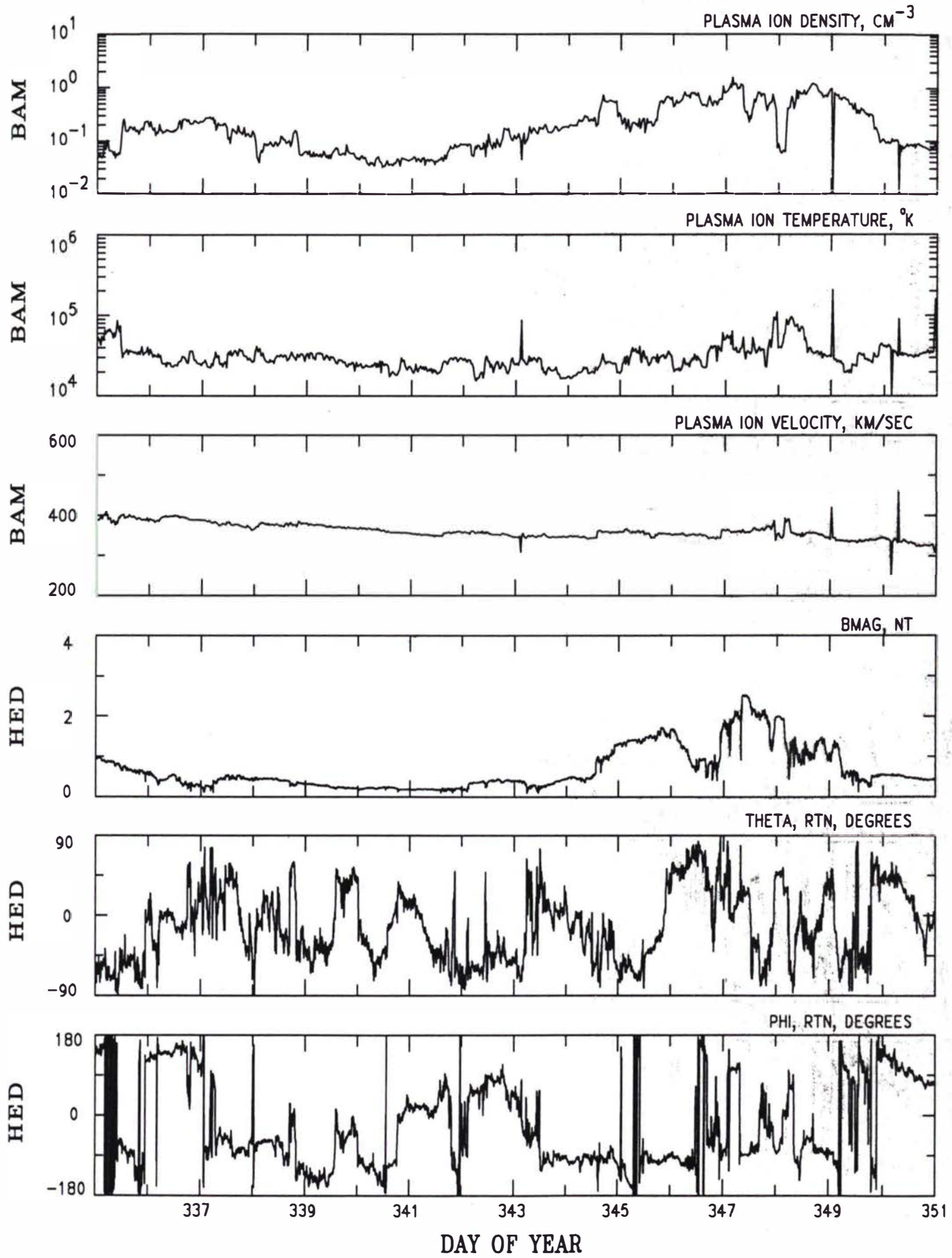
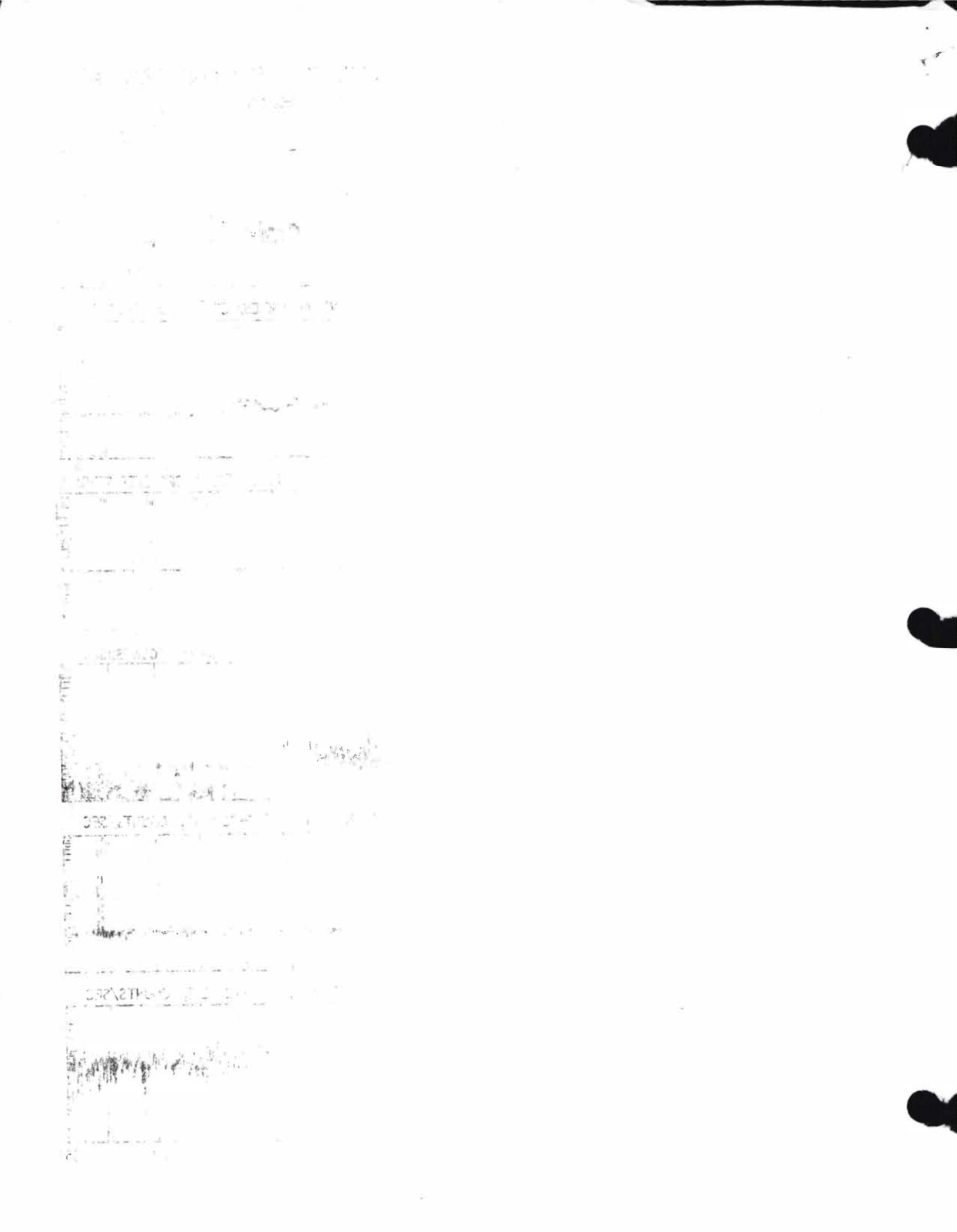
# ULYSSES CDR – SOLAR WIND PLASMA AND MAGNETIC FIELD

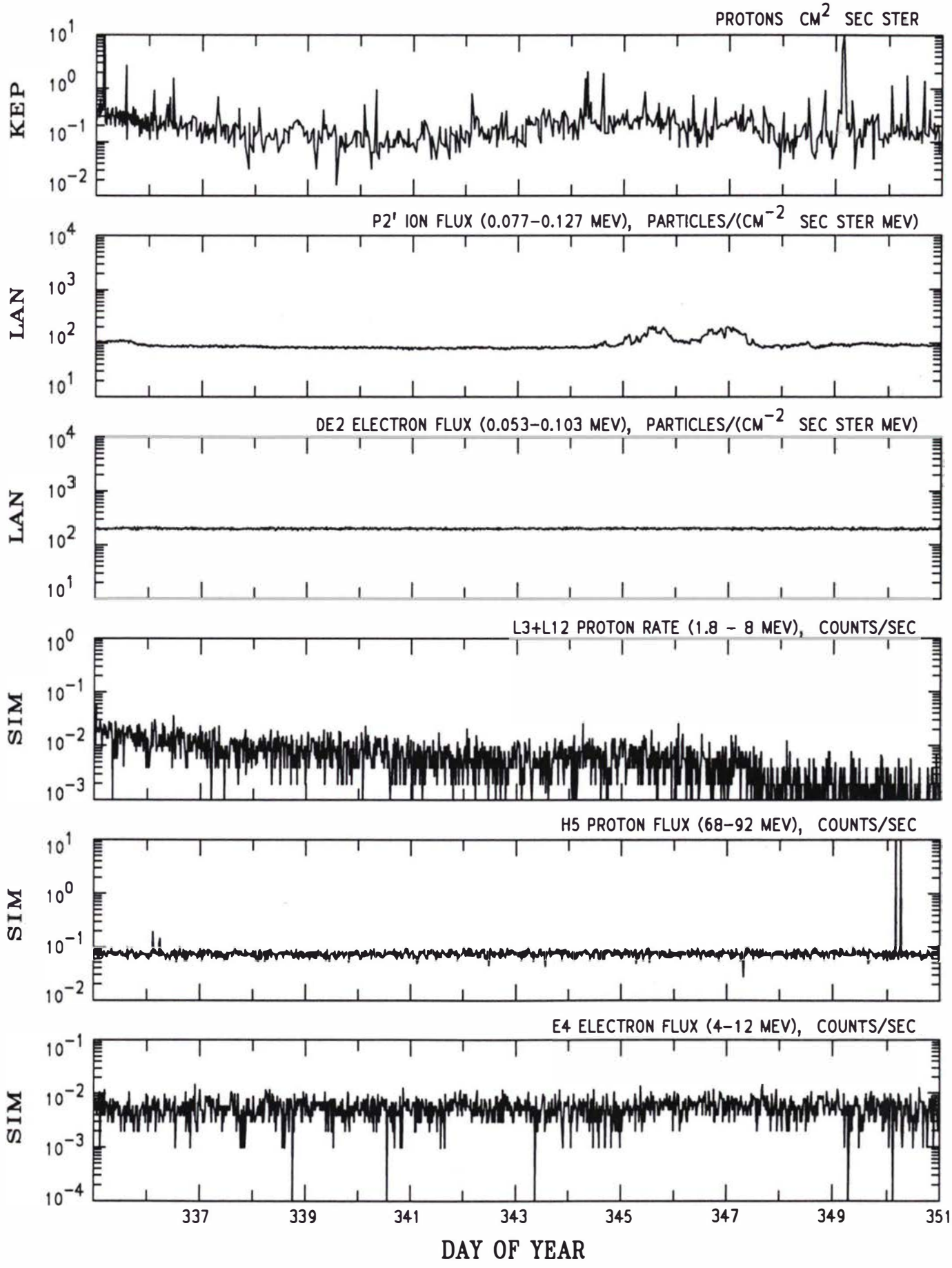
97 335 DEC 1 00:00:00.000 – 97 351 DEC 17 00:00:00.000





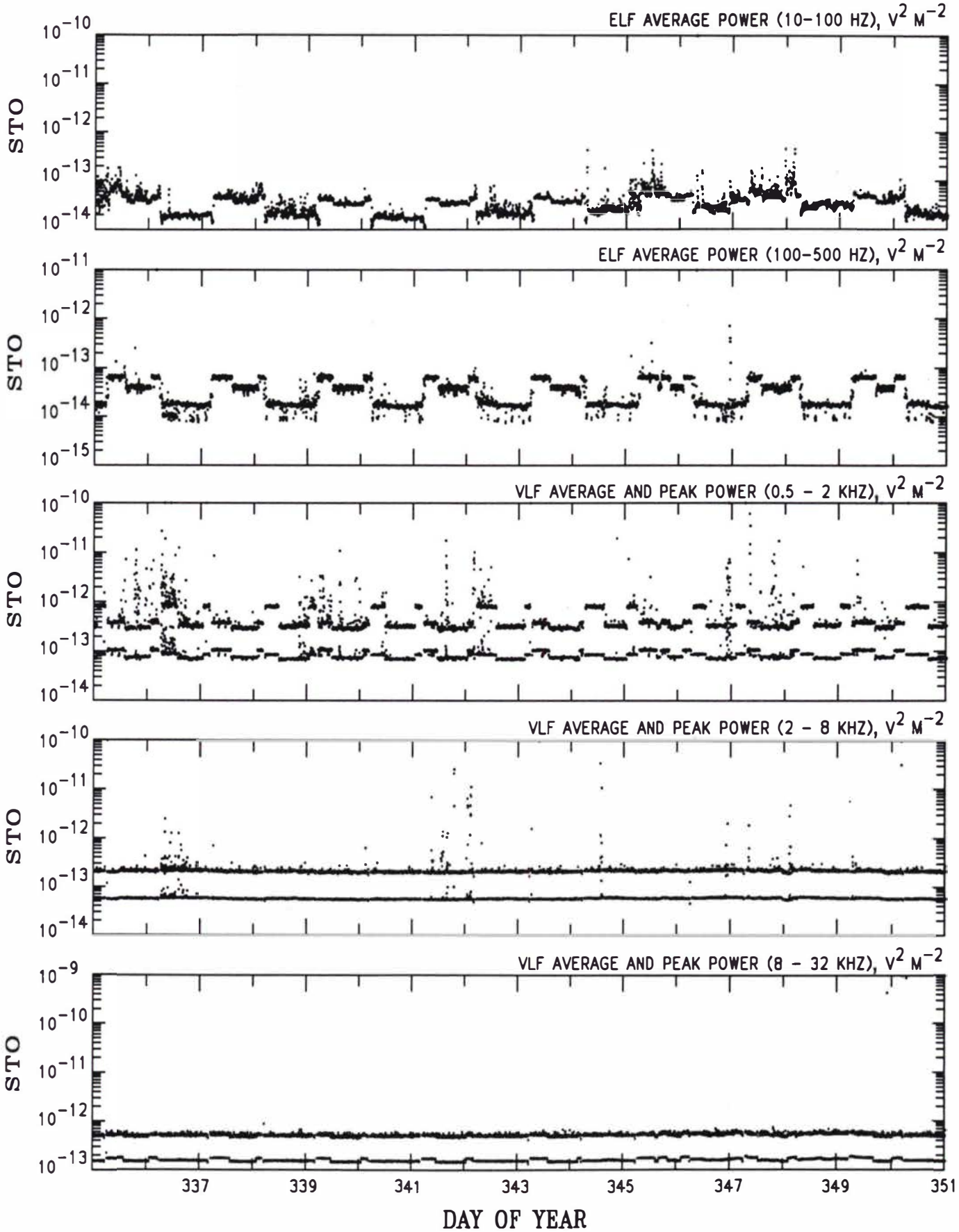
# ULYSSES CDR - ENERGETIC PARTICLES, LOW ENERGY IONS AND COSMIC RAY

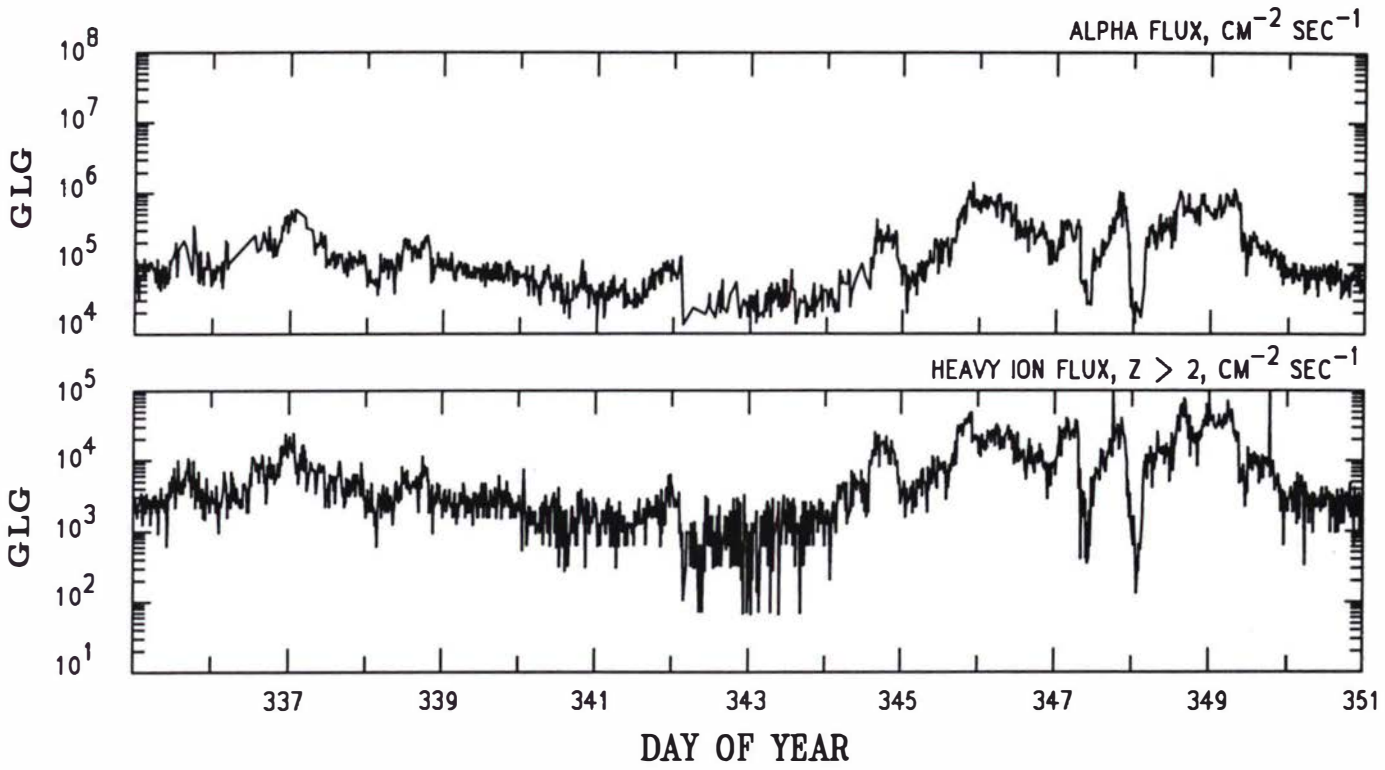
97 335 DEC 1 00:00:00.000 - 97 351 DEC 17 00:00:00.000



# ULYSSES CDR - PLASMA WAVE

97 335 DEC 1 00:00:00.000 - 97 351 DEC 17 00:00:00.000

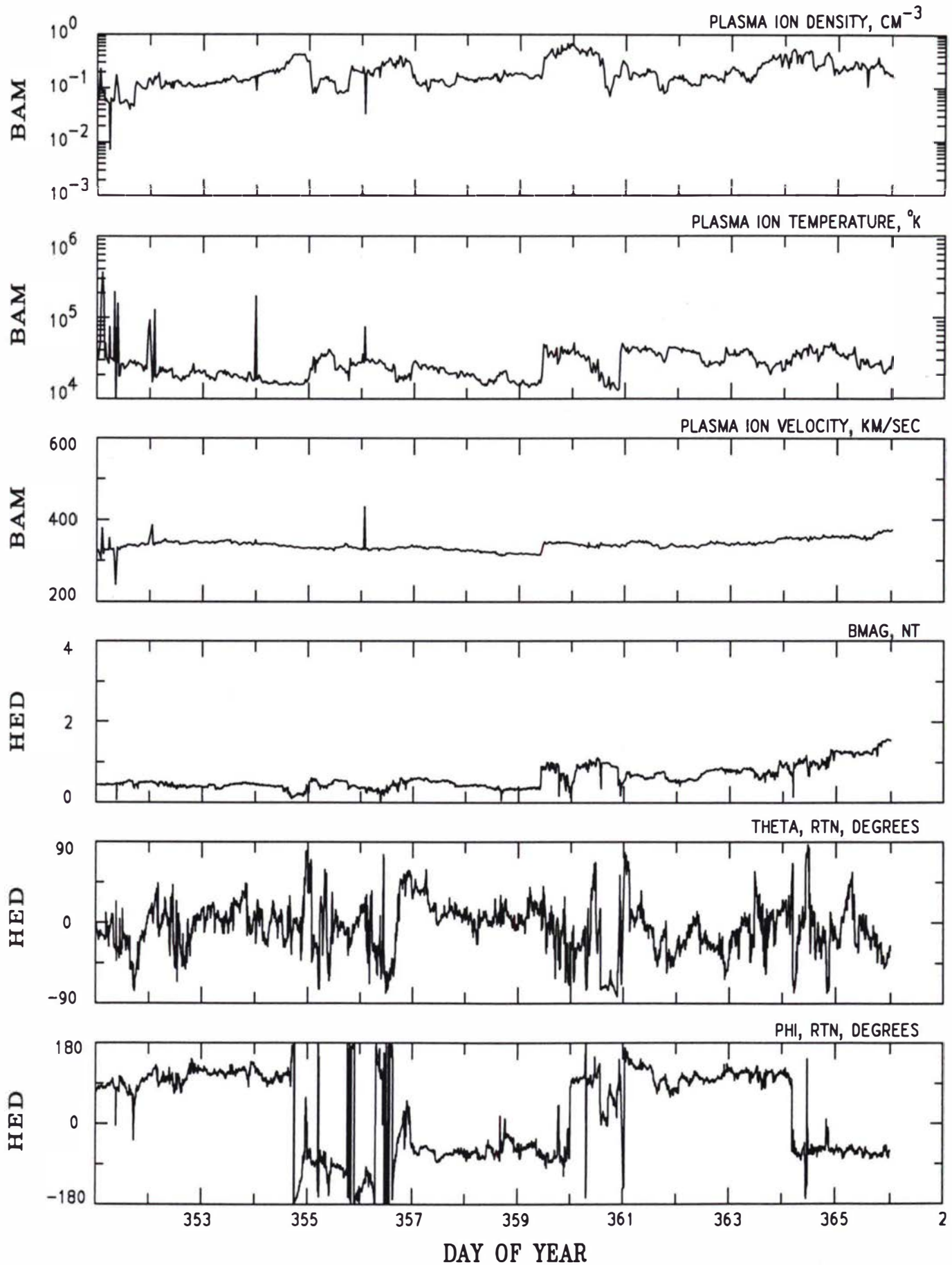



ULYSSES CDR – SOLAR WIND ION COMPOSITION
97 335 DEC 1 00:00:00.000 – 97 351 DEC 17 00:00:00.000
ALPHA FLUX, CM$^{-2}$ SEC$^{-1}$
GLG
$10^8$
$10^7$
$10^6$
$10^5$
$10^4$
HEAVY ION FLUX, Z > 2, CM$^{-2}$ SEC$^{-1}$
GLG
$10^5$
$10^4$
$10^3$
$10^2$
$10^1$
337
339
341
343
345
347
349
351
DAY OF YEAR



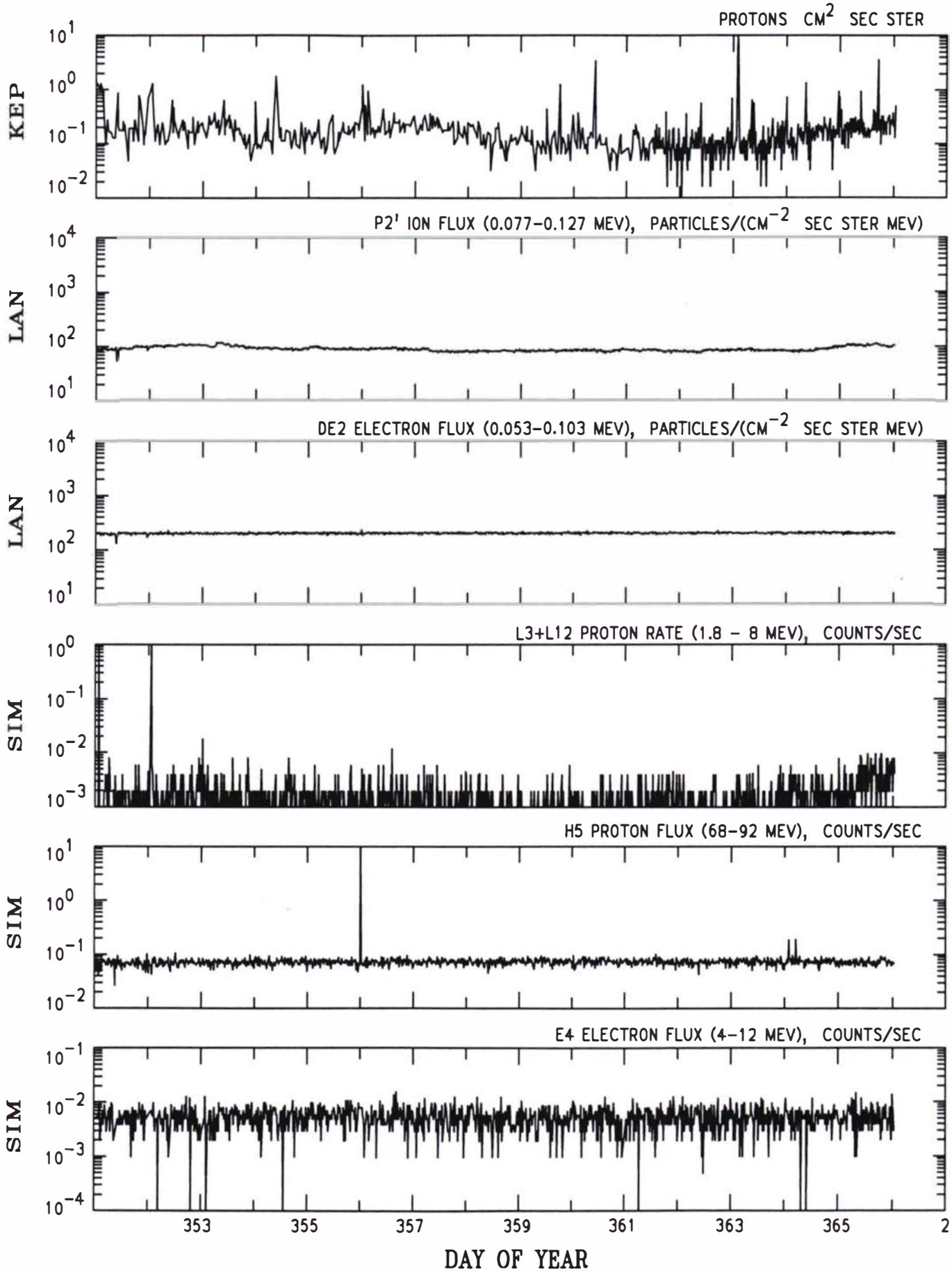
# ULYSSES CDR - SOLAR WIND PLASMA AND MAGNETIC FIELD

