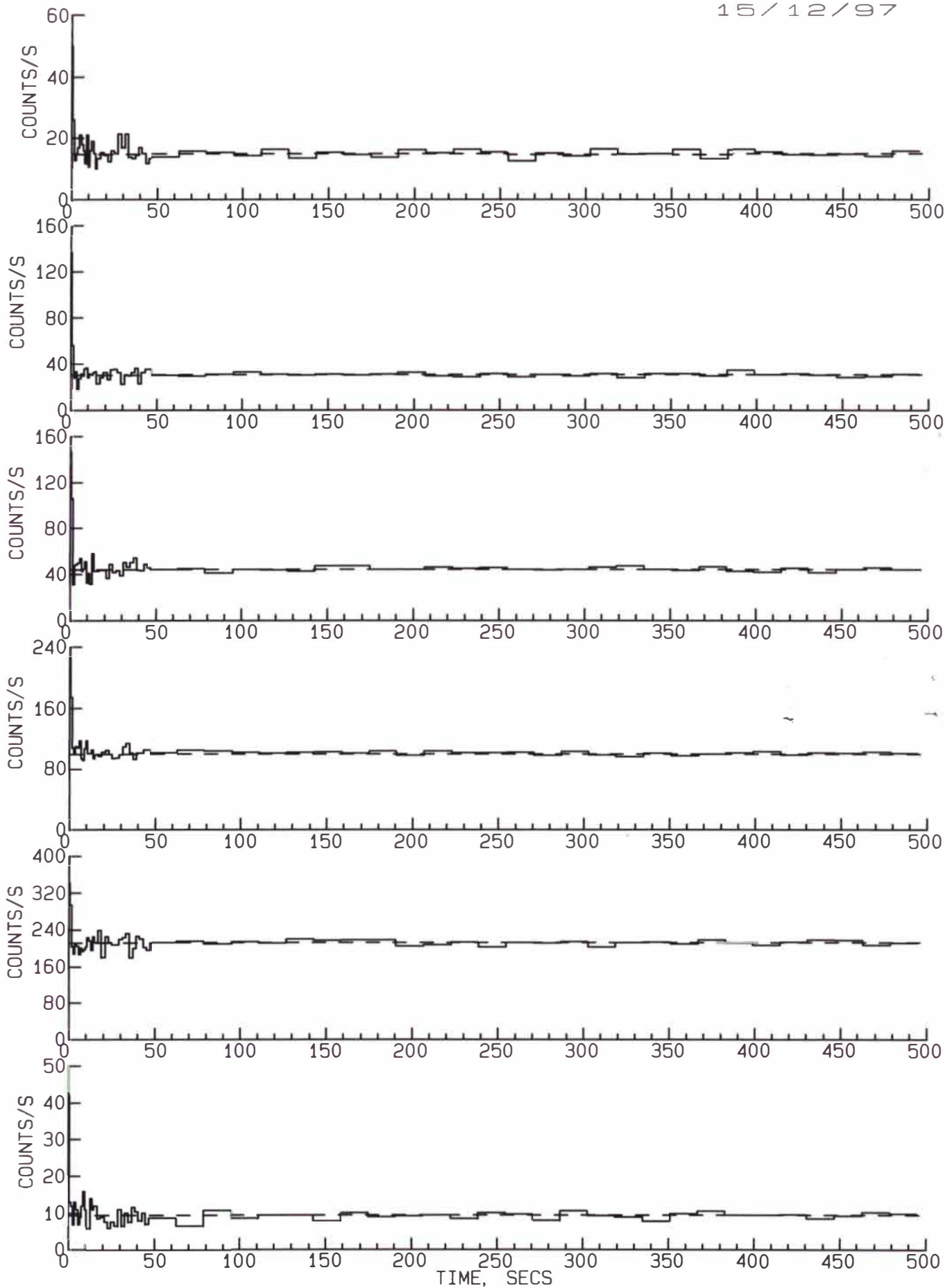
73-101 keV

46-73 keV

18-46 keV

4-18 keV

15/12/97



ULYSSES

31/01/93

Ttrig=66283.663

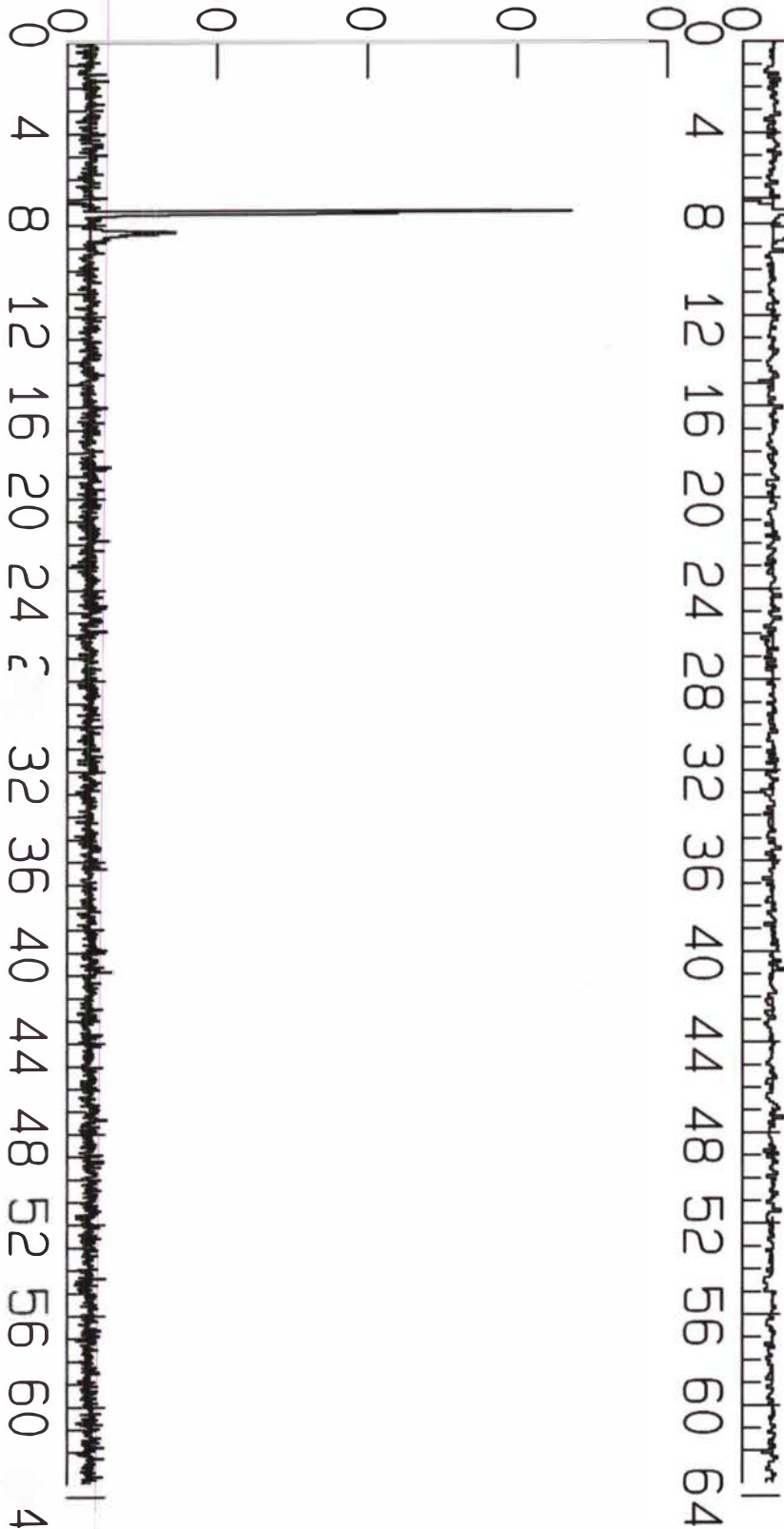
22- 147 keV

COUNTS/0.031 S

COUNTS/0.125 S

0
100
200
300
400

0
400
800
1200



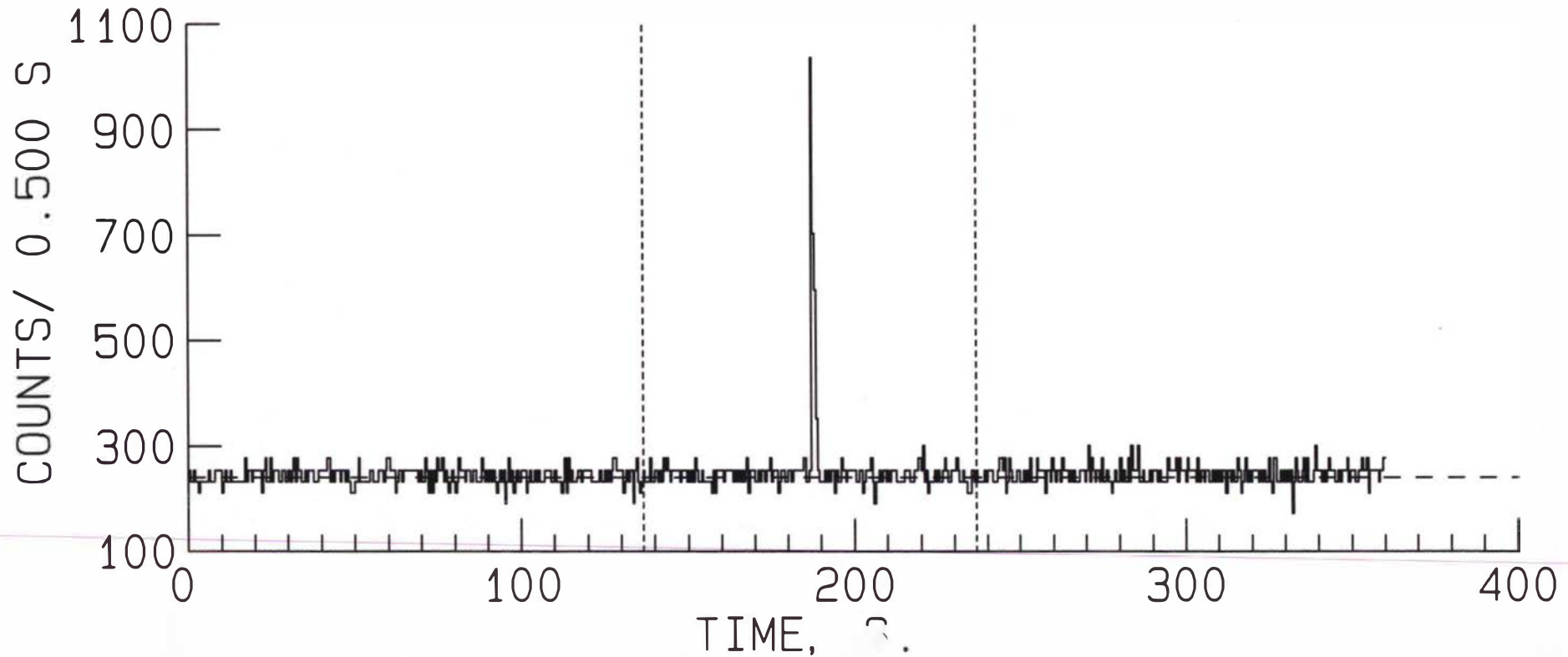
ULYSSES RT

15/12/97

31/ 1/93 66096.109 s

22- 147 keV

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



COMPTTEL/BATSE/IPN Burst Localizations

All Coordinates Epoch J2000.0

UB= Ulysses/BATSE UP = Ulysses/PVO BP= BATSE/PVO							BATSE Position					COMPTTEL Position			
Center							Radius								
Burst	Rf	Ra	Dec	Radius	(-/+)	D (AU)	Ra	Dec	lg	Smin	Rf	Ra	Dec	lg	Smin
GRB910425 UB	1	115.140	23.172	51.733	0.053	2.848	91.29	-22.77	1.02	0.27	3	90.20	-22.20	0.92	0.28
GRB910503 UB	1	117.730	22.657	30.352	0.010	3.042	87.45	38.74	0.87	0.03	3	87.00	38.60	0.44	0.30
GRB910601 UB	1	307.038	-20.538	52.936	0.011	3.708	310.12	32.34	0.17	0.02	3	309.90	32.70	0.46	0.37
GRB910627 UB	1	134.824	18.425	66.820	0.031	4.215	197.99	-2.48	0.28	1.28	3	199.40	-5.00	1.63	0.96
UP	1	133.523	18.792	68.352	0.036	3.621	-	-	-	1.53	-	-	-	-	0.71
GRB910709	NA	NA	NA	NA	NA	NA	172.77	81.67	2.31	NA	3	144.10	75.60	1.80	NA
GRB910814 UB	1	328.558	-13.966	45.699	0.018	4.918	346.35	30.43	0.48	1.89	3	343.80	29.50	0.39	0.19
UP	1	328.287	-14.629	46.428	0.019	4.626	-	-	-	1.87	-	-	-	-	0.17
GRB911118 UB	1	166.979	6.889	30.110	0.017	4.972	167.03	-20.85	0.36	2.37	3	166.30	-22.50	1.11	0.71
UP	1	162.619	8.562	32.018	0.019	4.248	-	-	-	2.29	-	-	-	-	0.75
BP	1	190.131	-2.551	30.766	0.086	6.813	-	-	-	1.76	-	-	-	-	0.23
GRB920622 UB	1	150.167	6.667	41.335	0.009	5.800	162.1	47.17	0.31	0.43	3	162.50	49.20	0.81	2.44
GRB920627 UB	1	150.590	6.327	23.540	0.049	5.869	166.02	-2.58	0.65	5.74		166.80	-8.50	1.18	1.61
GRB920830 UB	1	338.192	0.949	86.268	0.018	?	258.53	-73.99	0.54	1.81	3	259.00	-74.50	1.35	1.78
GRB930118	NA	NA	NA	NA	NA	NA	228.40	-34.30	?	NA	4	221.80	-34.80	1.47	NA
GRB930131 UB	1	161.411	-14.563	22.256	0.011	4.218	182.04	-8.24	2.16	1.09	3	186.20	-7.90	1.77	2.93
GRB930309 UB	1	332.600	14.645	36.601	0.035	3.998	325.41	51.73	0.72	0.93	3	322.70	55.20	0.74	4.67
GRB930612 UB	1	143.974	-11.184	63.928	0.053	4.870	103.07	-69.76	0.4	0.07	3	106.50	-71.00	1.60	0.17
GRB930704 UB	1	146.146	-11.823	82.959	0.113	5.089	100.9	60.8	0.59	2.01	3	99.30	62.80	1.08	0.07
BM	1	159.825	8.635	68.701	2.319	1.981	-	-	-	1.04	-	-	-	-	0.45
GRB931229	NA	NA	NA	NA	NA	NA	240.06	19.7	1.4	NA	3	241.90	21.00	2.35	NA
GRB940217 UB	1	328.736	51.947	69.334	0.050	3.038	29.07	4.55	0.69	0.84	3	30.10	3.10	0.32	0.94
GRB940301 UB	1	321.914	52.508	59.395	0.136	2.953	103.51	64.35	0.35	0.02	3	102.70	64.00	0.40	0.17
GRB940314 UB	1	314.850	51.972	64.530	0.220	?	354.86	-2.14	0.94	0.77	3	356.00	-1.40	1.43	0.92
GRB940520 UB	1	300.149	41.387	40.380	0.133	2.986	323.5	6.93	0.88	0.16	3	324.70	7.70	0.70	0.27
GRB940619 UB	1	303.998	39.140	69.375	0.211	3.039	299.05	-29.89	0.34	0.20	3	298.50	-31.50	1.15	1.44
GRB940708 UB	1	308.119	39.489	17.431	0.038	?	301.58	24.66	1.02	1.61	3	300.50	22.70	1.03	0.56
GRB940728 UB	1	133.614	-41.397	36.245	0.131	?	85.49	-39.87	1.44	0.17	3	85.10	-38.00	1.10	0.75
GRB940921 UB	2	155.516	-55.210	54.361	0.121	2.583	196.59	-18.71	?	6.49	4	207.10	-16.40	0.68	0.75
GRB941017	NA	NA	NA	NA	NA	NA	302.63	11.10	?	NA	4	301.70	13.30	2.10	NA
GRB950208 UB	2	334.715	-27.012	83.397	0.022	2.301	337.06	54.19	?	2.17	4	344.80	56.00	1.95	0.05
GRB950421 UB	2	177.048	-19.097	81.048	0.226	2.171	71.92	-63.03	?	1.41	4	70.10	-61.70	1.43	0.11
GRB950425 UB	2	178.121	-21.566	17.005	0.207	2.154	163.16	-35.21	?	1.90	4	164.90	-33.80	0.34	0.11
GRB950522 UB	2	7.656	42.578	86.989	0.063	2.039	109.57	19.31	?	1.60	4	110.81	20.34	1.14	1.47
1	Hurley, K. et al Huntsville workshop (1995)						Smin = minimum distance between point and IPN annulus								
2	BACODINE/IPN burst alert messages (Hurley)														
3	BATSE 3B Catalog														
4	Meegan, C. Priv. Comm. (Trigger Messages)														

GRB	RA°	DEC°	DIMENSIONS	SOURCE
17 FEB 94	29	+4	6'x60'	IAUC 5940
25 APR 91	90	-22		A&A Suppl. 97, 75
09 NOV 91	111	-27	1'x6'	CoI calculation
01 MAY 92	124	-33	1'x2'	CoI calculation
11 MAR 92	132	-36	1'x4'	CoI calculation
22 MAY 91	138	-51	2'x2'	CoI calculation
18 NOV 91	167	-23	2'x10'	CoI calculation
31 JAN 93	184	-10	0.3'x96'	Hurley et al. (preprint)
27 JUN 91	199	-4		A&A Suppl. 97, 75
17 MAY 92	203	-17	2'x6'	CoI calculation
17 JUL 91	247	-58	1'x1'	CoI calculation
SGR 1900+14	285	+14		pos. of G42.8+0.6
06 APR 92	289	-58	2'x2'	CoI calculation
22 JAN 91	297	-71	2'x6'	CoI calculation
25 MAY 92	301	-43	2'x3'	CoI calculation
25 MAR 92	351	13	2'x7'	CoI calculation

From this list, approx. half will be selected for study (depending on season). SGR 1900+14 is one of the three *soft-gamma repeaters*. It has been tentatively associated with a supernova-remnant G42.8+0.6 (Hurley et al., preprint).

21. For SEST proposals, indicate:

- a) Your preferred LST interval :
- b) The period when the targets can be observed, taking into account the Sun constraint (50°) :

22. Justification of requested number of observing nights. Do not include any correction for expected meteorological conditions:

Eight fields are to be imaged in four colours, twice. The exposure time will be 10 min in B, and 5 in V, R, and Z. Hence, in total, 400 min integration.

CoIs are constantly revising the list of targets. Some reduction in the size of error boxes is possible; this may limit the need to image by mosaic.

23. Reasons why the observations cannot be performed in remote mode.

24. Important notice:

If the programme described in this application requires excellent seeing or photometric conditions or low water vapour content, a back-up programme using the same instrumentation has to be described on a separate page.

From holger@astro.ku.dk Thu Jul 7 00:49 PDT 1994
Date: Thu, 7 Jul 94 09:51:25 +0200
From: holger@astro.ku.dk (Holger Pedersen)
To: boer@cesr.cnes.fr, hpedersen@nbivax.nbi.dk,
khurley@sunspot.ssl.berkeley.edu
Subject: NTT_observing_time
Content-Type: text
Content-Length: 1062

Kevin, Michel:

I am pleased to report verbal information from ESO that we have been granted one night of observing time on the 3.5-m New Technology Telescope, in March 1995, for the execution of the observing program mailed to you earlier. The observations are to be conducted using remote control, from Garching. I hope that you can join me in Garching.

Similar observations will be done at the 1.54-m Danish telescope, La Silla, August 5 - 12, 1994. If there is any update to Kevin's list of positions, please let me know.

Best regards

Holger

July 7, 1994

```
=====
Holger Pedersen           e-mail    holger@astro.ku.dk
Copenhagen University Observatory  phone (45) 3532 3966
Oster Voldgade 3          -      (45) 3532 3999 (secretary)
DK 1350 Copenhagen        -      (45) 3888 6779 (private)
Denmark                   fax      (45) 3532 3989
=====
```

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.

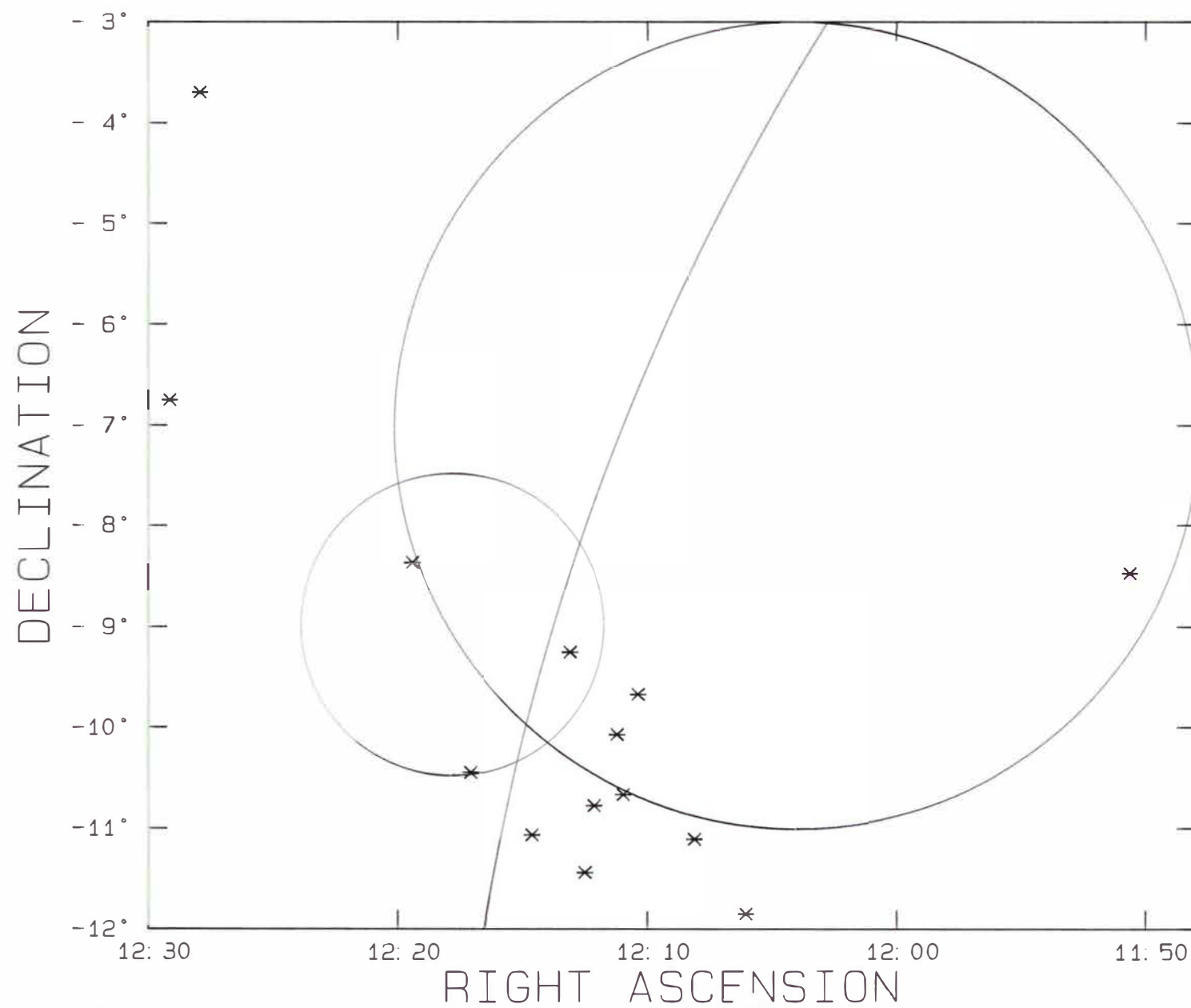
YES: Burst definitely detected by one or more DMSP satellites (8,9,10,11).

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

13/10/93

JAN 31, 1993 18: 24



Hi Brenda,

I'm writing a poster paper for Huntsville on the IPN location of the Jan 31 1993 burst. I'm wondering what the location accuracy is for the highest energy EGRET photon. Is it better than the location accuracy obtained from the average of the 16 photons? Our semi-final annulus will have a width of about 20", so I'm anxious to see to what extent it can be confirmed by other observations.