97 351 DEC 17 00:00:00.000 - 98 002 JAN 2 00:00:00.000



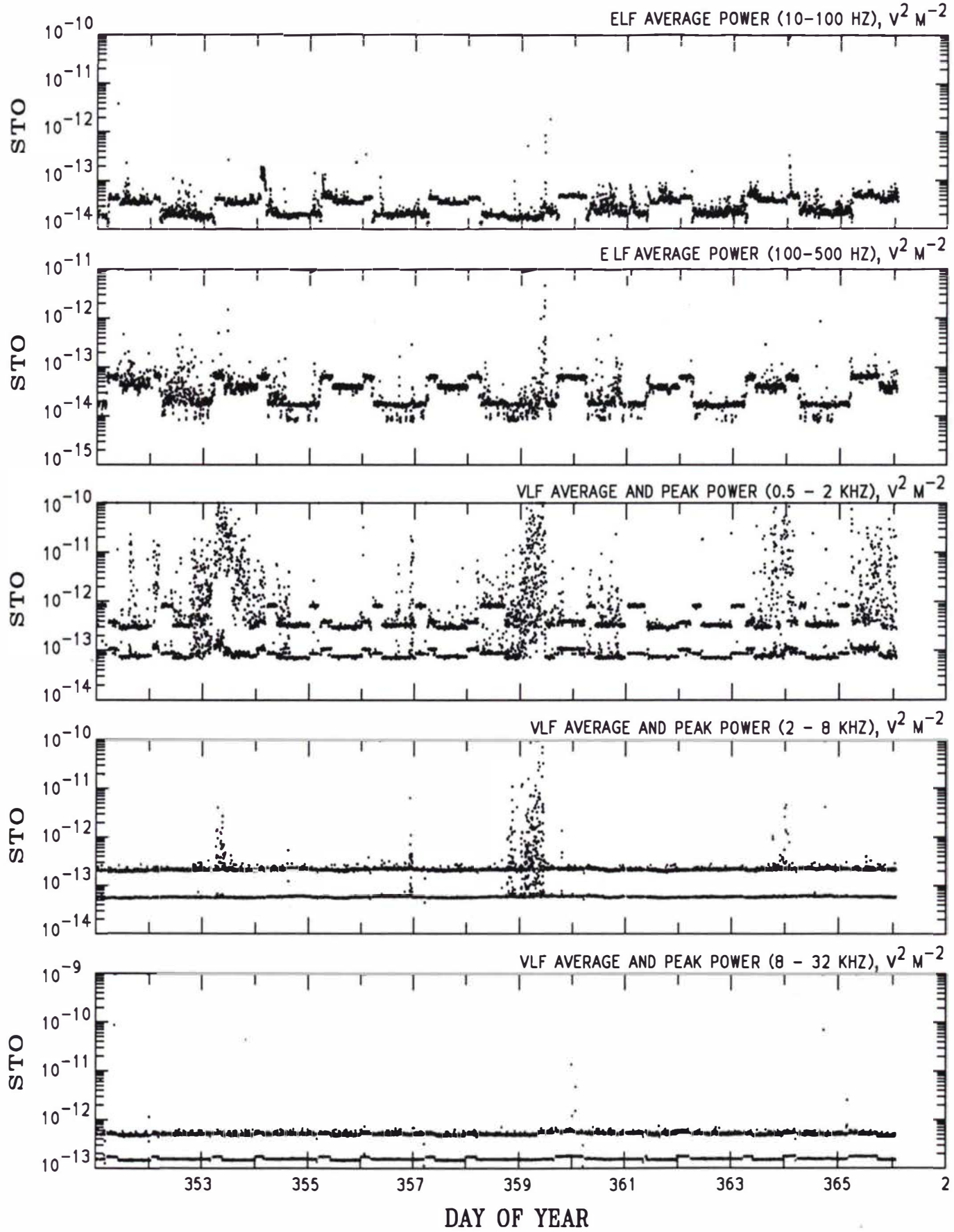
# ULYSSES CDR - ENERGETIC PARTICLES, LOW ENERGY IONS AND COSMIC RAY

97 351 DEC 17 00:00:00.000 - 98 002 JAN 2 00:00:00.000



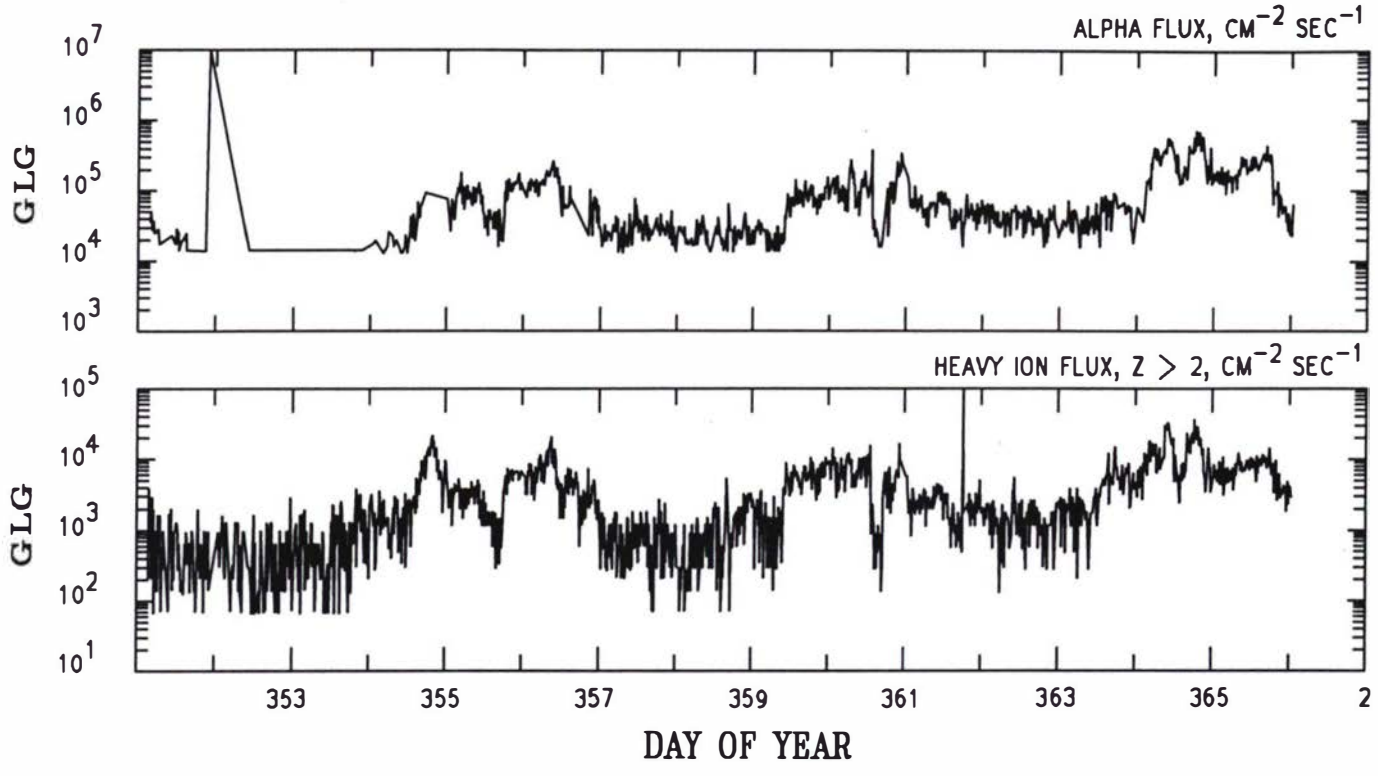
# ULYSSES CDR – PLASMA WAVE

97 351 DEC 17 00:00:00.000 – 98 002 JAN 2 00:00:00.000



# ULYSSES CDR – SOLAR WIND ION COMPOSITION

97 351 DEC 17 00:00:00.000 – 98 002 JAN 2 00:00:00.000



From HENZE@fender.msfc.nasa.gov Wed Dec 3 13:07:13 1997
Date: Wed, 3 Dec 1997 15:05:16 -0600 (CST)
From: Bill Henze (205-544-7616) <HENZE@fender.msfc.nasa.gov>
To: burst@comptel.sr.unh.edu, grobad@estsa2.estec.esa.nl,
cline@lheavx.gsfc.nasa.gov, barthelmy@lheavx.gsfc.nasa.gov,
bacodine@pandora.gsfc.nasa.gov, scott@circe.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, band@cass09.ucsd.edu,
gruber@cass09.ucsd.edu, matteson@cass09.ucsd.edu,
PACIESAS@fender.msfc.nasa.gov, HORACK@fender.msfc.nasa.gov,
khurley@sunspot.ssl.berkeley.edu, lmm@egret.gsfc.nasa.gov,
mops@osse.nrl.navy.mil, grove@osse.nrl.navy.mil,
matz@osse.nrl.navy.mil, share@osse.nrl.navy.mil,
messina@osse.nrl.navy.mil, sandora@osse.nrl.navy.mil,
park@kabul.llnl.gov
Subject: Burst Trigger Message

BATSE BURST TRIGGER

NO.: 6515

TIME: TJD=0783 SECONDS= 9295

TYPE: FLARE SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= 37.4 AZIMUTH=352.2 ERROR= 0.3 DEGREES

COMMENTS:
GOES M1.2, OPTICAL 1N SOLAR FLARE. SINGLE PULSE WITH SUBSTRUCTURE, MAX AT APPROX. T+21 S, DUR. GREATER THAN 120 S. VISIBLE ABOVE 100 KEV, NOT ABOVE 300 KEV.

```
          262 65663.9 KONUS 30S,HARD,2PKS (+UL@63120,3100LS,MOD,20S)(13NO,14NO)

970922    265  2888.4 BATSE#6392,32880/SEC
       13 265  2894.4 PEAK(50/S),2910.5(110),@97DEG,ONE-SIDED,EDGE SR. DUBIOUS
       14 265  2894.6 PKS(200/S),2910.6(500/S),@109,ONE-SIDED,EDGE SAA.DUBIOUS

970925    268 81795.8 BATSE#6397,9551/SEC
       14 268 81798.3 PEAK (70/S,<10S) @ 42DEG (13SAA)

971009    282 68215.8 BATSE#6422,10861/S@1.8S+UL@69240,3050LS,MOD+KONUS@68215.0
       14 282 68217.2 PEAK(180/S,<2S)@83 (TRIGGER PEAK 68215.64) (13NO@145)

971019    292 53754.2 KONUS,10S (+UL@51000,2950LS,MOD,10S)
       14 292 53752.6 RISE,~50SEC,SOFT,NO TRIG (13 NO)

971029    302  5318.4 BATSE#6453,4717/S@35.8S (KONUS@5351.8,120S)(UL WEAK@2820)
       14 302  5326.0 PKS, 44.0,66.0,NO TRIG,@102DEG (13NO@49DEG)

971101    305 23484.5 KONUS (10SEC,FRED)(UL@26040,MOD,10S@2950LS)
       14 305 23483.8 PEAK (200/S,<2S) (13SR) TRIGGER PEAK 23483.0

971110    314 68141.3 KONUS,100SEC (UL@67080 @2950LS,MOD)(13 SR)
       14 314 68161.3 PEAKS, 213.3, MULT PEAKS,HARD,TRIGGER PKS 68213.19,213.91

971127    331 47595.8 BATSE#6509 (139968/S)
       13 331 47595.8 PKS,613.8,759.8(240),767.8(140)
       14 331 47760.5 PKS(3000/S),47768.5(2000), INTENSE, NOTRIG

971201    335  9295.6 BATSE#6515 (8768/S)
       14 335  9306.4 PK(SOFT)+9310.4(160)+9316.4(220)+9328.4(150),NOTRIG(13NR)

971207    341 72232.9 BATSE#6525 (7892/S@12.0)
       14 341 72244.2 PK(270),268.2,284.2 (@80DEG),TRIG PK 72244.28 (13NR)

971218    352 52499.9 BATSE#6535 (9181/S@+2.3S)
       13 352 52500.2 PK(70),52536.2(?)(SOFT,@38DEG)    (14SAA)

971219    353 79974.5 KONUS,10S,SPIKE@+4 (UL 77580,15SEC,MOD) (13SAA,14NR)

980109    009  4345.6 BATSE#6564(1401/S)+SAX,25S(IAU6805)(13NO@74,14NA@144)

980113    013 14845.7 BATSE#6570 (9376/S,COMPLEX,DUR60S)
       13 013 14869.2 PKS(50),879.2(50),883.2(50) (ONE-SIDED,@119DEG)
       14 013 14848.3 PEAK(60/S,<4S), NO TRIGGER

980119    019U 5100   ULYSSES MOD(32MS) @2350LS
       14 019  5375.9 PEAK (900/S,<8S,SOFT) (TRIG PEAKS 5372.9,5374.6)(13NO)

980124    024 23673.0 BATSE#6576, 16971/S @7.7S,SPIKY,MAX@+42.5,DUR100S)
       13 024 23679.1 PEAK(90/S,<8S),23707.1,23717.1 (LAST 2 WEAK,ONE-SIDED)
       14 024 23679.6 PEAK(300/S,<10S),707.6WEAK,715.6WEAK
       14 024 23679.1 TRIGGER PKS 679.07,679.99 (.1024S); 12.8MS PEAK 23678.43

980125    025 74368.7 BATSE#6581, 34996/S,MULT PKS,MAIN PK@+40,270S
       13 025 74416.4 PEAK @108DEG(220/S,<8S) (14NO@125)

  J202    033U37380   ULYSSES MODERATE, 10SEC@2265LS
       13 033 35713.6 PEAK(80/S),35717.6(70),<8SEC OVERALL
       14 033 35712.9 PEAK(200/S),35718.9(400/S),<10SEC OVERALL, NO TRIGGER
```

From TERRELL@nisdp0.lanl.gov Fri Feb 27 15:11 PST 1998
From: TERRELL@nisdp0.lanl.gov
Date: Fri, 27 Feb 1998 16:11:55 -0700
To: khurley@sunspot.ssl.berkeley.edu, bonnard@milkyway.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, cline@lheavx.gsfc.nasa.gov,
henze@fender.msfc.nasa.gov, filippo@botes1.tesre.bo.cnr.it,
kmarar@isac.ernet.in
X-Vmsmail-To: @MAILOUTUL.DIS
Subject: DMSP GRB: 1997(many),980109,980113,980119,980124,980125,980202,980203

From: jterrell@lanl.gov (James Terrell) 980227
To: khurley@sunspot.ssl.berkeley.edu, bonnard@milkyway.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, cline@lheavx.gsfc.nasa.gov,
filippo@botes1.tesre.bo.cnr.it, henze@fender.msfc.nasa.gov,
kmarar@isac.ernet.in, kraken@rosserv.gsfc.nasa.gov,
scott@milkyway.gsfc.nasa.gov, teegarden@lheavx.gsfc.nasa.gov,
vnp@isac.ernet.in, yosimori@rikkyo.ac.jp
Subj: DMSP GRB detections: 1997(many),980109,980113,980119,980124,980125,980202,980203

The following GRB were detected by DMSP13 or DMSP14 (or NOT detected, if indicated).
No detection can occur for bursts more than 118 degrees from spacecraft zenith,
or if in the presence of very high counting rates (SAA,SR,NR).
Data are normally in 2-sec counts, except when the DMSP14 trigger circuit is
tripped, giving 12.8ms data, usually reported here as 102.4ms counts.
Numerous other BATSE GRB were also detected, but not reported here; numerous
weak detections by Ulysses have not been checked because of low counting
rates expected at an indefinite time.

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| DATE | FL | DAY | TIME | NOTES---(ND=NO DATA,NA=NOT APPARENT & NOT ANALYZED)------REPORTED<br>(NO=DATA CHECKED--SHOWS NO DETECTION)(SR=S. RADIATION BELT)<br>(NR=NORTH RADIATION BELT)(SAA=SOUTH ATLANTIC ANOMALY) | |
|---|---|---|---|---|---|
| 970111 | | 011 | 35040.2 | BATSE GRB#5773 (8727CTS/2S) (SEE IAU6569,6571,6574,6598) | |
| | | 011 | 35040.2 | BEPPO SAX TRIG,INTENSE,50S,3 PEAKS(232.10,19.67J) IAU6533 | |
| | 13 | 011 | 35040.0 | PEAKS(40/S),48.0(50/S),58.0(60/S),@24DEG,@848KM,SOFT | REP0313 |
| 970111 | | 011 | 85744.6 | KONUS (HARD,SLOW RISE) +TGR (UL:NO) (DMSP13:NO) | |
| 970117 | | 017 | 53211 | TGR+SAX GRB (KONUS INOP)+UL@54420(STRONG,20S) (13:NO) | |
| 970124 | | 024 | 44343.4 | KONUS(MULT PKS)+UL@46253@2100LS,STRONG+TGR (13SAA) | |
| 970201 | | 032 | 57250.7 | BATSE GRB#5989 (53612/SEC) +UL | |
| | 13 | 032 | 57222.1 | PEAK (100/S,~30S,SOFT,BROAD) (@111DEG) UNCONVINCING | |
| 970218 | | 049 | 50996.1 | KONUS (STRONG,5SEC) +UL@51274,2000LS (STRONG,8SEC) | |
| | 13 | 049 | 51001.0 | PEAK (320/S,<6S) | REP0624 |
| 970222 | | 053 | 86006.6 | KONUS (MOD.STRONG,SEV.SEC) +UL@85873,2000LS,MOD,2S(13NO) | |
| 970226 | | 057 | 31585.9 | KONUS (STRONG,SOFT PK@+39) +UL@30547,2000LS(V.INT,40S) | |
| | 13 | 057 | 31595.8 | PEAK (270/S,10SEC) (MODERATELY STRONG) | REP0313 |
| 970228 | | 059 | 10680.8 | BEPPOSAX(IAU6572)MOD.INT.,80S,4 PKS (75.46,11.75J)IAU6578 | |
| | | 059 | 10680.8 | INT.X-RAY,RADIO(IAU6576,6577),OPTICAL(6584),MOTION(6629) | OPTICAL |
| | 13 | 059 | 10659.1 | PKS,667.1(60/S,ONE-SIDED,SOFT,@74DEG) DOUBTFUL (+UL,WIND) | |
| 970313 | | 072 | 30096.5 | KONUS(MOD.STRONG,PK@+11,40S)+UL@28380,2000LS(MOD.INT,10S) | |
| | 13 | 072 | 28355.8 | PEAK (180/S,<2S,SOFT) (NO PEAK AT 30096!) (CONFLICT) | REP0501 |

From HENZE@fender.msfc.nasa.gov Wed Dec 3 13:21 PST 1997
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id NAA19792; Wed, 3 Dec 1997 13:21:09 -0800
m: HENZE@fender.msfc.nasa.gov
Date: Wed, 3 Dec 1997 15:20:44 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971203152044.2243a470@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6516
Content-Type: text
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6516
EVENT OF 1997 DEC 1 DAY OF YEAR=335
EVENT CROSSING TIME AT BATSE : 20639. S. OR 05:43:59.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 170.000 38.000
BATSE PEAK COUNTING RATE: 15000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 1/12/ 97 IS:
RA= 170.717 DEC= 12.335 DIST= 5.383 AU
BATSE-ULYSSES DISTANCE = 805343794. KM.
NGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=154.33 DEG.
GHT TRAVEL TIME ALONG PROJECTED PATH=-2421.14 SECS.
CROSSING TIME AT ULYSSES IS 18218. S. OR 05:03:37 +/- 215.29 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 1/12/ 97 IS:
RA= 288.155 DEC= -23.656 DIST= 2.033 AU
MARS-BATSE DISTANCE = 304104832. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 54.01 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 596.07 SECS.
CROSSING TIME AT MARS IS 21235. S. OR 05:53:55 +/- 151.55 SECONDS

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6516 | 971201 | 10783 | 20639 | 15000 | 170 | +38 | 1 |

BATSE BURST TRIGGER
NO.: 6516

TIME: TJD=0783 SECONDS=20639

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

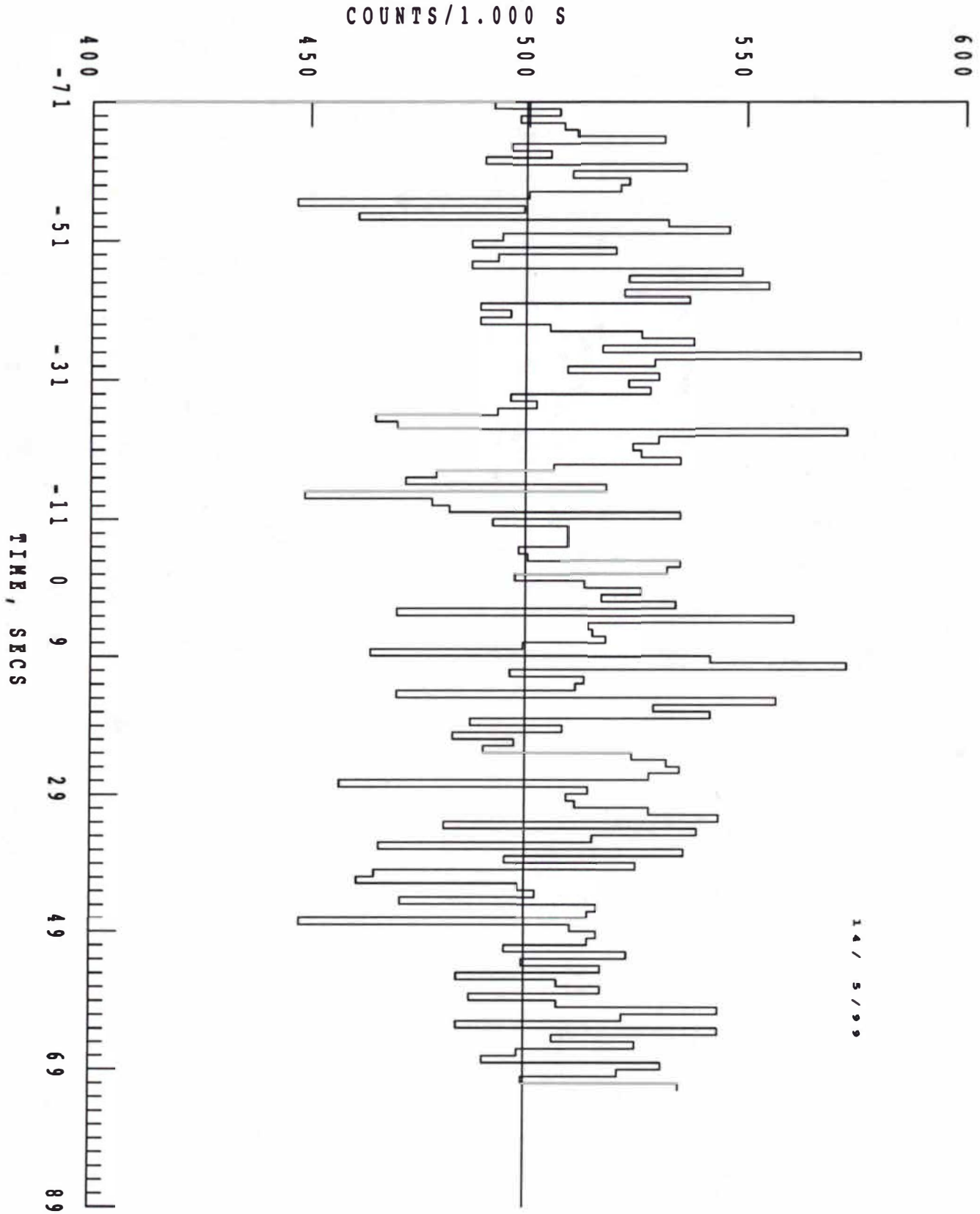
INTENSITY: COUNTS/CM2

CATION: ZENITH= 88.3 AZIMUTH=264.5 ERROR= 5.2 DEGREES

COMMENTS:
GRB. DUR. APPROX. 1 S. VISIBLE ABOVE 300 KEV.

NEAR 01/12/97 20690.010

100-1000 keV



Position moved

BATSE BURST# 6516

ULYSSES RT 18/01/00

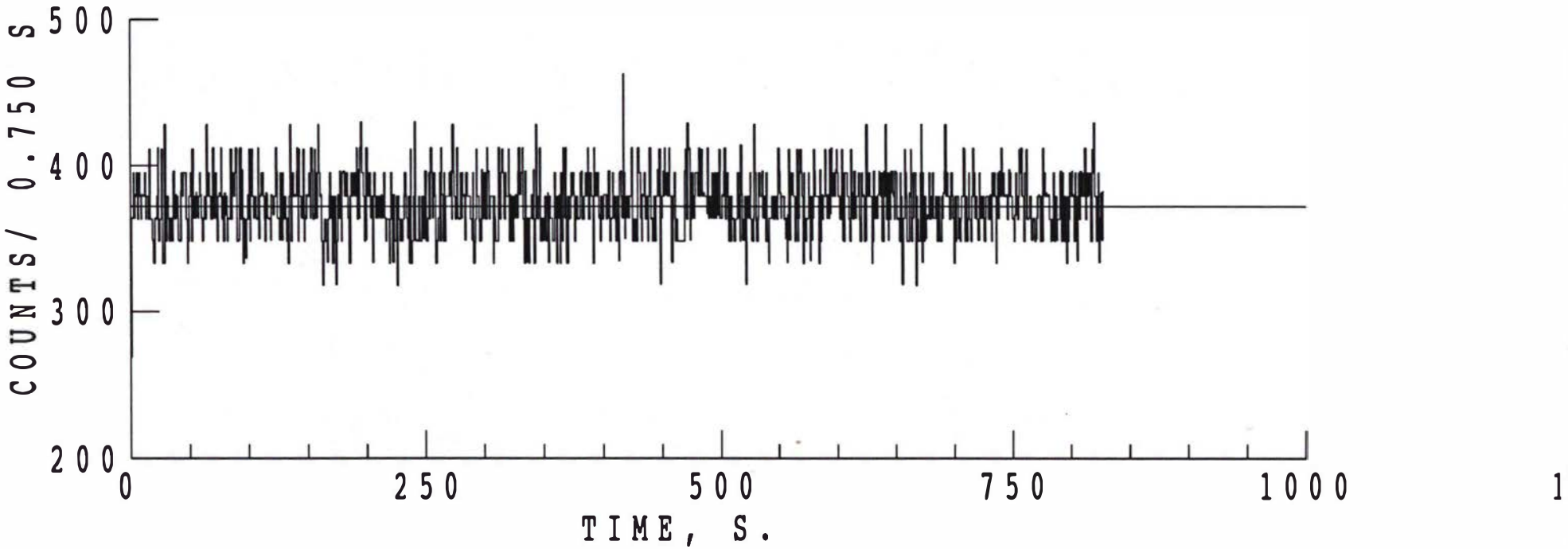
01/12/97 18828.039 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV

N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



BATSE BURST# 6516

ULYSSES RT 3/12/97

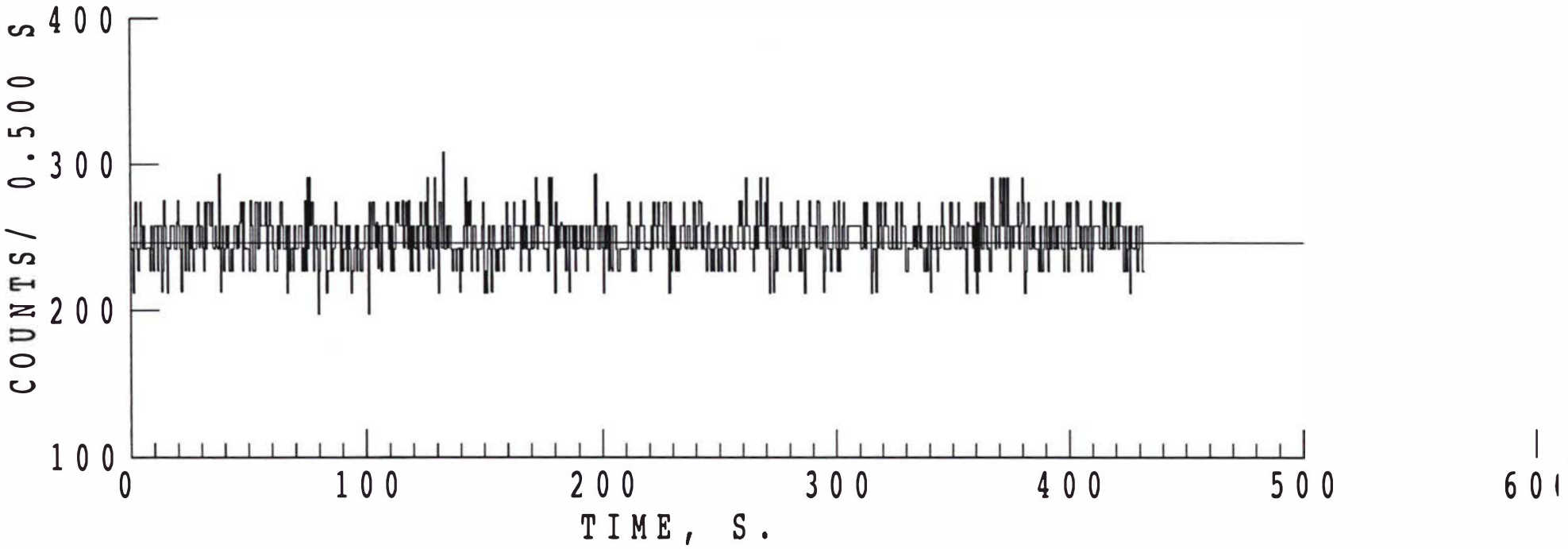
1/12/97 18000.031 s

0.250 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From HENZE@fender.msfc.nasa.gov Wed Dec 3 13:19:17 1997
Date: Wed, 3 Dec 1997 15:18:19 -0600 (CST)
From: Bill Henze (205-544-7616) <HENZE@fender.msfc.nasa.gov>
To: burst@comptel.sr.unh.edu, grobad@estsa2.estec.esa.nl,
cline@lheavx.gsfc.nasa.gov, barthelmy@lheavx.gsfc.nasa.gov,
bacodine@pandora.gsfc.nasa.gov, scott@circe.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, band@cass09.ucsd.edu,
gruber@cass09.ucsd.edu, matteson@cass09.ucsd.edu,
PACIESAS@fender.msfc.nasa.gov, HORACK@fender.msfc.nasa.gov,
khurley@sunspot.ssl.berkeley.edu, lmm@egret.gsfc.nasa.gov,
mops@osse.nrl.navy.mil, grove@osse.nrl.navy.mil,
matz@osse.nrl.navy.mil, share@osse.nrl.navy.mil,
messina@osse.nrl.navy.mil, sandora@osse.nrl.navy.mil,
park@kabul.llnl.gov
Subject: Burst Trigger Message