Kevin

From root Wed Oct 13 13:47 1993

Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)

id AA14988; Wed, 13 Oct 93 13:47:12

Received: from sage0.gsfc.nasa.gov by sunspot.ssl.berkeley.edu (4.1/1.30.1)

id AA13652; Wed, 13 Oct 93 13:52:12 PDT

Received: from abeach.gsfc.nasa.gov.egretnet by sage0.gsfc.nasa.gov (4.1/1.35)

id AA05961; Wed, 13 Oct 93 16:51:40 EDT

From: bld@sage0.gsfc.nasa.gov (Brenda Dingus)

Message-Id: <9310132051.AA05961@sage0.gsfc.nasa.gov>

Subject: 930131 EGRET position

To: khurley@space6.ssl.berkeley.edu

Date: Wed, 13 Oct 1993 16:52:13 -0400 (EDT)

In-Reply-To: <9310140115.AA14977@space6.ssl.berkeley.edu> from "khurley@space6.ssl.berkeley.ec

X-Mailer: ELM [version 2.4 PL22]

Mime-Version: 1.0

Content-Type: text/plain; charset=US-ASCII

Content-Transfer-Encoding: 7bit

Content-Length: 368

Status: R

Hi Kevin,

The best position is obtained from the average of 16 gammas, since even at 1 GeV the point spread function is wide (68% contained within 1.3 degrees). EGRET just doesn't have a chance at < arcmin level. The nucleus carries away too much momentum in the pair production process.

Let me know if you have any more questions. See you in Huntsville!

Brenda

Good Schader KPD Jun 17

July 11

Will not

July 20

Galaxy in over box - bright

23

In place - won't observe

Jan 31

Gas visible not true
Another variable nearby

Will be Schmidt of Jan 14 '93 WATCH position

Copy of FAX sent 8:00pm Thurs

Hi Michael -

It's been a long time since we met at JPL -- I still remember our dinner together with Kevin at the restaurant by the water.

I think we have found the problem with the your SCET time tags on day 93031 at records 643-655.

Using our own EDR, we calculate SCET times* which seem reasonable, and which are in close (1 ms) agreement with those calculated by Jim Schmidling. This is to be expected, since his calculations are the basis for EDR time tags in the first place (both are calculated using the SCLK-SCET coefficients in a linear-regression fit, as you know). This establishes that the SCET times actually inserted into our EDR are the ones which should have been inserted, and that your SCET values could be in error.

Additionally, Jim has calculated backwards from the SCET times in the EDR to produce a "calculated SCLK". This calculated SCLK should match the SCLK originally used to produce the SCET (of course!). All the calculated SCLK times agree with the original SCLK when our SCET times are used. When your SCET times are used, the calculated SCLK is wrong -- and also has fractional parts. However, the SCLK values used are always integers, hence your SCET values did not come from valid SCLK values, and must be in error.

The cause of the your SCET errors could be that your have an EDR with incorrect SCET values in the specified records, but the fact that our EDR is correct makes this unlikely.

Close examination of the accompanying table suggests another explanation. Your errors could be accounted on the assumption that you print the fractional part of the SCET separately from the whole part -- but contiguously, with no white space. If the fractional part has missing leading 0's and is then left-adjusted, the resulting SCET would in error (as printed).

I hope this is the explanation, because the correction would be easy.

Cheers,

Roger Williams
Space Sciences Lab, UC Berkeley

TABLE of SCET VALUES

REC	OUR CALCULATED SCET_from_EDR	BEG_of_DAY_offset	SECS_into_day	YOUR SCET (_ = missing 0)
641	1359648585.987854	- 1359590399.9997558059	= 58185.988098145 ~ 58185.988	= 58185.988
642	1359649097.995850	- 1359590399.9997558059	= 58697.996094227 ~ 58697.996	= 58697.996
643	1359649610.003845	- 1359590399.9997558059	= 59210.004089117 ~ 59210.004	= 59210. _409
644	1359650122.011841	- 1359590399.9997558059	= 59722.012084961 ~ 59722.012	= 59722. _121
645	1359650634.019836	- 1359590399.9997558059	= 60234.020080090 ~ 60234.020	= 60234. _200
646	1359651146.027832	- 1359590399.9997558059	= 60746.028075933 ~ 60746.028	= 60746. _281
647	1359651658.035828	- 1359590399.9997558059	= 61258.036072254 ~ 61258.036	= 61258. _361
648	1359652170.043808	- 1359590399.9997558059	= 61770.044052124 ~ 61770.044	= 61770. _441
649	1359652682.051804	- 1359590399.9997558059	= 62282.052047968 ~ 62282.052	= 62282. _520
650	1359653194.059799	- 1359590399.9997558059	= 62794.060043097 ~ 62794.060	= 62794. _600
651	1359653706.067795	- 1359590399.9997558059	= 63306.068038940 ~ 63306.068	= 63306. _680
652	1359654218.075790	- 1359590399.9997558059	= 63818.076034069 ~ 63818.076	= 63818. _760
653	1359654730.083786	- 1359590399.9997558059	= 64330.084030151 ~ 64330.084	= 64330. _840
654	1359655242.091782	- 1359590399.9997558059	= 64842.092025995 ~ 64842.092	= 64842. _920
655	1359655754.099777	- 1359590399.9997558059	= 65354.100021124 ~ 65354.100	= 65354. _999 **
656	1359656266.107758	- 1359590399.9997558059	= 65866.108002186 ~ 65866.108	= 65866.108
657	1359656778.115753	- 1359590399.9997558059	= 66378.115997314 ~ 66378.116	= 66378.116
658	1359657290.123749	- 1359590399.9997558059	= 66890.123993158 ~ 66890.124	= 66890.124

* These SCET times, of course, are not truly accurate times -- they are expected to match actual SCET only within 50ms or so, since they are estimated by the fit.

** a slight change in value from .1000 to . _999 was made in order to make the point about a missing 0 (our numbers include a clock correction and are 2 ms more than yours)

* CCT-FAX *

MAR 15 1993 11:47

Dr. -Ing. MICHAEL SOMMER

+49 8032 8629

S 1

To Peter Wenzel, Ulysses Project Science Team ESTEC
FAX 0031 1719 84 698

From Michael Sommer, D-82031 Samerberg,
FAX (49) 8032 8629

CC. RSM
✓

The unique cosmic gamma ray burst of January 31, 1993 has been detected by all instruments on the Compton Gamma Ray Observatory (CGRO) and by our Ulysses GRB-Experiment. We are preparing an ApJ Letter to be published soon. The short and intense peak of the emission enables us to measure the burst arrival time within less than 15 msec. The source position of the burst is determined by the burst arrival time difference between Ulysses and CGRO and depends on accurate timing and position of both spacecraft. Unfortunately the SCL/SCET correlation seems to be a steady problem area. I have been analysing the tape around Jan 31 and took the first and the last record of the tape to establish a linear interpolation for our burst trigger time in SCL units. The deviation of the time at the beginning of the record and the predicted time from the interpolation is only 7 msec and well acceptable. But one record before the deviation is as high as 891 msec as seen in the table below.

The burst trigger occurred at SCL = 36 631 568.711 units. We derived UT = 66283.535 sec on 93-031. May I ask the project to check the corresponding SCET or UT on January 31, and the position of Ulysses at the time of the burst (RA, declination Epoch 1950 and range from center of the earth) in order to crosscheck our findings from the data tapes?

record	date	UT (sec)	difference (sec)	between SCET and a linear interpolation of SCL units between the first and the last record of the tape
641	93-031	58185.988	-0.008	
642	93-031	58697.996	-0.008	
643	93-031	59210.380	0.369	
644	93-031	59722.118	0.099	
645	93-031	60234.198	0.171	
646	93-031	60746.278	0.243	
647	93-031	61258.358	0.315	
648	93-031	61770.438	0.387	
649	93-031	62282.518	0.459	
650	93-031	62794.598	0.531	
651	93-031	63306.678	0.603	
652	93-031	63818.758	0.675	
653	93-031	64330.838	0.747	
654	93-031	64842.918	0.819	
655	93-031	65354.998	0.891	
656	93-031	65866.108	-0.007	record of GRB930131
657	93-031	66378.116	-0.007	(SCET of header)
658	93-031	66890.124	-0.007	

With best wishes, Michael Sommer

JS says: add 2ms for clock correction ✓ Add 2
Also, these records may not have been validated -
some data went out w/o validation



ULYSSES

TELECOMMUNICATIONS MESSAGE

european space agency
mail stop 264-318
4800 oak grove drive
pasadena ca 91109 usa

Attention: Dr. K. Hurley		Transmit No.: (510) 643-7629
Organisation: U.C. Berkeley	Date: 15 Mar. 1993	Pages: 3
From: Edgar Page	Phone: (818) 354-1805	Fax: (818) 393-4500
Copies:		
Dear Kevin, Please find on pages 2 and 3 the message I received from Peter Wenzel and the Michael Sommer fax. Thanks and best wishes, <i>Edgar</i> D.E. Page Took last record on tape, first record on tape $\frac{SCET_2 - SCET_1}{SCLK_2 - SCLK_1} = \text{Average correction coeff } 2.000 \dots 37$ Linear interpolation using this correction + SCLK gives SCET. Compare this to header times to get "difference"		

14846, dte, 18 jun 91

TELEFAX
SOLAR AND HELIOSPHERIC SCIENCE DIVISION
FAX NR. (+31) 1719 84698

Date: 15 March 1993

Ref.:

Nr. of Pages: 2

From: R.P. Dergel

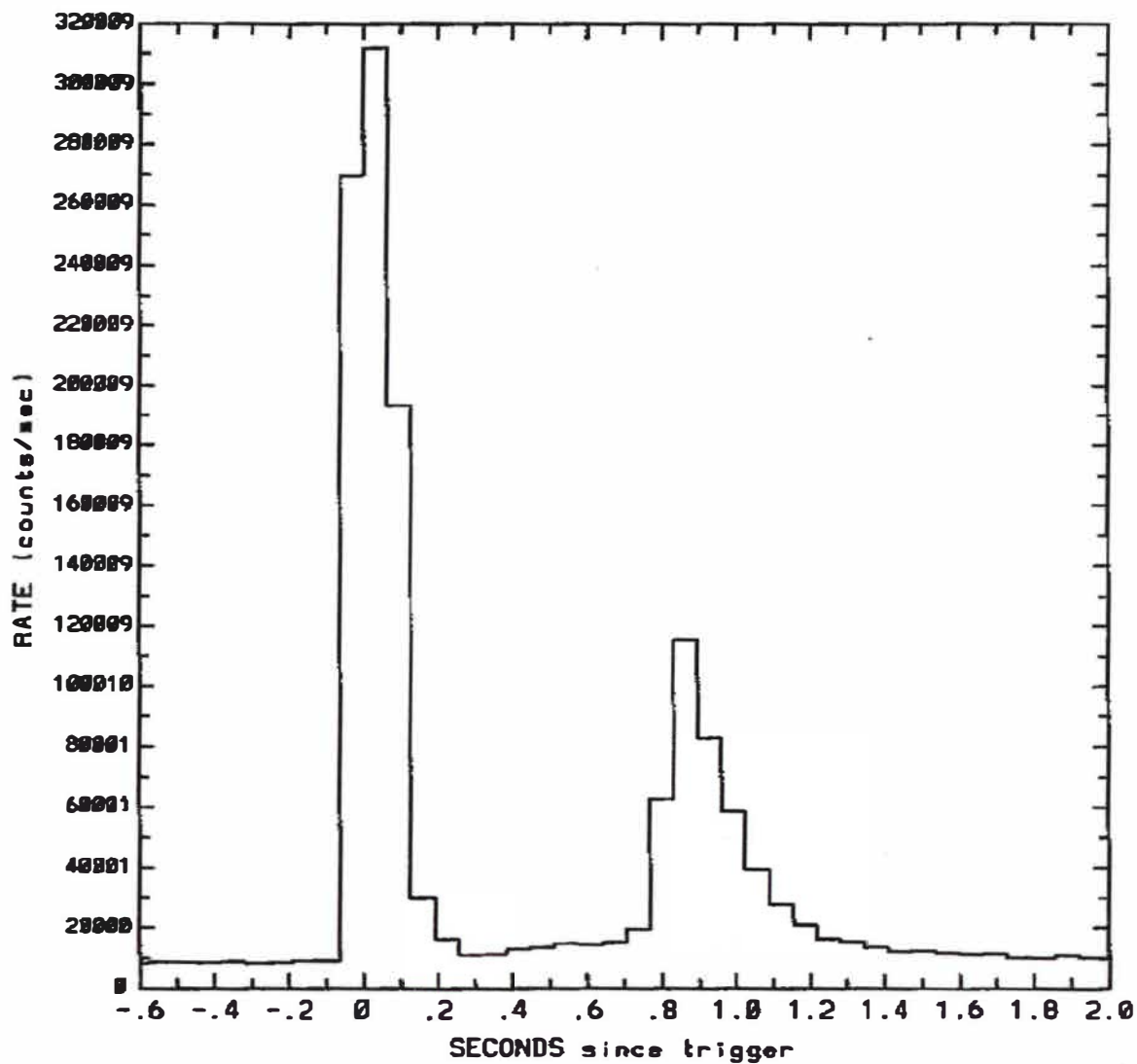
To: D.E. Page

Subject: ULS / HUS-GRB

Dear Edgar,
attached is a request received from
Mike Sommer.
Since you are closer to the subject
can you please try to get the answer.
You may also wish to close the loop
with Kevin Hurley to avoid duplication.

Best regards, Pete

European Space Agency/ESTEC, P.O. Box 299, 2200 AG Noordwijk
The Netherlands



9-FEB-1993 09:01:59

Created by MOPS 80
(Burst Display)
Version 2.18

Trigger # : 2151

Trigger Time:
9818 / 68231.682

Burst Data Type:
DISCSC

Deadtime
Corrected: N

Background Data
Type: PREB + DISCLA

Minimum Integ. Time:
0.064 seconds

Detectors (7..8):
0011818

Discriminators:
(1, 2)

Quality Mask:
80ISP8

BATSE

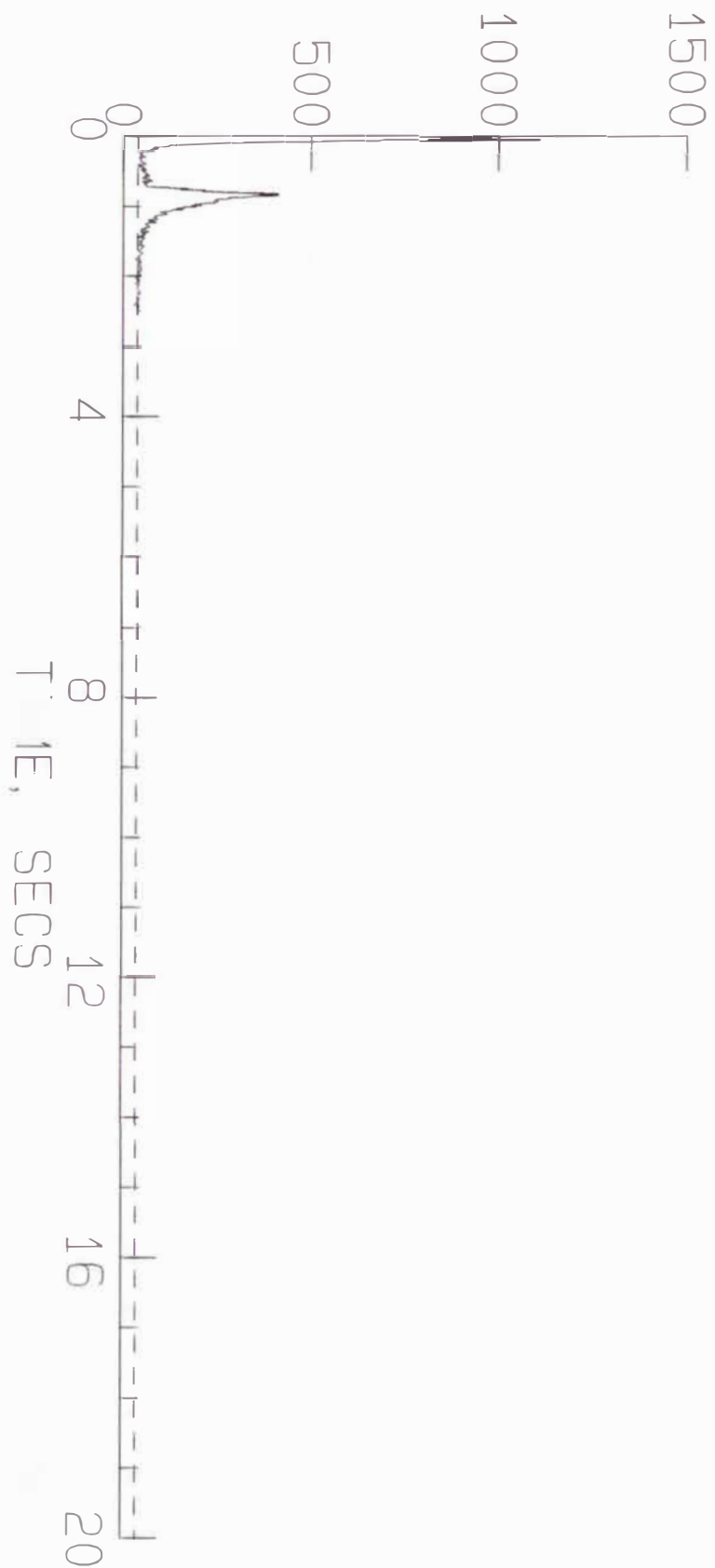
31/01/93

63231.708

30- 50 keV

COUNTS/ .008 S

Note - in the raw data,
there is 1 byte .064 ms
bin prior to 0



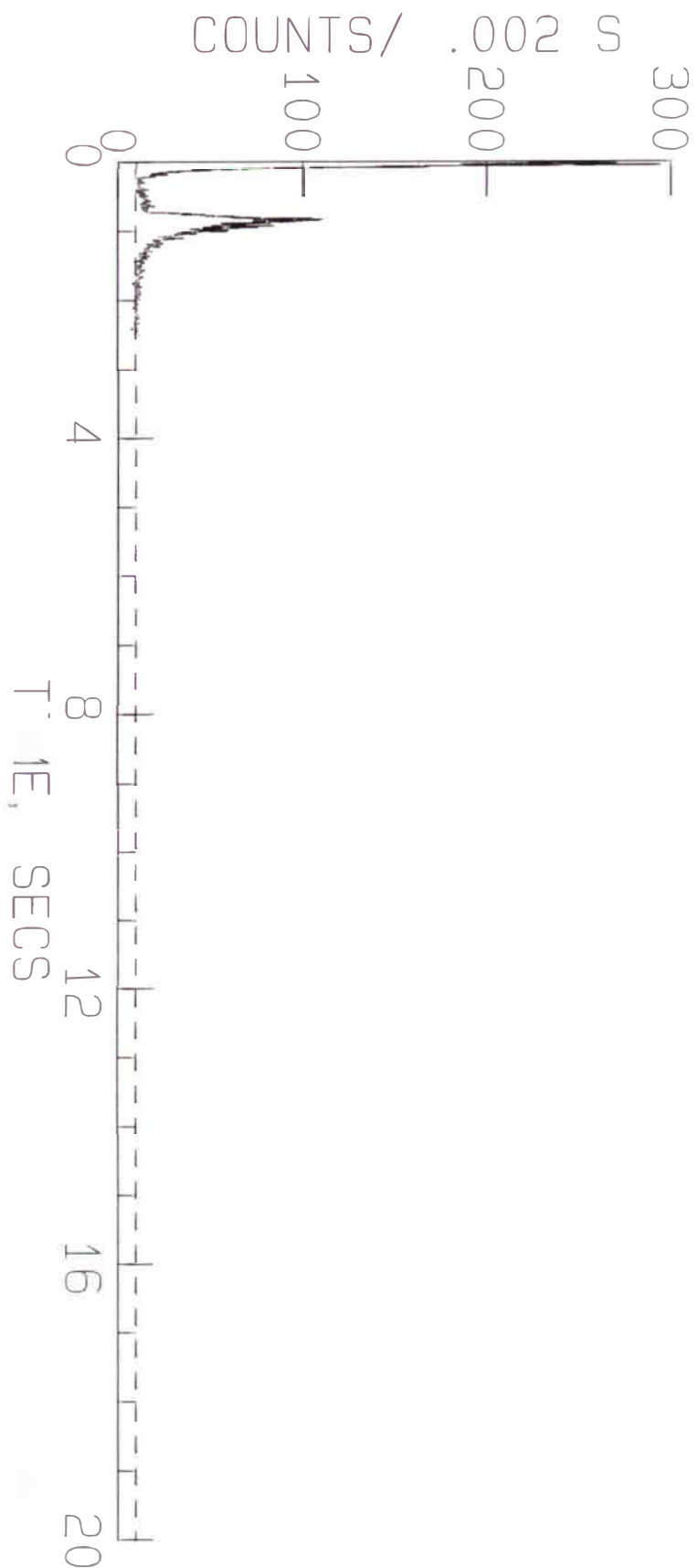
BATSE

31/01/93

68231.708

30- 50 keV

Note - in the raw data,
there is 1 high
bin prior to
.064 ms



BATSE

31/01/93

68231.708

50- 100 keV

COUNTS/ .008 S

3000
2000
1000
0



4

8

12

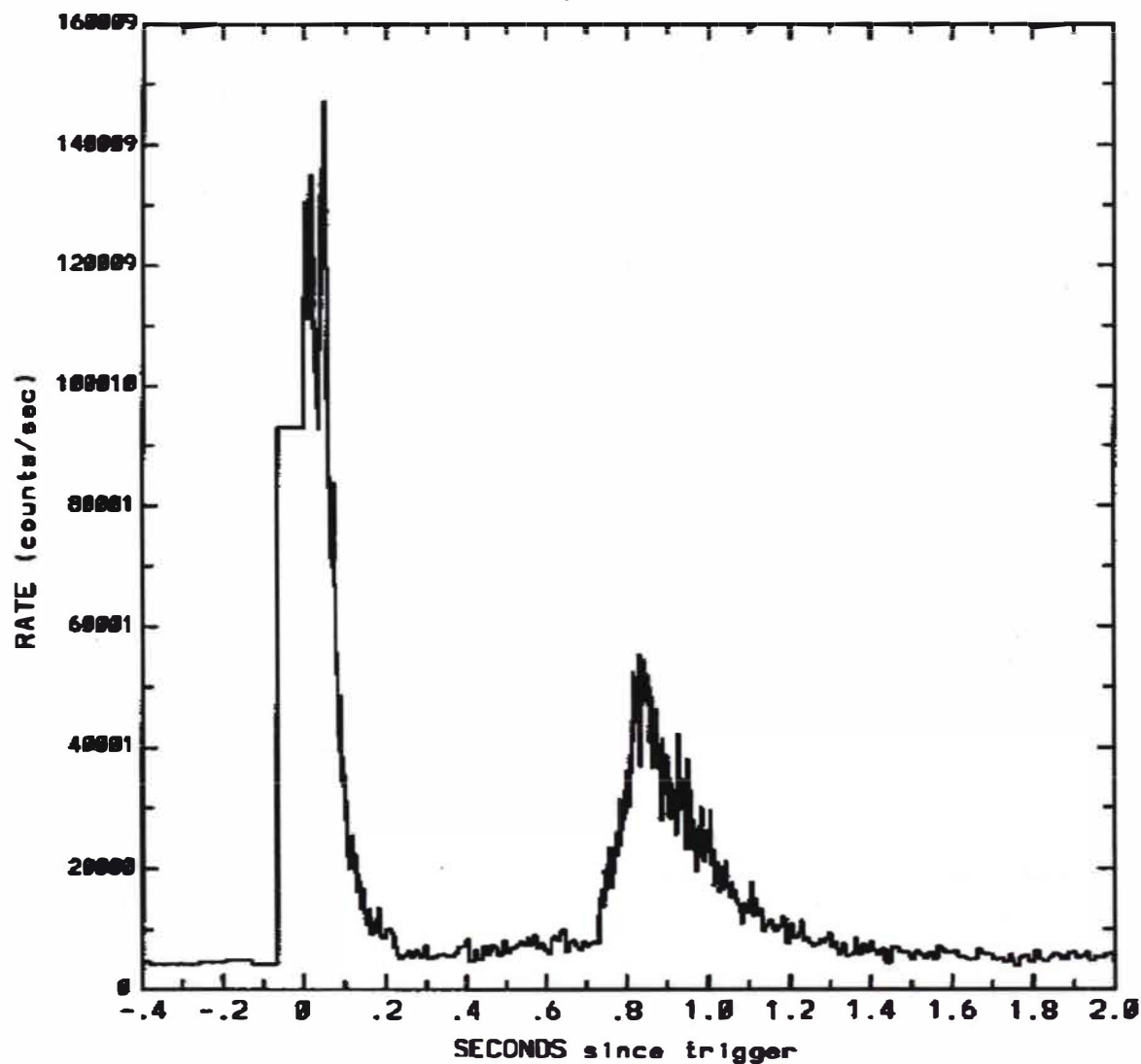
16

20

TIME, SECS

Note - in the raw data,
there is a high .064 us
prior to 0

Data for K. Hurley



19-MAR-1993 16:19:23

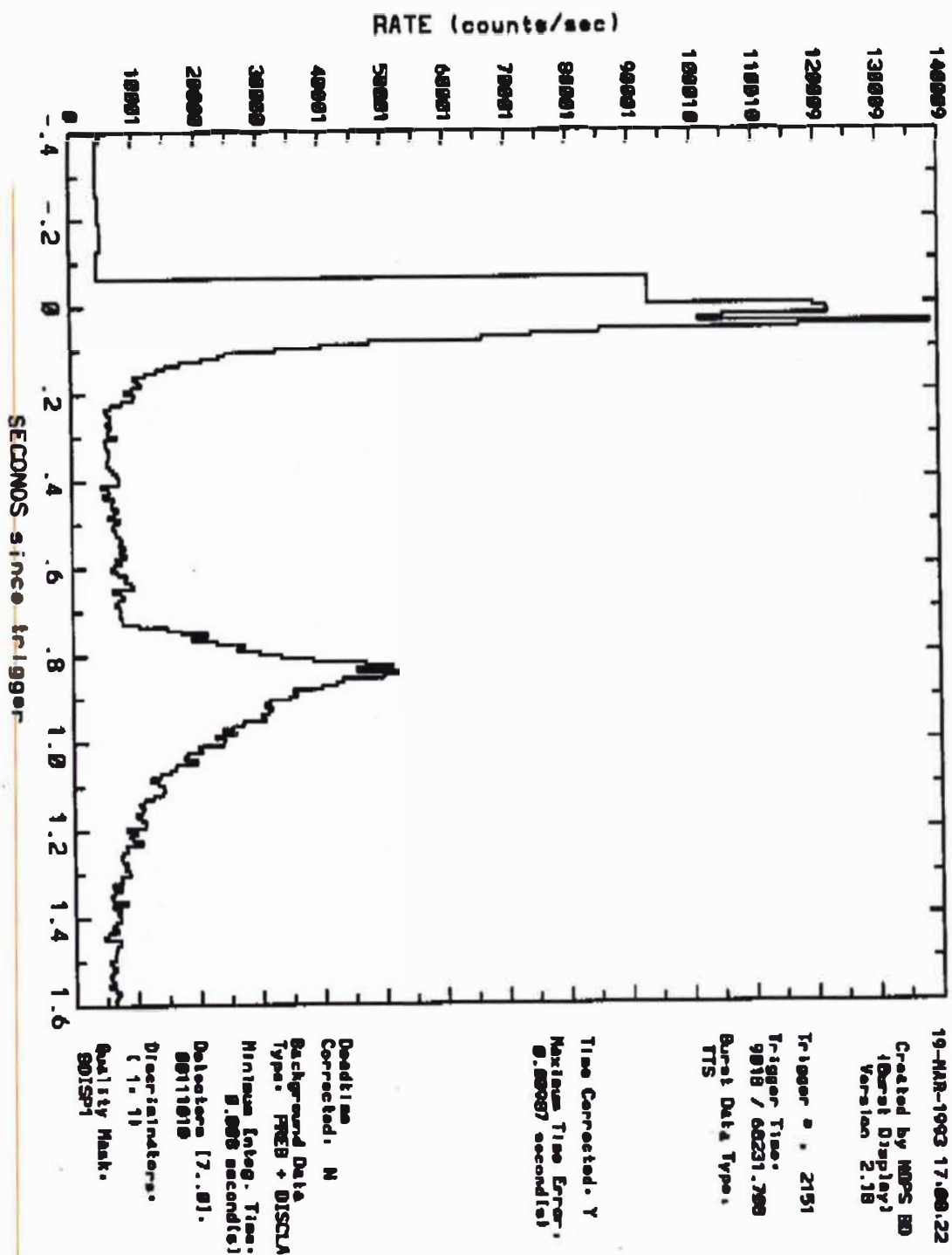
Created by MOPS 80
(Burst Display)
Version 2.18

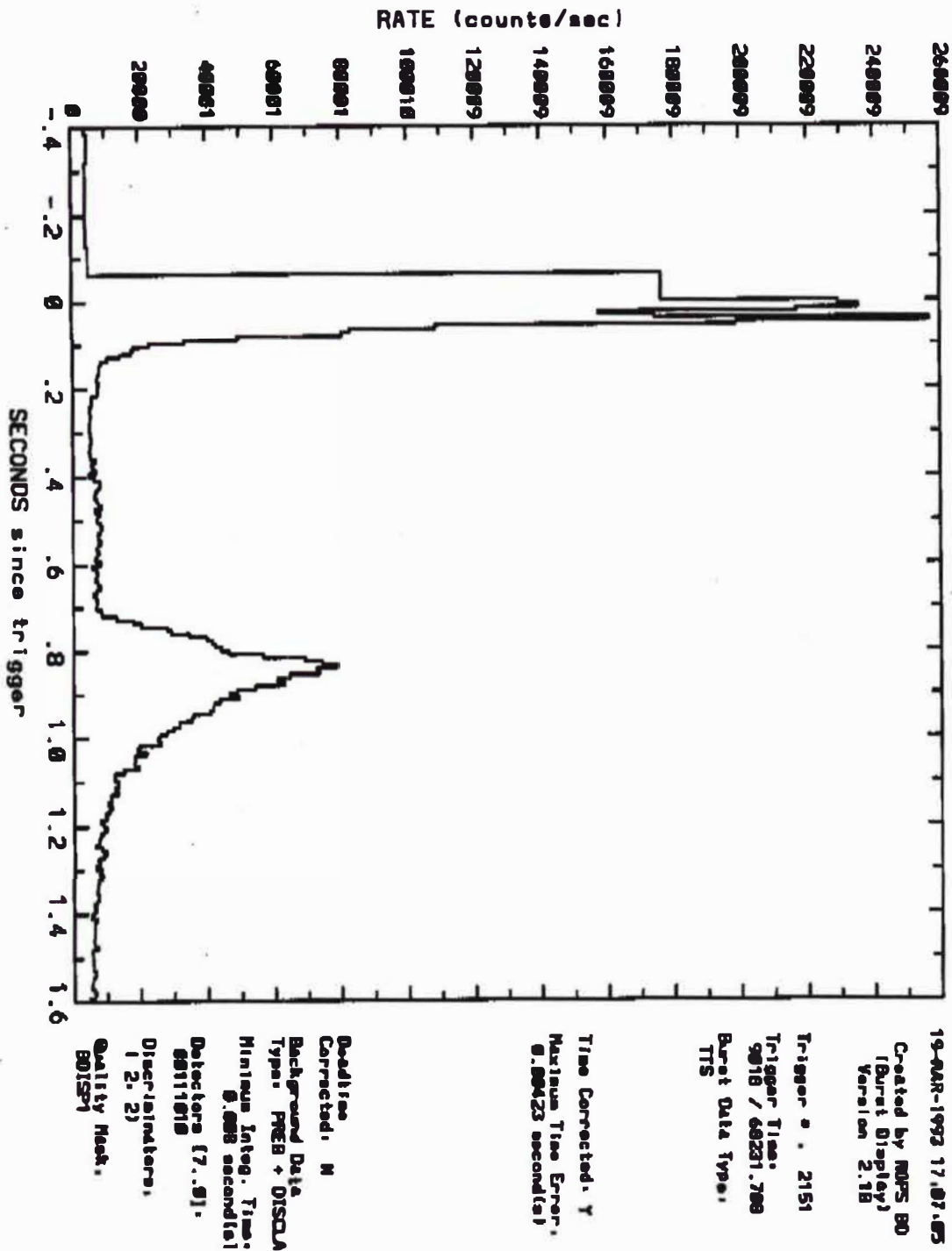
Trigger # : 2151

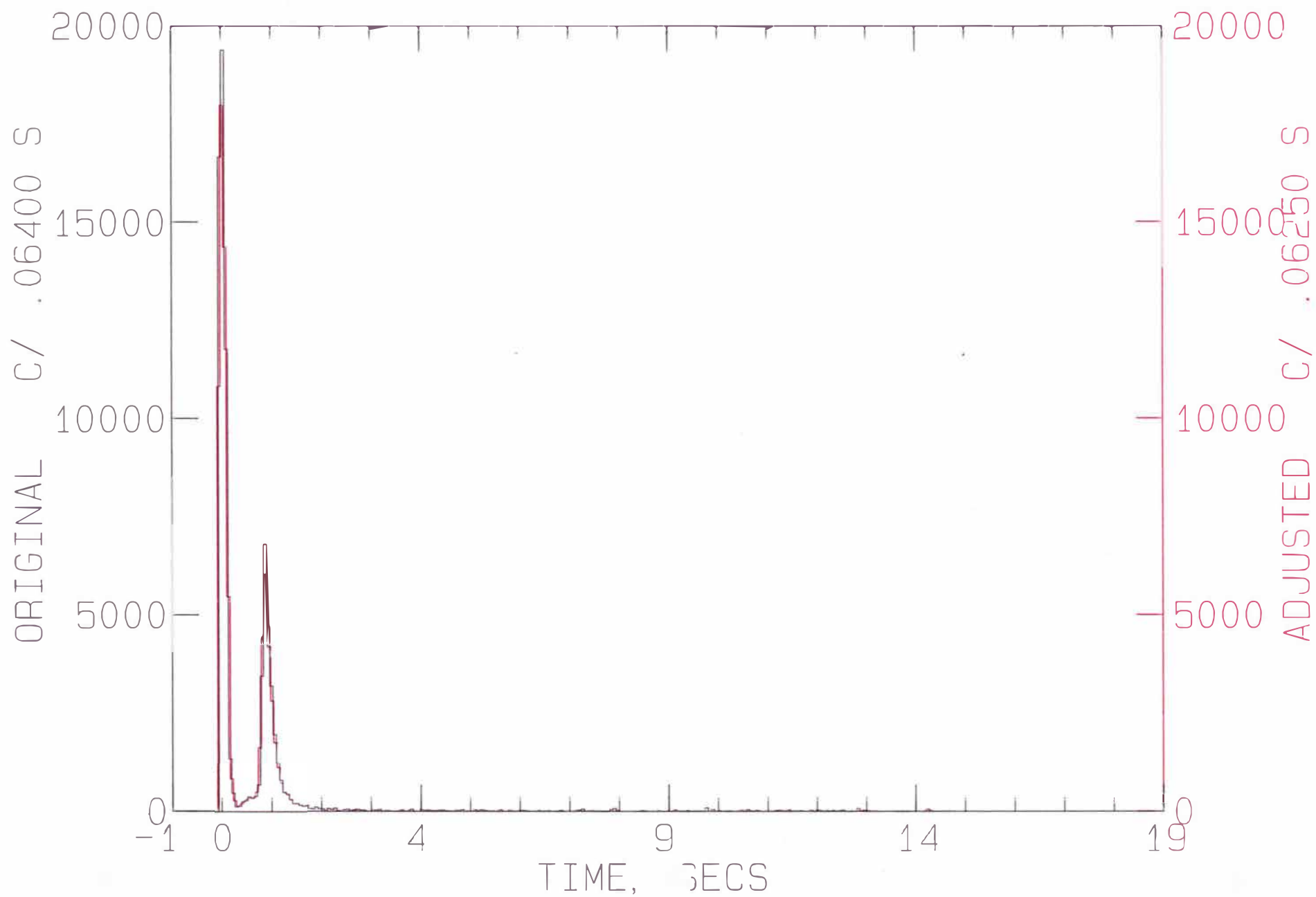
Trigger Time:
9818 / 68231.788Burst Data Type:
TTS (rebinned to 2ms)

Time Corrected: Y

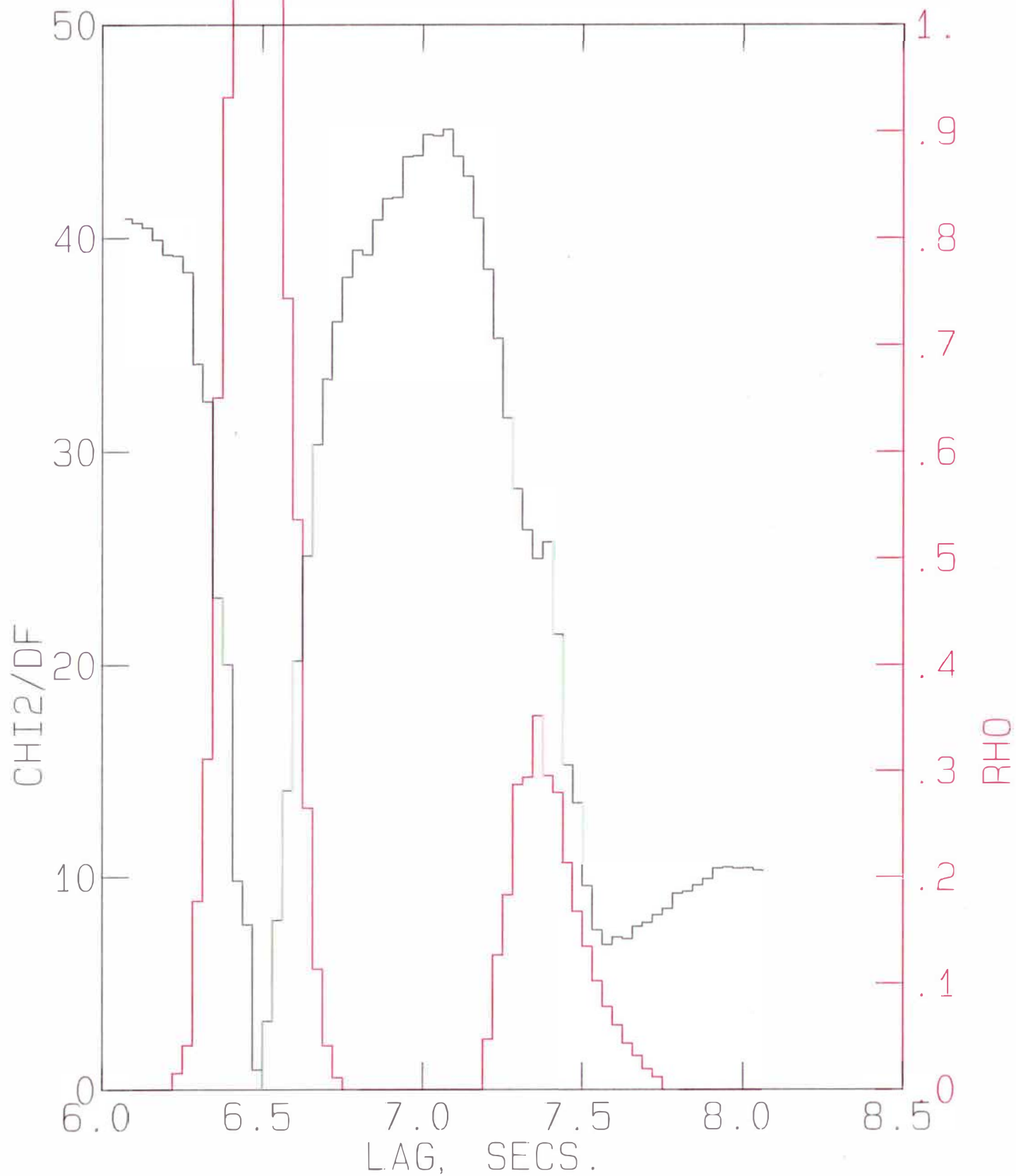
Maximum Time Error:
8.88987 second(s)Deadtime
Corrected: NBackground Data
Type: PRED + DISCLAMinimum Integ. Time:
0.002 second(s)Detectors [7..8]:
00111010Discriminators:
(1 1 1) 30-50 keV onlyQuality Mask:
001SP8







BATSE -ULYSSES CORRELATION 31/ 1/93 15/ 3/93 68231.682



BATSE

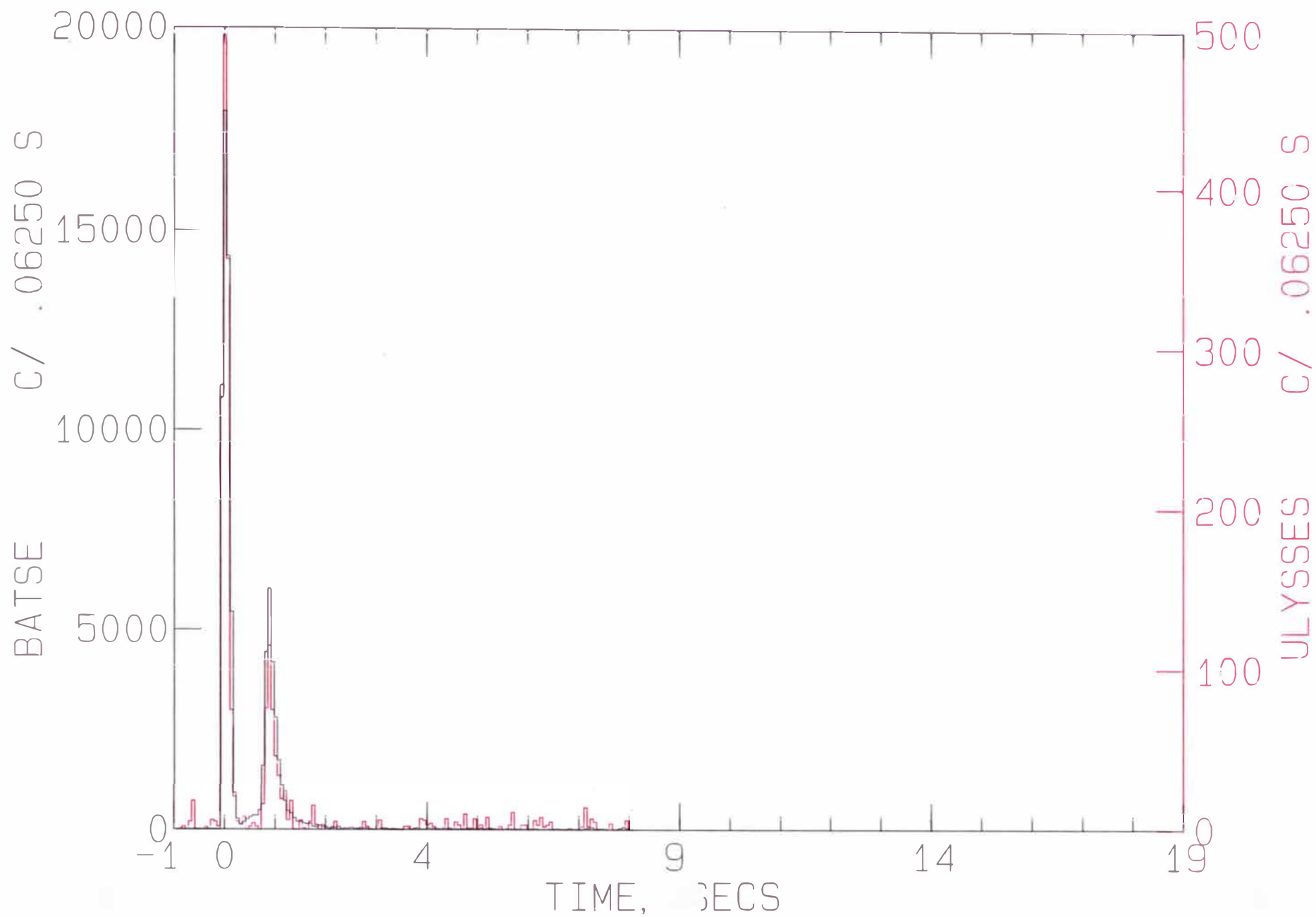
-ULYSSES

CORRELATION

31/ 1/93

68231.682

15/ 3/93



From SCHAEFER@TGRS.GSFC.NASA.GOV Sun Feb 7 12:41:02 1993
Date: Sun, 7 Feb 1993 15:42:58 -0500 (EST)
From: SCHAEFER@TGRS.GSFC.NASA.GOV
Subject: How things are going in Chile
To: khurley@sunspot.ssl.berkeley.edu
X-Vmsmail-To: LHEAVX::BARTHELMY, PALMER, TEEGARDEN, LHEAVX::CLINE, LTP::SCHAEFER, SMTP%"khurley@sur
Content-Length: 3248

Hi;

I am nearing the end of my observing here at CTIO, and I thought that the various interested parties and helpers would be interested in getting a summary of what I have observed and found. I have had six straight nights of clear weather, and so have accomplished all my goals, with one night of IR array time to spare. And tonight promises to be clear too! I have been averaging 4-5 hours of sleep each night, since there is so much to do in the day (flats, preparing, reducing) and there have been no cloudy nights for rest.

I did obtain a Schmidt plate of the GB930131 field with a delay of 35 hours from the burst. The plate was 5.25x5.25 degrees, with the blue sensitive IIAO emulsion (unfiltered), for 30.0 minutes of integration. The plate reaches to almost the limit of the Palomars, hence from 20-21 magnitude deep! The two most relevant corners of the plate are at (J2000) 12h 8m 34s -6d 23' and 12h 9m 3s -11d 29'. Thus, my plate covers the arc from the IPN from COMPTTEL's 3 sigma boundary in the north to about 2.3 sigma in the south. It also covers the EGRET position (along the IPN arc) from many sigma in the north to 1.5 sigma in the south. I have examined the plate by a (tedious) visual comparison with the Palomars. This is a good comparison since the color sensitivities are nearly identical as are the limits. I have examined the entire plate to a limit of roughly 17th magnitude with no 'new stars'. I have also examined a swath 1/3 degree wide around the IPN arc to virtually the plate limit (i.e. to 20th magnitude), and find no 'new stars'. We must now examine this limit for how well it constrains the various echo models.

For my CCD time, I managed to get to use the 2048x2048 chip. This offers a wide (13.3'x13.3') FOV so that mosaics of the smallest new IPN boxes were not needed. The trade off is that there is a huge amount of data generated, which is laborious and slow to handle. So I looked deeply at the MAYDAY box and the GB920311 box. In addition, I continued the staring at the weird red dwarf in the 1944 OT field that has a rabid and variable B/U excess. I'll have this data reduced soon in La Serena.

For my IR array time, the small FOV (roughly 54" square) means that even the MAYDAY box had to be mosaiced with two 3x2 grids. Given this, I cannot go significantly deeper without improvements in the position. This also means that I did not look at any of the other new IPN positions. As for old IPN positions, two (5 March 1979 and 18 April 1979) were small enough to look deeply in with minimal mosaicing. In both of these cases, the previous IR limits were pretty poor (none and K=13), so that current measures can greatly improve the limits. It is getting very embarrassing for the many theorists with extragalactic model, since there are no host galaxies in the boxes. In fact, I believe that these limits rule out the various AGN burst models. I have also looked deeply into the 1928 OT and 1944OT boxes. I have one more night with the IR array, which I will spend on the 1928OT, the N49, the 18 April 1979, and the 1928 OT (depending on what is high through the night).

I leave for La Serena tomorrow, and return to Washington on 16 February.