BATSE BURST TRIGGER

NO.: 6517

TIME: TJD=0783 SECONDS=48448

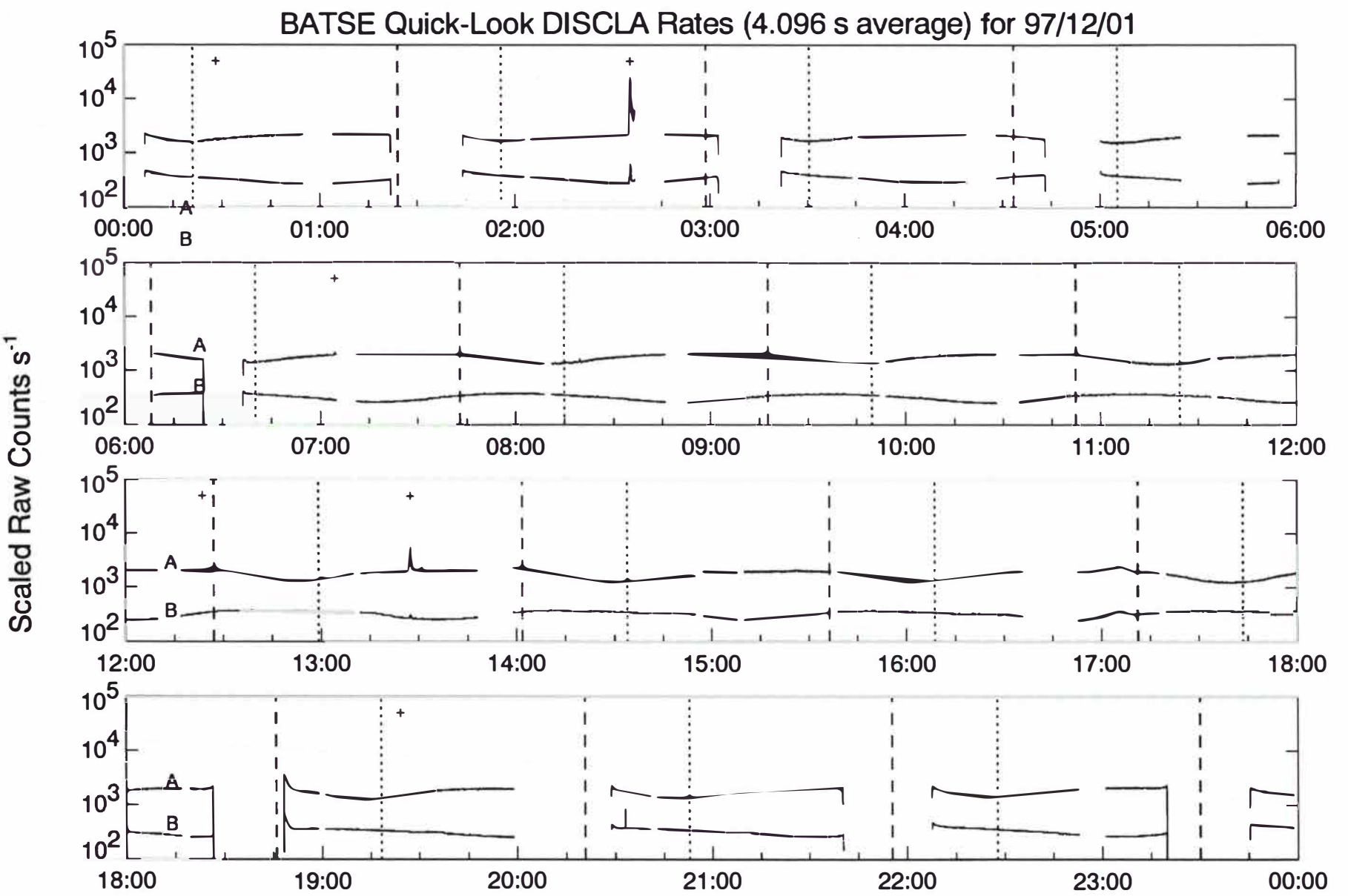
TYPE: FLARE SOLAR FLARE TRIGGER SIGNAL:N

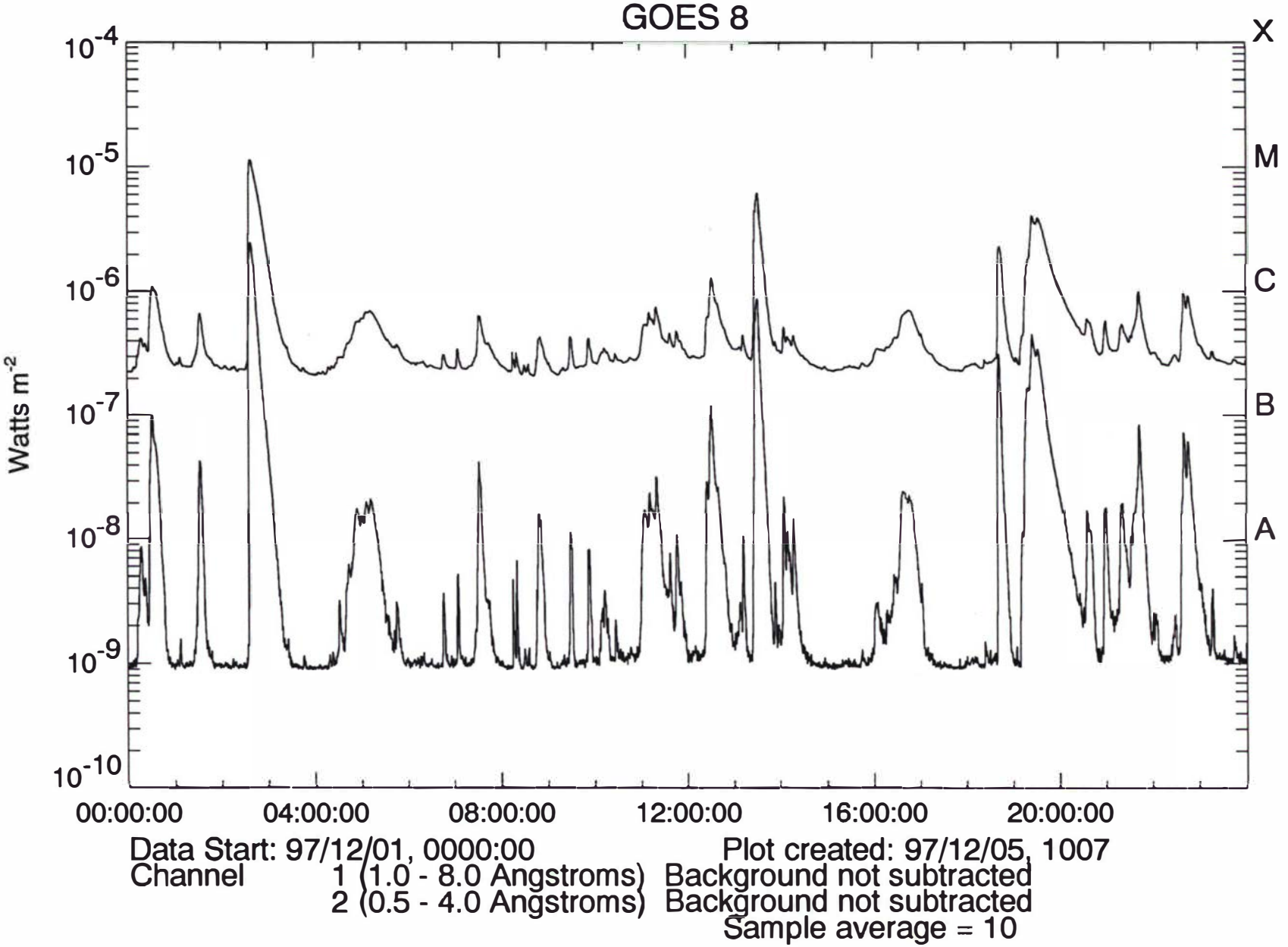
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

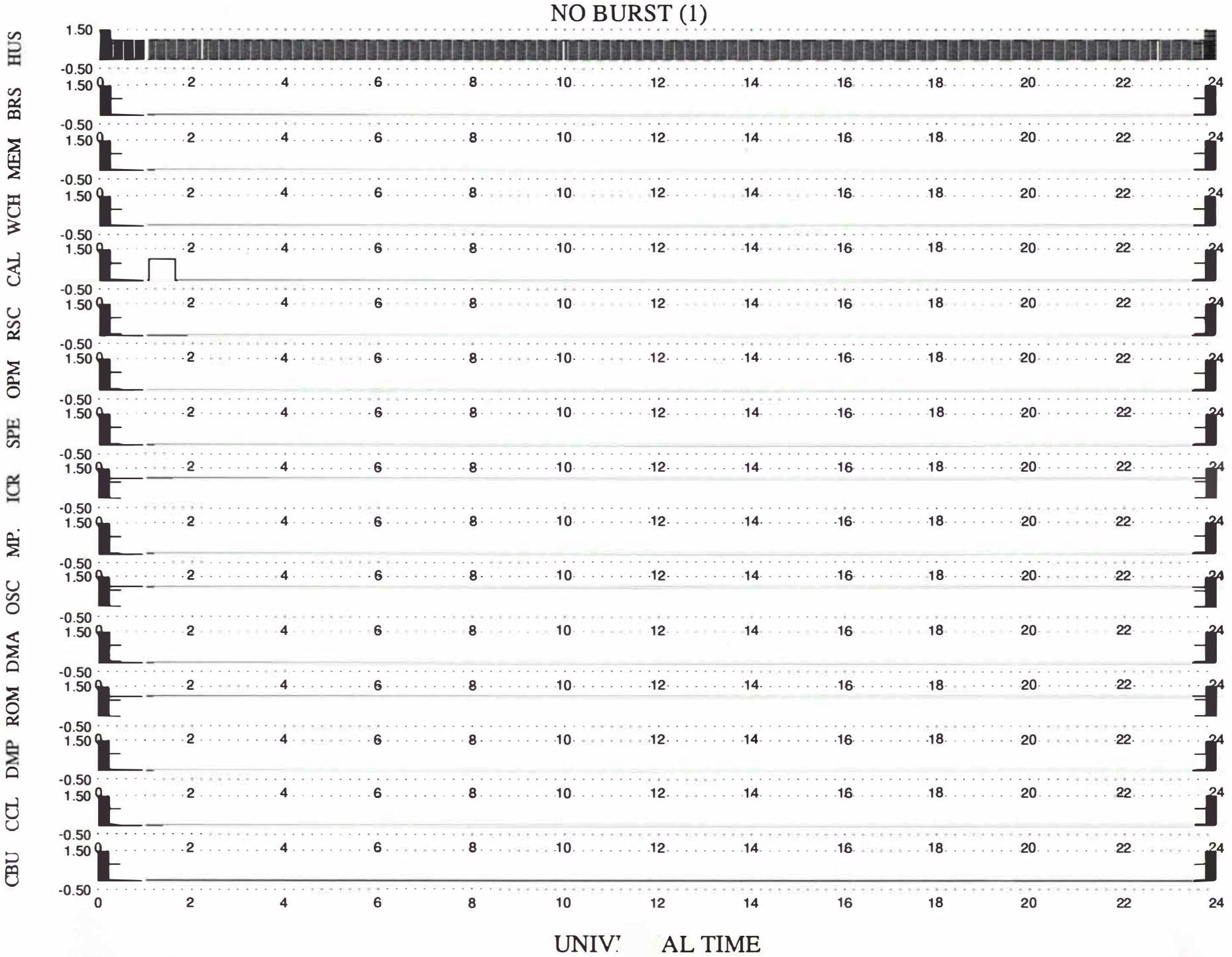
LOCATION: ZENITH= 35.9 AZIMUTH=353.0 ERROR= 1.1 DEGREES

COMMENTS:
GOES C6.6, OPTICAL SF SOLAR FLARE. TWO PULSES, TOTAL DUR. APPROX. 300 S., STARTING AT APPROX. T-35 S. MAIN PULSE HAS MAX APPROX. T. NOT VISIBLE ABOVE 100 KEV.


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/01
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/05, 1009 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

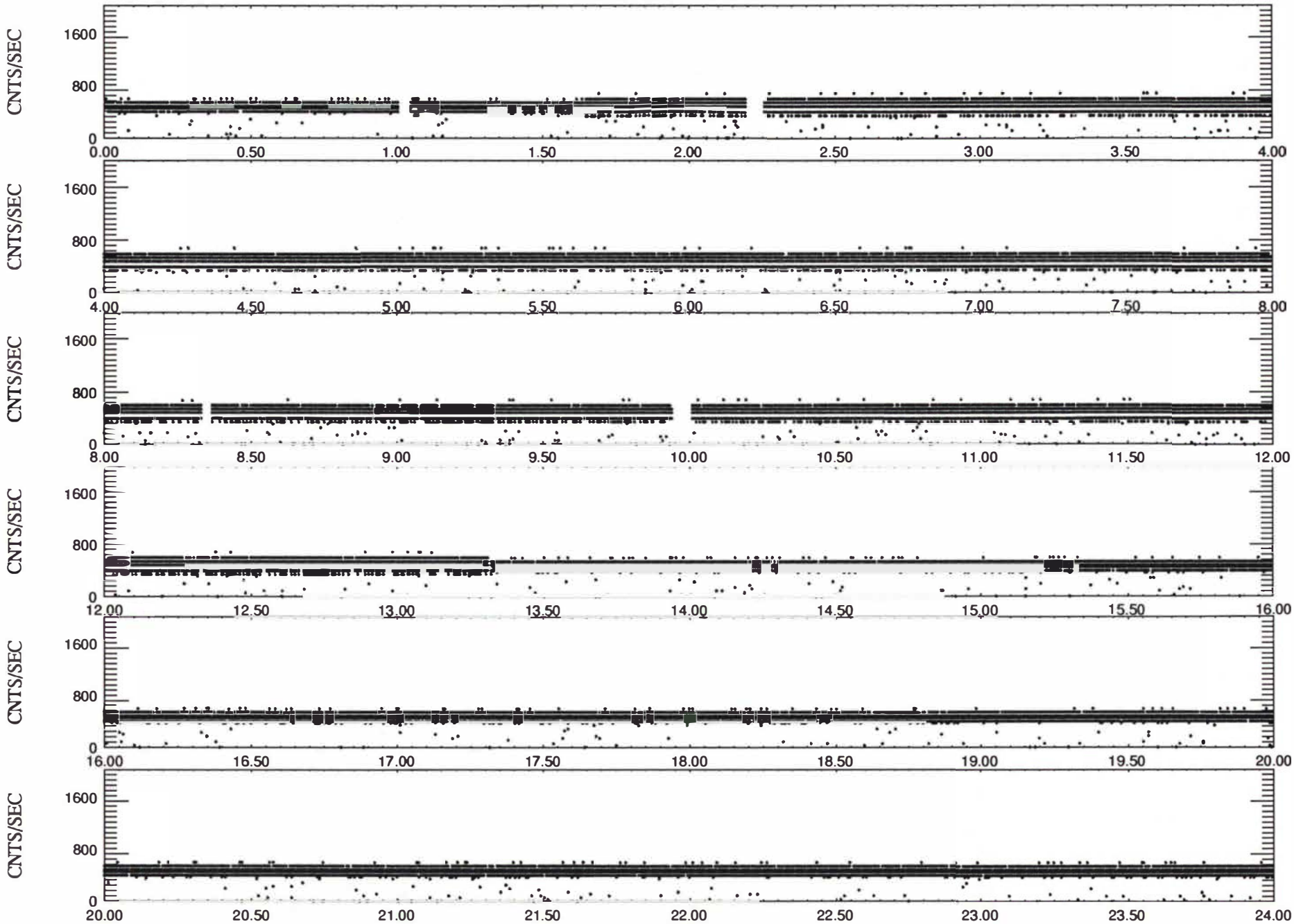

GOES 8
X
M
C
B
A
Watts m-2
10-4
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/01, 0000:00
Plot created: 97/12/05, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 335, year 1997 to day 335, year 1997 3/12/98



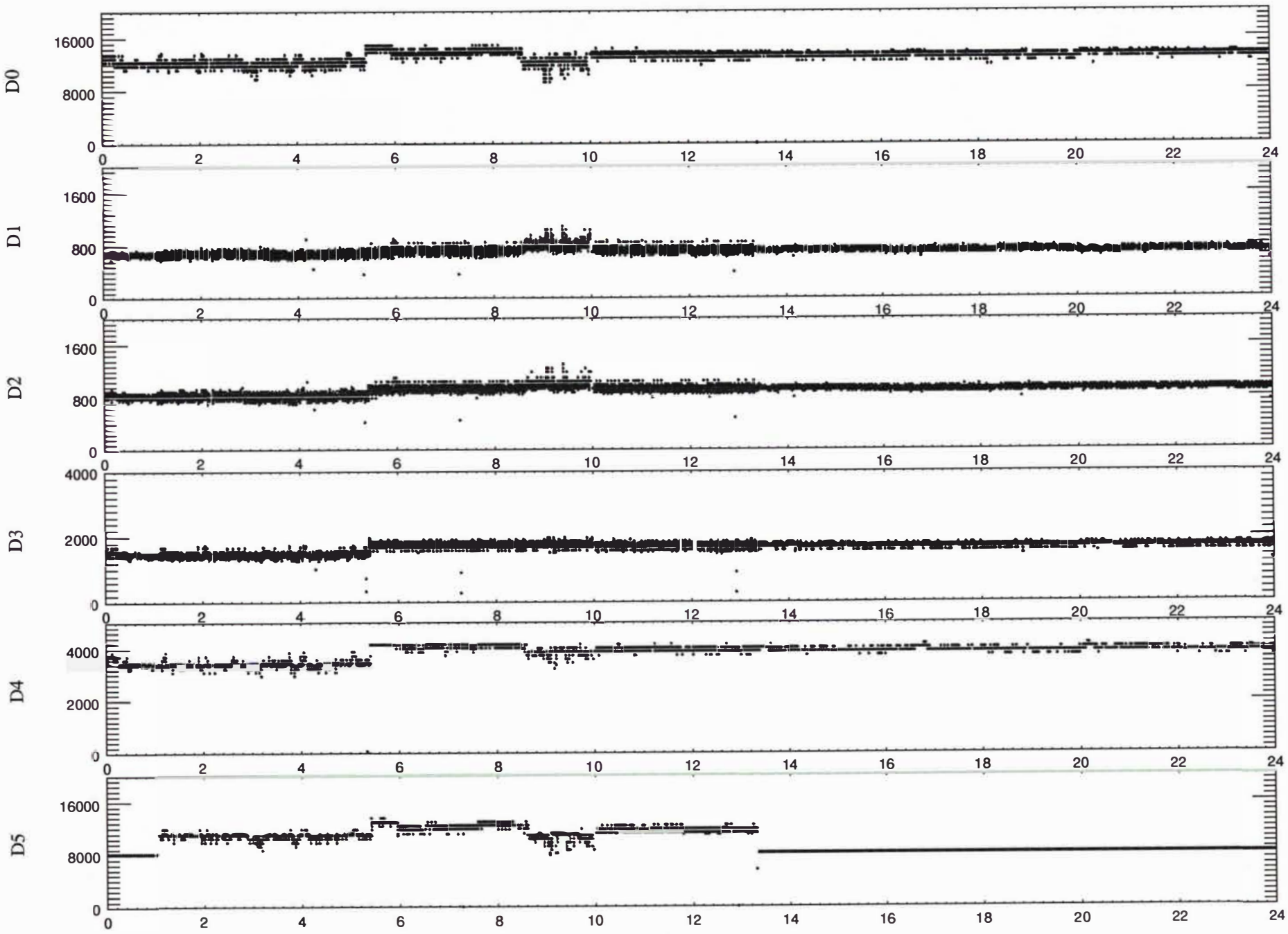
HUS 2A, MODE 1, NOT AVERAGED EDR day 335, year 1997 to day 335, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV' 'AL TIME

HUS 2B COUNTS / SEC EDR day 335, year 1997 to day 335, year 1997 3/12/98



From WOODSP@SSLMOR.msfc.nasa.gov Thu Dec 4 09:16:19 1997
Return-Path: <WOODSP@SSLMOR.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA19483; Thu, 4 Dec 1997 09:16:18 -0800
From: WOODSP@SSLMOR.msfc.nasa.gov
Received: from SSLMOR.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA25399; Thu, 4 Dec 1997 09:16:08 -0800
Date: Thu, 4 Dec 1997 11:16:04 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971204111604.21el0417@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6518
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6518
EVENT OF 1997 DEC 2 DAY OF YEAR=336
EVENT CROSSING TIME AT BATSE : 48891. S. OR 13:34:51.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 36.000 -14.000
BATSE PEAK COUNTING RATE: 3000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 2/12/ 97 IS:
RA= 170.736 DEC= 12.290 DIST= 5.362 AU
BATSE-ULYSSES DISTANCE = 802123954. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 44.05 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1923.18 SECS.
CROSSING TIME AT ULYSSES IS 50814. S. OR 14:06:54 +/- 402.16 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 2/12/ 97 IS:
RA= 288.990 DEC= -23.557 DIST= 2.036 AU
MARS-BATSE DISTANCE = 304625184. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 80.59 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 166.15 SECS.
CROSSING TIME AT MARS IS 49057. S. OR 13:37:37 +/- 176.56 SECONDS

BATSE BURST TRIGGER
NO.: 6518

TIME: TJD=0784 SECONDS=48891

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

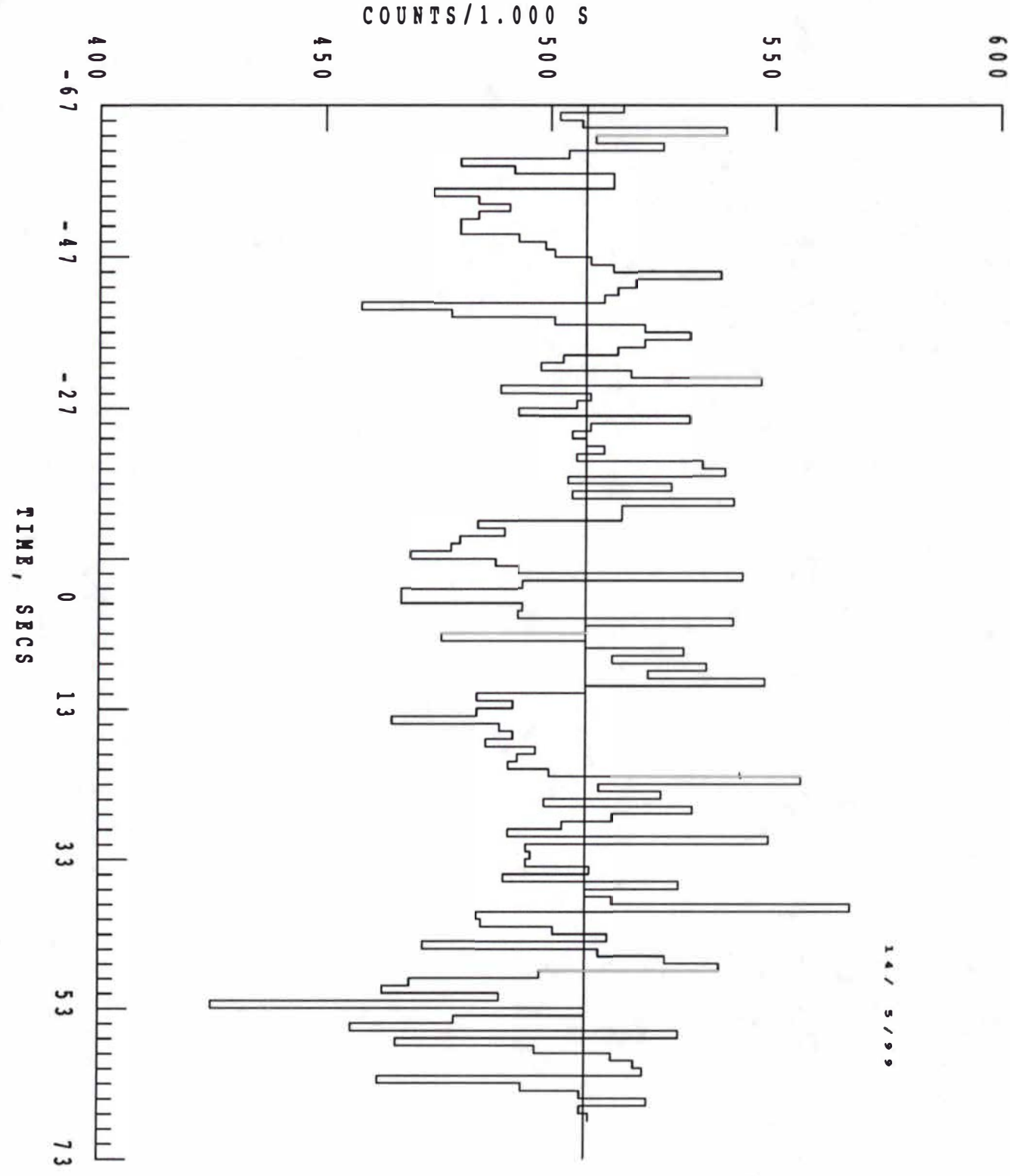
LOCATION: ZENITH=130.8 AZIMUTH=112.5 ERROR=6.1 DEGREES

COMMENTS:
GRB LASTING ABOUT 7 SEC. SINGLE PULSE. NOT VISIBLE ABOVE
300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6518 | 971202 | 10784 | 48891 | 3000 | 036 | -14 | 7 |