Cheers,
Brad

From kouveliotou%8868.span@Sdsc.Edu Sat Feb 13 14:28:06 1993
Date: Sat, 13 Feb 93 22:28:19 GMT
From: kouveliotou%8868.span@Sdsc.Edu (Chryssa Kouveliotou NASA/MSFC (205) 544-7711)
Subject: Kevin, could you take care of this ? (updated IPN location)
To: khurley@sunspot.ssl.berkeley.edu
X-St-Vmsmail-To: HURLEY
Content-Length: 2171

From: GROSSC::SHRADER 9-FEB-1993 11:44:08.36
To: lheavx::gehrels, lheavx::bartholemy, batse::fishman, batse::kouveliotou, lheavx::schaefer
CC:
Subj: FWD: Gamma Ray Burst (fwd)

From: SMTP%"starrfie@hydro.la.asu.edu" 9-FEB-1993 10:21:59.63
To: rmw@lowell.edu (R. Mark Wagner), tharriso@nmsu.edu (Tom Harrison at NMSU),
shrader@grossc.gsfc.nasa.gov (Chris Shrader)
CC:
Subj: Gamma Ray Burst (fwd)

From: starrfie@hydro.la.asu.edu (Sumner Starrfield)
Message-Id: <9302091522.AA04499@hydro.la.asu.edu>
Subject: Gamma Ray Burst (fwd)
To: rmw@lowell.edu (R. Mark Wagner), tharriso@nmsu.edu (Tom Harrison at NMSU),
shrader@grossc.gsfc.nasa.gov (Chris Shrader)
Date: Tue, 9 Feb 93 8:22:34 MST
X-Mailer: ELM [version 2.3 PL11]

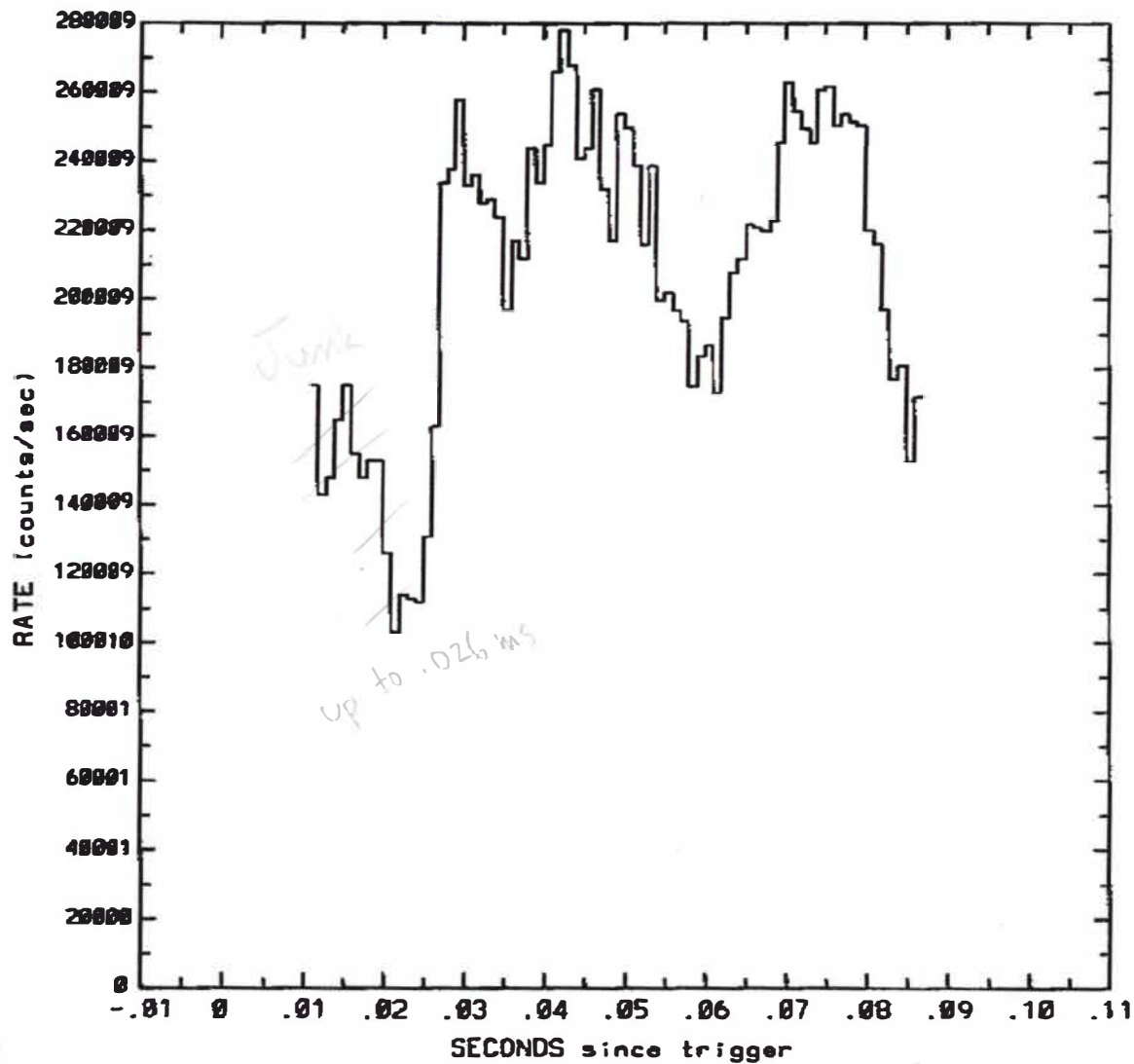
Forwarded message:

>From iiap!tpp@vigyan.ernet.in Tue Feb 9 05:00:20 1993
Date: Tue, 9 Feb 93 16:17:25 EST
From: iiap!tpp@iiap.ernet.in (Dr.T.P.Prabhu)
Message-Id: <9302092117.AA02284@iiap.ernet.in>
To: vigyan!starrfie
Subject: Gamma Ray Burst
Cc: tpp@sangam.ncst.ernet.in, aquila.uni-muenster.de!anupama@vigyan.ernet.in,
vigyan!chipman@grossc.gsfc.nasa.gov

Dear Dr. Starrfield,

Anupama sent me a copy of the report on the GRB source of 31 Jan. I was already at our observatory then where we had received a briefere report from Dr. Manchanda of TIFR bombay. Two of us observed the region from our 1-m and 2.3-m telescopes on 2 Feb 93. The 1-m field is 2 arcmin NS and 3 arcmin EW centred on the coordinates and frames cover BVRI. The 2.3m field extends to an additional 1.5 armin north and 1 arcmin west. It covers R and H-alpha bands. We could identify all stars seen in Palomar charts. There are more opbjects on our R abnd I frames. There is a marginal detection of a source in Halpha band slightly southwest of the coordinbates. We intend to observe the region again during 17/18 Feb by which time we will also have photometrics results from the earlier frames. We are interested in any further information available on this source from other observers and also suggestions on what else we could do to identify it.

Regards,
Tushar Prabhu
K.V.K. Iyengar
tpp@iiap.ernet.in kvki@iiap.ernet.in
9 February 1993



9-FEB-1993 09:08:38

Created by MOPS BD
(Burst Display)
Version 2.18

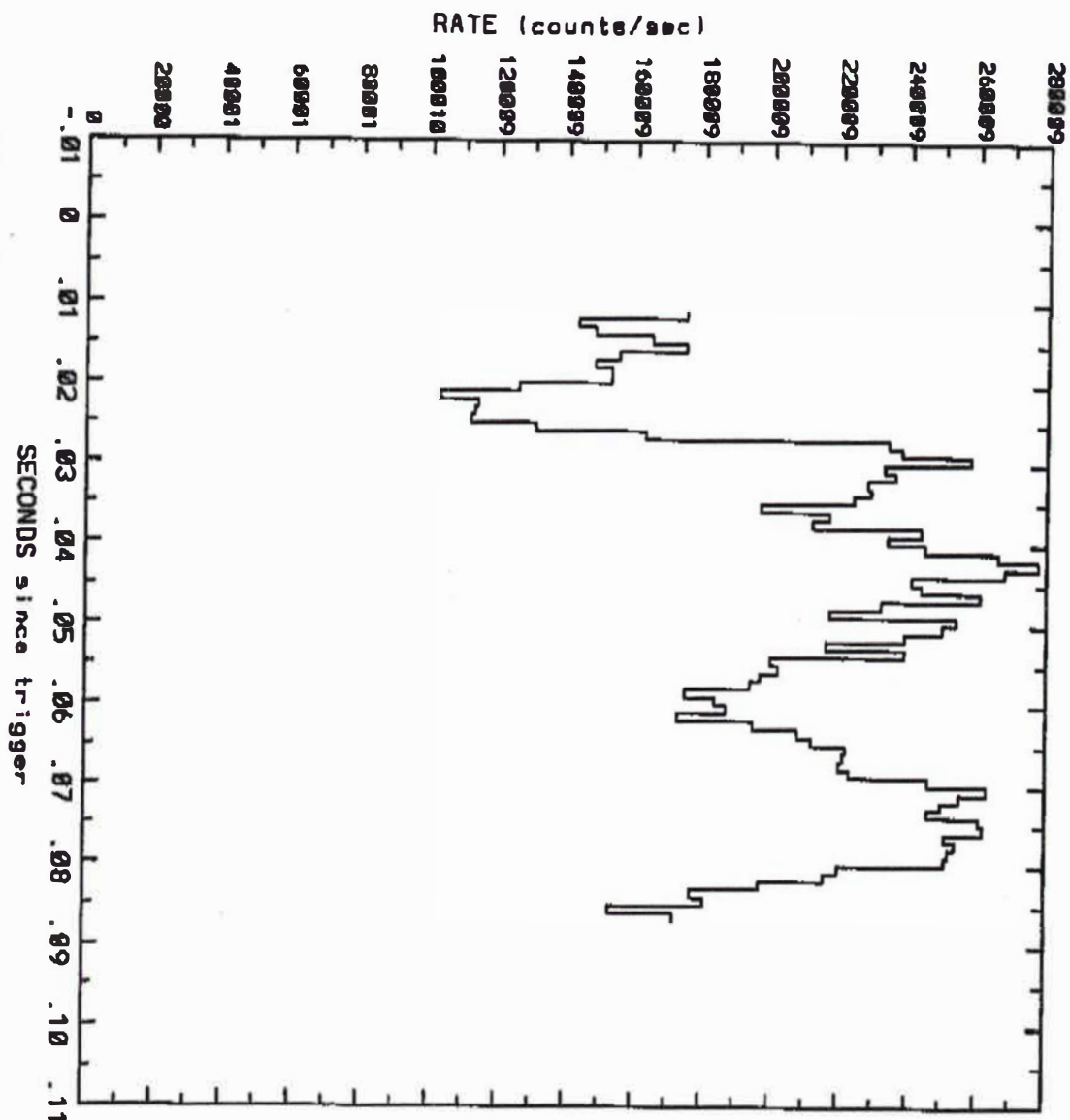
Trigger # : 2151

Trigger Time:
9018 / 68231.700Burst Data Type:
TTE

682

Multiple Events
Ignored: 397Deadtime
Corrected: NBackground Data
Type: DISCLAMinimum Integ. Time:
0.001000 second(s)Detectors (7..0):
0011010Discriminators:
(1, 2)Quality Mask:
BDISP0

4. 6. 1903

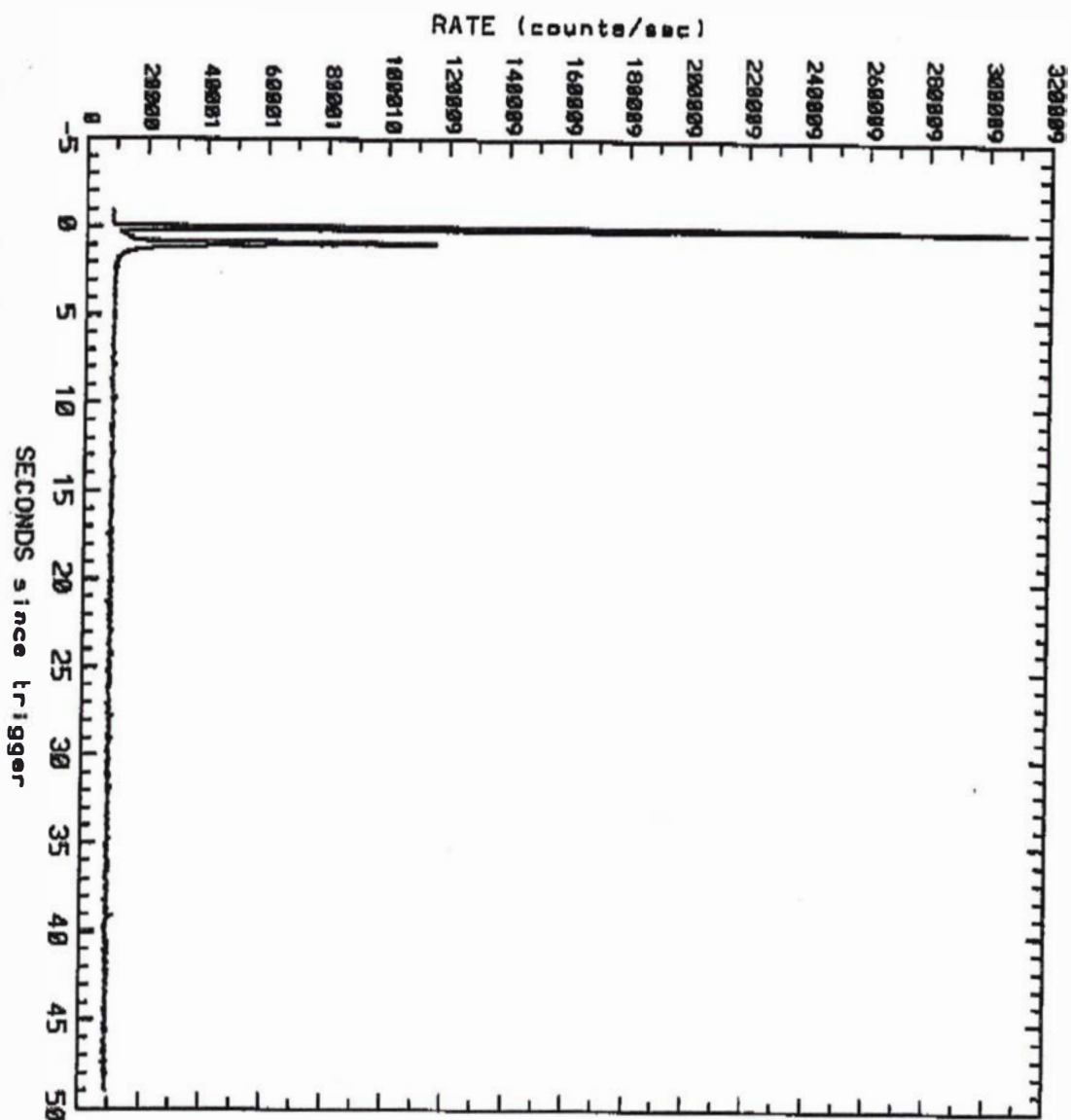


9-FEB-1993 09:08:38

Created by MOPS BD
(Burst Display)
Version 2.18

Trigger = 2151

Trigger Time:
9018 / 68231.700Burst Data Type:
TTEMultiple Events
Ignored. 397Deadtime
Corrected. N
Background Data
Type: DISCLA
Minimum Integ. Time:
0.001000 seconds
Detectors [7..8].
0011010
Discriminators:
1 1. 2)
Quality Mask:
801SP0

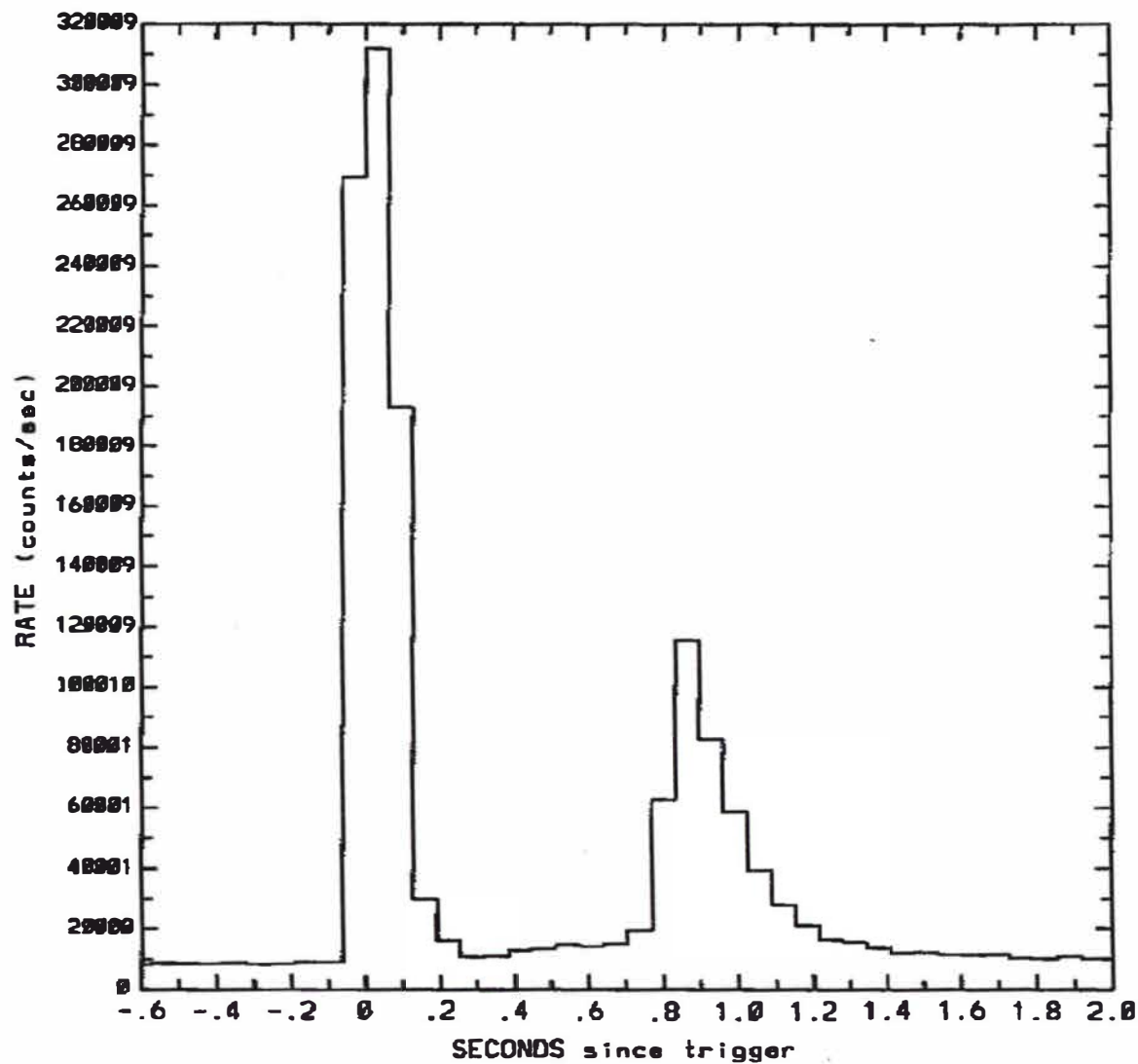


9-FEB-1993 00:59:58

Created by MOPS BD
(Burst Display)
Version 2.78

Trigger # = 2151

Trigger Time:
9818 / 06237.682Burst Data Type:
DISCSCDeadtime
Corrected: NBackground Data
Type: PREB + DISCLAMinimum Integ. Time:
0.064 secondsDetectors [7..0]:
0011010Discriminators:
1 1, 2]Quality Mask:
001SP8



9-FEB-1993 09:01:59

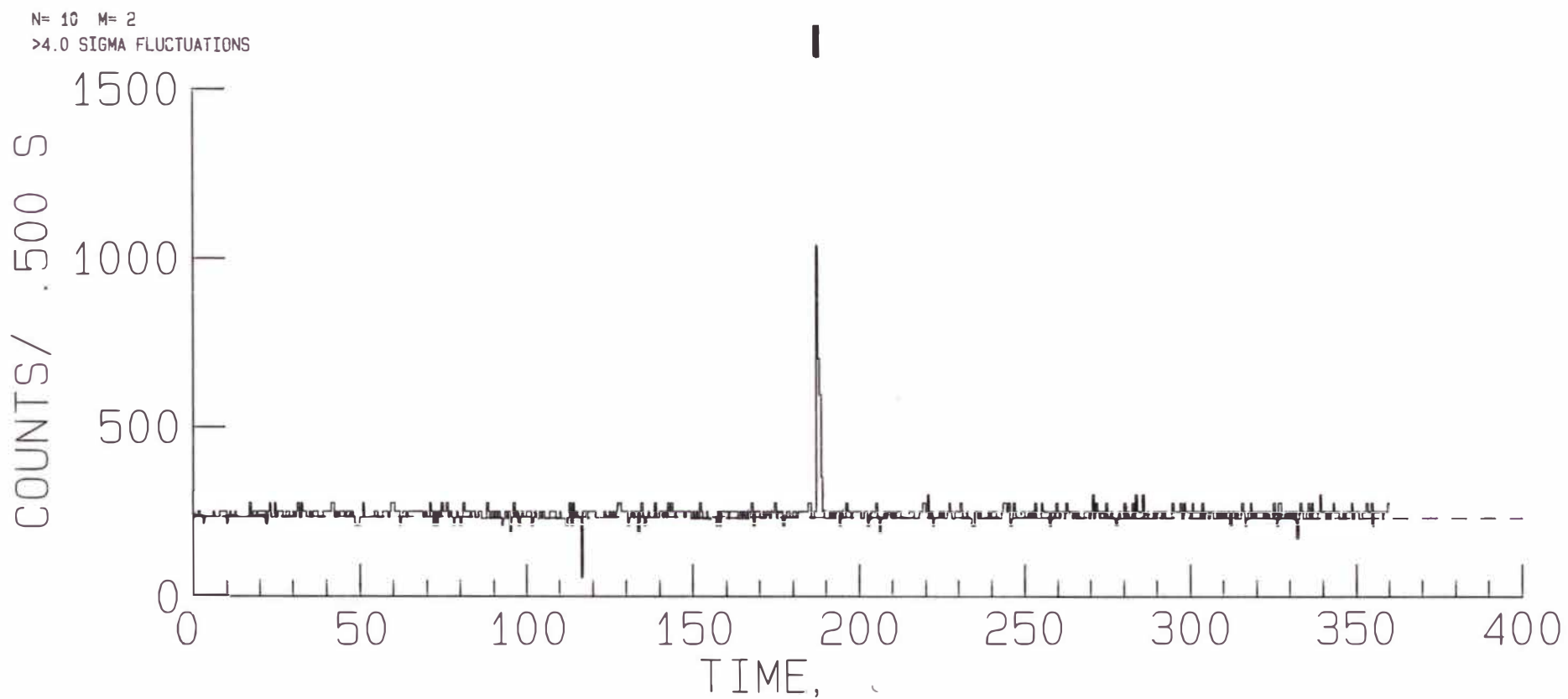
Created by MDPS BD
(Burst Display)
Version 2.18

Trigger #: 2151

Trigger Time:
9018 / 68231.682Burst Data Type:
DISCSCDeadtime
Corrected: NBackground Data
Type: PREB + DISCLAMinimum Integ. Time:
0.064 secondsDetectors [7..8],
0311010Discriminators:
(1, 2)Quality Mask:
BDISP0