NEAR 02/12/97 48828.988

100-1000 keV



BATSE BURST# 6518

ULYSSES RT 4/12/97

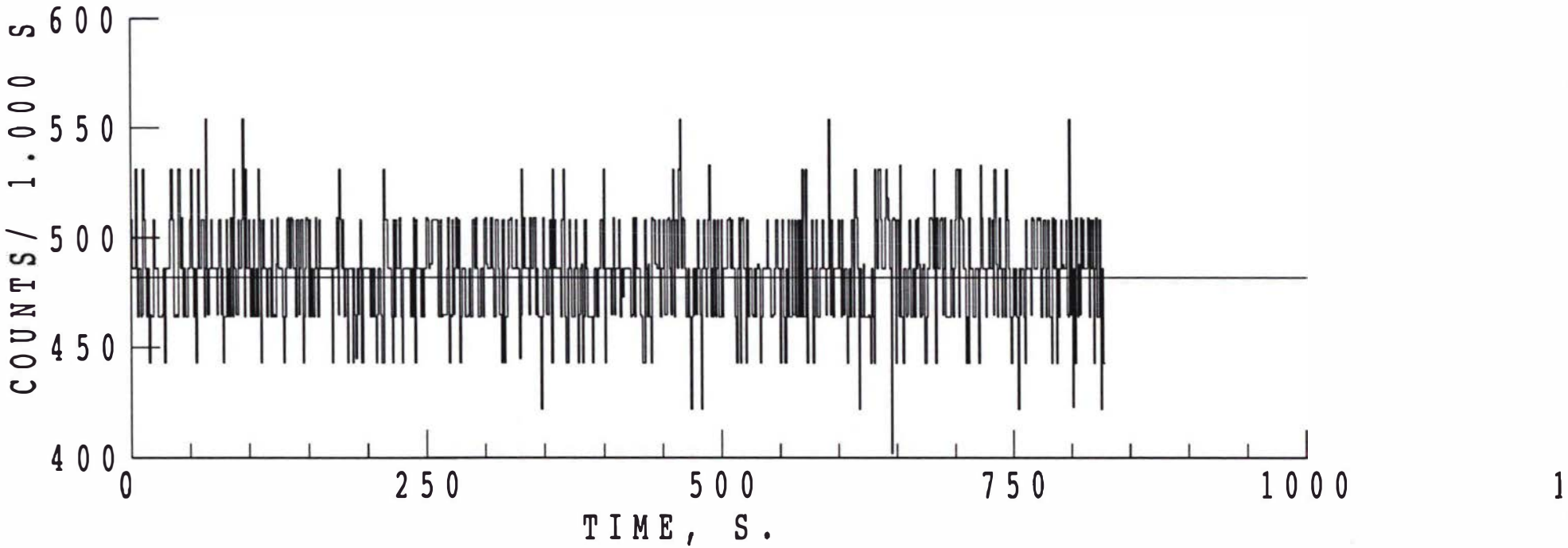
2/12/97 50400.359 s

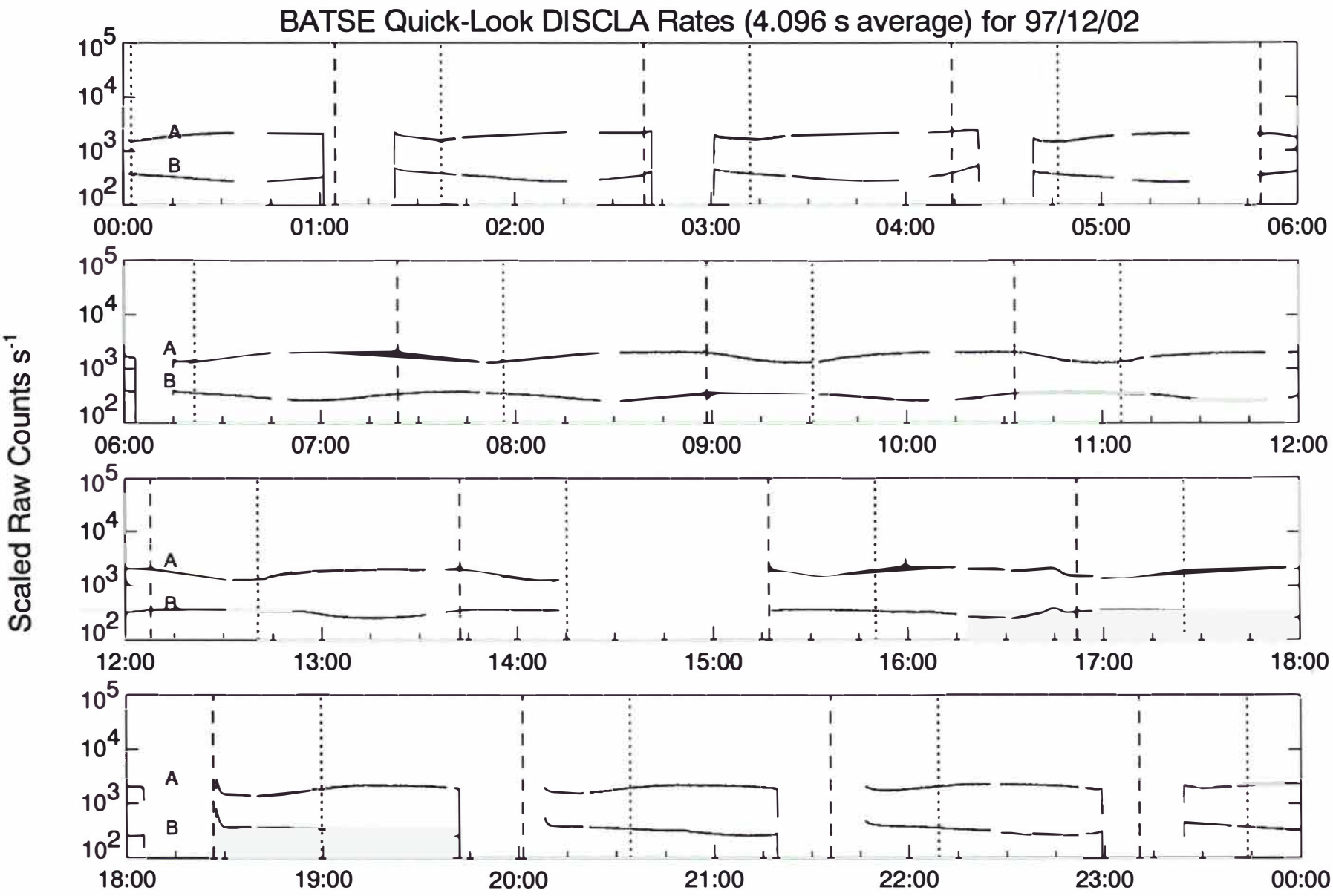
0.500 S INTERVALS REGROUPED BY 2

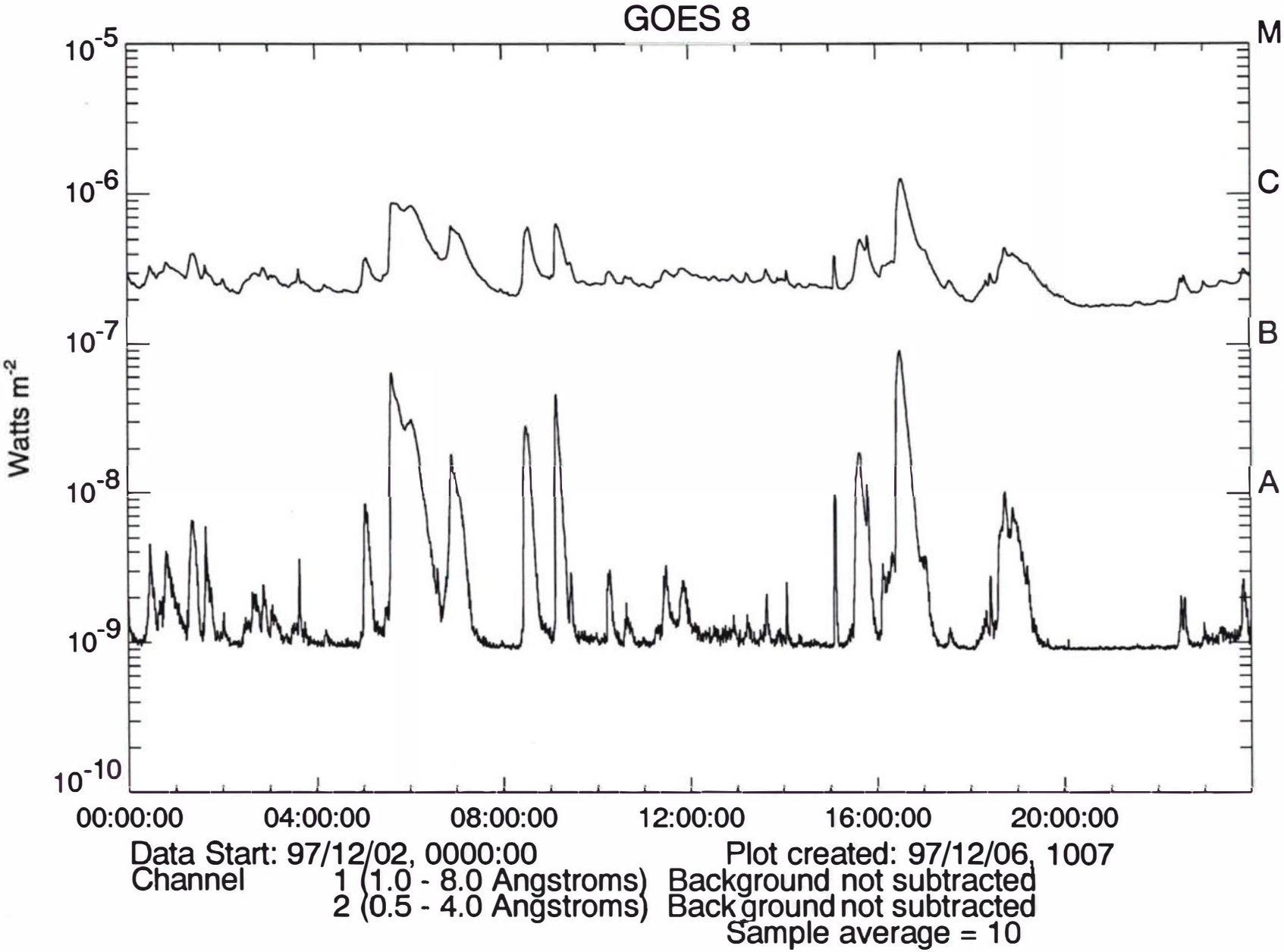
0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

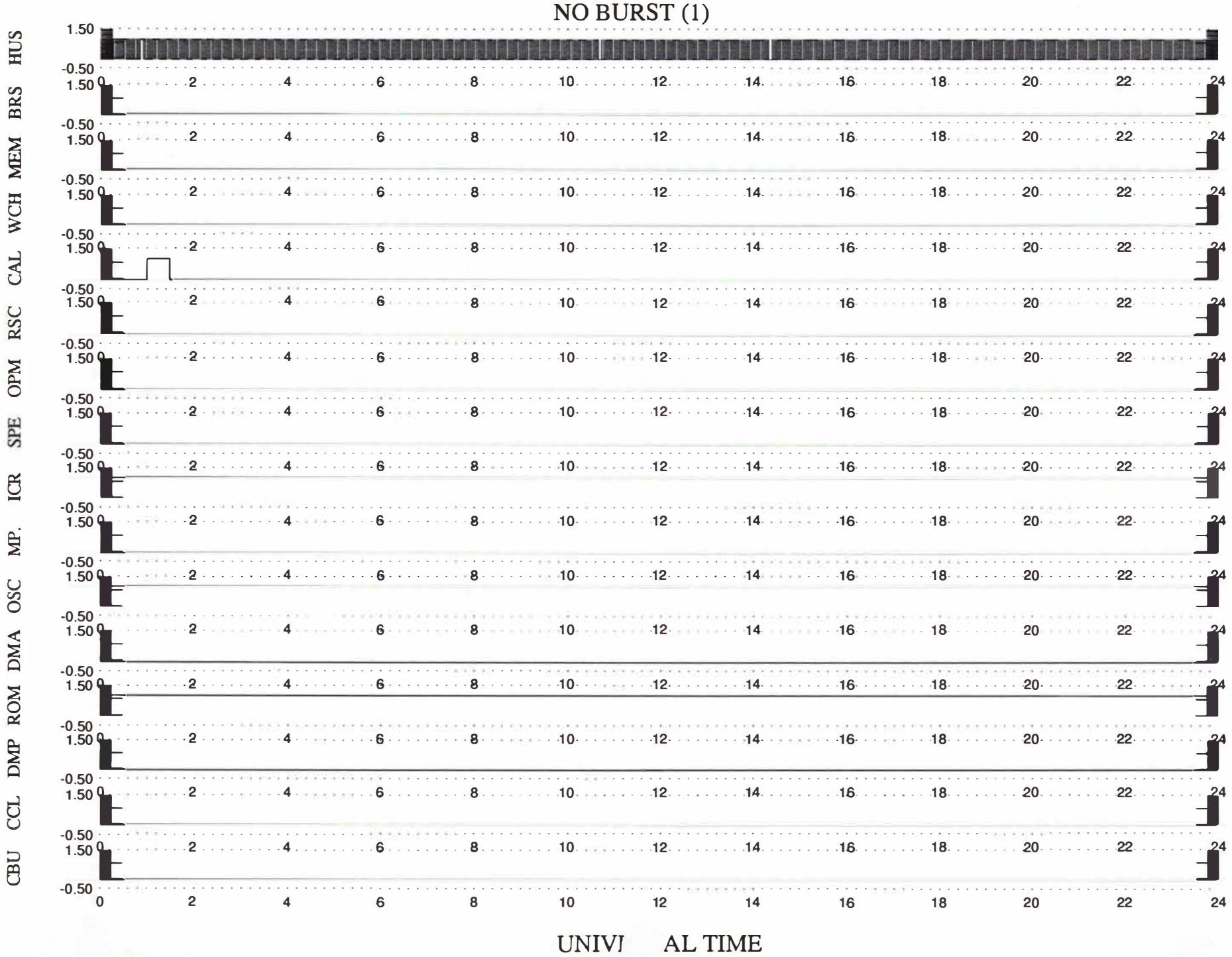
N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/02
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/06, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

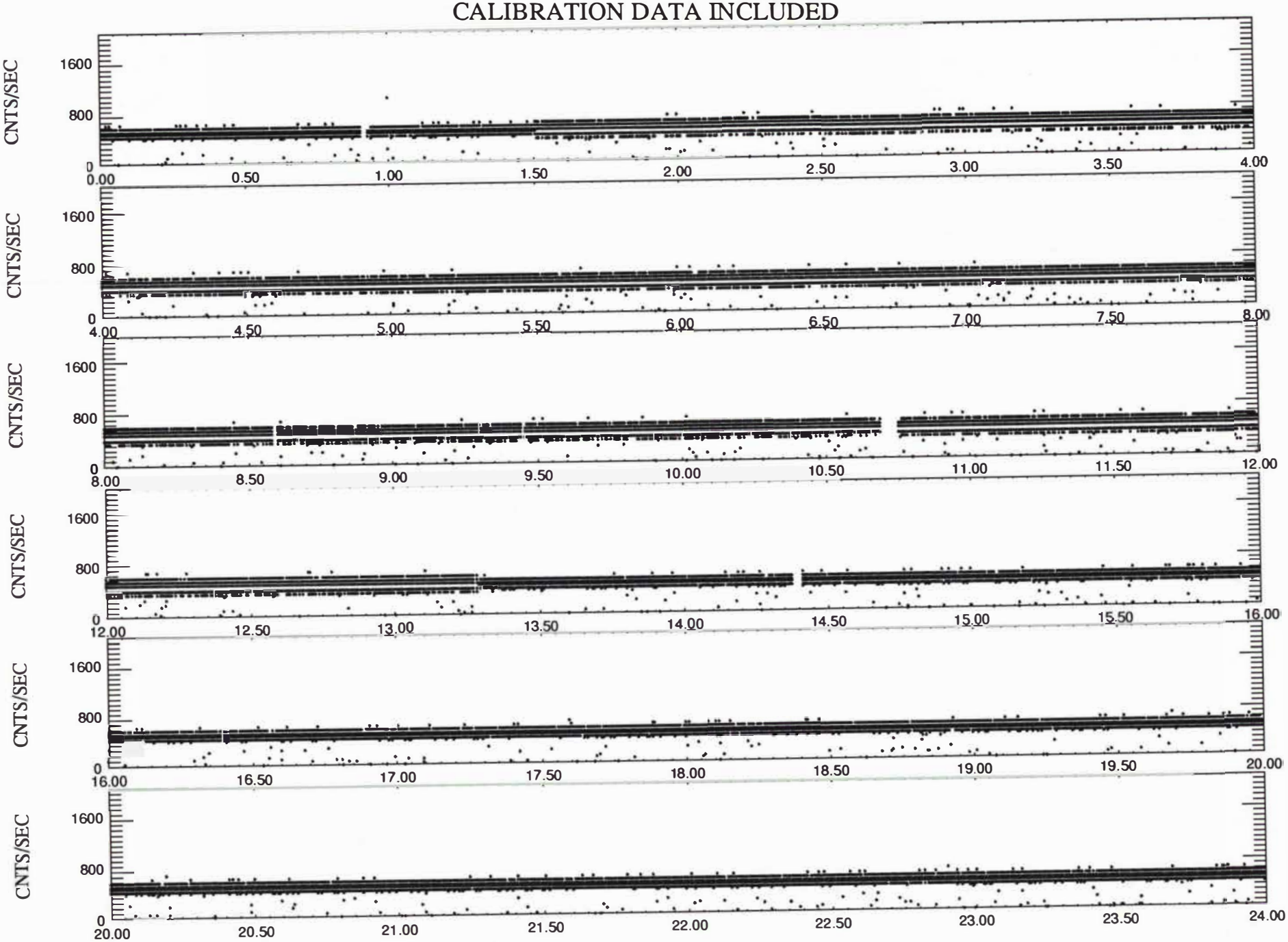

GOES 8
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/02, 0000:00
Plot created: 97/12/06, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 336, year 1997 to day 336, year 1997 3/12/98



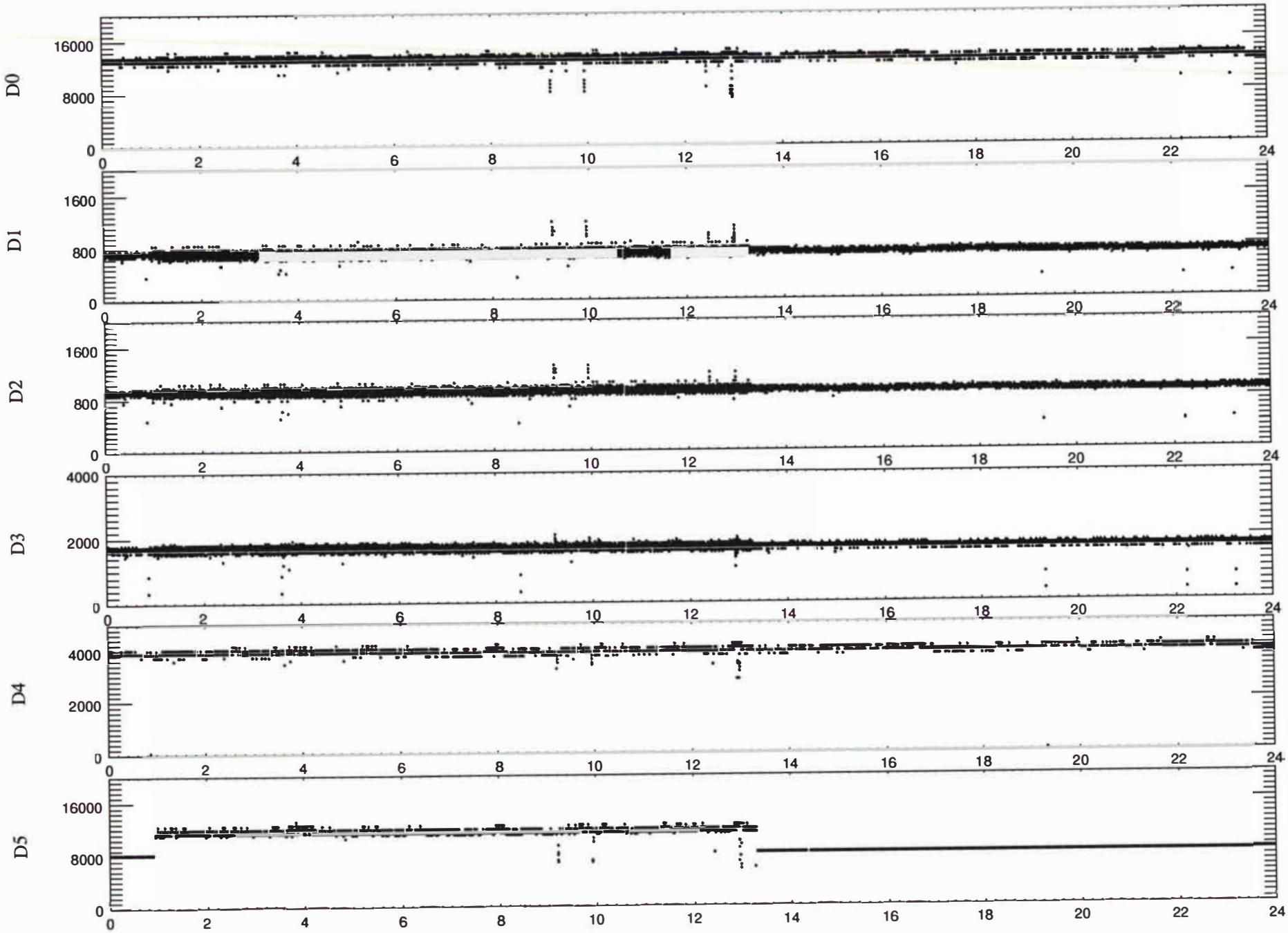
HUS 2A, MODE 1, NOT AVERAGED EDR day 336, year 1997 to day 336, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV[illegible]AL TIME

HUS 2B COUNTS / SEC EDR day 336, year 1997 to day 336, year 1997 3/12/98



Date: Jan 10 2012

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

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

## 2. For Konus events

☑ Konus ecliptic latitude used with latest calibration?

## 2. For Odyssey events

☐ Was CHECKMO run to eliminate data gaps?

☐ Did the Odyssey ephemeris correspond to the event time? (When there is data in the database, the ephemeris is for the start of record, usually ~1320 s prior to the request time; when there is no data in the database, the ephemeris is for the request time in the e-mail, so the request time in mosearch should be equal to the GRB time. Note that the time in the return e-mail will be ~1320 s prior to the time requested, in the line "no HEND data…")

☐ Was Mars-blocking used?

☐ For cruise phase data (April – October 2001), was the updated data used? (Old data has timing errors)

☐ GRS database searched for triggered data? Database data between August 2005 and January 2006 should be re-extracted, due to timing errors. (E-mailed data should be OK).

☐ GRS and HEND data cross-correlated to check timing?

## 2. For 3 or More Spacecraft events

☐ $\Sigma$ $3\Delta t$'s calculated, and/or BMAPSUM executed?

## 3. For INTEGRAL events

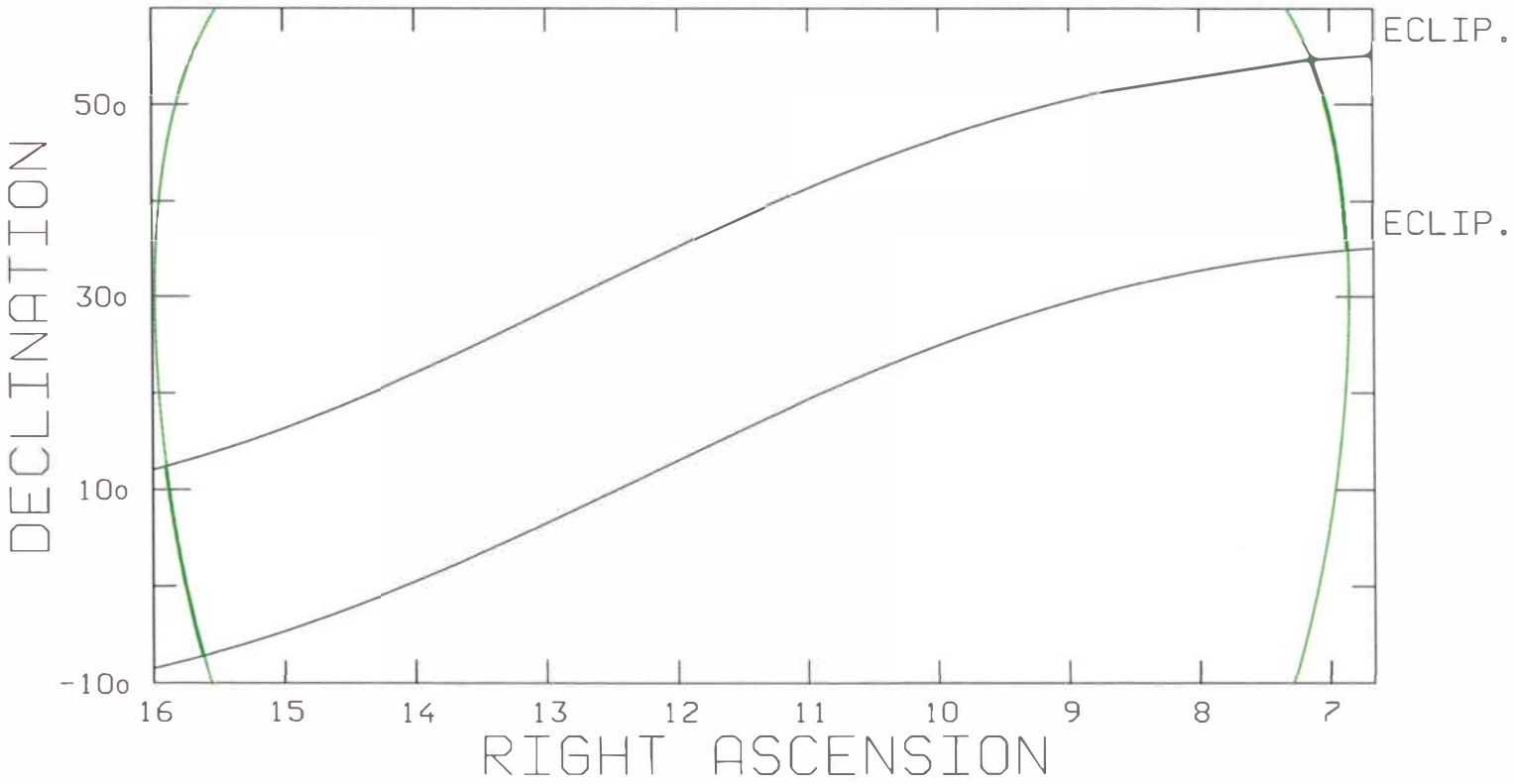
☐ INTEGRAL SPI-ACS website checked for bursts that weren't transmitted automatically?

☐ 125 ms added to INTEGRAL SPI-ACS time for bursts prior to April 2 2004 11:00 UT?

☐ Updated ephemeris used for bursts prior to September 30, 2003?

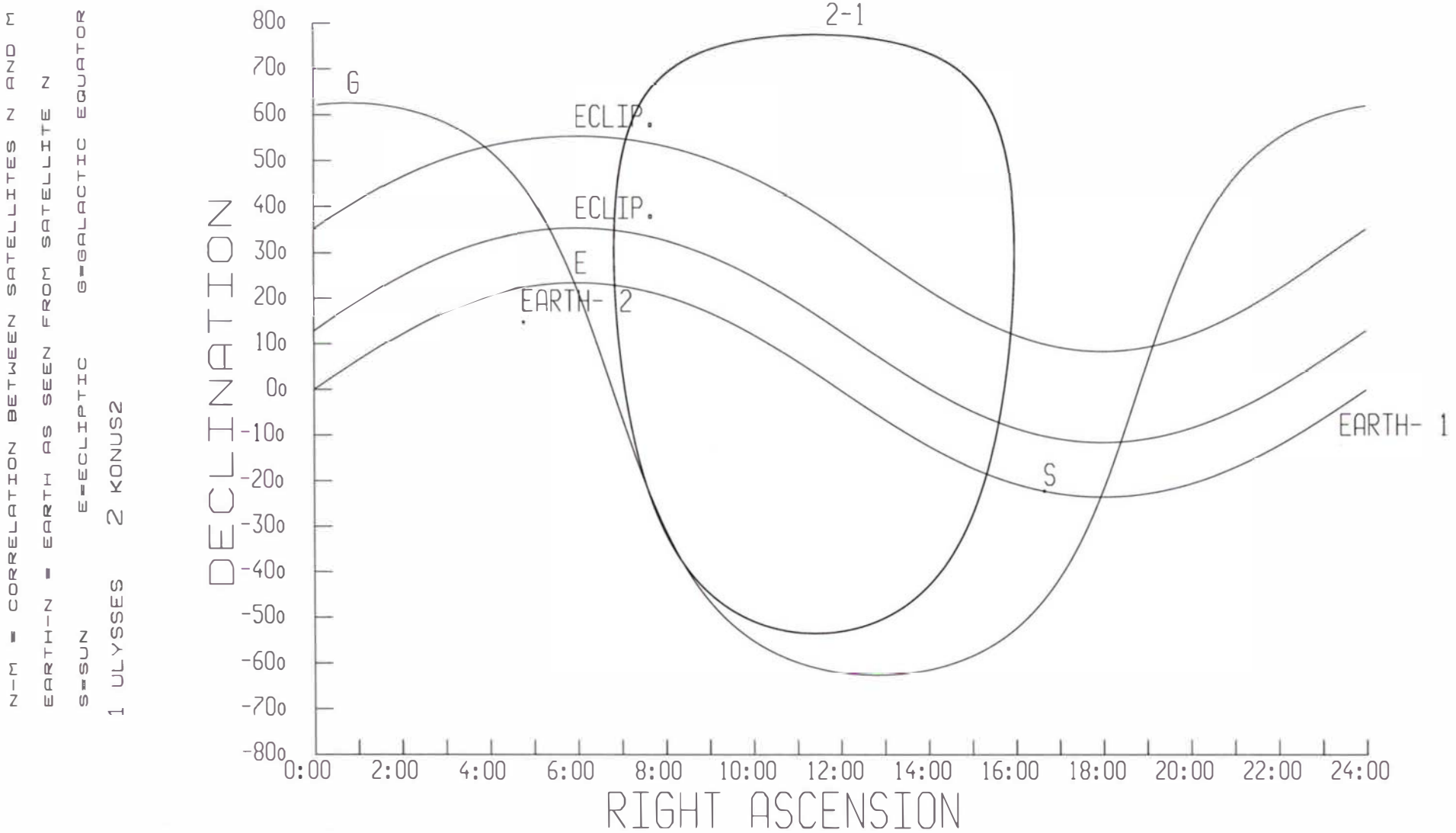
---

☑ ACCESS and MBL4 databases updated with identical times?