17 / 2 / 93

ULYSSES RT
31/ 1/93 66096.102 s
0- 0 keV



BATSE

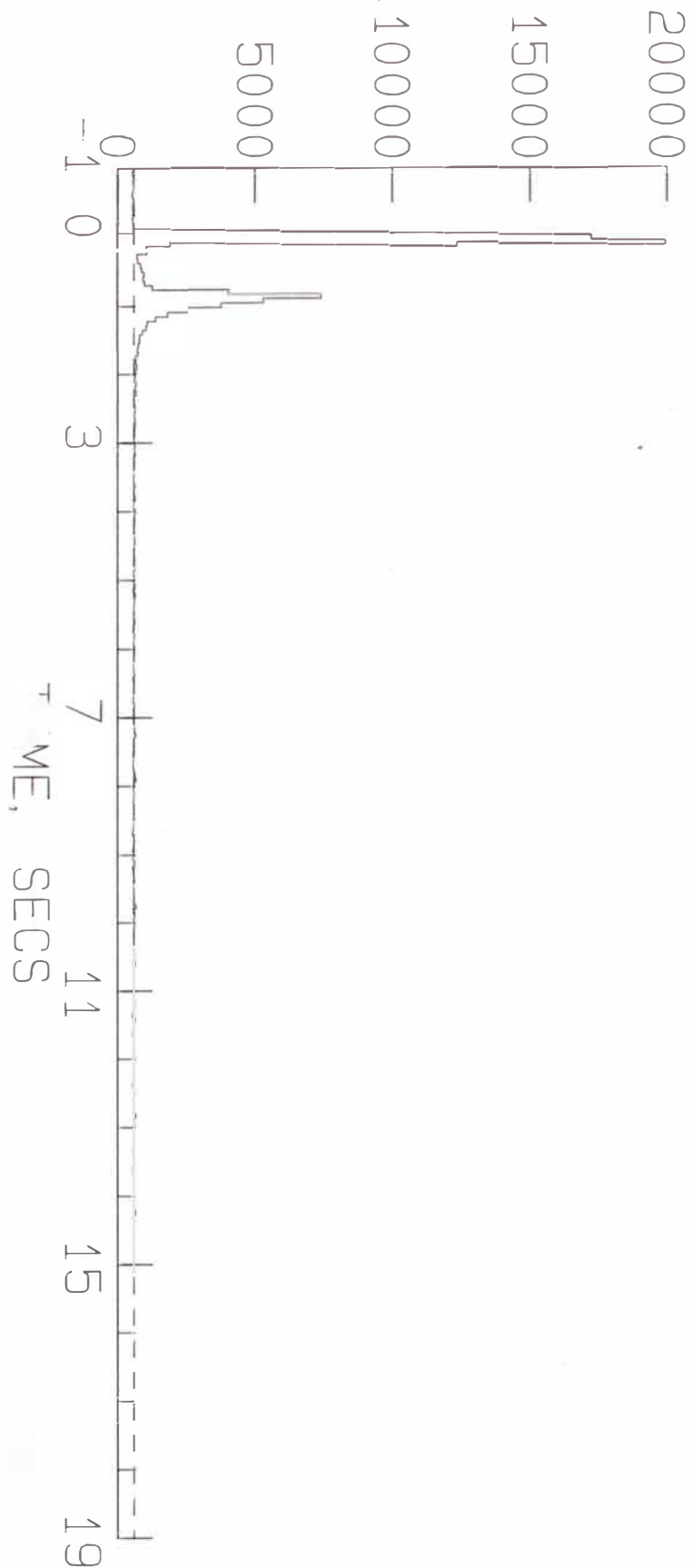
31/01/93

~~68231.682~~

25- 100 keV

JK

COUNTS/ .064 S

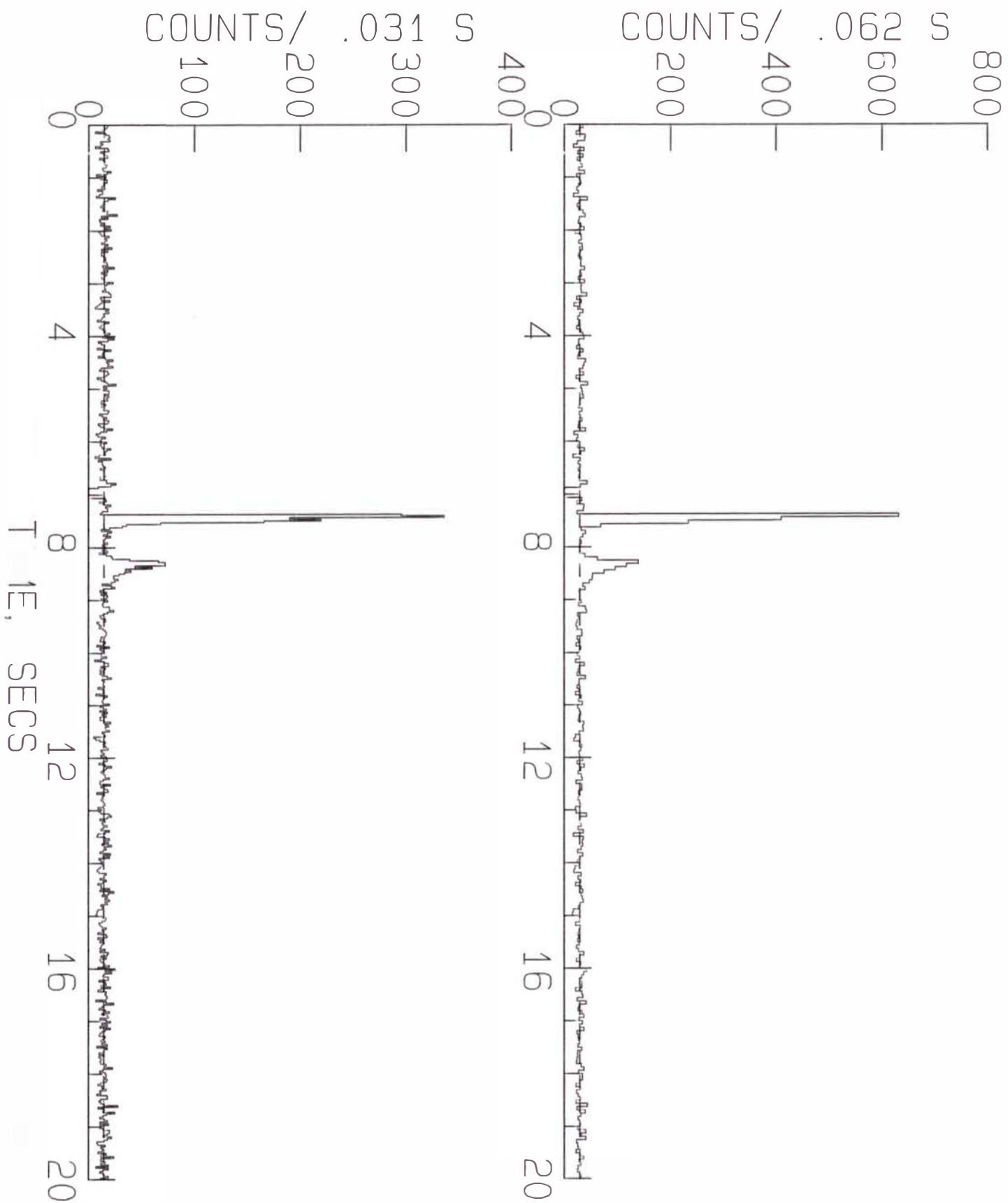


ULYSSES

31/01/93

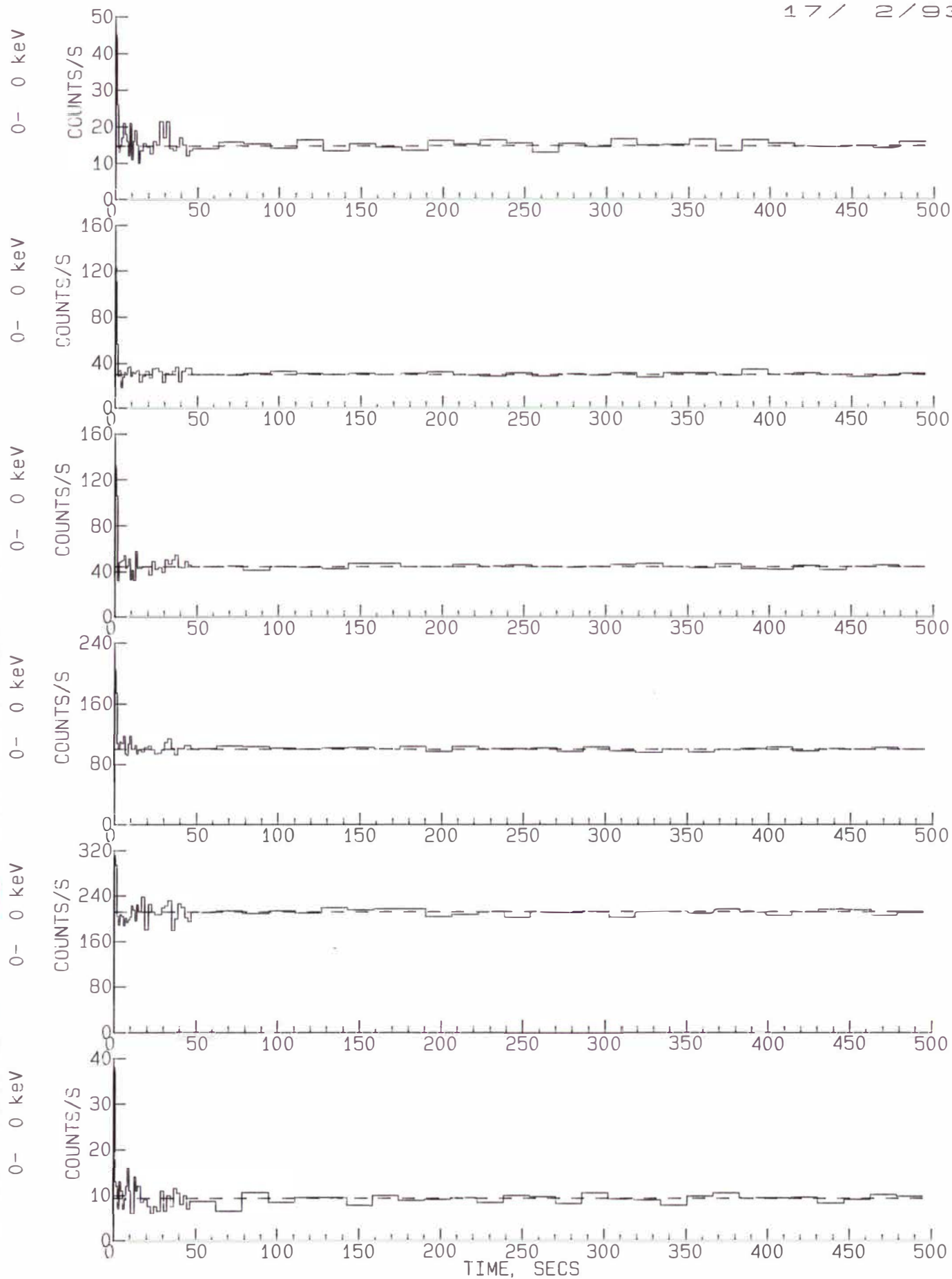
~~66276.156~~

0- 0 keV



BURST SPECTRAL COUNT RATES

ULYSSES 31/01/93

~~66283.534~~

From FICHTEL@lheavx.gsfc.nasa.gov Fri Feb 5 05:43:23 1993
Date: Fri, 5 Feb 1993 8:35:40 -0500 (EST)
From: FICHTEL@lheavx.gsfc.nasa.gov
Subject: January 31 Burst
To: khurley@space6.ssl.berkeley.edu
X-Vmsmail-To: KHURLEY
Content-Length: 430

Dear Kevin:

As you know by now, one finally occurred. We can probably obtain a position to about $2/3$ of a degree (one sigma), but the more exciting news is that we see a few gamma rays with energies higher than any yet seen. We are now working on the TASC spectrum. We shall stay in close touch. I should like to see a paper written quickly; so we shall have to be sure to encourage Mike Sommer. Best wishes, Carl.

From @mitvma.mit.edu:green%cfaps2.span@cfa.bitnet Sat Feb 13 16:18:56 1993
X-Delivery-Notice: SMTP MAIL FROM does not correspond to sender.
Date: Sat, 13 Feb 93 18:45:17 EST
From: green%cfaps2.span@cfa.BITNET@mitvma.mit.edu
Subject: IAUC 5708: alpha Ori; GRB 930131; 2CG 135+01; etc.
To: quaj@cfa.BITNET@mitvma.mit.edu
X-St-Vmsmail-To: ST%QUAJ
Content-Length: 2675

Circular No. 5708

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)

ALPHA ORIONIS

E. Guinan, B. Deeney, and K. Miller report: "Photoelectric photometry being carried out at Villanova University Observatory shows that alpha Ori is undergoing a rapid decrease in brightness. Beginning in 1992 October the star's brightness has decreased about 0.45 mag, to V about +0.87 in early 1993 February. The last time alpha Ori was this faint occurred about 4-4.5 yr ago. We encourage complementary observations over the next few months."

GRB 930131

W. Wenzel and J. Greiner, Sonneberg Observatory, report that they have made blink comparison of pairs of plates taken Feb. 3.2 and 4.2 UT of a 2-degree radius surrounding the gamma-ray burst reported on IAUC 5702. No suspicious object was found down to threshold mag about 15.

2CG 135+01

The Compton Observatory EGRET Team (C. von Montigny, K. Brazier, G. Kanbach, and H. A. Mayer-Hasselwander, Max-Planck-Institut fur Extraterrestrische Physik; D. L. Bertsch, B. L. Dingus, C. E. Fichtel, R. C. Hartman, S. D. Hunter, J. R. Mattox, P. Sreekumar, and D. J. Thompson, Goddard Space Flight Center, NASA; D. A. Kniffen, Hampden-Sydney College; J. Chiang, J. Fierro, Y. C. Lin, P. F. Michelson, and P. L. Nolan, Stanford University; and E. Schneid, Grumman Aerospace Corporation) reports the detection of the COS-B source 2CG 135+01. The EGRET position excludes the quasar 0241+622 from being the counterpart, but is consistent with the variable radio source GT 0236+610 (Gregory et al. 1989, Ap.J. 339, 1054). No flux variation is evident, but the observation (1991 Nov. 28-Dec. 12) does not cover the phase of the radio outburst. Additional EGRET exposure is planned for the period 1993 Feb. 25-Mar. 9, which corresponds to the phase interval 0.26-0.71 of the 26.5-day period. The radio outburst normally occurs at phase 0.5-0.7. Simultaneous observations at other wavelengths would be of interest. Those planning observations should contact Carl Fichtel at fichtel@lheavx.gsfc.nasa.gov.

PERIODIC COMET SCHWASSMANN-WACHMANN 1

Total V CCD magnitude estimates by H. Mikuz, Ljubljana, Slovenia, using 0.2-m cameras: Jan. 25.94 UT, [17.7; Feb. 8.76, 12.8.

From @mitvma.mit.edu:brian%cfaps1.span@cfa.bitnet Fri Feb 5 16:26:43 1993
X-Delivery-Notice: SMTP MAIL FROM does not correspond to sender.
Date: Fri, 5 Feb 93 18:40:10 EST
From: brian%cfaps1.span@cfa.BITNET@mitvma.mit.edu
Subject: IAUC 5707: GRB 930131, RE J0751+14
To: quaj@cfa.BITNET@mitvma.mit.edu
X-St-Vmsmail-To: ST%QUAI,ST%QUAJ,ST%QUAK
Content-Length: 3018

Circular No. 5707

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)

GRB 930131

The Compton Observatory EGRET Team (M. Sommer, K. Brazier, G. Kanbach, H. A. Mayer-Hasselwander and C. von Montigny, Max-Planck-Institut fur Extraterrestrische Physik; D. L. Bertsch, B. L. Dingus, C. E. Fichtel, R. C. Hartman, S. D. Hunter, J. R. Mattox, P. Sreekumar and D. J. Thompson, NASA Goddard Space Flight Center; D. A. Kniffen, Hampden-Sydney College; J. Chiang, J. Fierro, Y. C. Lin, P. F. Michelson and P. L. Nolan, Stanford University; and E. Schneid, Grumman Aerospace Corporation), together with coinvestigator K. Hurley, University of California, report that the EGRET detector on the Gamma Ray Observatory imaged the Jan. 31 gamma-ray burst at energies above 30 MeV. The highest event energies are significantly greater than have been observed in any previous burst. The location is R.A. = 12h11m, Decl. = -10.7 (equinox 2000.0; 68-percent-confidence radius 40'; 95-percent-confidence radius 66'), near the edge of the error box reported on IAUC 5702; see also IAUC 5704.

RE J0751+14

V. Piirola and P. Hakala, University of Helsinki and Vatican Observatory communicate: "We report the discovery of variable circular and linear polarization over the 13.9-min spin period of the intermediate polar RE J0751+14 (R.A. = 7h51m17s.3, Decl. = +14 44'23", equinox 2000.0; $V = 14.1$) from observations with the Nordic 2.5-m telescope on 1992 Oct. 26. The total (peak-to-peak) circular polarization variation was 4.2 $\pm$ 0.6 percent in the I band (830 nm) and 2.2 $\pm$ 0.3 percent in the R band (690 nm), with slightly stronger negative extremes and a faster transition from the negative to the positive values. The linear polarization reached about 2 percent in I and 0.8 percent in R. A preliminary analysis suggests cyclotron emission from two regions near the opposite magnetic poles of the white dwarf and field strength in the range 5-10 MG. The position-angle variability could be tentatively explained with an inclination of the magnetic white dwarf rotation axis 45-70 deg and the two cyclotron-emission regions 35-60 deg from the rotation poles. The intensity modulation was 0.18 mag in I and 0.10 mag in R, with a double-peaked structure, but in the UBV bands the lightcurve was nearly sinusoidal over the spin period, and the amplitude decreased to about 0.07 mag. The UBV power spectra peak at 14.5 min, which could be the beat period corresponding to a binary period of about 5 hr. Further polarimetric, spectroscopic and photometric observations are encouraged."

From CLINE@lheavx.gsfc.nasa.gov Tue Feb 2 06:21:01 1993
Date: Tue, 2 Feb 1993 9:12:58 -0500 (EST)
From: CLINE@lheavx.gsfc.nasa.gov
Subject: Copy of E-mail to Fishman
To: KHURLEY@space6.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"KHURLEY@SPACE6.SSL.BERKELEY.EDU"
Content-Length: 1690

KEVIN:

Since I don't know how to get through to you in Europe, I'm sending you this:

To: SSL::Fishman

Subj: Luck with the big burst.

Enter your message below. Press CTRL/Z when complete, or CTRL/C to quit:

JERRY:

Scott Barthelmy really took off last night when Dave Palmer and he found out about the BIG burst. Using the Comptel presumably 2-degree localization, he and David got time on the VLA last night !! Also, Brad Schaefer was at CTIO in Chile, and the burst's direction was visible at night for 6 hours, so Brad is looking at it also !! Scott also got the Kitt Peak Schmidt telescope to raster scan, at 1/3 degree tile size, the field ALSO !! Hurley is in Europe with the Integral collaboration, and I don't know whether Mars Observer is on, in the burst mode, yet, so the network's results will be somewhat delayed. It may be, if M. O. is not on, that we will only get an annular segment across the Comptel/BATSE fields of view. Whatever. The luck here is fantastic, but the work of Scott Barthelmy, in my opinion, was the SINE QUA NON. - TLC

Time is relevant here, since Schaefer is in Chile for a week or less, so obviously, if we could home in on the direction, we could get Schaefer to have the opportunity for a deeper search. I assume that there is no one in Berkeley to talk to in your absence, so I hope you get this. We will try to find out how to get someone at the ski lift there with you Integral guys. I won't say that the very existence of the Integral meeting in Europe may have killed the one opportunity in history to solve the grb puzzle, along with its various other time, money and manpower black hole features, but I won't say that. - TLC

From CHIPMAN@GROSSC.GSFC.NASA.GOV Fri Feb 5 10:13:06 1993
Date: Fri, 5 Feb 1993 13:12:50 -0500 (EST)
From: CHIPMAN@GROSSC.GSFC.NASA.GOV
Subject: COMPTON OBSERVATORY SCIENCE REPORT FOR FEBRUARY 4, 1993
To: KHURLEY@sunspot.ssl.berkeley.edu
X-Vmsmail-To: SMTP%"KHURLEY@SUNSPOT.SSL.BERKELEY.EDU" ! SENT TO @PICOI
Content-Length: 7330

Compton Observatory Science Report #105
Thursday, February 4, 1993
Eric Chipman, Compton Observatory Science Support Center

Questions or comments can be sent to the Compton SSC. Phone 301/286-7764,
e-mail SPAN GROSSC::CHIPMAN, Internet chipman@grossc.gsfc.nasa.gov.

The Compton spacecraft continues normal operations.
There was a maneuver on Tuesday, February 2, to the attitude of
period 208. The times of the maneuver were from 1433Z to 1443Z. The
maneuver covered an angle of 16.01 degrees. The HGA boom angle with respect
to the celestial equator is now 24.41 degrees.

BATSE

Ulysses detected the intense gamma-ray burst observed on January 31st by
both BATSE and COMPTEL.

During viewing period 208 BATSE folded-on-board pulsar data is being collected
for the Crab Pulsar, PSR0344+54, PSR329+54, PSR0540-693, PSR0628-28,
PSR1813-36 and Her X-1.

As of February 3rd, BATSE has detected 550 cosmic gamma-ray bursts out of a
total of 2054 on-board triggers in 652 days of operation. There have been 595
triggers due to solar flares with emission above 60 keV.

The following information was included in IAU circular 5703, issued
on 3 Feb 1993:

GRB 930131

T. L. Cline, S. Barthelmy, and D. Palmer, Goddard Space Flight
Center, NASA, on behalf of the Ulysses/Compton Interplanetary Net-
work team for the localization of gamma-ray burst sources (K.
Hurley, M. Sommer, M. Boer, and M. Niel for Ulysses; G. Fishman, C.
Kouveliotou, C. Meegan, W. Paciesas, and R. Wilson for CGRO/BATSE),
communicate: "We report the source location of the event of Jan.
31.78972 UT. The source annulus defined by the observations from
Ulysses and Compton Gamma Ray Observatory/BATSE has a radius of
22.253 deg, from a center at R.A. = 10h43m.2, Decl. = -14 18'
(equinox J2000.0). This annulus intersects the CGRO/Comptel source
region (published on IAUC 5702), and provides a ring segment 1'
thick passing through R.A. = 12h13m52s, Decl. = -11 37'.3 and R.A.
= 12h09m08s, Decl. = -7 13'.0, reducing the IAUC 5702 source region
by nearly two orders of magnitude. This is an exceptionally in-
tense burst with an extremely rapid onset, and could be a good can-
didate for study at other wavelengths."

$\alpha = 160.800$ $\delta = -14.300$
= 1950 Ulysses coords

COMPTEL

As announced in IAU Circular 5702 (see below) and a special CGRO science
report earlier this week, a strong cosmic gamma-ray burst was detected
in the field of view of COMPTEL, at an instrumental zenith angle of
approximately 29 degrees, on Sunday, 31 January 1993, TJD 9018.
(To be known hereafter as the "Super Bowl burst" - it was a boring
game, anyway.)

This event was a good test of the rapid response capabilities of the
BATSE and COMPTEL teams to bursts occurring within COMPTEL's field of

view, and the rapid determination of their location for "real-time" counterpart searches. Within approximately six hours of the BATSE trigger on this event, the COMPTEL real-time data were processed, and an "image" of the burst obtained.

Preliminary information on the location of this burst, derived from the COMPTEL data, is given in an IAU Circular, copied below.

A number of ground-based observatories have pursued rapid follow-up observations of this field for possible counterparts at other wavelengths.

This exercise demonstrates the practical feasibility of locating gamma-ray bursts fortuitously occurring within COMPTEL's field of view in "near-real time."

IAU Circular Announcement (IAUC 5702):

GRB 930131

J. Ryan, M. Kippen, and M. Varendorff, University of New Hampshire, report on behalf of the Compton Telescope (COMPTEL)/Compton Observatory Team:

"The COMPTEL team has imaged a gamma ray burst at energies > 0.72 MeV which took place on 31 January 1993 at 18:57:11 UT. This event was recorded by the BATSE experiment and was noted as being one of the most intense bursts yet observed by BATSE. The burst exhibited two short peaks in intensity, spanning a period of just over one second. The COMPTEL analysis (which incorporated a total of 41 events) has resulted in a 1-sigma source location error box whose corners are located at the following positions (equinox 2000.0)

RA = 12h 13.0m	Decl. = -7 33'
RA = 12h 23.0m	Decl. = -7 37'
RA = 12h 22.6m	Decl. = -10 26'
RA = 12h 12.6m	Decl. = -10 19'

This error box is roughly 3 degrees on a side and is centered at approximately R.A. = 12h 17.8m, Decl. = -8 59' (equinox 2000.0).

WE ARE SOLICITING COLLABORATORS TO OBSERVE THE REGION WITH LARGE FIELD-OF-VIEW OR RASTERING INSTRUMENTS IN AN EFFORT TO IDENTIFY A COUNTERPART AT OTHER WAVELENGTHS.

The effort is being coordinated by Dr. Bernie McNamara at New Mexico State University (bmcnamar@nmsu.edu, 505-646-2614) and Dr Jim Ryan at the University of New Hampshire (jryan@unh.edu, 603-862-3510).

EGRET

EGRET operations were normal this week. The review of the two weeks of test data delivered to the Compton Observatory Science Support Center is complete, and data will now be transferred to the Center on the agreed schedule. Data reduction and analysis in Phase 2 continues on schedule, and we plan to be able to deliver the standard Phase 2 guest observer products to the appropriate guests on the promised plan of about three months after the end of the observation period.

The lead article in the News and Views section of Nature this week, written by the editor in chief, was on the EGRET paper that appeared in the Physical Review Letters describing the SMC result (Vol 70, p127-129, 11 Jan 1993). The EGRET measurements settled the question of whether cosmic rays are galactic or metagalactic in favor of their being galactic.

GRB 930131:

The Compton Observatory EGRET Team (M. Sommer, K. Brazier, G. Kanbach, H.A. Mayer-Hasselwander, C. von Montigny, Max-Planck Institut fur

Extraterrestrische Physik; D.L. Bertsch, B.L. Dingus, C.E. Fichtel, R.C. Hartman, S.D. Hunter, J.R. Mattox, P. Sreekumar, and D.J. Thompson, Goddard Space Flight Center, NASA; D.A. Kniffen, Hampden-Sydney College; J. Chiang, J. Fierro, Y.C. Lin, P.F. Michelson, and P.L. Nolan, Stanford University; and E. Schneid, Grumman Aerospace Corporation) together with co-investigator K. Hurley, University of California, report that the EGRET detector on the Gamma Ray Observatory imaged the gamma ray burst that occurred on Jan 31.78971 UT at energies above 30 MeV. The highest event energies are significantly greater than have been observed in any previous burst. The location is J2000 R.A. = 12h11m and Decl = -10.7 with a 68% confidence radius of 40' and a 95% confidence radius of 66'. This position is near the edge of the error box reported by the COMPTEL Team in IAU Circular 5702.