ECLIP.
ECLIP.
DECLINATION
50o
30o
10o
-10o
16
15
14
13
12
11
10
9
8
7
RIGHT ASCENSION

# EVENT OF DEC 3, 1997 14:33

10/01/2012



konus 19971203 52468

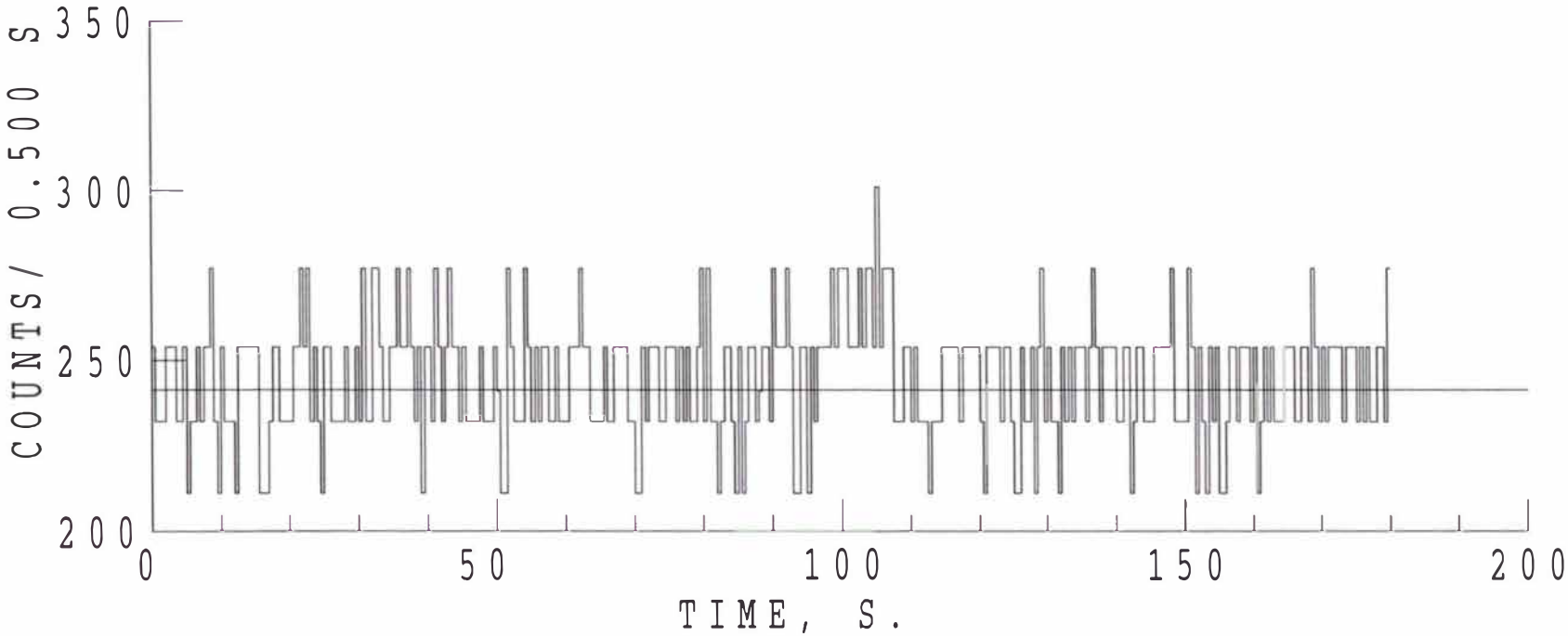
ULYSSES RT 09/01/12

03/12/97 52380.352 s

0- 0 keV

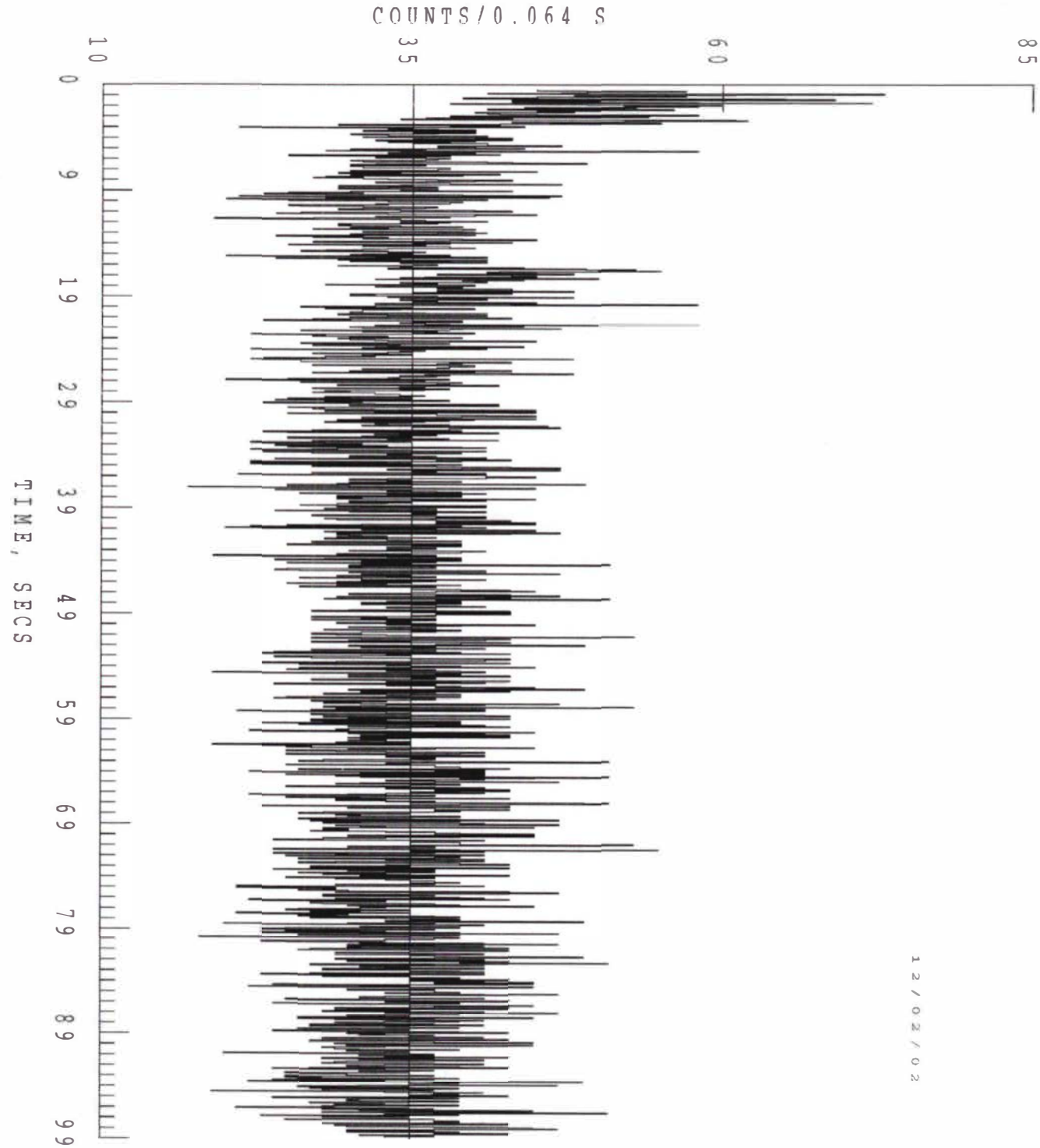
N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



KONUS2 03/12/97 53596.089

50- 200 keV



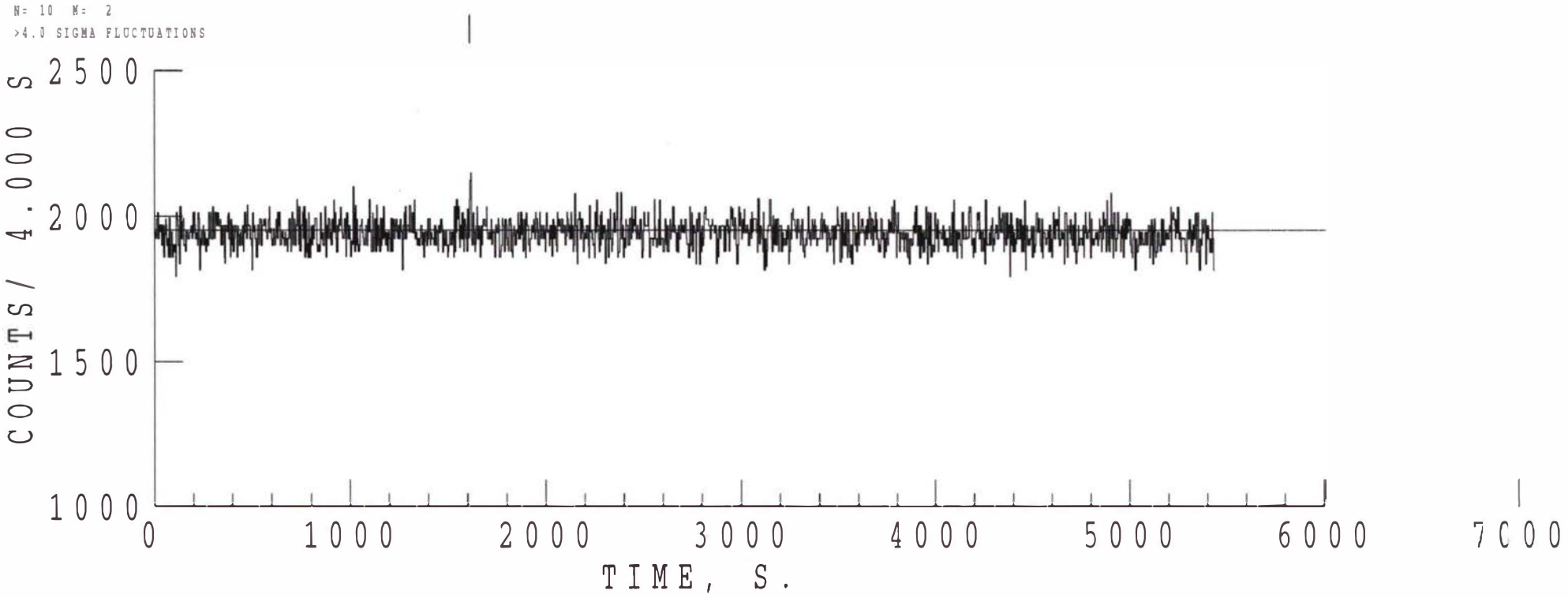
KONUS2 19971203 53596

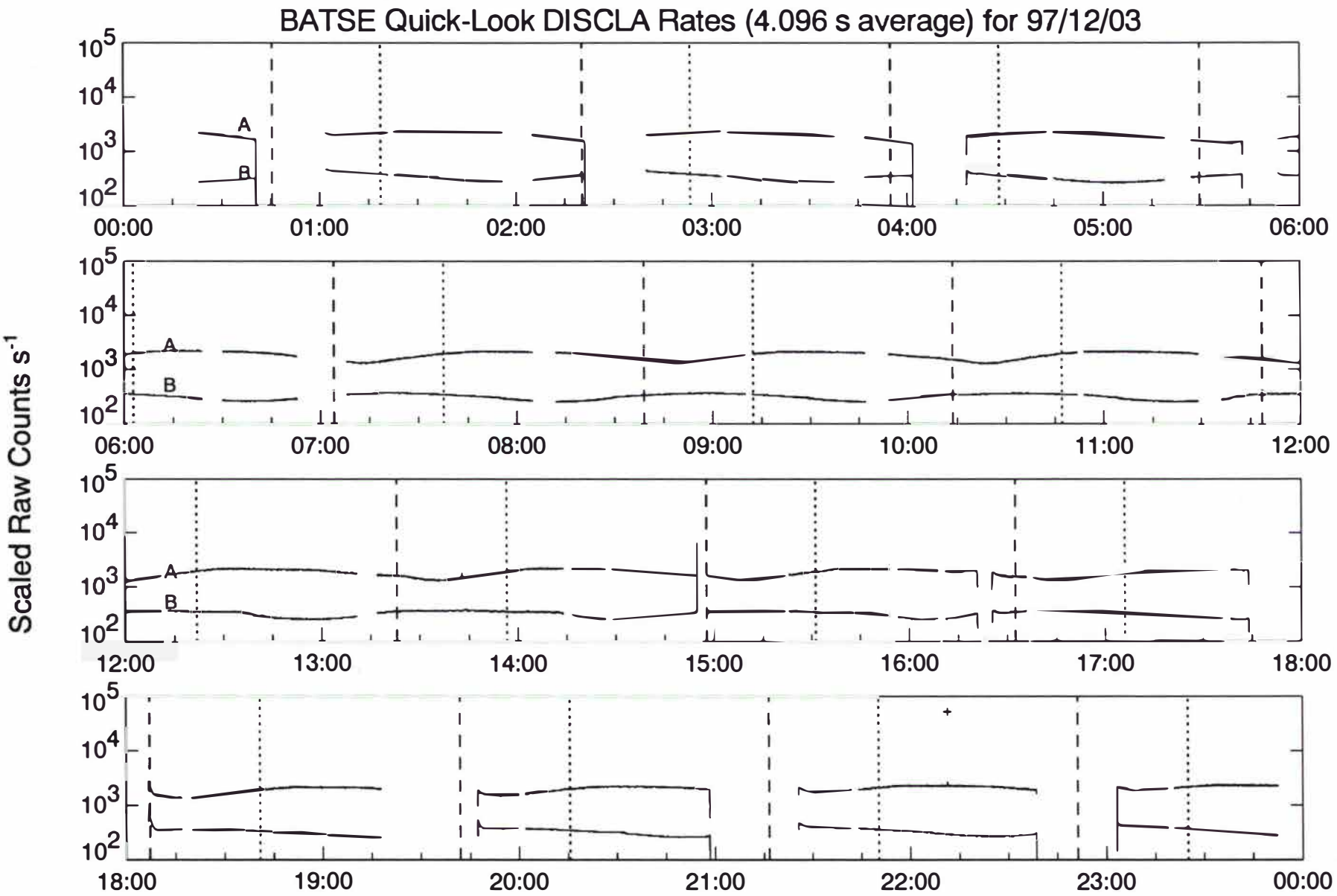
ULYSSES RT 12/02/02

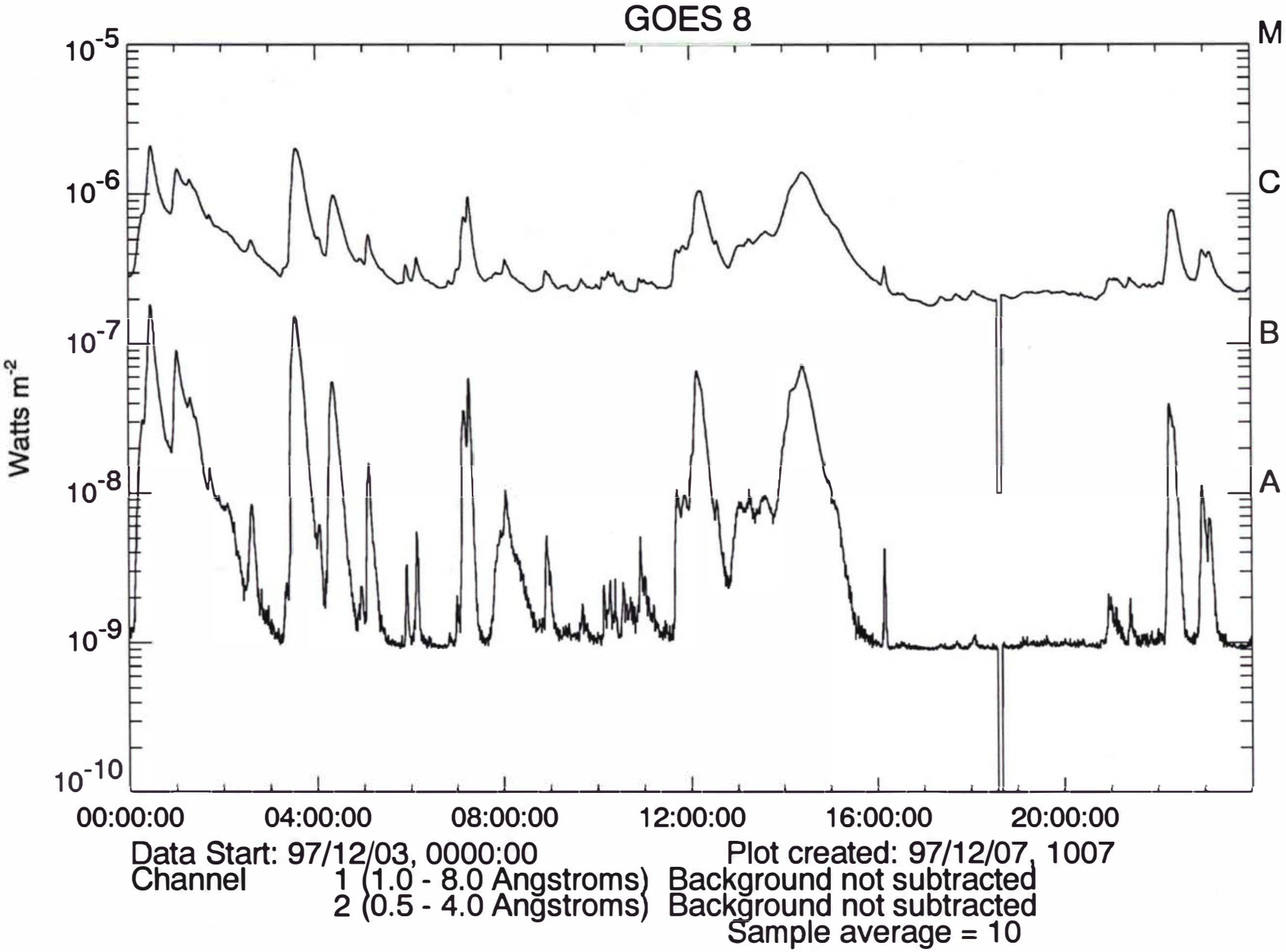
03/12/97 50868.332 s

0.500 S INTERVALS REGROUPED BY 8

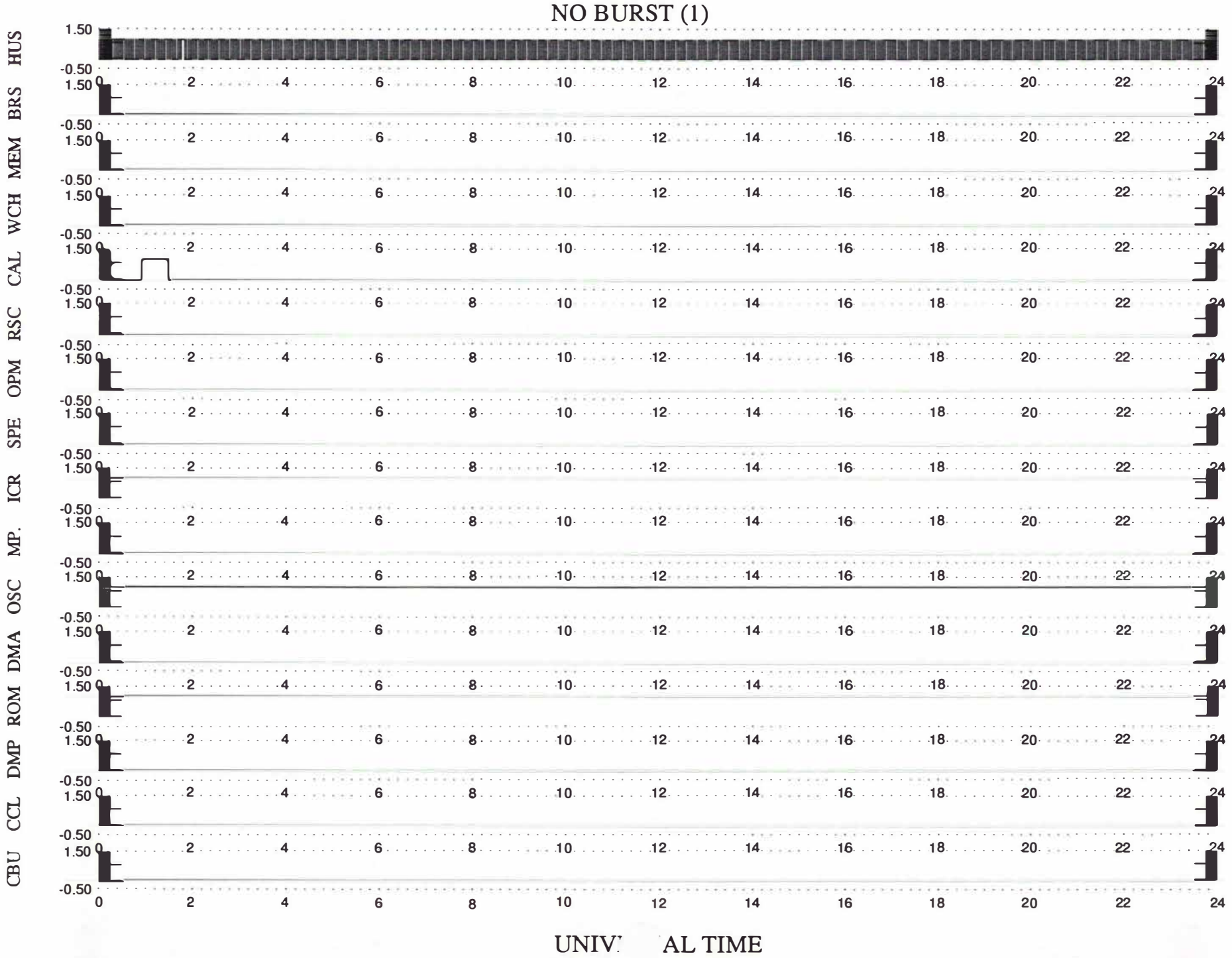
0- 0 keV




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/03
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/07, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

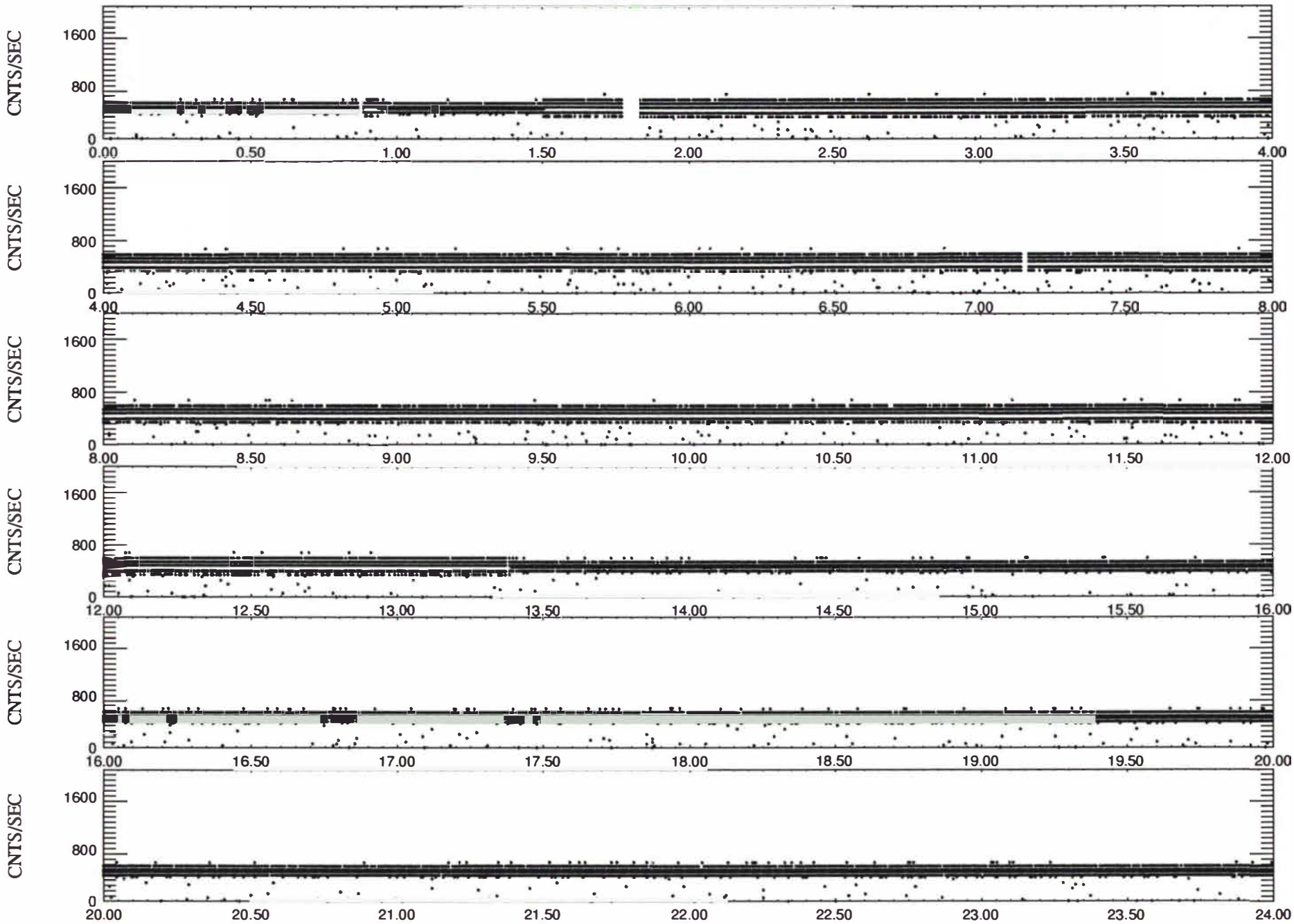

GOES 8
M
C
B
A
$10^{-5}$
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/03, 0000:00
Plot created: 97/12/07, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 337, year 1997 to day 337, year 1997 3/12/98