OSSE

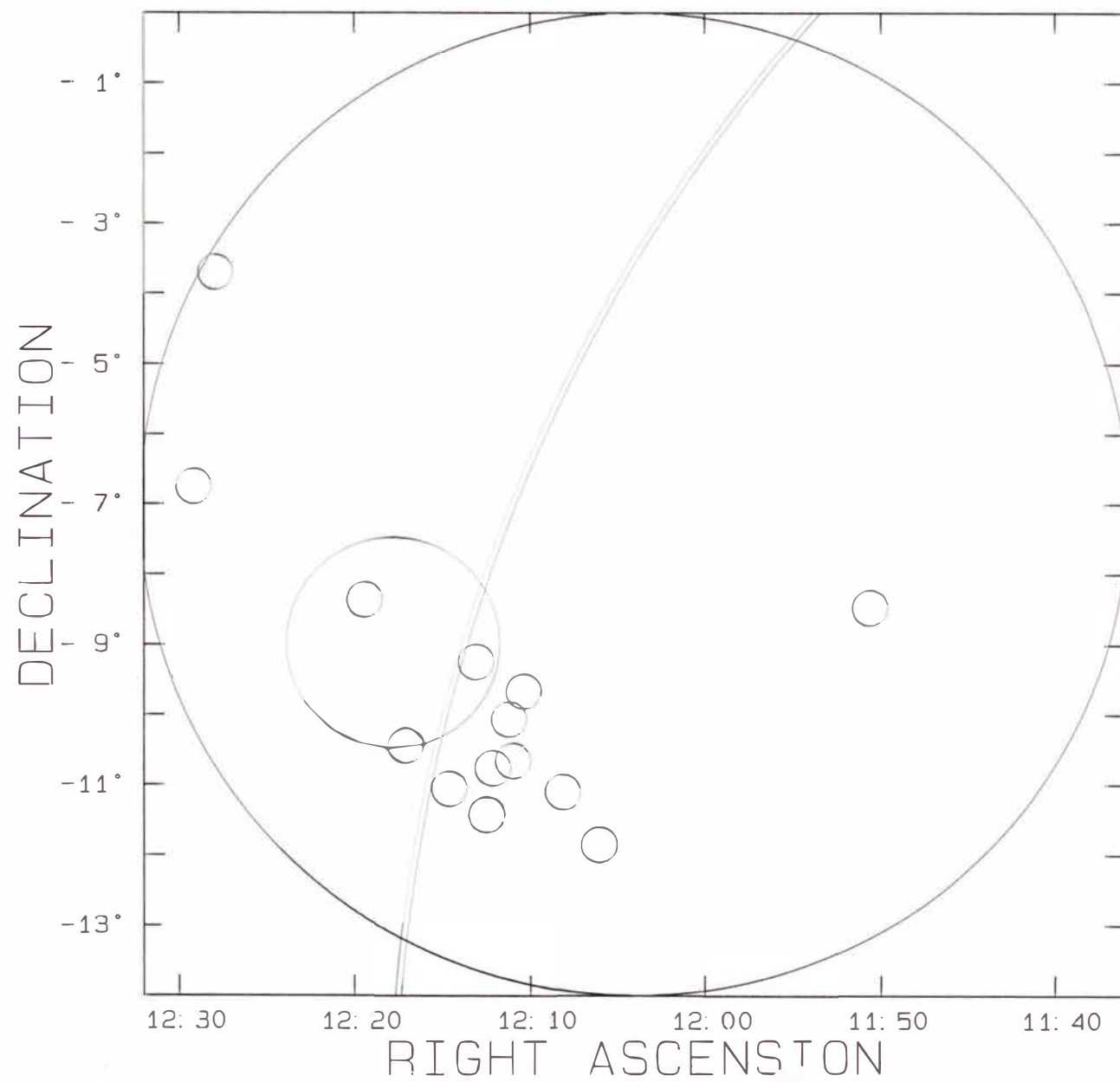
OSSE operations continue to be normal.

During the one week of viewing period 208, the Z-axis target is NGC 4507 (GI: L. Bassani) and the X-axis target is NGC 6814 (PI team). These two targets will be paired again in viewing period 228 for one week.

The Sun is not accessible along the OSSE scan plane during viewing period 208, so the slewing response is disabled.

GRB 930131, the very intense burst detected by BATSE and imaged by COMPTEL (IAUC 5702), was also detected in the OSSE shield segments. It reached a peak intensity of >35,000 counts per 16 ms above ~100 keV.

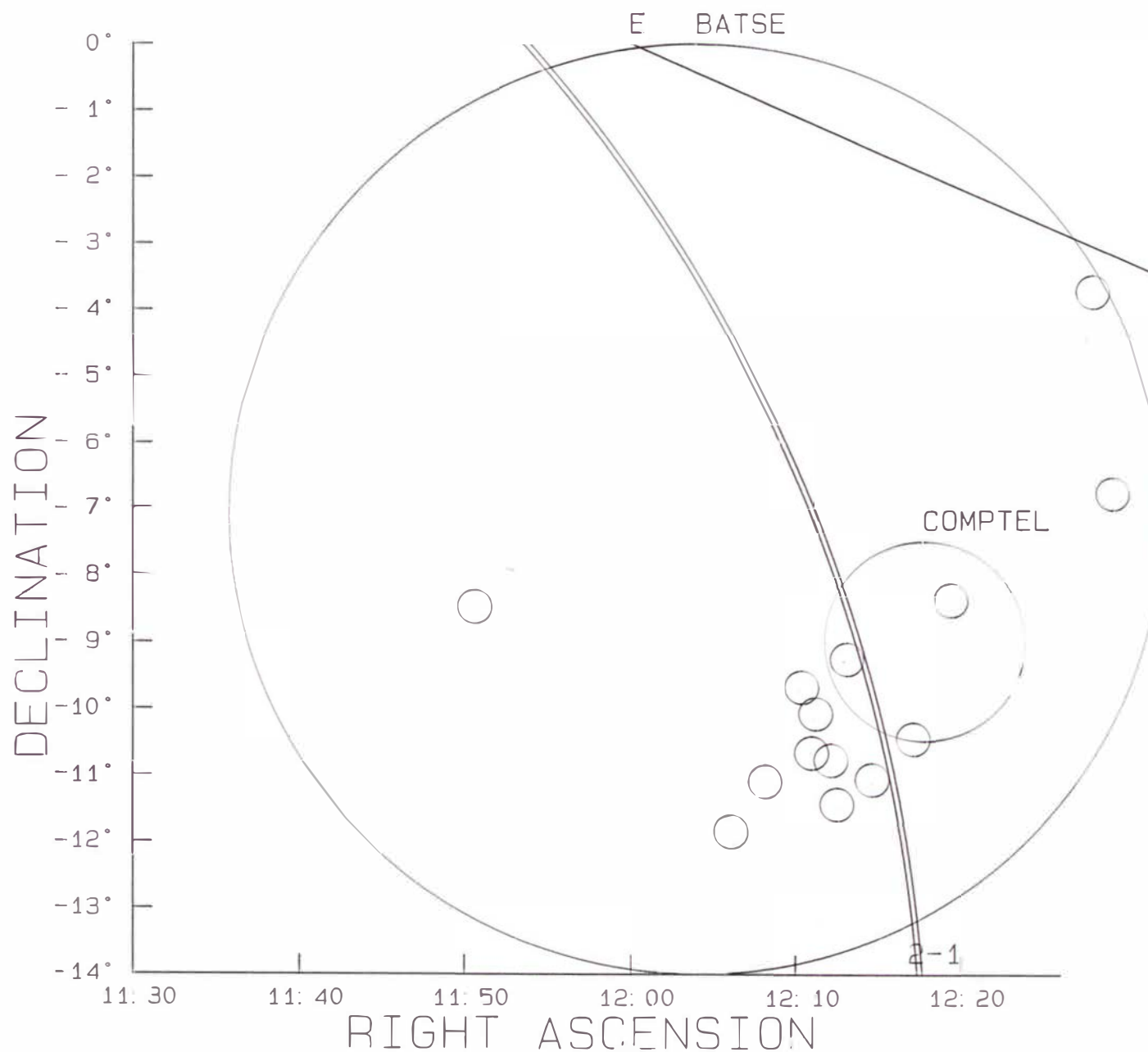
JAN 31, 1993 18: 24



EVENT OF JAN 31, 1993 18: 24

17/ 2/93

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



BATSE

31/01/93

68231.708

25- 100 keV

COUNTS/S TTS

50000



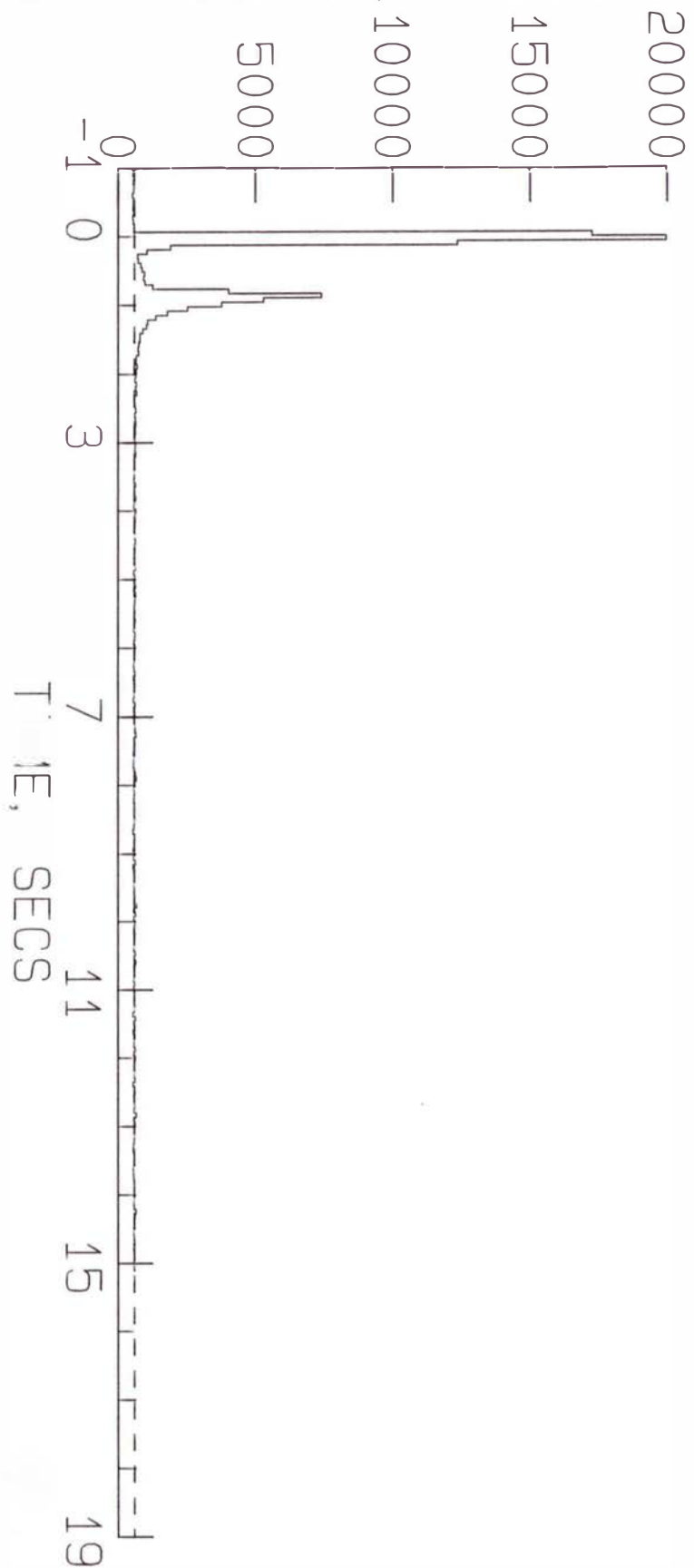
BATSE

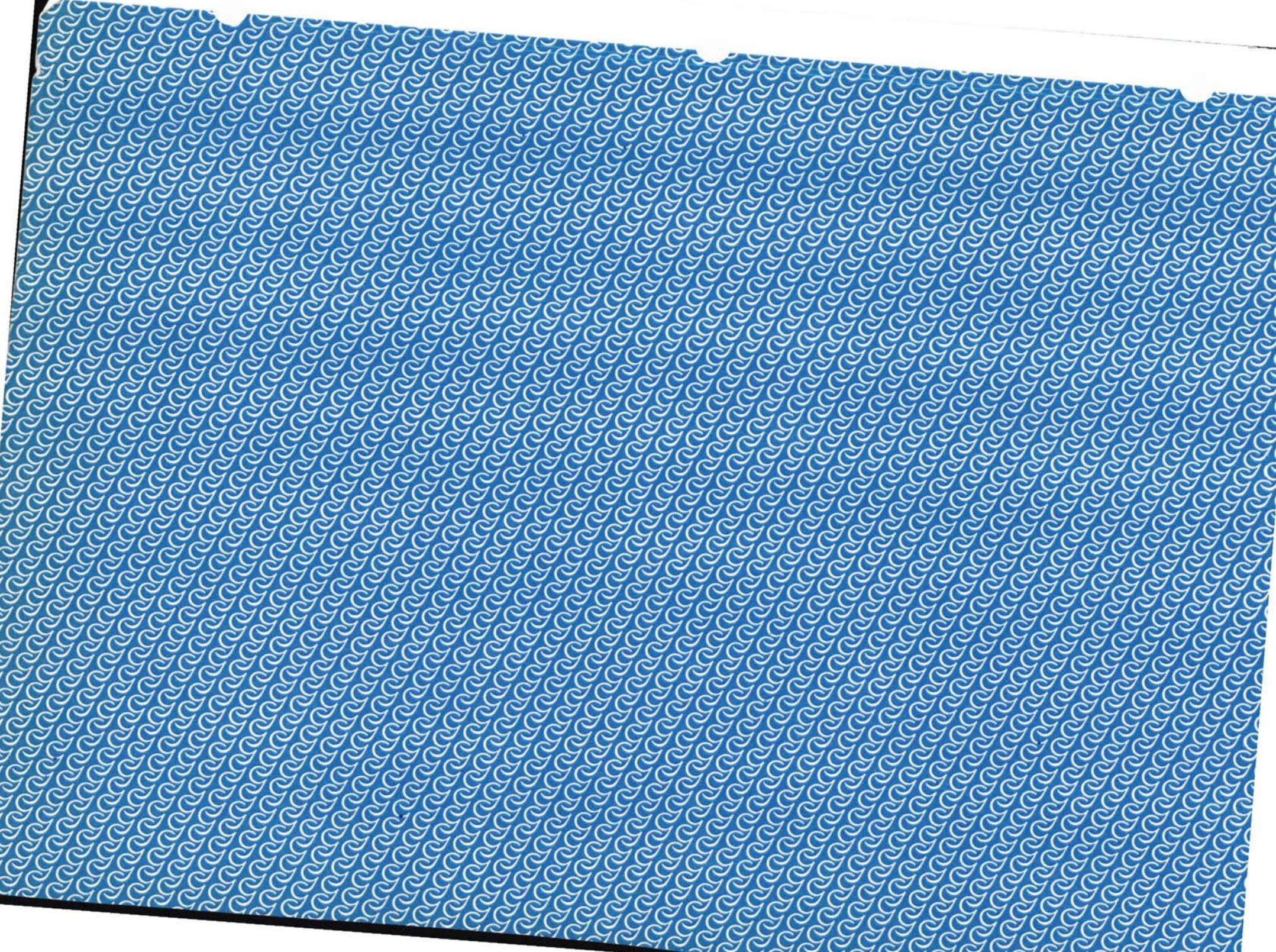
31/01/93

68231.682

25- 100 keV

COUNTS/ .064 S





Fax to

**Dr. Kevin Hurley
Eurotel
Les Diablerets
Switzerland
(41) 026 5323 71**

KEVIN:

The crusade is over, for this one, for now.

Jake Trombka and Bill Boynton hopped onto the Mars Observer data in real time at a Mars Observer meeting in Arizona where totally everybody who was anybody on M. O. was present (including John Laros, whom they appeared to ignore, or at least to be indifferent towards). They discovered, to their dismay, what with the testing and fussing about on the spacecraft, that although the burst mode had been ON up to the previous day, it was OFF during only some tens of hours prior to and beyond the time of the event.

The anti-beauty of this is that the meeting had been disrupted to some extent to allow focussing on this exciting possibility, for nothing. The beauty of this incident may yet be that Bill Boynton (the Proj. Sci. or whatever), and the other planetary specialists (as distinct from Trombka or Gls such as Laros), might have become somewhat more aware of a general interest in gamma ray bursts, and perhaps may less tempted to 'sweep them under the rug.'

TLC



Fax to
Dr. Kevin Hurley
Integral Ski Lodge
Switzerland
025 5323 71

KEVIN:

So far, so good. Your assistant gave me the orbit predict but he had no idea how close to reality it is, with a systematic error estimate. He also didn't speculate as to how or when the true orbit data will be available. You and I know better than anyone: It isn't a question of the location of the center of the source region but the estimates of the uncertainty-widths that gives it the name 'error box.' I will put out an IAU telegram with an annulus of ± 2 arc minutes width.

Your Ulysses time history fax shows the first big peak 7.4 seconds past the labeled zero of time; the time listed at the top of the picture is 66263.534. The E-mailed data, on the other hand, giving a time for each 31.25-ms data bin, show that time (66263.534) as the onset of the big peak, at 7.375 seconds after the start of the data. Here we go again. I have assumed that the only contradiction is in the labelling of the time history fax; I assume that the trigger at the intensity rise, which took place 7.3etc seconds after prehistory onset, is the listed time since that is what is shown in the listing.

Our present conflict is what to do about Comptel, since the source region intersection of their source with the annulus would be the basis for our best IAU telegram. The politics of this could be a great waste of time. I am tempted to use the BATSE source and let the reader discover that there exists a Comptel region that is half as wide. That way we don't have to get into the issue of coauthors.

TLC

From mkippen@comptel.unh.edu Mon Mar 1 06:49:36 1993
From: RMKIPPEN@unh.edu (Marc Kippen)
Subject: GRB930131 Triangulation
To: khurley@sunspot.ssl.berkeley.edu
Date: Mon, 1 Mar 93 9:50:44 EST
X-Mailer: ELM [version 2.3 PL11]
Content-Length: 788

Dear Dr. Hurley,

I was informed by Gerry Fishman of BATSE that there may be a change in the BATSE/Ulysses triangulation for GRB930131 from that reported in IAUC #5703. If so, I would be very interested in the revised arc for comparison to our COMPTTEL position map.

Best Regards,

Marc Kippen

R. Marc Kippen	==> Internet: RMKIPPEN@UNH.EDU
Space Science Center / Morse Hall	SPAN : 6865::MKIPPEN
University of New Hampshire	Phone : (603) 862-4703
Durham, NH 03824	FAX : (603) 862-4685

~~~~~

From khurley@space6.ssl.berkeley.edu Mon Mar 1 09:27:50 1993  
Date: Mon, 1 Mar 93 09:18:45  
From: khurley@space6.ssl.berkeley.edu  
Content-Length: 210

There was an error in the coordinate epoch for the Jan 31 GRB. The ring center is at RA(2000)=161.410, dec(2000)=-14.563. The radius and uncertainty were correct as given in the IAU circular, however.

Kevin

From CLINE@lheavx.gsfc.nasa.gov Wed Mar 10 12:12:14 1993  
Date: Wed, 10 Mar 1993 15:10:30 -0500 (EST)  
From: CLINE@lheavx.gsfc.nasa.gov  
Subject: Jan 31 93 event.  
To: KHURLEY@space6.ssl.berkeley.edu  
X-Vmsmail-To: SMTP:"KHURLEY@SPACE6.SSL.BERKELEY.EDU"  
Content-Length: 765  
X-Lines: 12  
Status: RO

KEVIN:

I ran these pre-preliminary numbers off for Brad Schaefer's Ap J Lett:  
circle center RA 161.4062 dec -14.5627 theta 22.2545 d-theta 0.0065 degrees  
in 2000 eqx. Questions: (1) are these consistent with your preliminary values?  
(2) I am using your Ulysses predicts, I assume: thus: will the change to the  
true values introduce a shift outside this error? (It is based on 95 millisec)  
(3) do you agree to publishing this result and if so with what written caveat?  
(4) I am now running off an improvement that I will trust to 40 millisec  
or so, with the hope that profile comparison will get it to even better  
someday: waht (that is: what) do you think will be the ultimate:  
Schaefer says that you said  
one second of arc ! Did you mean that? ..... TLC

From khurley@space6.ssl.berkeley.edu Thu Mar 11 11:31:36 1993  
Date: Thu, 11 Mar 93 11:22:54  
From: khurley@space6.ssl.berkeley.edu  
Status: RO  
Content-Length: 849  
X-Lines: 14

I'm e-mailing you the output of my program for Jan 31. There are some  
differences in the numbers, and I can't tell where they come from since I  
don't have your input. The position for Ulysses was the predict ephemeris,  
and I am trying to get the final values, since there may be errors of .002  
degrees otherwise. For that reason, I used a delta-t of 300 ms, and got an  
annulus width of about 4'. I think that ultimately, if we can assume that  
Ulysses triggered on the rising edge at the same point BATSE did, we can get  
down to perhaps 3 ms or so (the accuracy of the Ulysses To), reducing the  
annulus width to around 2.4'. Then using the final ephemeris will reduce  
that error by another factor of two or so, getting to an arcsecond. Perhaps  
that's a bit optimistic, but we will definitely be in the arcsecond range,  
if all goes well.

Kevin

From CLINE@lheavx.gsfc.nasa.gov Thu Mar 11 14:10:55 1993  
Date: Thu, 11 Mar 1993 17:09:35 -0500 (EST)  
From: CLINE@lheavx.gsfc.nasa.gov  
Subject: JAN 31 AGAIN  
To: KHURLEY@space6.ssl.berkeley.edu  
X-Vmsmail-To: SMTP:"KHURLEY@SPACE6.SSL.BERKELEY.EDU"  
Status: RO  
Content-Length: 804  
X-Lines: 12

KEVIN

Looking at your 93 Jan 31 printout, I see that the discrepancy (which is not  
much, but is yet first order, given the data) is in the T-zeroes.  
You have 24m43s543ms and 57m11s682ms respectively, whereas I have  
etc83.534 and etc31.618. Thus, two questions: (1) where did you get the .543?  
I have .534 as the Ulysses last 3 digits. Is this a clock correction or a  
mistaken digit interchange? More significant is the GRO difference: I am using  
a time that is 64 milliseconds earlier than yours. I think that this is the  
correct way to correlate the leading edges, if I interpret the GRO and Ulysses  
data records properly. Anyway, even with these two (hopefully temporary)  
differences, the combined error is surely less than 100 ms, considerably less  
than the 300 that you conservatively use. - TLC

Mar 17 08:07 1993 standard input Page 1

From CLINE@lheavx.gsfc.nasa.gov Wed Mar 17 07:16:32 1993  
Date: Wed, 17 Mar 1993 10:15:47 -0500 (EST)  
From: CLINE@lheavx.gsfc.nasa.gov  
Subject: 93 Jan 31 again.  
To: KHURLEY@space6.ssl.berkeley.edu  
X-Vmsmail-To: SMTP:"KHURLEY@space6.ssl.berkeley.edu"  
Content-Length: 330

KEVIN:

Again, I disagree - by a trivial amount, but finite and therefore worth  
pursuing. You said that my trigger or zero time of 66283.534 must be a  
transcription error or something, since you are sure that it's 66283.543  
BUT I got that from your data listing of 18.412092675 hrs. Check it out!  
So, what am I missing? - TLC



Mar 17 14:39 1993 standard input Page 1

From khurley@space6.ssl.berkeley.edu Wed Mar 17 09:03:58 1993  
Date: Wed, 17 Mar 93 08:55:32  
From: khurley@space6.ssl.berkeley.edu  
Content-Length: 438

The To that you got in the data file was not calculated as accurately as the one I calculate, so mine is the one to take. I found out that there was a clock correction of +2ms for the time of the burst, so if you want, you can add that to my To. Also, we are checking out a possible timing anomaly which occurred just before the event. Although we don't think it affected the To, we will have to wait a few days before verifying this.

30.khurley Tue Mar 16 08:23:23 1993 1

From khurley@space6.ssl.berkeley.edu Mon Mar 15 15:00:49 1993  
Received: from space6.ssl.berkeley.edu by sunspot.ssl.berkeley.edu (4.1/1.30.1)  
id AA09044; Mon, 15 Mar 93 15:00:47 PST  
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)  
id AA02925; Mon, 15 Mar 93 14:52:17  
Date: Mon, 15 Mar 93 14:52:17  
From: khurley@space6.ssl.berkeley.edu  
Message-Id: <9303160252.AA02925@space6.ssl.berkeley.edu>  
Apparently-To: cline  
Status: RO  
Content-Length: 758  
X-Lines: 11

By now, you have probably redone the Ulysses ephemeris for Jan 31, and discovered that there is no difference in RA and Dec, and a very small difference in the range. I reran my triangulation program for this ephemeris, and have e-mailed you the result. Also, I used 66283.543 for the Ulysses To. I think that your 534 must have been a transcription error, since I can't find that value anywhere. The To will have to be corrected for the clock drift, which I will get within the next day or so. It shouldn't exceed 50 ms. Finally, I ran my correlation program, and found a BATSE fiducial about 70 ms earlier, as you said, and that new value is also in the output I sent you. Let me know whether you get the same RA, Dec, and

From khurley@space6.ssl.berkeley.edu Wed Oct 13 16:26:36 1993  
Date: Wed, 13 Oct 93 16:21:21  
From: khurley@space6.ssl.berkeley.edu  
Content-Length: 1288