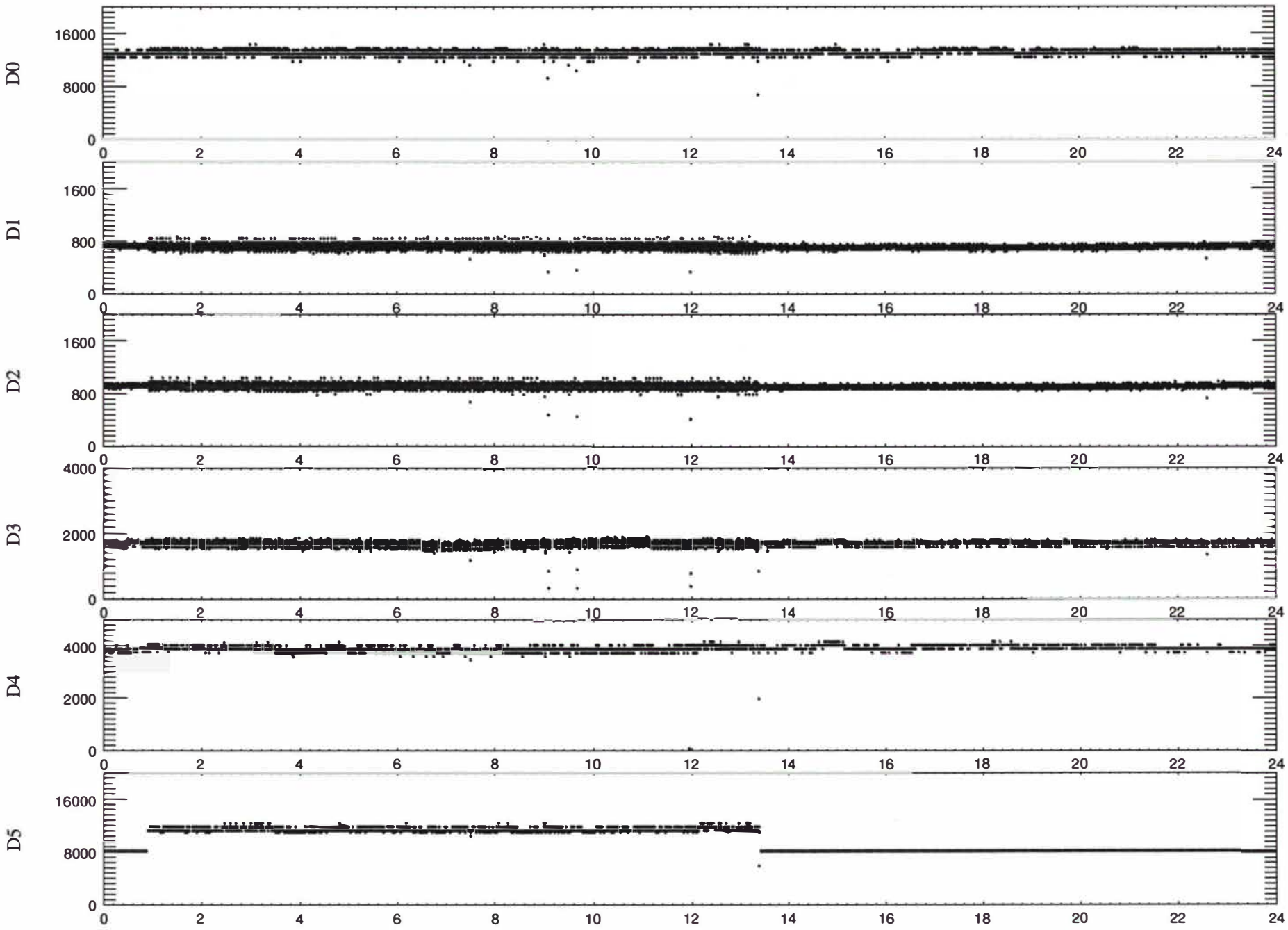
HUS 2A, MODE 1, NOT AVERAGED EDR day 337, year 1997 to day 337, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV AL TIME

HUS 2B COUNTS / SEC EDR day 337, year 1997 to day 337, year 1997 3/12/98



From SURASAK@SSLLES.MSFC.NASA.GOV Mon Dec 8 12:19:22 1997
Return-Path: <SURASAK@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA04260; Mon, 8 Dec 1997 12:19:15 -0800
From: SURASAK@SSLLES.MSFC.NASA.GOV
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA19202; Mon, 8 Dec 1997 12:19:15 -0800
Date: Mon, 8 Dec 1997 14:18:58 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971208141858.23403e08@SSLLES.MSFC.NASA.GOV>
Subject: Crossing Windows for BATSE Burst 6519
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6519
EVENT OF 1997 DEC 4 DAY OF YEAR=338
EVENT CROSSING TIME AT BATSE : 16434. S. OR 04:33:54.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 196.000 -35.000
BATSE PEAK COUNTING RATE: 2750 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 4/12/ 97 IS:
RA= 170.752 DEC= 12.239 DIST= 5.335 AU
BATSE-ULYSSES DISTANCE = 798162373. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=127.05 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1603.99 SECS.
CROSSING TIME AT ULYSSES IS 14830. S. OR 04:07:10 +/- 394.57 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 4/12/ 97 IS:
RA= 290.658 DEC= -23.347 DIST= 2.043 AU
MARS-BATSE DISTANCE = 305660704. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 99.57 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -169.48 SECS.
CROSSING TIME AT MARS IS 16265. S. OR 04:31:04 +/- 171.98 SECONDS

BATSE BURST TRIGGER

NO.: 6519

TIME: TJD=0786 SECONDS=16434

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

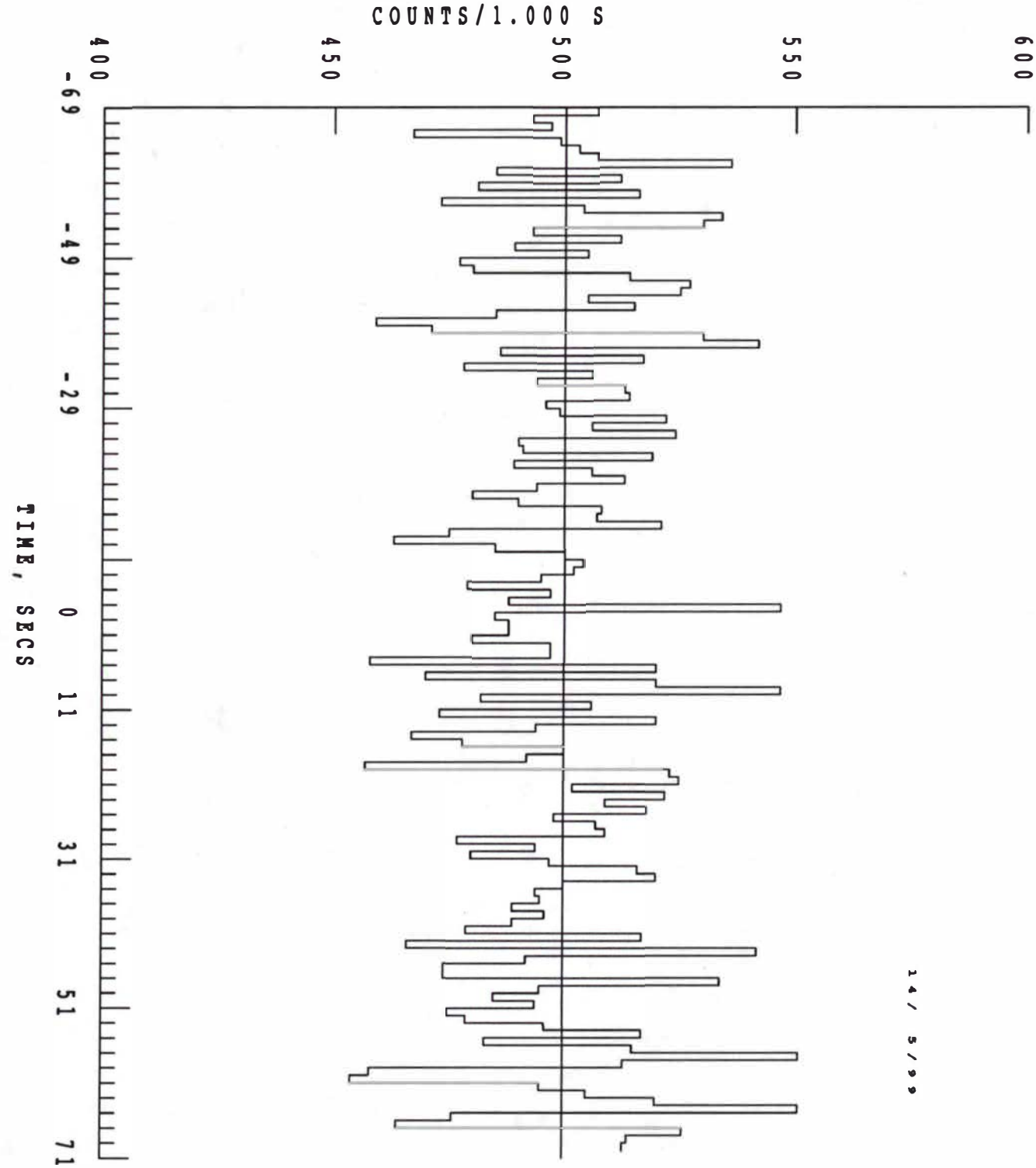
LOCATION: ZENITH=82.5 AZIMUTH=338.9 ERROR=6.028 DEGREES

COMMENTS:
GRB. ABOUT 5 SECONDS PULSE FOLLOWED BY WEAKER BUT LONGER DURATION(ABOUT 40 SECONDS). VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6519 | 971204 | 10786 | 16434 | 2750 | 196 | -35 | 60 |

NEAR 04/12/97 16490.961

100-1000 keV



BATSE BURST# 6519

ULYSSES RT 8/12/97

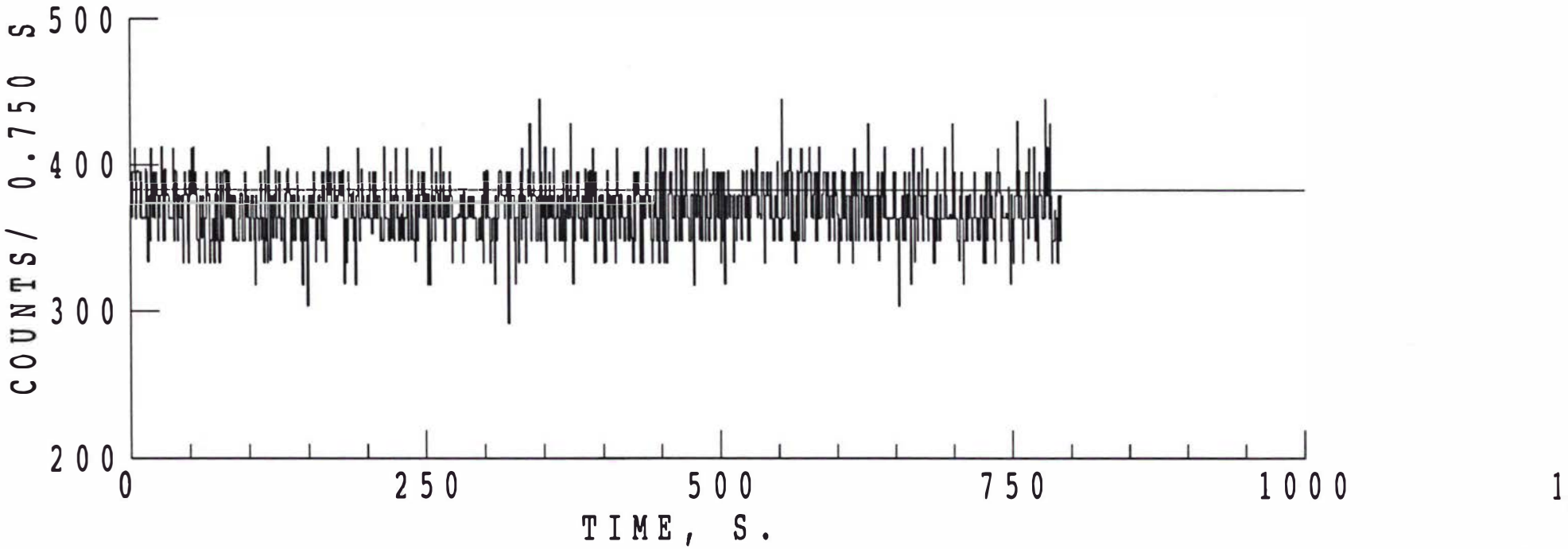
4/12/97 14436.141 s

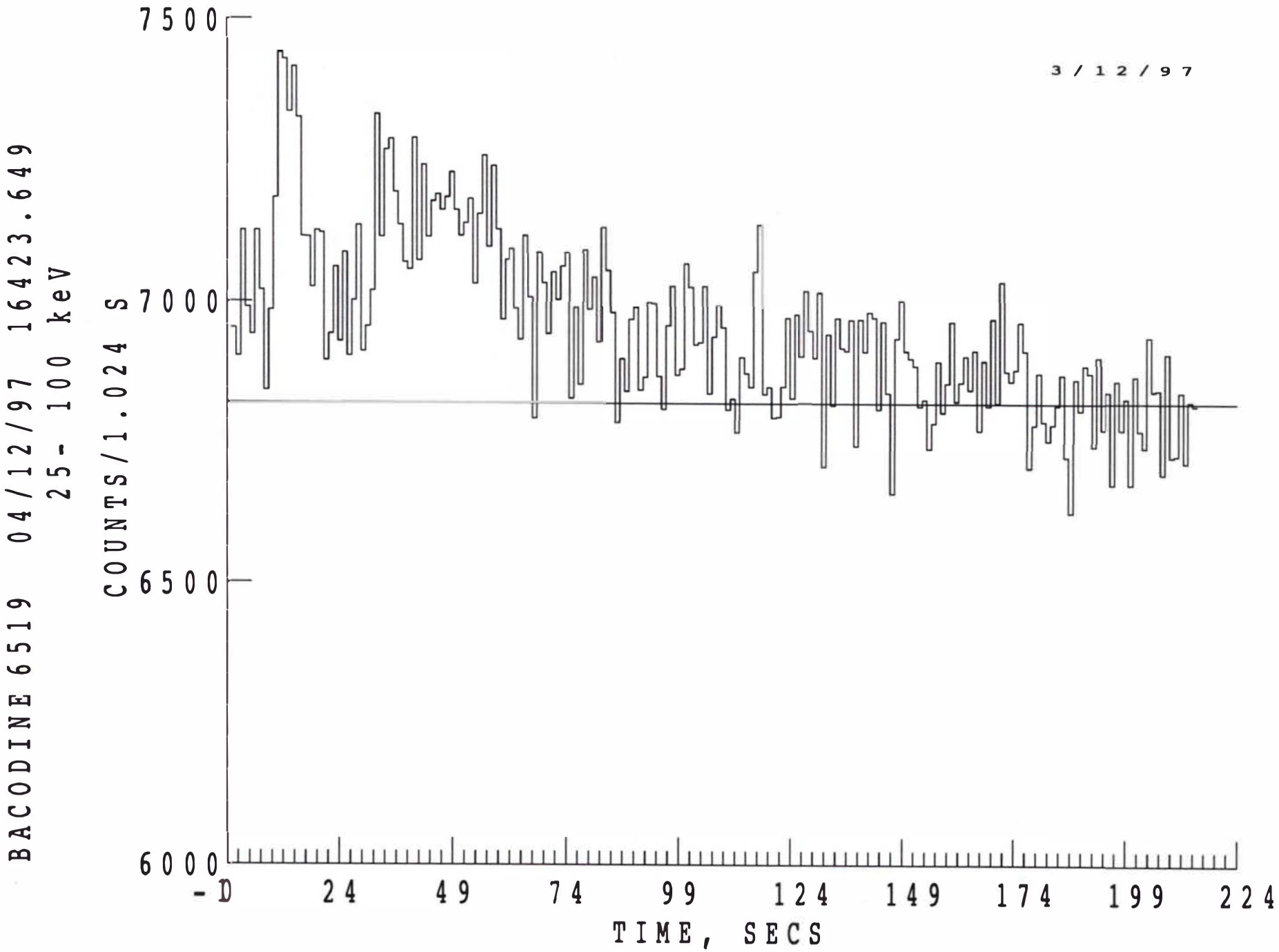
0.250 S INTERVALS REGROUPED BY 3

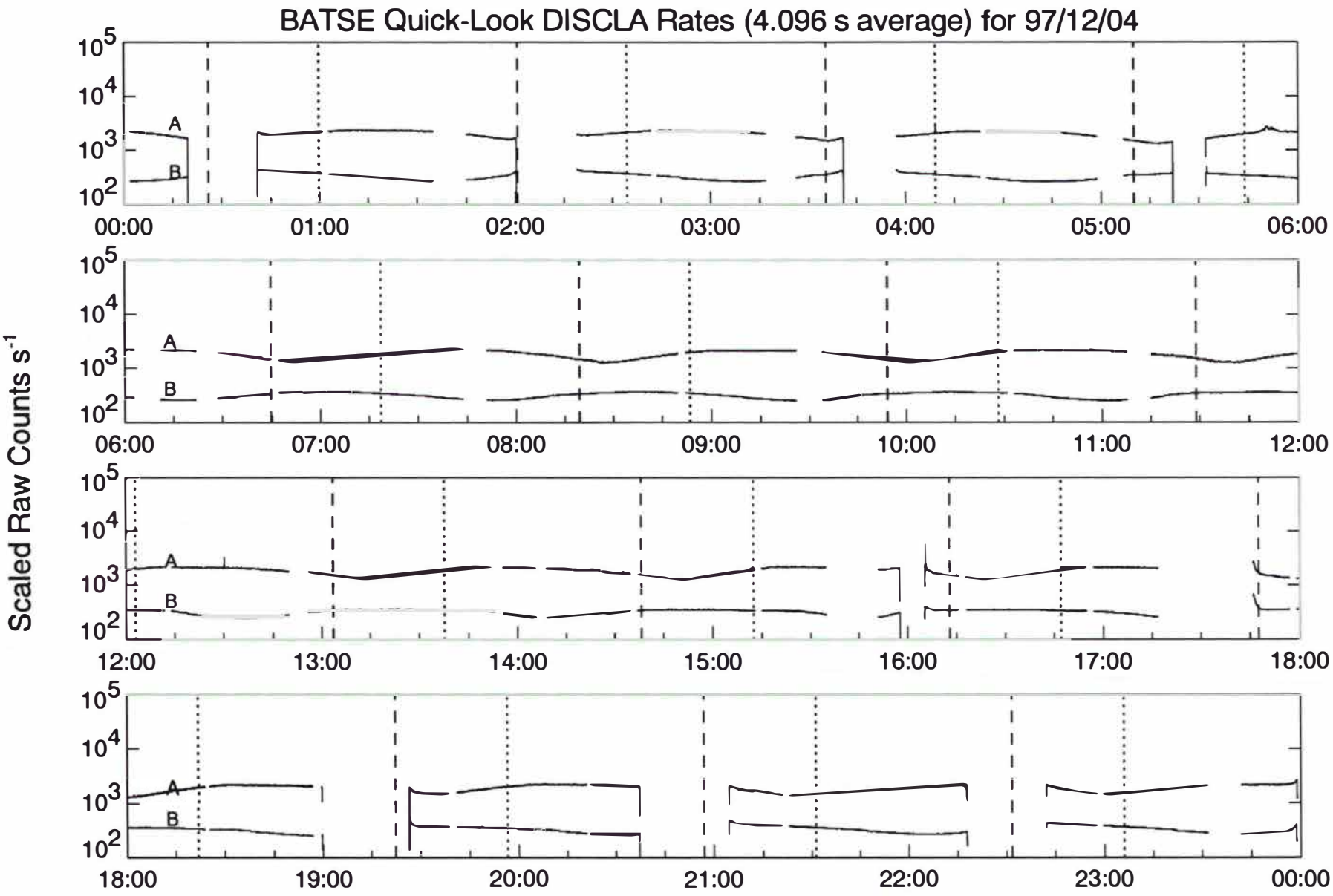
0- 0 keV

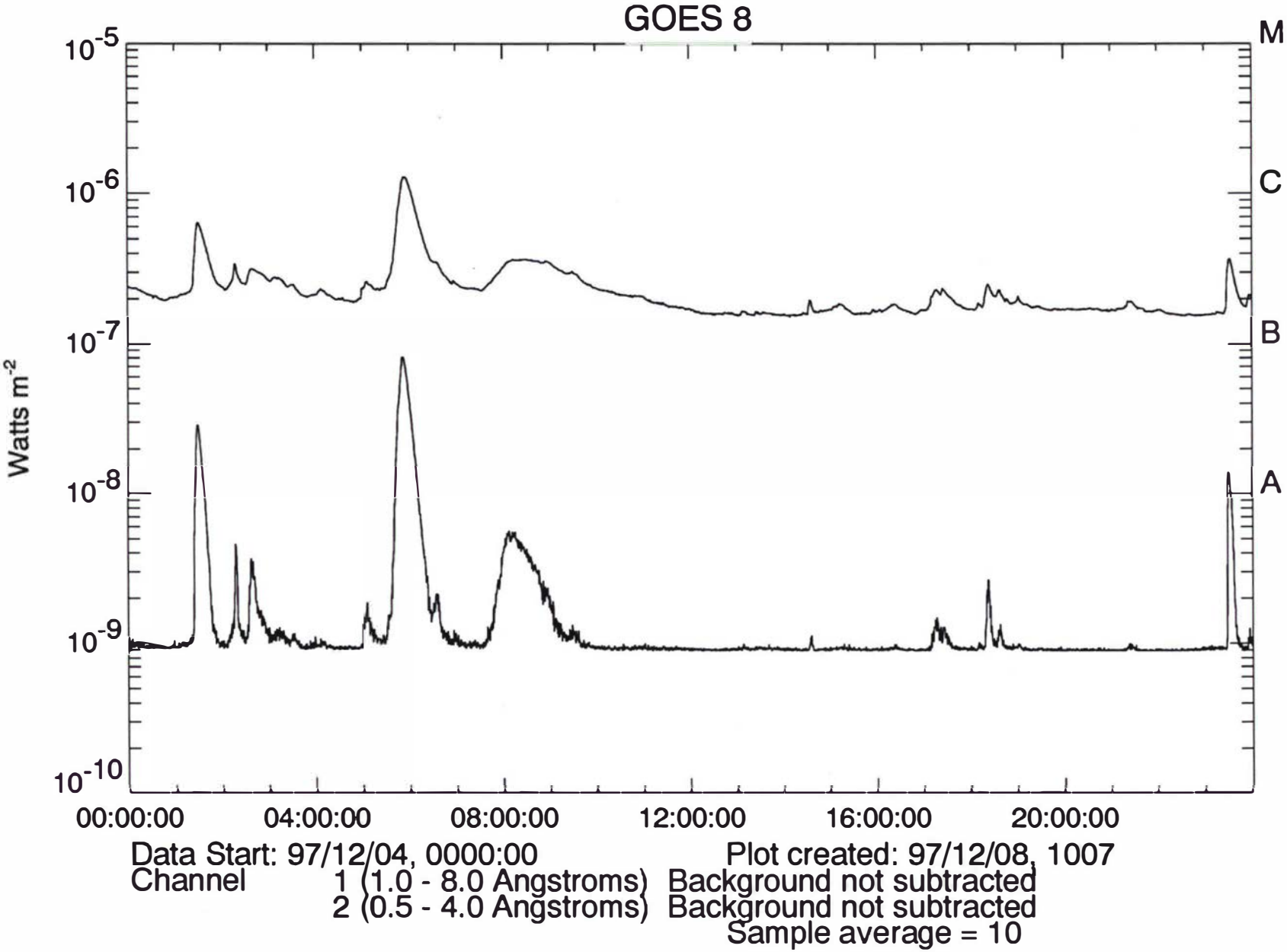
N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

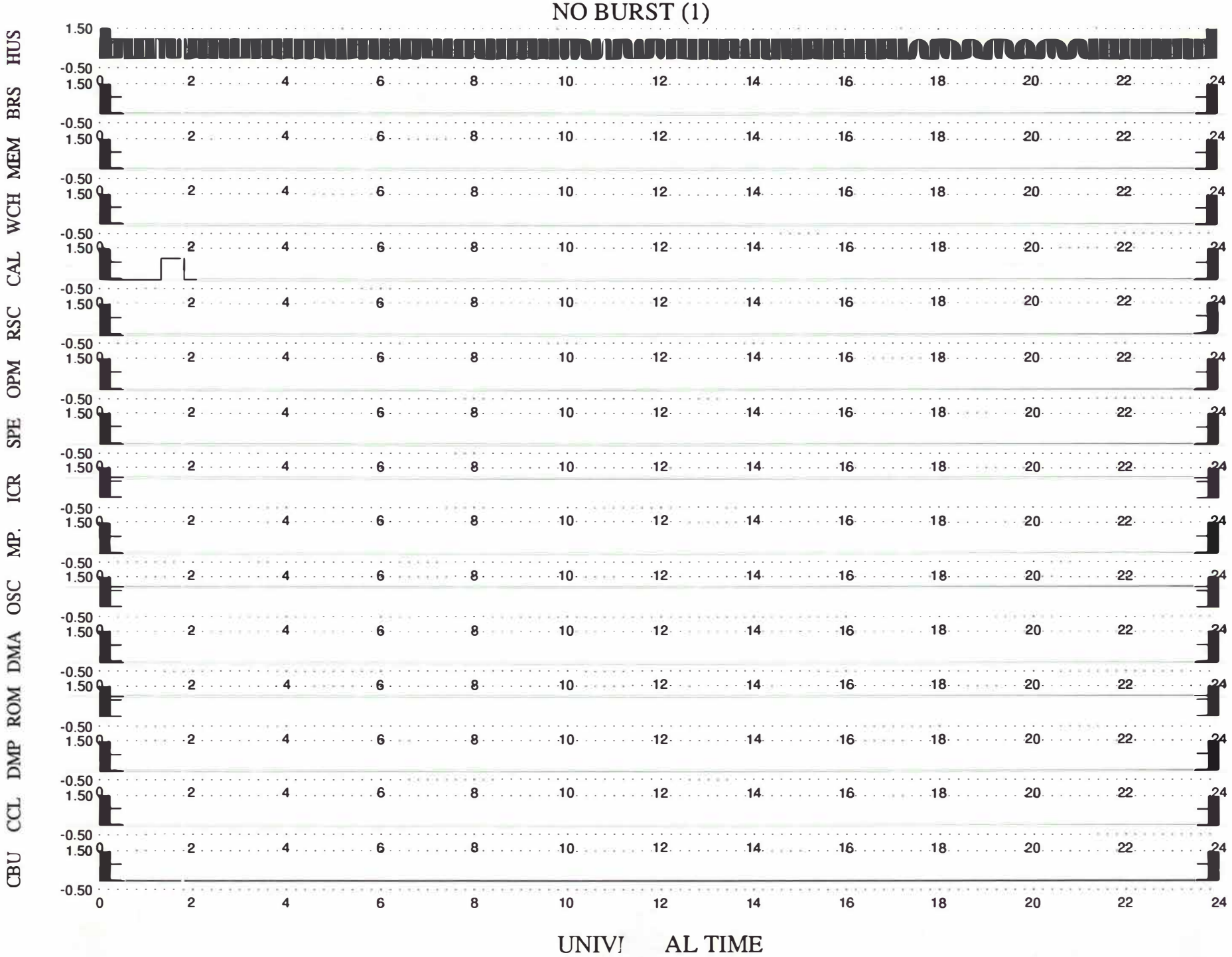



BACODINE 6519 04/12/97 16423.649
25- 100 keV
COUNTS/1.024 S
7500
7000
6500
6000
3/12/97
-D
24
49
74
99
124
149
174
199
224
TIME, SECS


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/04
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/08, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