I just wrote a draft of the Huntsville paper about the Jan 31 1993 event. To refine the position, I did a few things:

1. I wrote a new, accurate precession routine
2. I checked the internal timing of the Ulysses experiment and determined that there are exactly 236 pre-trigger time history bins. Thus the trigger time refers to a time  $236 \cdot \Delta T$  secs since start of record, where  $\Delta T$  is the time resolution
3. I checked the spacecraft clock drift for the time of this event. It turns out that you have to add 2 ms to the Ulysses trigger time, getting 18:24:43.545 as the final time
4. I recalculated the Ulysses ephemeris. In my old ephemeris file, one line of data was missing. I.e., instead of 6 lines of data with positions every three hours, there were only 5 lines, with the 6th line full of zeros. (I don't know if the file I sent you had this problem or not). This, with the new precession routine, changed things very slightly.

Anyway, I'll fax you the paper today, but I wanted to send you the data files for the ephemeris and the triangulation program, to see whether you agree with the results. In particular, do you get the same Ulysses coordinates when you precess from the JPL-supplied 1950, to J2000? And do you agree with the semi-final annulus?

Kevin

From root Thu Oct 14 07:15 1993  
Received: by space6.ssl.berkeley.edu (AIX 2.1 2/4.03)  
id AA15196; Thu, 14 Oct 93 07:15:47  
Received: from TGRS.GSFC.NASA.GOV by sunspot.ssl.berkeley.edu (4.1/1.30.1)  
id AA18491; Thu, 14 Oct 93 07:20:47 PDT  
Date: Thu, 14 Oct 93 07:20:47 PDT  
Message-Id: <9310141420.AA18491@sunspot.ssl.berkeley.edu>  
Received: from [128.183.8.198] ([128.183.8.198]) by TGRS.GSFC.NASA.GOV with SMTP;  
Thu, 14 Oct 1993 10:21:06 -0400 (EDT)  
To: KHurley@space6.ssl.berkeley.edu  
From: cline@tgrs.gsfc.nasa.gov (T L Cline)  
Subject: 93 Jan 31 rechecking  
Status: R

KEVIN:  
Using all your emailings today, I get, as confirmation check:  
1950-interpolation for 66283.50 of 160.7936, -14.2998, and 2104.9146, with  
conversion to 2000-eqx ra, dec of 161.410916, -14.563198; using these and  
trigger-fiducial times as before, agreeing with yours, to get the final  
annulus with 161.41075, -14.56318, and 22.25580 pm 0.00230 deg.  
Terrific! TLC  
-- T. L. Cline ----- LHEAVX::CLINE

Mar 17 08:06 1993 standard input Page 1

From @UCBSP.SSL.BERKELEY.EDU:BOER@CESRVD.SPAN.NASA.GOV Wed Mar 17 02:36:56 1993  
Date: Wed 17 Mar 93 03:37:13-PST  
From: \$C <BOER@CESRVD.SPAN.NASA.GOV>  
To: KHURLEY@sunspot.ssl.berkeley.edu  
Subject: [Resent-MM Mail]  
Content-Length: 632

Received: from CESRVD by UCBSP.SSL.BERKELEY.EDU via MAIL-11 with  
DECnet; Wed, 17 Mar 93 03:36:40-PST  
Date: Wed 17 Mar 93 03:36:40-PST  
From: BOER@CESRVD.SPAN.NASA.GOV (MICHEL BOER CESR TOULOUSE (33) 61 55  
66 40 FAX (33) 61 55 67 01)  
Subject:  
To: "UCBSP::KHURLEY"@CESRVD.SPAN.NASA.GOV

Cher Kevin,  
J'ai appris que l'anneau de GRB 930131 pouvait avoir change.  
S'il te plait, pourrais tu me faire parvenir sa derniere position,  
afin de voir si nous l'avons bien prise en compte. Aussi,  
n'oublie pas a l'avenir de me tenir au courant des differentes  
positions, de facon a ne pas rester sur des donnees fausses.

Merci  
Michel

Mar 17 14:42 1993 standard input Page 14

From khurley@space6.ssl.berkeley.edu Wed Mar 17 09:06:25 1993  
Date: Wed, 17 Mar 93 08:57:58  
From: khurley@space6.ssl.berkeley.edu  
Content-Length: 206

Dans l'IAU, Cline a donne les coordonnees en 1950 et non en 2000 comme cite.  
Il y avait aussi quelques modifications entre le QEDR et le EDR. Je  
t'envoie les entrees et sorties de BMAP.

Amities

Kevin



\*\*\*\*\*  
\*CATSEARCH PROGRAM\*  
\*\*\*\*\*

BATSE BURST # 2152 /  
EVENT OF 1993 JAN 32 DAY OF YEAR= 32  
EVENT CROSSING TIME AT BATSE : 76271. S. OR 21:11:11.2  
COORDINATES ARE .000 .000 6800. (RA, DEC, DIST.)  
BURST ARRIVAL DIRECTION: 73.500 -2.100  
BATSE PEAK COUNTING RATE: 0000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND  
INTERPOLATED POSITION OF ULYSSES ON 32/ 1/ 93 IS:  
RA= 160.621 DEC= -14.332 DIST= 4.209 AU  
BATSE-ULYSSES DISTANCE = 629635243. KM.  
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 93.31 DEG.  
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -121.17 SECS.  
CROSSING TIME AT ULYSSES IS 76150. S. OR 21:09:10.0 +/- 412.19 SECONDS

ND

From PREECE@ssl.msfc.nasa.gov Mon Feb 1 13:23:57 1993  
Date: Mon, 1 Feb 1993 15:23:08 -0600 (CST)  
From: PREECE@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.: 02152

TIME: TJD=9018 SECONDS=76271

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=119.7 AZIMUTH=202.3 ERROR= DEGREES

COMMENTS:

WEAK BURST, 6 SEC DURATION. NOT VISIBLE ABOVE 300 KEV.

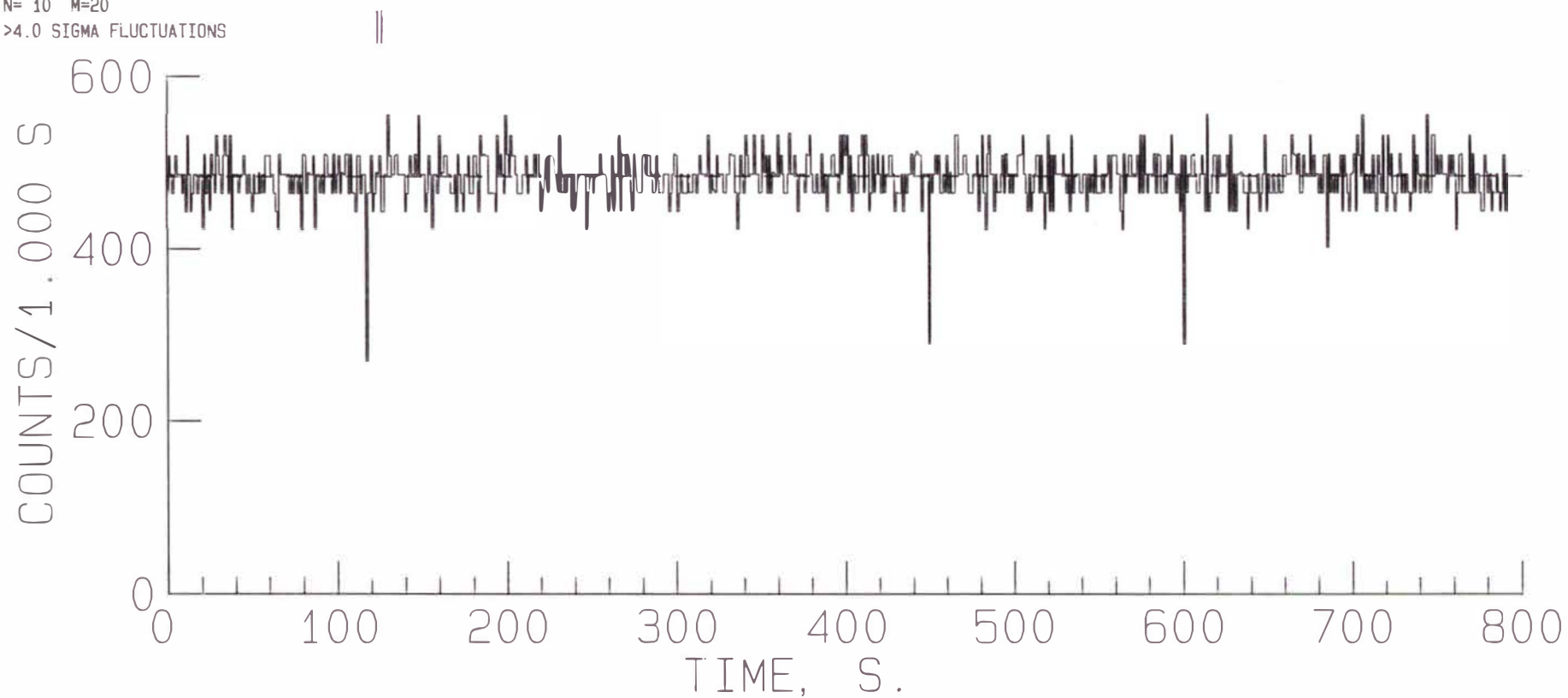
From PREECE@ssl.msfc.nasa.gov Mon Feb 1 13:30:34 1993  
Date: Mon, 1 Feb 1993 15:29:07 -0600 (CST)  
From: PREECE@ssl.msfc.nasa.gov  
Subject: BATSE burst  
To: khurley@sunspot.ssl.berkeley.edu  
X-Vmsmail-To: SMTP%"khurley@sunspot.ssl.berkeley.edu",BATSE::KOUVELIOTOU  
Content-Length: 108

| BATSE # | Date   | TJD  | sec   | Max ct/s | RA  | Dec |
|---------|--------|------|-------|----------|-----|-----|
| 2152    | 930131 | 9018 | 76271 | 3200     | 077 | -03 |

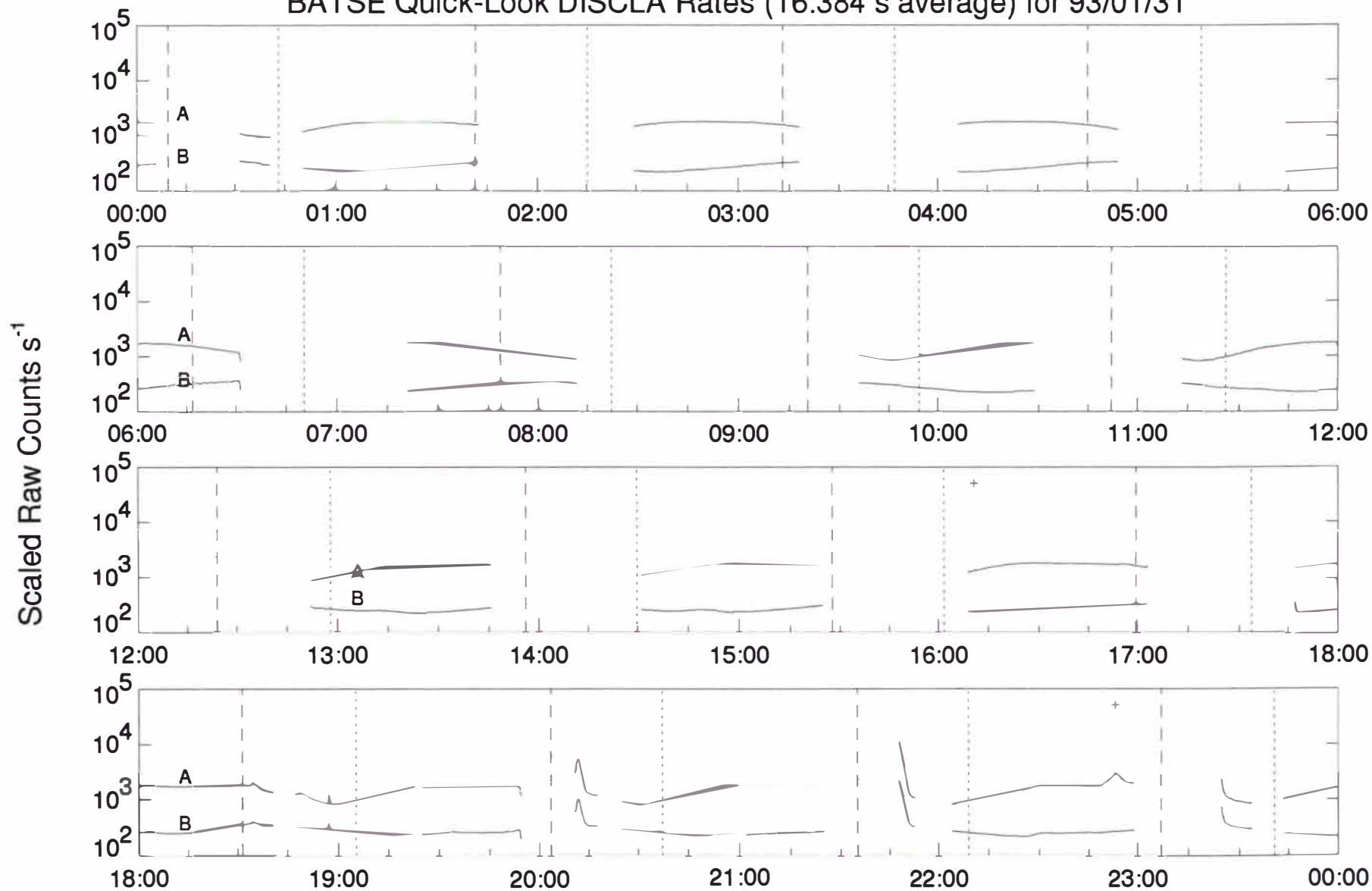
13 / 2 / 93

ULYSSES RT  
31/ 1/93 75636.258 s  
.500 S INTERVALS REGROUPED BY 2  
0- 0 keV

N= 10 M=20  
>4.0 SIGMA FLUCTUATIONS



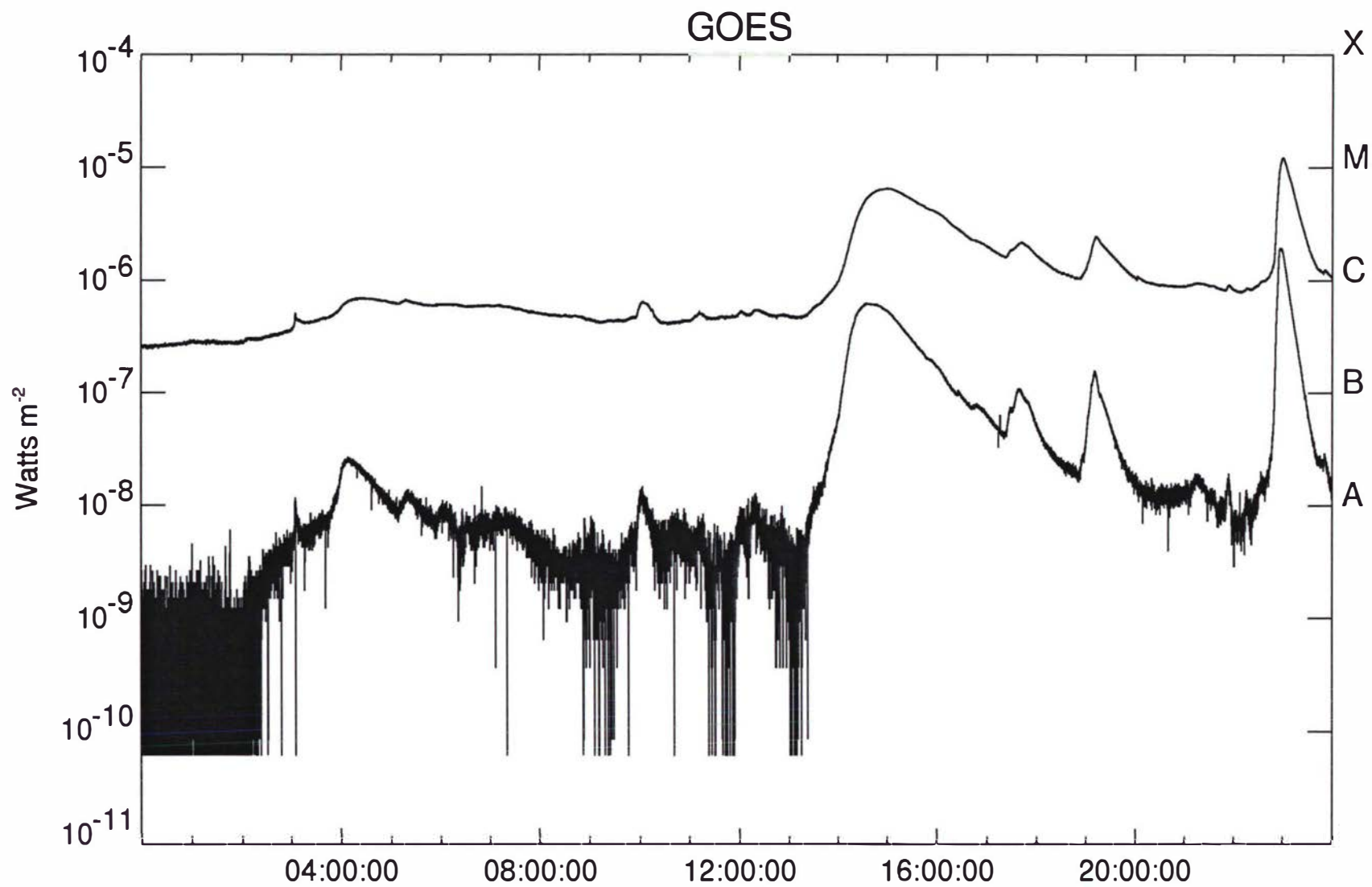
# BATSE Quick-Look DISCLA Rates (16.384 s average) for 93/01/31



Current Time: 93/02/16, 1532 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



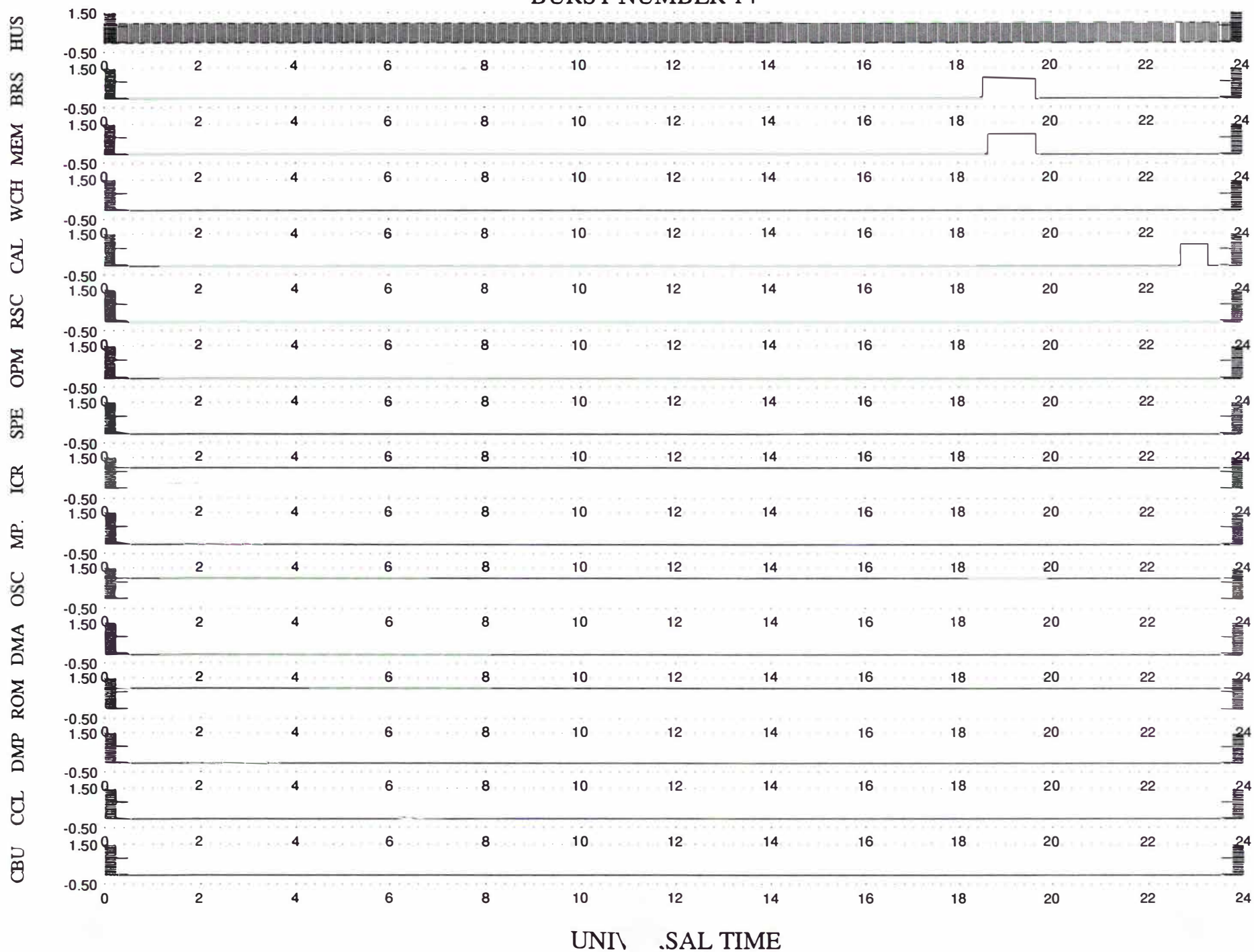
Data Start: 93/01/31, 0000:02

Plot created: 95/05/31, 2253

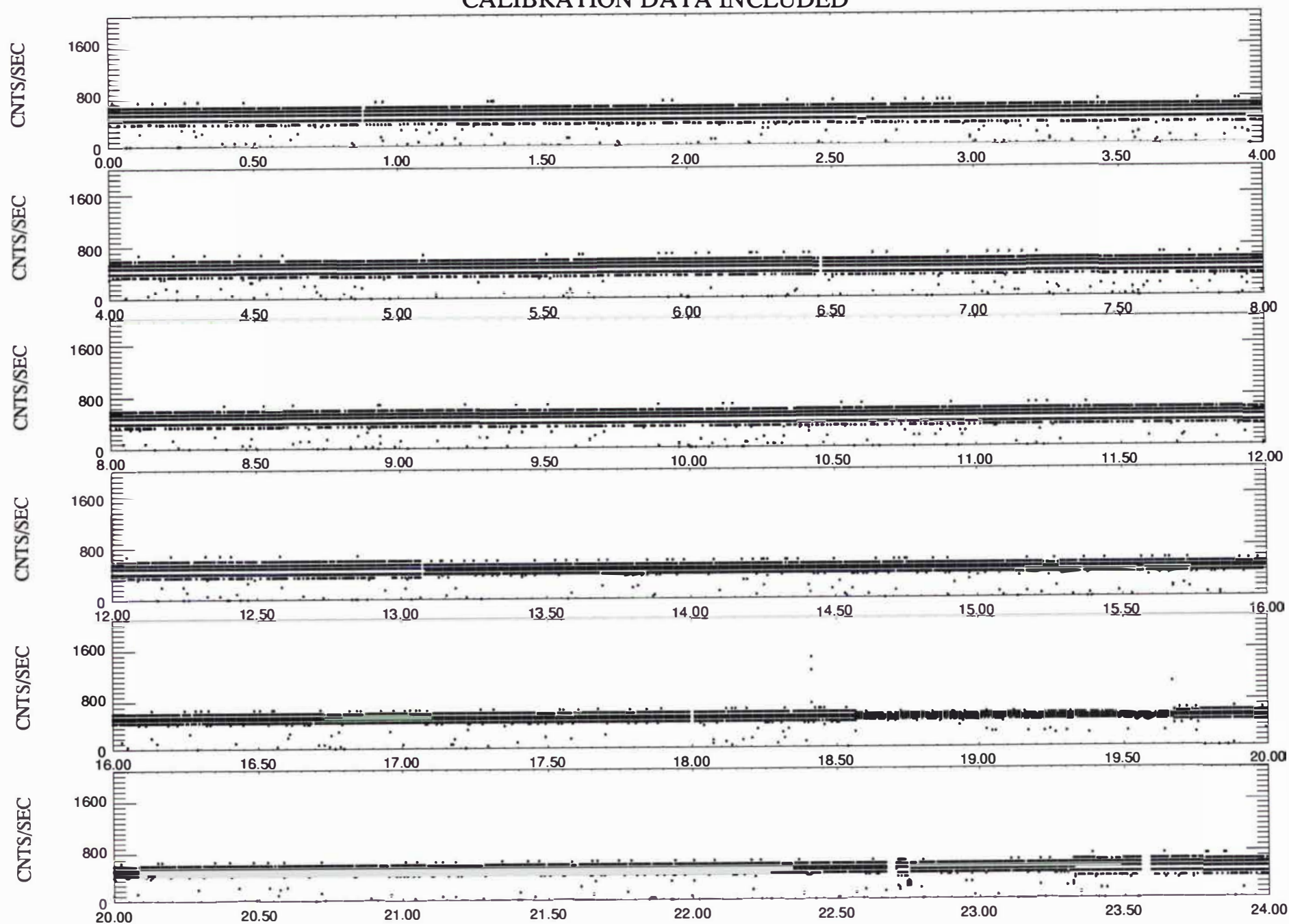
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted

2 (0.5 - 4.0 Angstroms) Background not subtracted

## BURST NUMBER 14



## CALIBRATION DATA INCLUDED



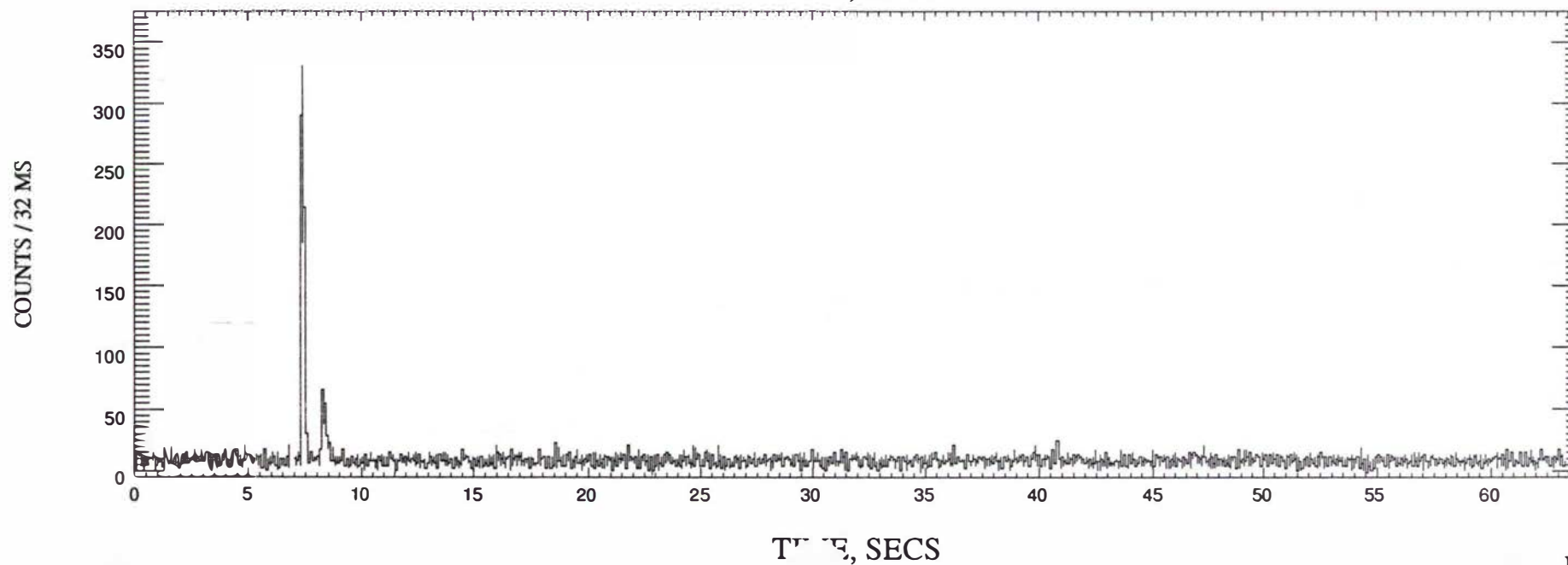
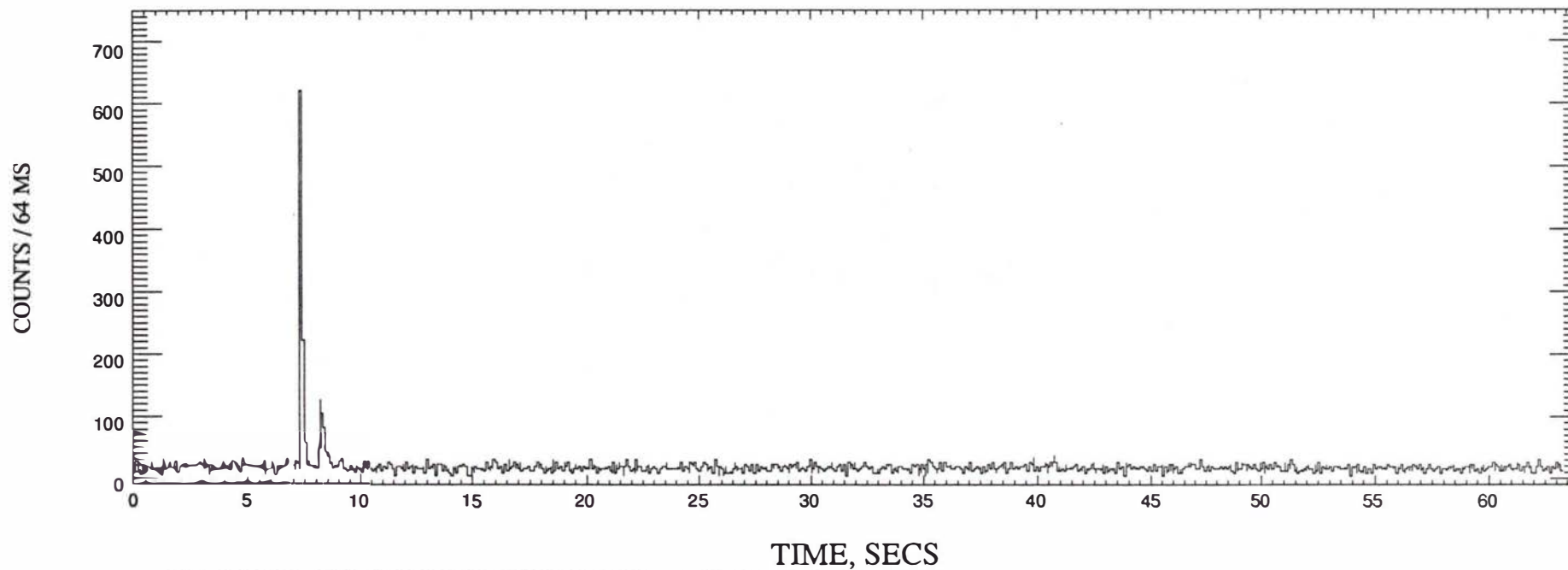
UNIV SAL TIME

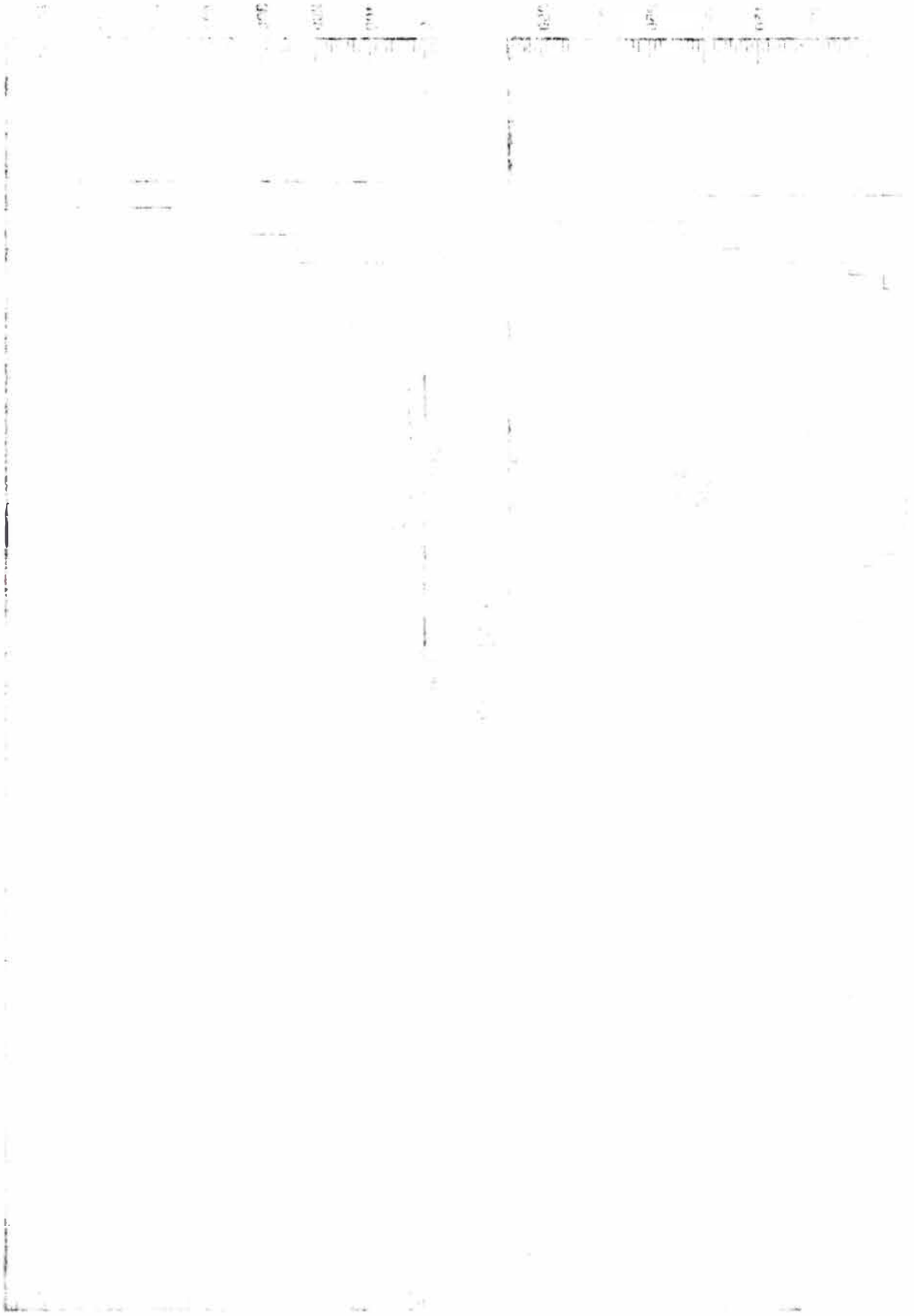




1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

Burst Counter 14 at UT=18.412091564602 h=66283.530 s 18:24:43.530



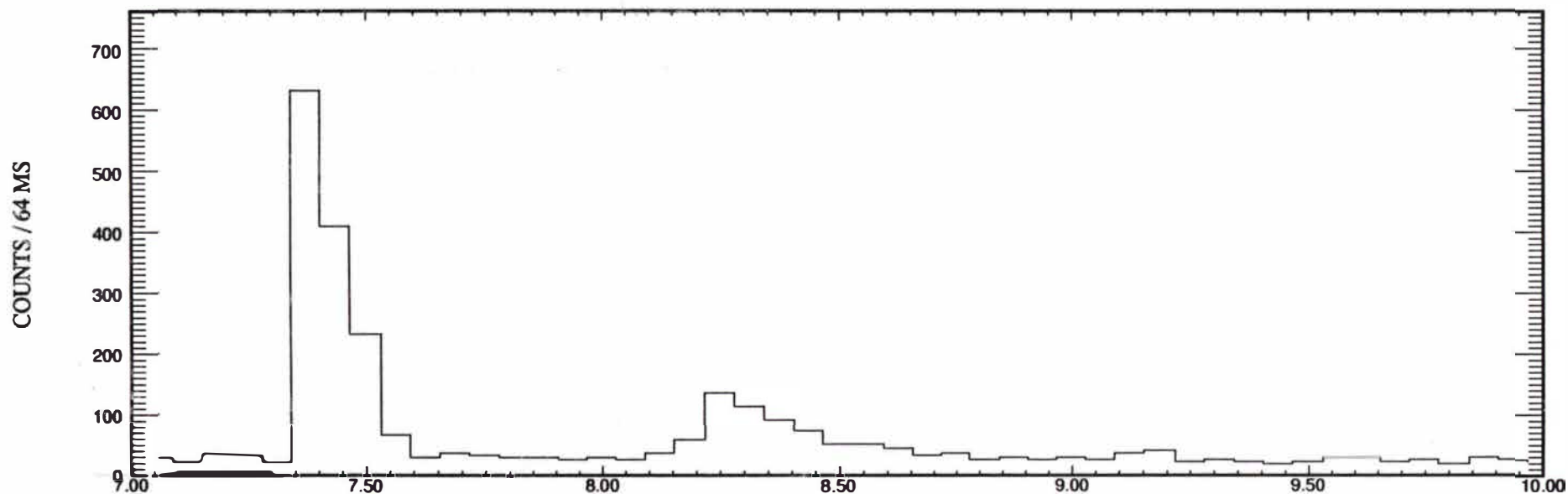


Control Panel for the 1000 Series

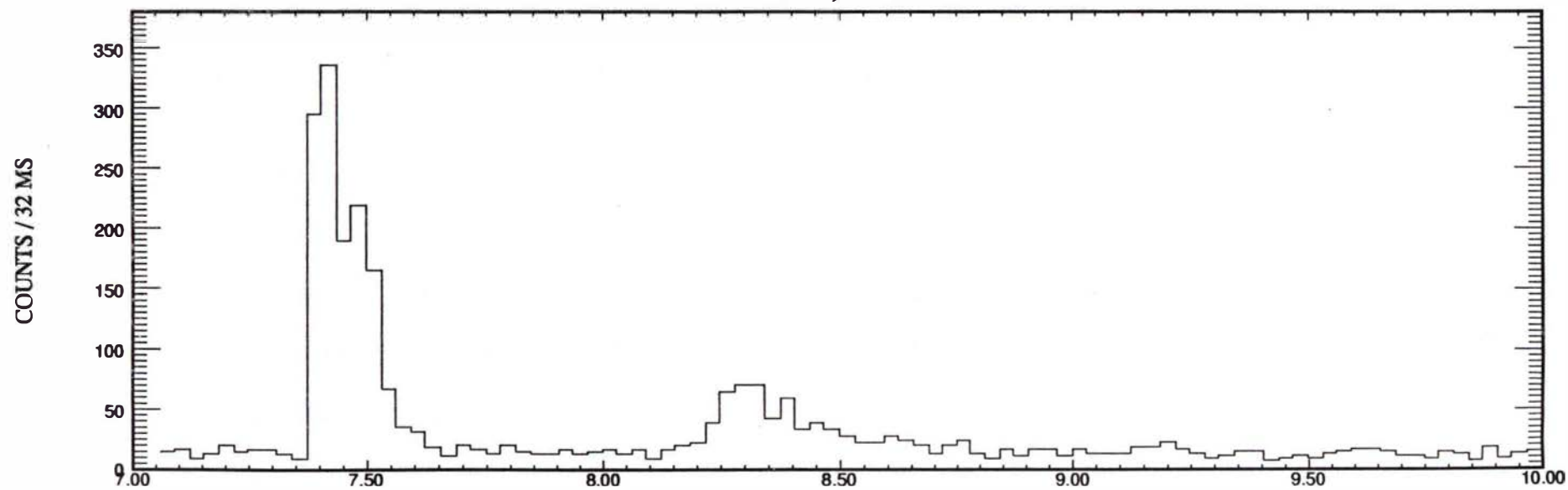
THIS IS A PRELIMINARY DRAWING. DO NOT SCALE TO THIS SIZE.

5/1/88

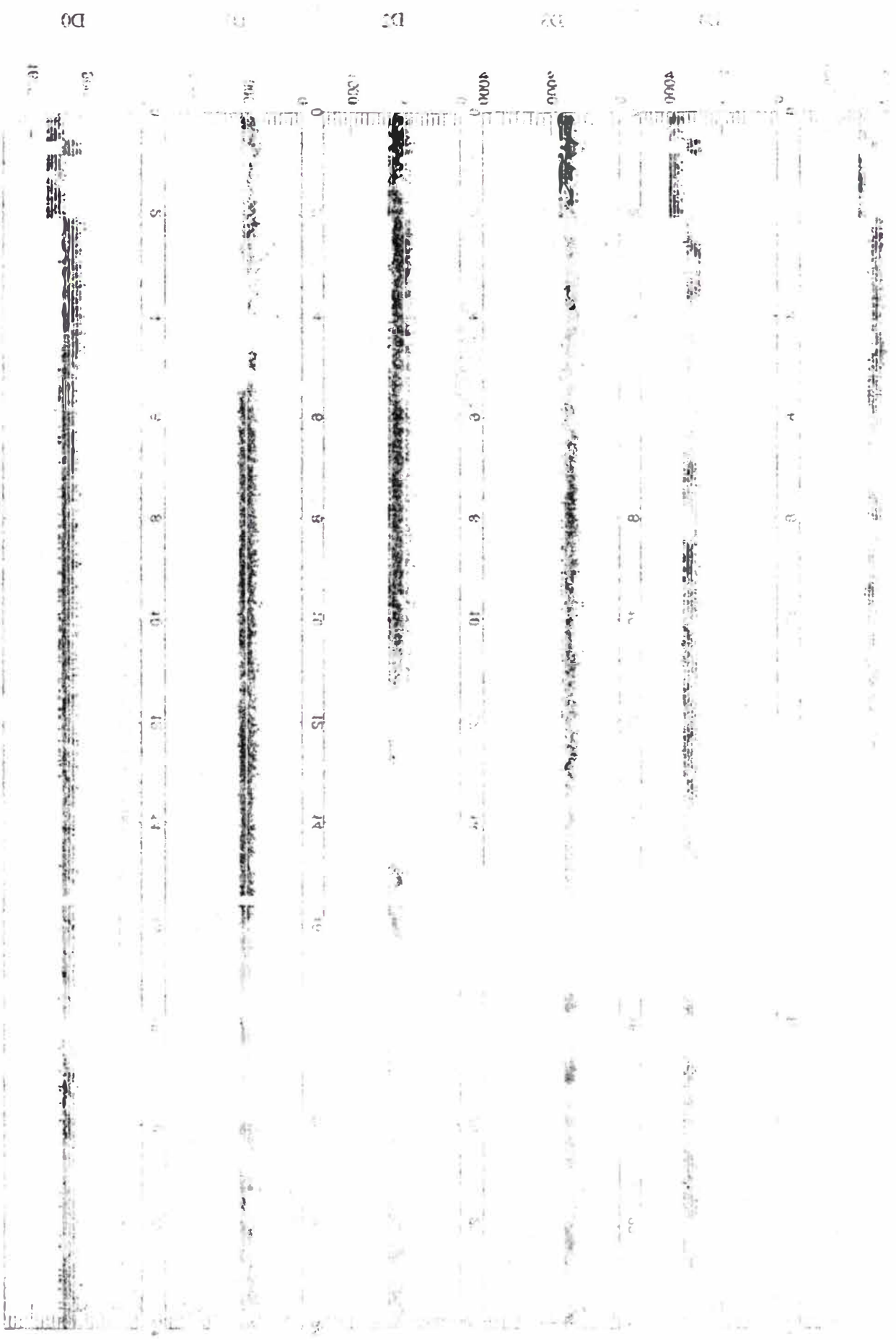
Burst Counter 14 at UT=18.412092675103 h=66283.534 s



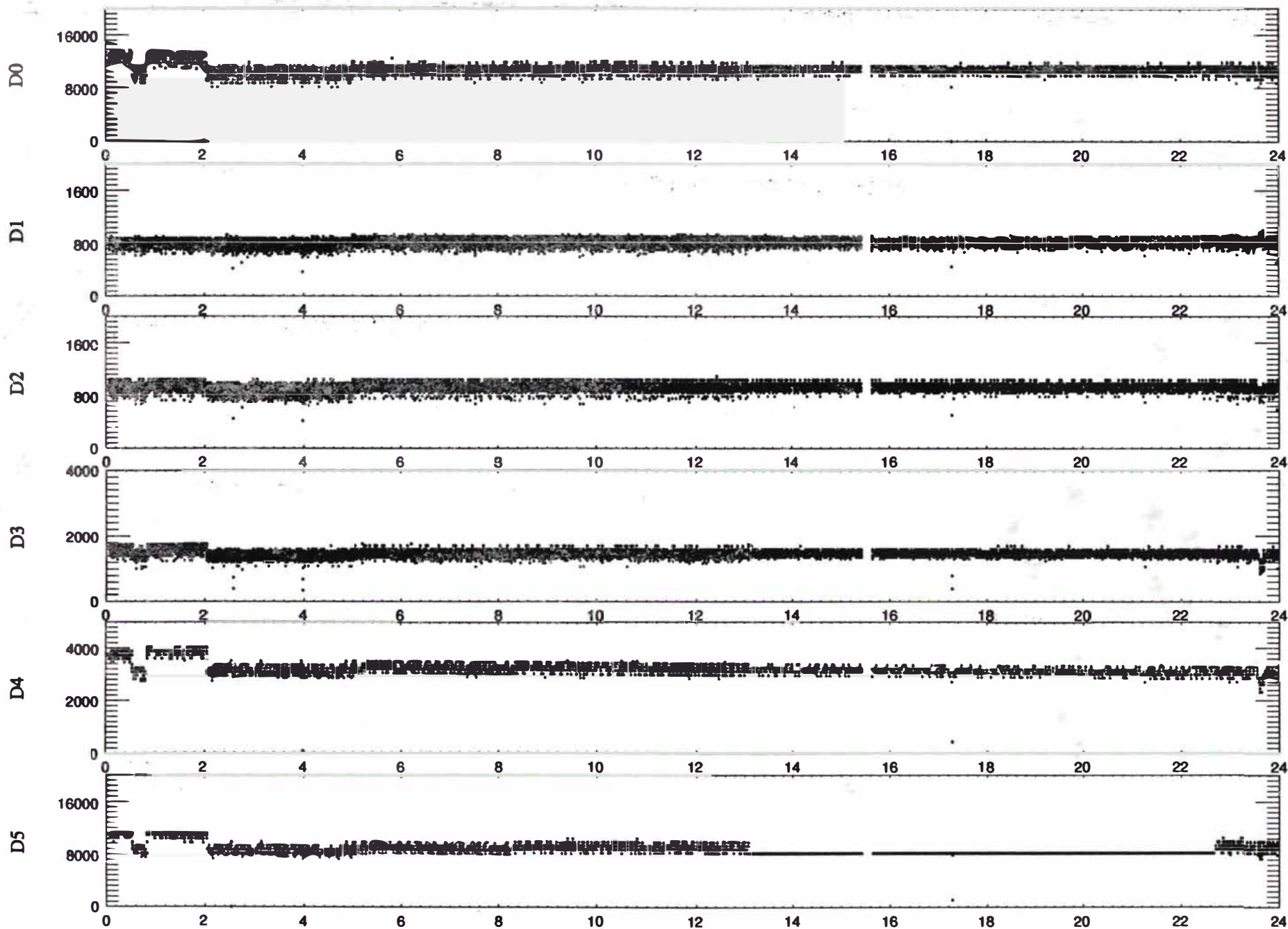
TIME, SECS



TIME, SECS



HN2 SB COLINT2 VSEC GRIDR 49A 31' 26N 1003 10 49A 31' 26N 1003



UNIVE L TIME