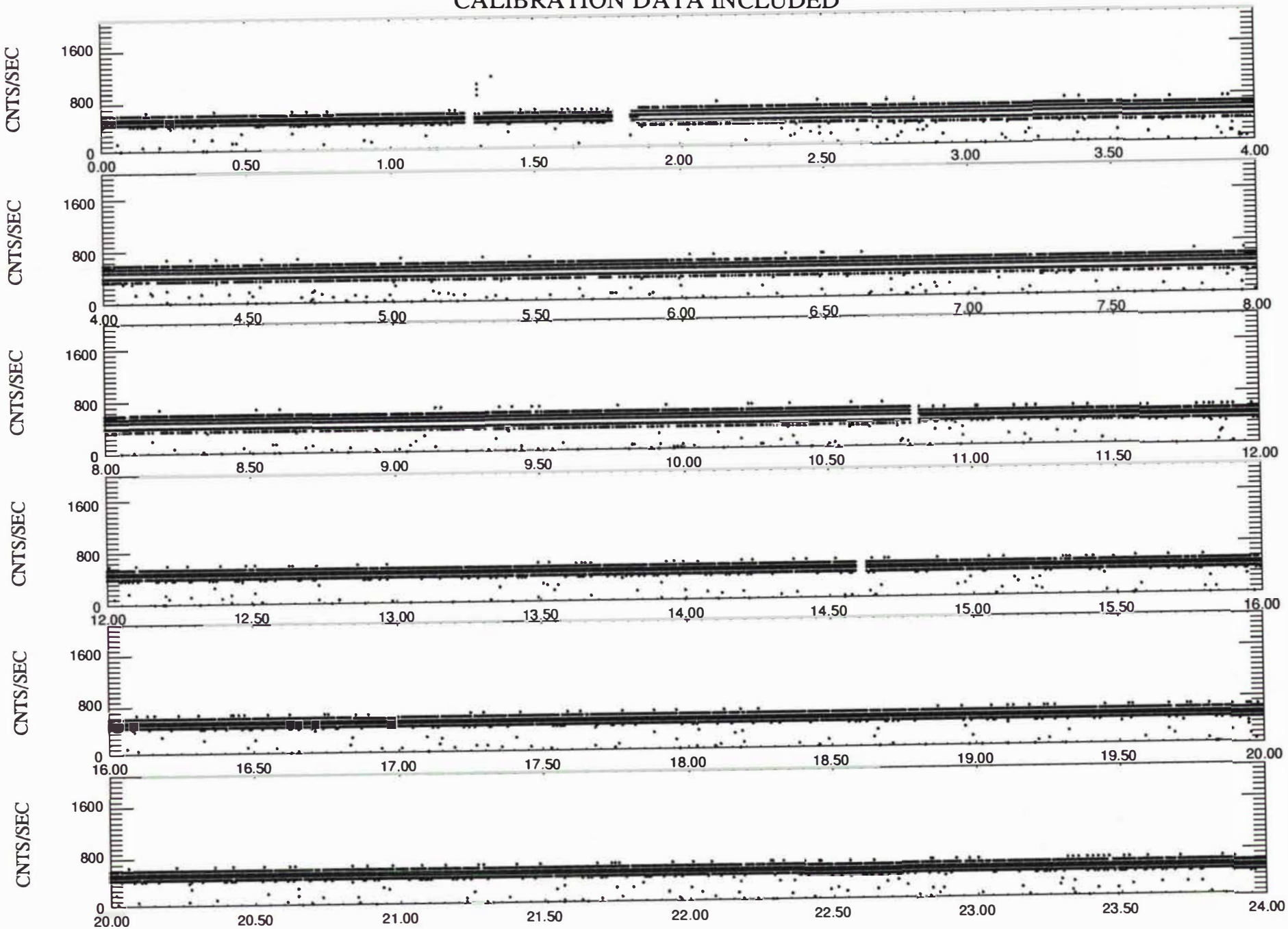

GOES 8
M
C
B
A
$10^{-5}$
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/04, 0000:00
Plot created: 97/12/08, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 338, year 1997 to day 338, year 1997 3/12/98



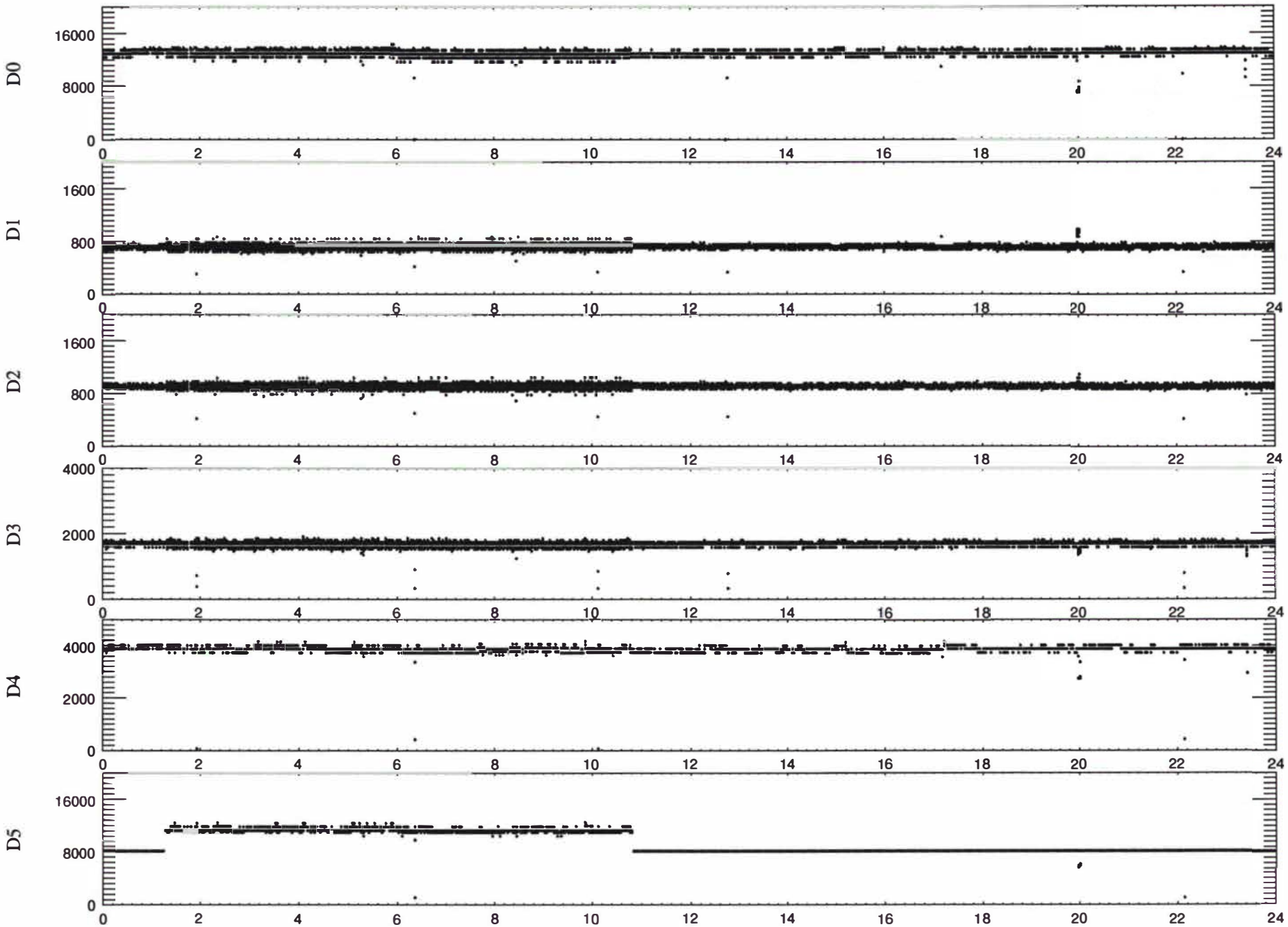
HUS 2A, MODE 1, NOT AVERAGED EDR day 338, year 1997 to day 338, year 1997 3/12/98

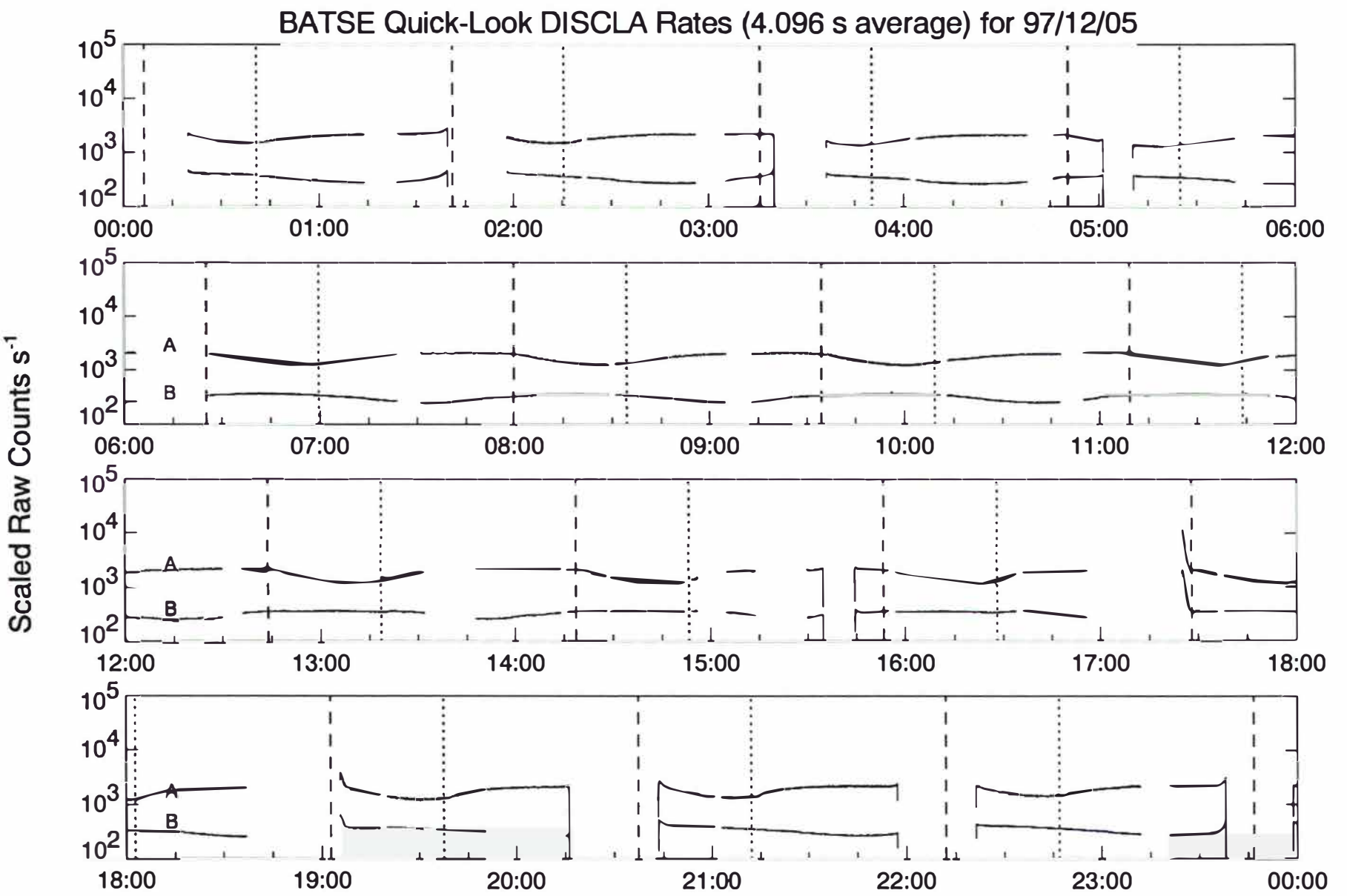
CALIBRATION DATA INCLUDED

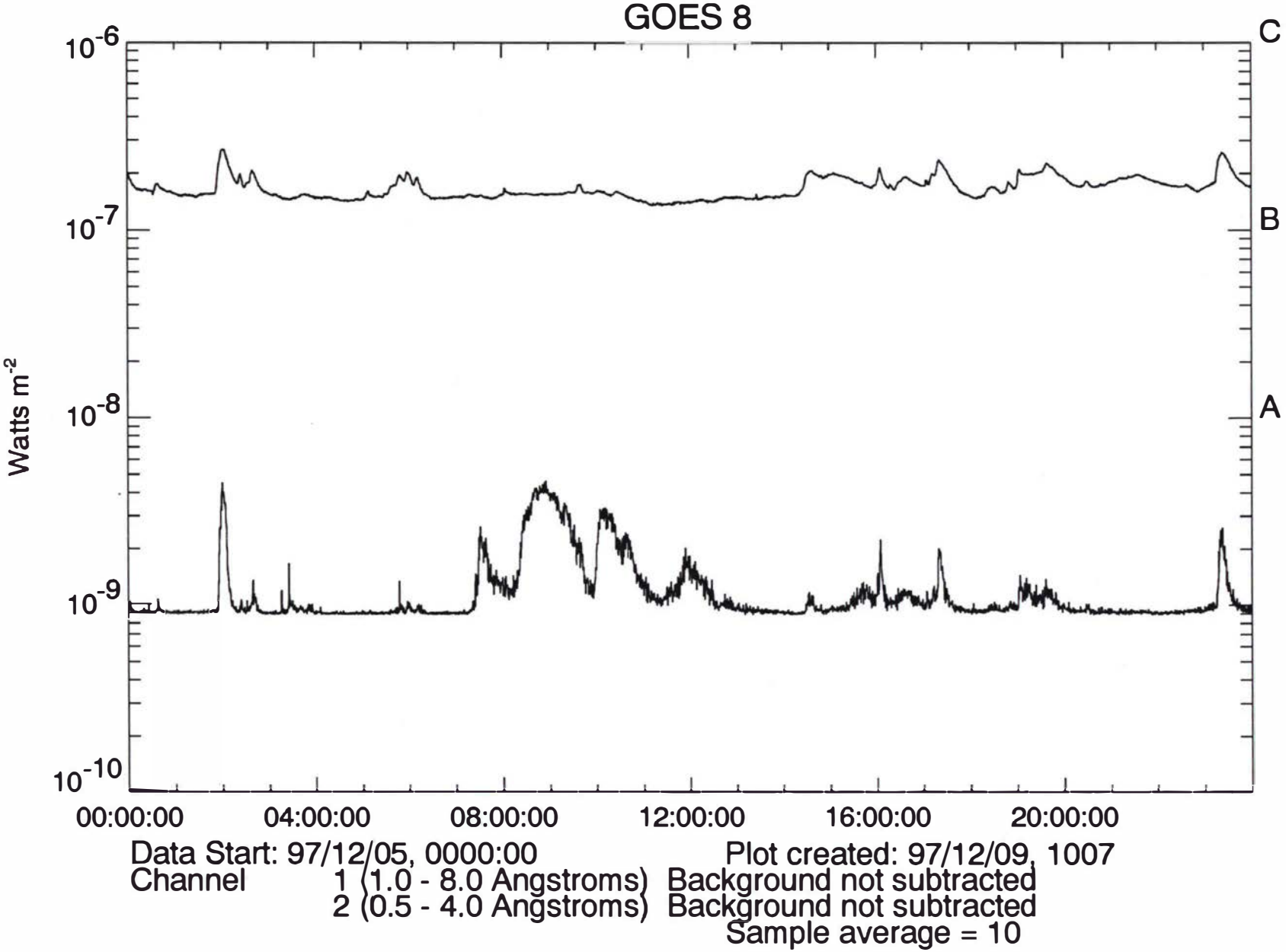



UNIV' 'AL TIME

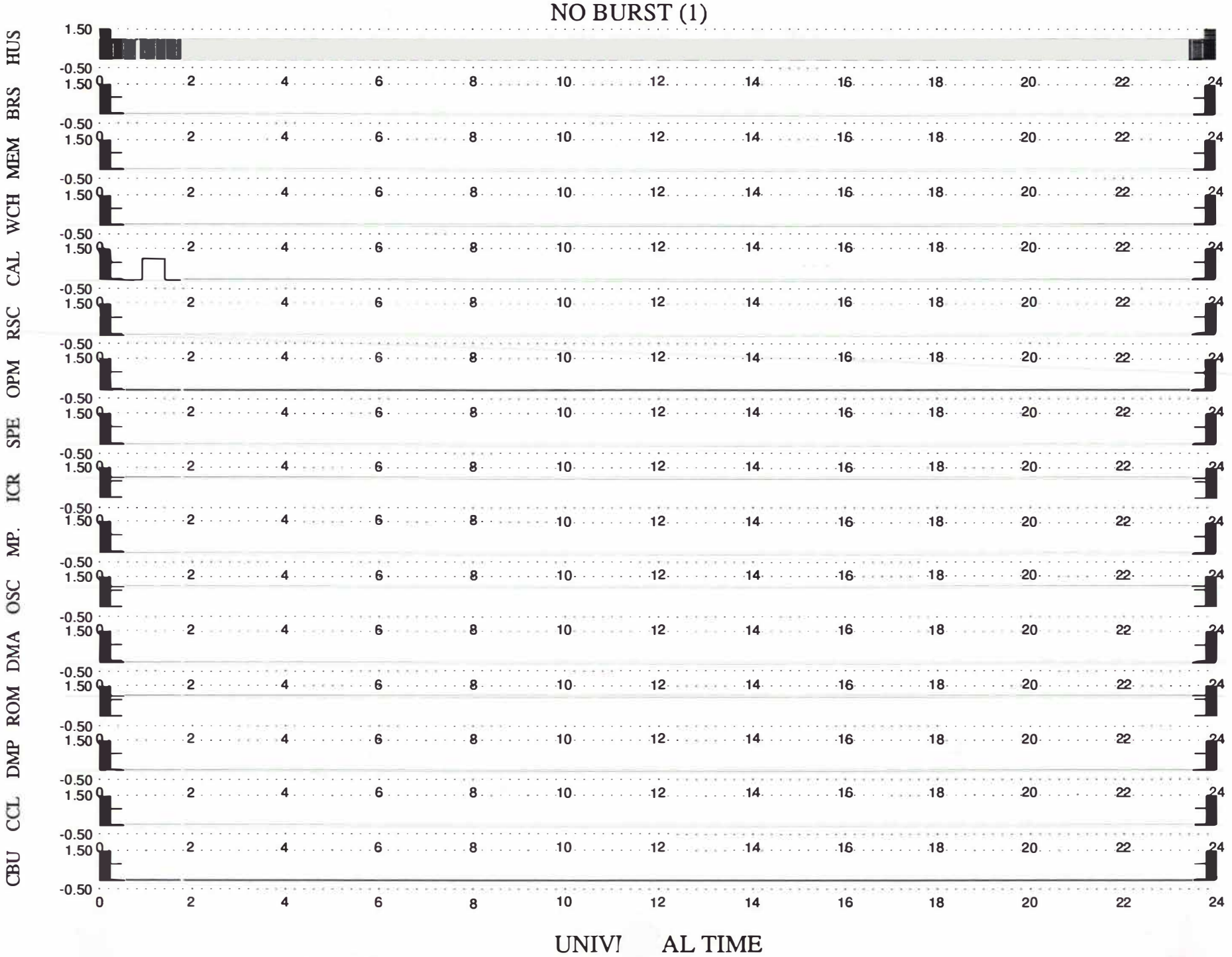
HUS 2B COUNTS / SEC EDR day 338, year 1997 to day 338, year 1997 3/12/98




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/05
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/09, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

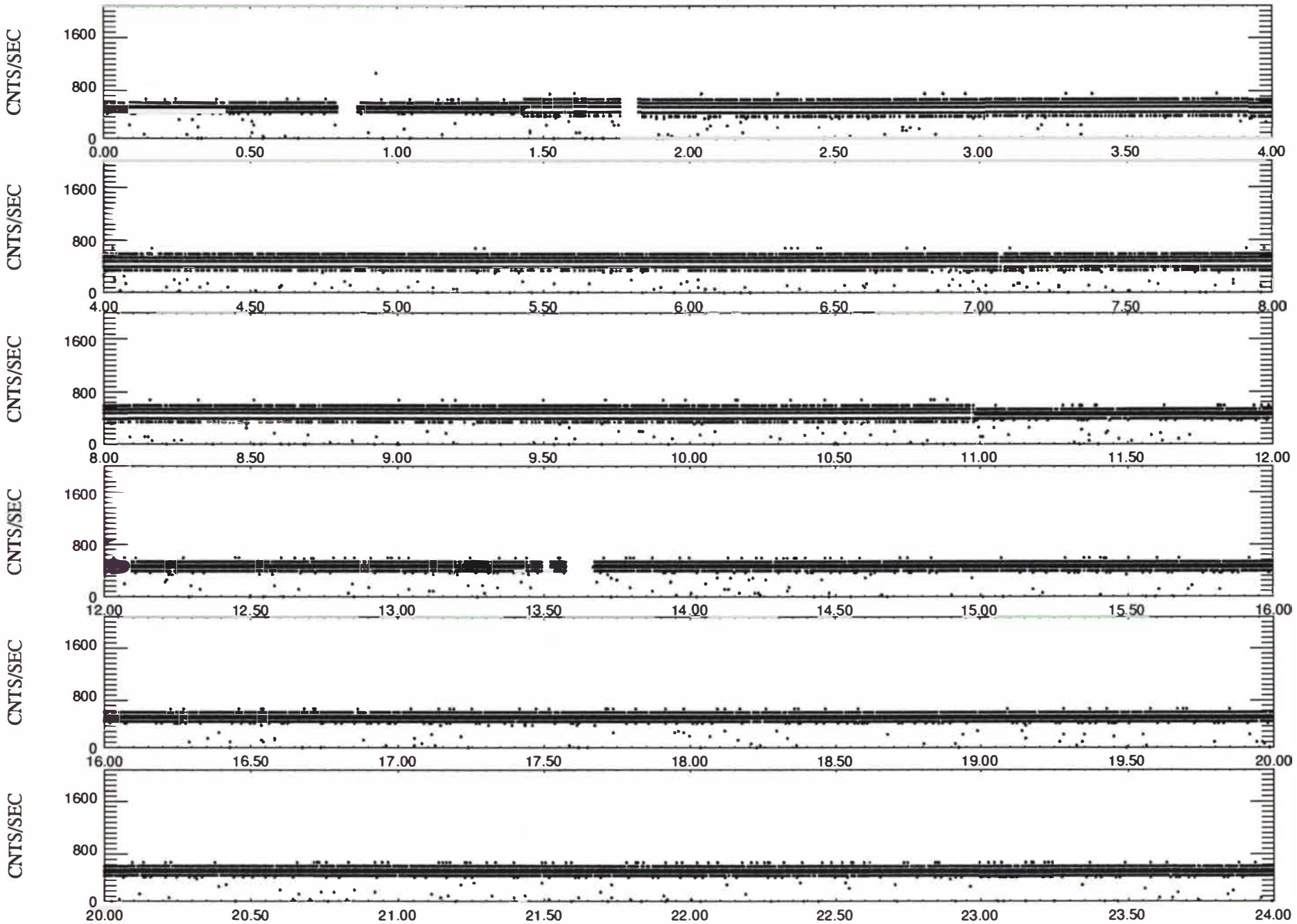

GOES 8
C
B
A
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/05, 0000:00
Plot created: 97/12/09, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 339, year 1997 to day 339, year 1997 3/12/98



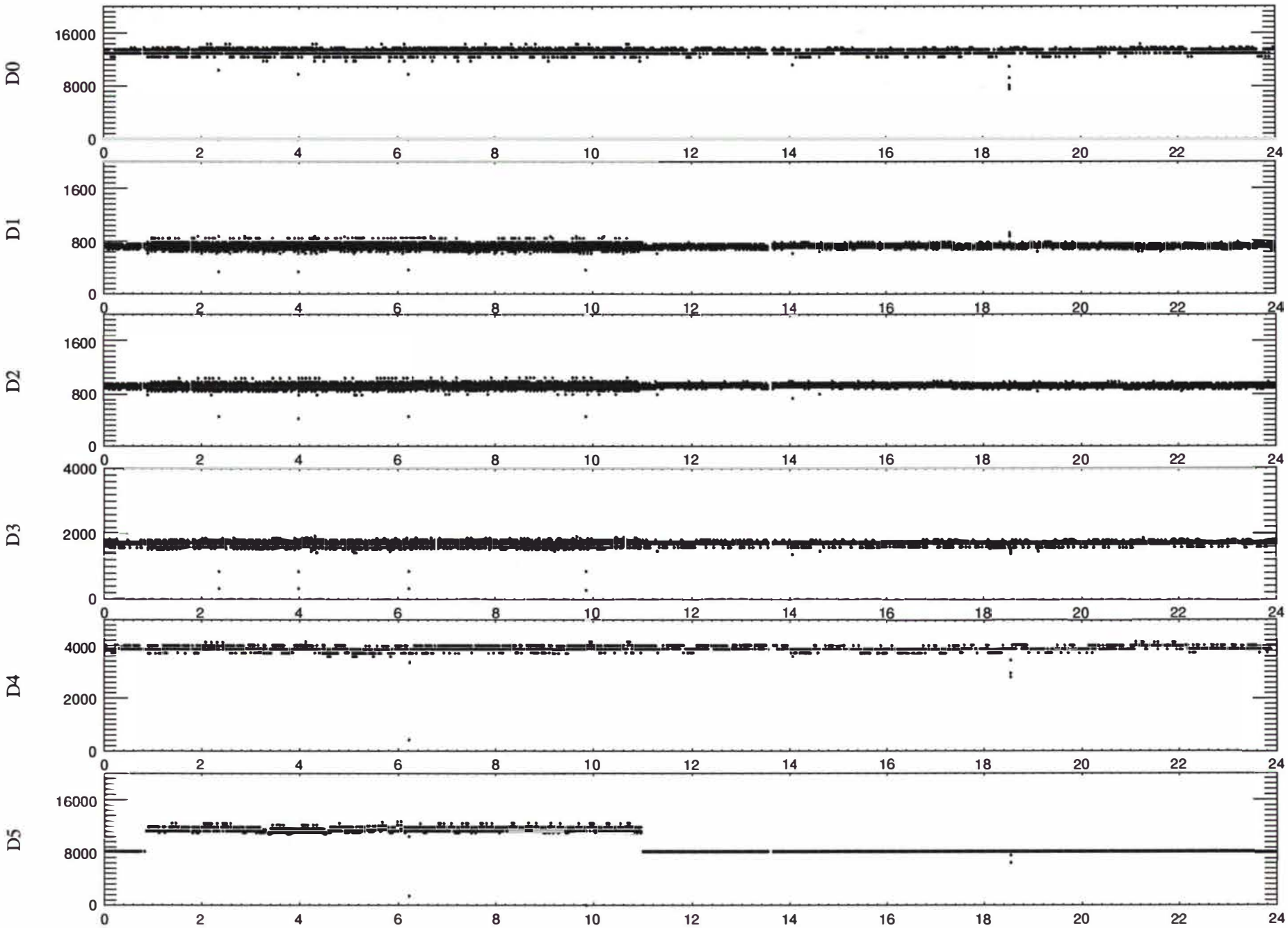
HUS 2A, MODE 1, NOT AVERAGED EDR day 339, year 1997 to day 339, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV[illegible]AL TIME

HUS 2B COUNTS / SEC EDR day 339, year 1997 to day 339, year 1997 3/12/98



```
From RICHARDSON@SSLMOR.msfc.nasa.gov Mon Dec  8 16:58:00 1997
Return-Path: <RICHARDSON@SSLMOR.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
        id QAA07913; Mon, 8 Dec 1997 16:57:56 -0800
From: RICHARDSON@SSLMOR.msfc.nasa.gov
Received: from SSLMOR.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
        id QAA22033; Mon, 8 Dec 1997 16:57:50 -0800
Date: Mon, 8 Dec 1997 18:16:16 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971208181616.21e11ec5@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6520
Content-Length: 1135
X-Lines: 26
Status: RO
```

GRBM event 971206A
at 12:50:29 = 46229
150s long

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

 BATSE BURST #     6520
 EVENT OF 1997 DEC  6 DAY OF YEAR=340
 EVENT CROSSING TIME AT BATSE      : 46277. S. OR 12:51:17.0
 COORDINATES ARE    0.000    0.000        6800. (RA, DEC, DIST.)
 BURST ARRIVAL DIRECTION: 118.000     4.000
 BATSE PEAK COUNTING RATE:   2250     C/S

 EVENT CROSSING TIME AT ULYSSES     WILL BE FOUND
 INTERPOLATED POSITION OF ULYSSES ON  6/12/  97 IS:
 RA=  170.762 DEC=    12.171 DIST=     5.297 AU
 BATSE-ULYSSES DISTANCE =  792433472. KM.
 ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=127.21 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1598.63 SECS.
 CROSSING TIME AT ULYSSES     IS 44678. S. OR   12:24:38 +/-  391.19 SECONDS

 EVENT CROSSING TIME AT MARS        WILL BE FOUND
 POSITION OF MARS ON  6/12/  97 IS:
 RA=  292.324 DEC=  -23.118 DIST=     2.050 AU
 MARS-BATSE DISTANCE =  306689568. KM.
 ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 19.89 DEG.
 LIGHT TRAVEL TIME ALONG PROJECTED PATH=  961.98 SECS.
 CROSSING TIME AT MARS        IS 47239. S. OR   13:07:18 +/-   75.04 SECONDS


                BATSE BURST TRIGGER
NO.: 6520

TIME: TJD=0788 SECONDS=46277

TYPE: BURST                     SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE:        SIGMA

INTENSITY:           COUNTS/CM2

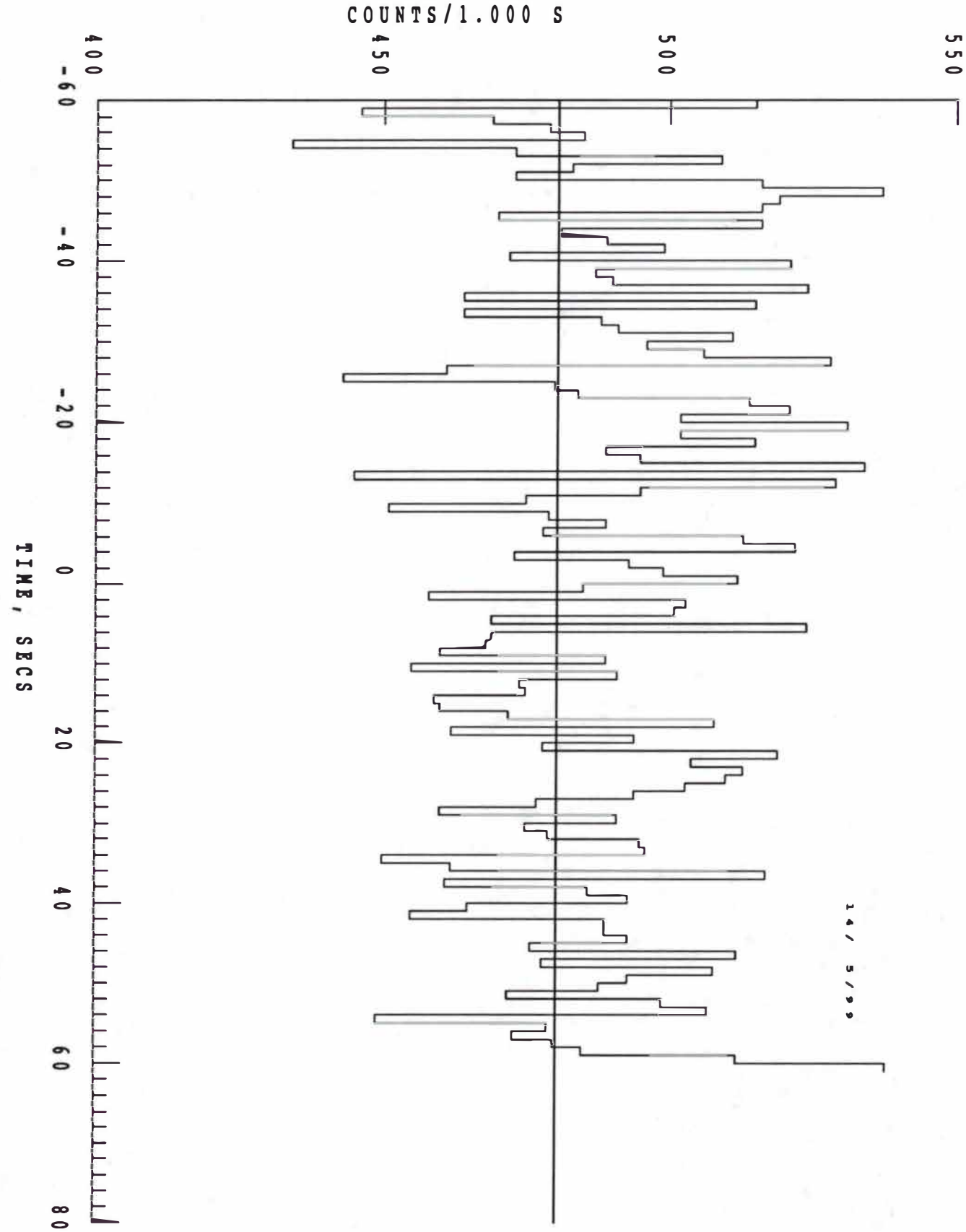
LOCATION: ZENITH=150.7  AZIMUTH=279.3  ERROR=6.4   DEGREES

COMMENTS:
GRB TWO PULSES. FIRST PULSE AT APPROX. T-68 SEC. WITH DURATION APPROX. =
22 SEC.  SECOND PULSE AT APPROX. T-10 SEC. WITH DURATION APPROX. = 27 SEC.
TOTAL DURATION APPROX. = 85 SEC. NOT VISIBLE ABOVE 300KEV.


 BATSE #   Date      TJD      SoD    Max ct/s   RA    Dec   Dur (s)
   6520    971206    10788    46277      2250   118   +04      85
```

NEAR 06/12/97 46185.923

100-1000 keV



BATSE BURST# 6520

ULYSSES RT 8/12/97

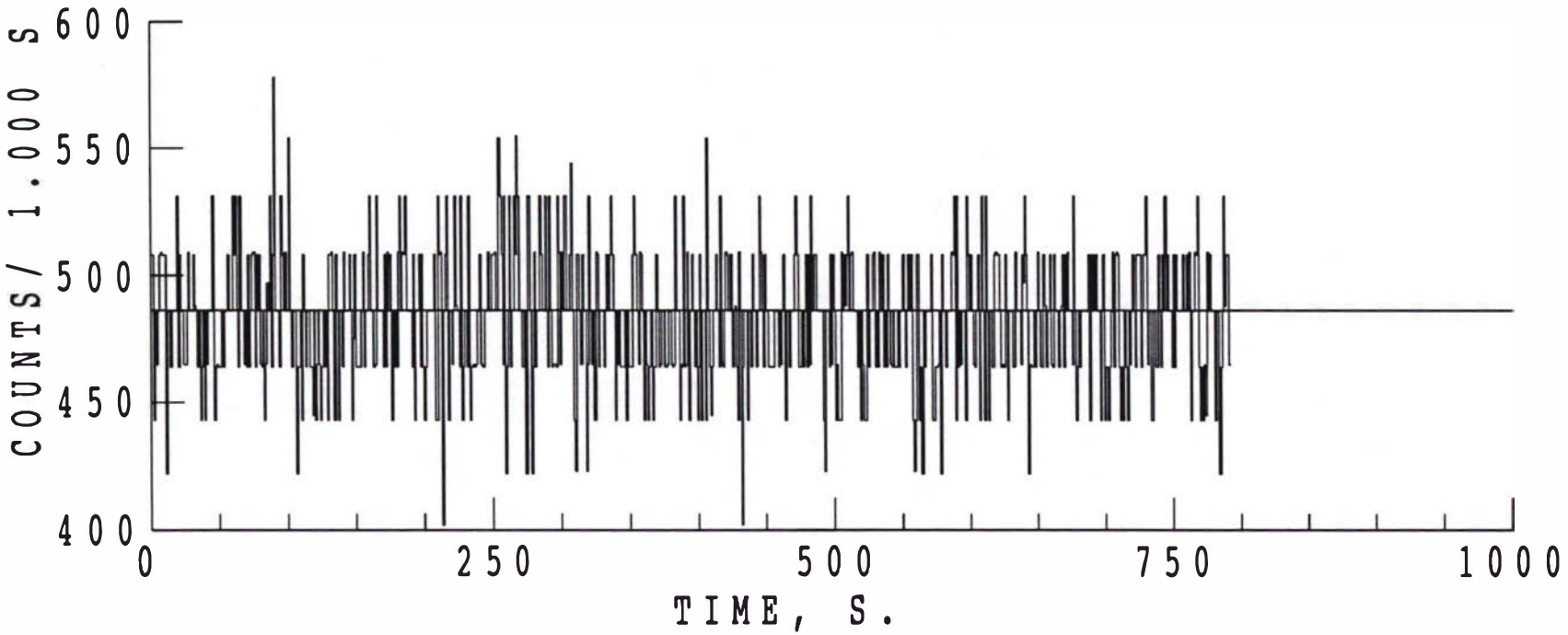
6/12/97 44280.156 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From SURASAK@SSLLES.MSFC.NASA.GOV Mon Dec 8 12:20:39 1997
Return-Path: <SURASAK@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA04273; Mon, 8 Dec 1997 12:20:29 -0800
From: SURASAK@SSLLES.MSFC.NASA.GOV
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA19230; Mon, 8 Dec 1997 12:20:29 -0800
Date: Mon, 8 Dec 1997 14:20:16 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971208142016.23403e08@SSLLES.MSFC.NASA.GOV>
Subject: Crossing Windows for BATSE Burst 6521
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6521
EVENT OF 1997 DEC 6 DAY OF YEAR=340
EVENT CROSSING TIME AT BATSE : 69652. S. OR 19:20:52.0 ≈ same time as BeppoSAX
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.) 971206B, WFC + GRBM event
BURST ARRIVAL DIRECTION: 161.000 -7.000 ~ same position
BATSE PEAK COUNTING RATE: 6600 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 6/12/ 97 IS:
RA= 170.762 DEC= 12.163 DIST= 5.293 AU
BATSE-ULYSSES DISTANCE = 791771770. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=158.52 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-2457.61 SECS.
CROSSING TIME AT ULYSSES IS 67194. S. OR 18:39:54 +/- 180.59 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 6/12/ 97 IS:
RA= 292.324 DEC= -23.118 DIST= 2.050 AU
MARS-BATSE DISTANCE = 306689568. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 56.30 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 567.68 SECS.
CROSSING TIME AT MARS IS 70220. S. OR 19:30:19 +/- 156.38 SECONDS

BATSE BURST TRIGGER
NO.: 6521

TIME: TJD=0788 SECONDS=69652

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

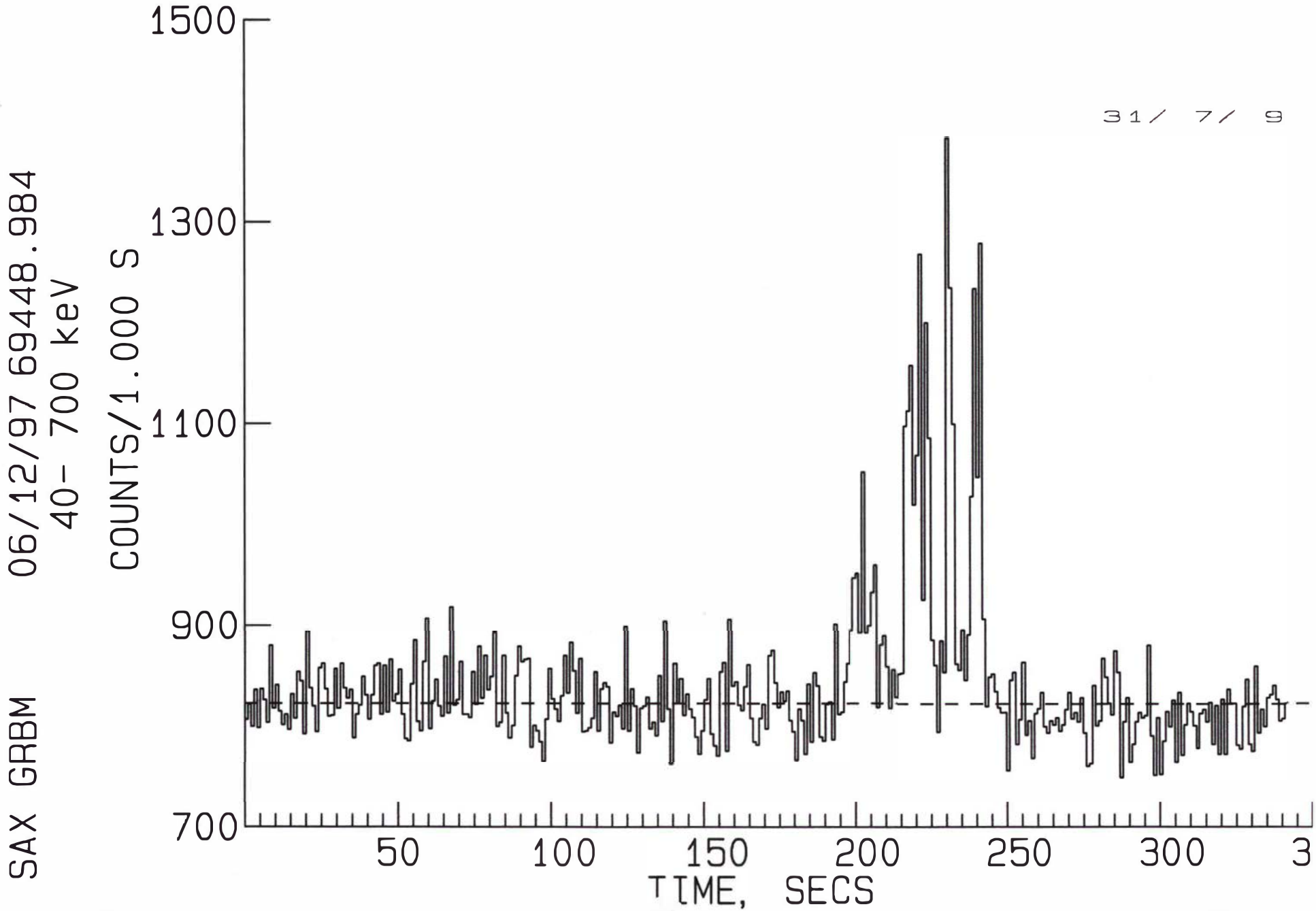
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=110.7 AZIMUTH=306.7 ERROR=1.927 DEGREES

COMMENTS:
GRB. STARTS AT ABOUT T-90S. DURATION ABOUT 51S. COMPLEX. NOT VISIBLE ABOVE
300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6521 | 971206 | 10788 | 69652 | 6600 | 161 | -07 | 51 |


SAX GRBM
06/12/97 69448.984
40- 700 keV
COUNTS/1.000 S
1500
1300
1100
900
700
50
100
150
200
250
300
TIME, SECS
31/ 7/ 9

SAX WFC 19971206B 67506

69607 s

30/07/09

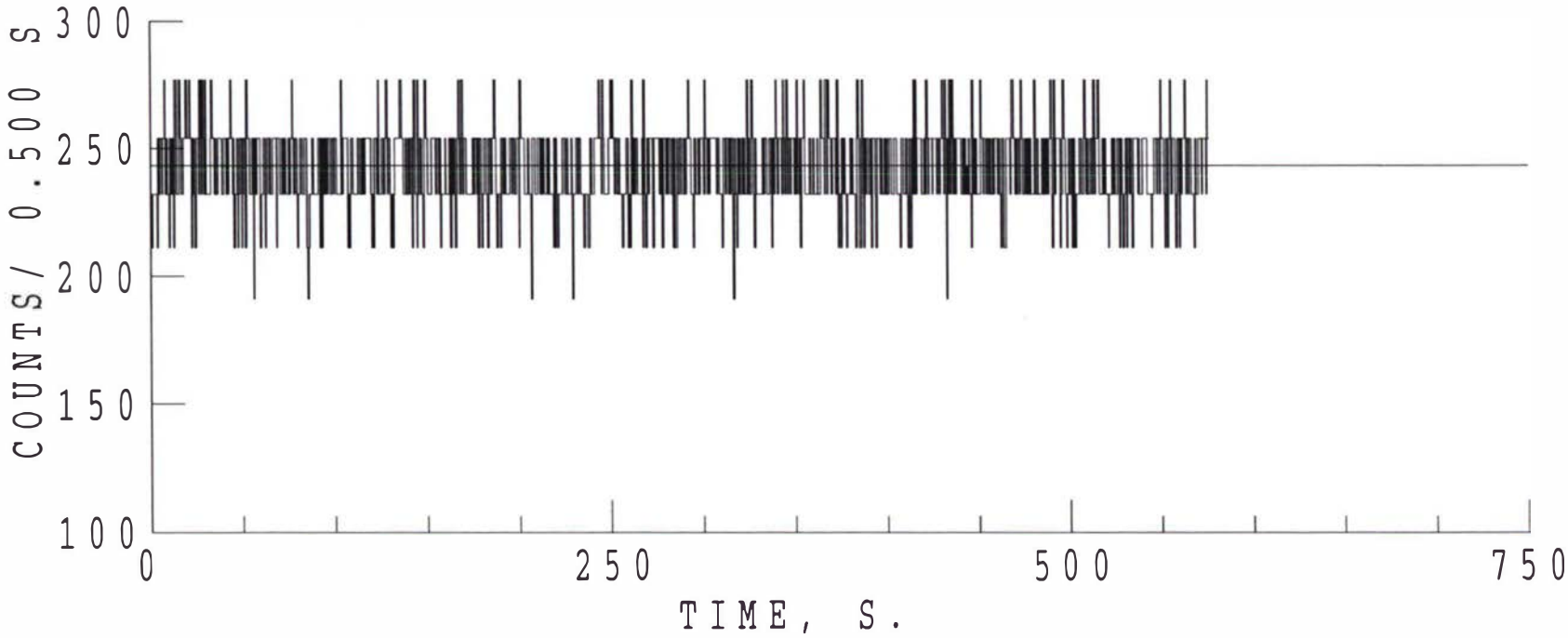
ULYSSES RT

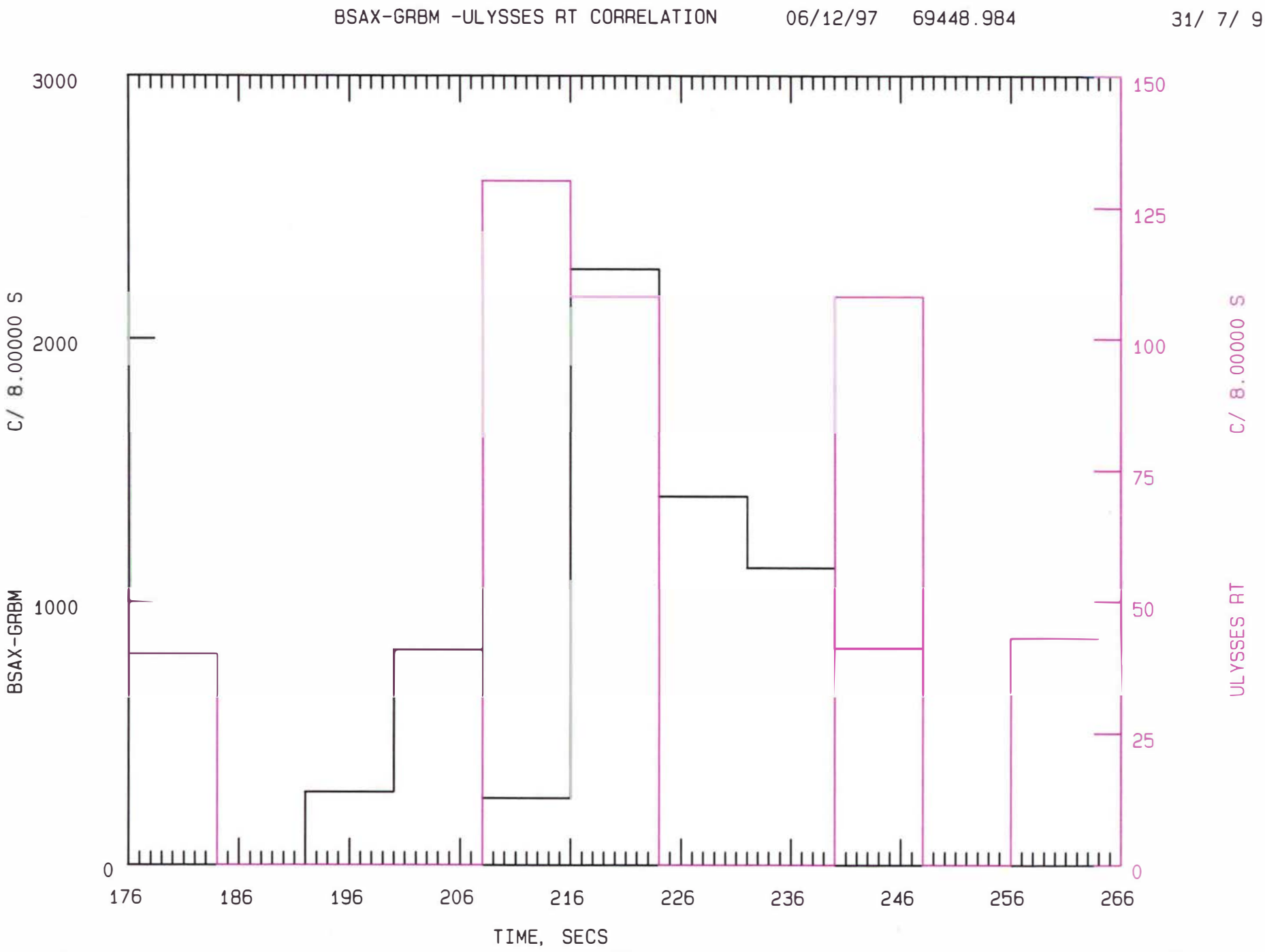
06/12/97 67212.414 s

0- 0 keV

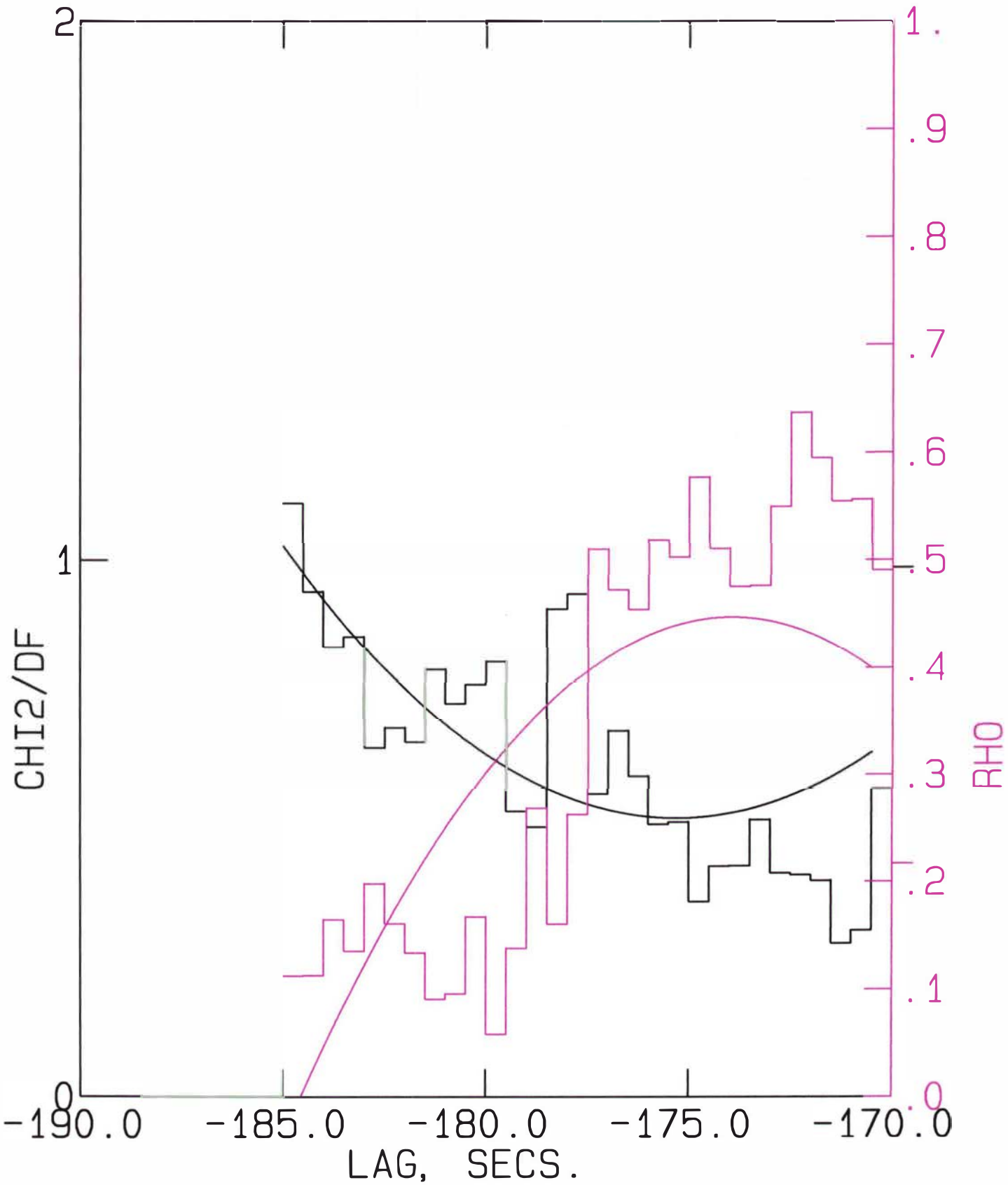
N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



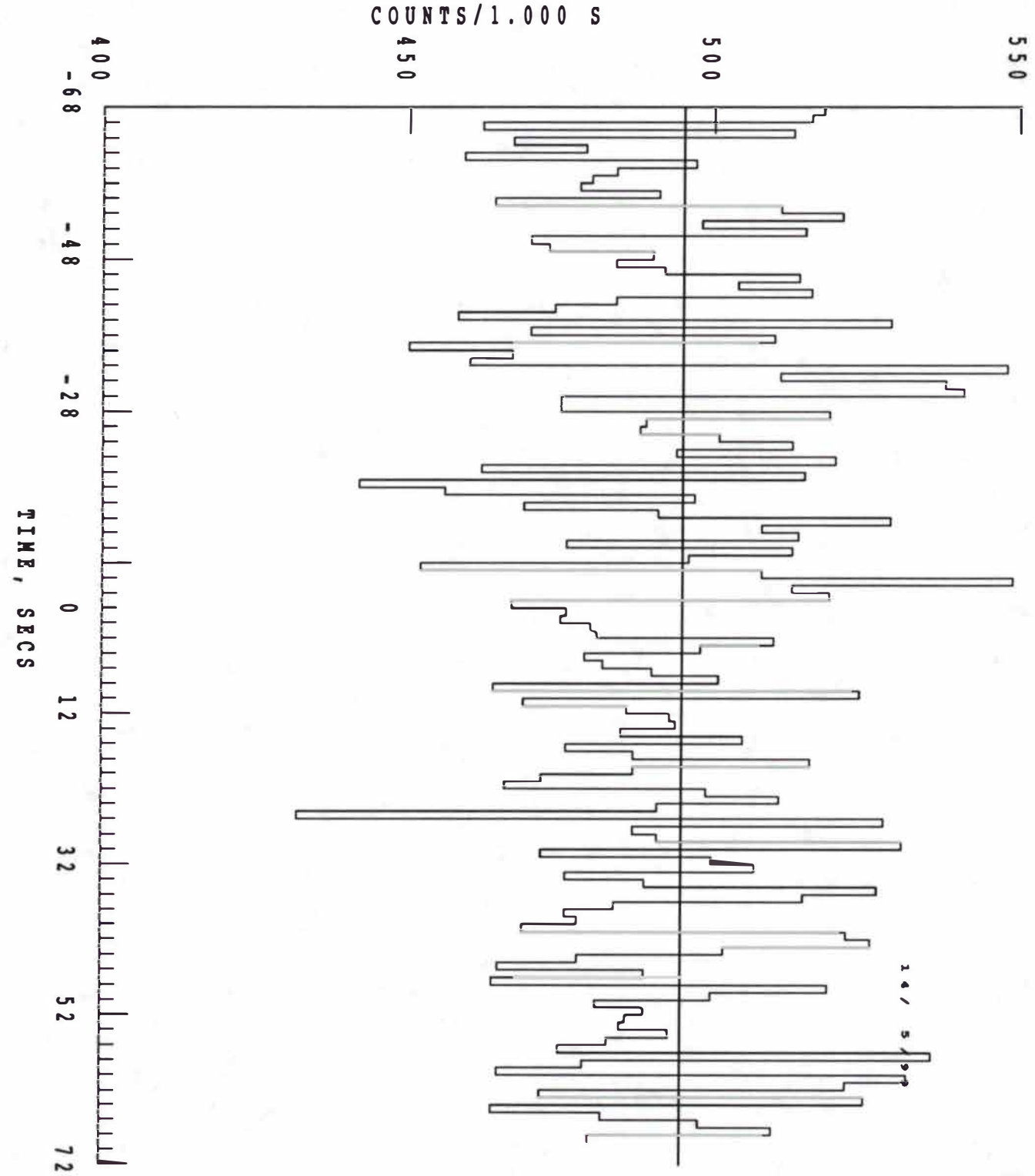

BSAX-GRBM -ULYSSES RT CORRELATION 06/12/97 69448.984 31/ 7/ 9
3000
2000
1000
0
C/ 8.00000 S
BSAX-GRBM
150
125
100
75
50
25
0
C/ 8.00000 S
ULYSSES RT
176
186
196
206
216
226
236
246
256
266
TIME, SECS

BSAX-GRBM -ULYSSES RT CORRELATION 06/12/97 69448.984



NEAR 06/12/97 69630.918

100-1000 keV



BATSE BURST# 6521

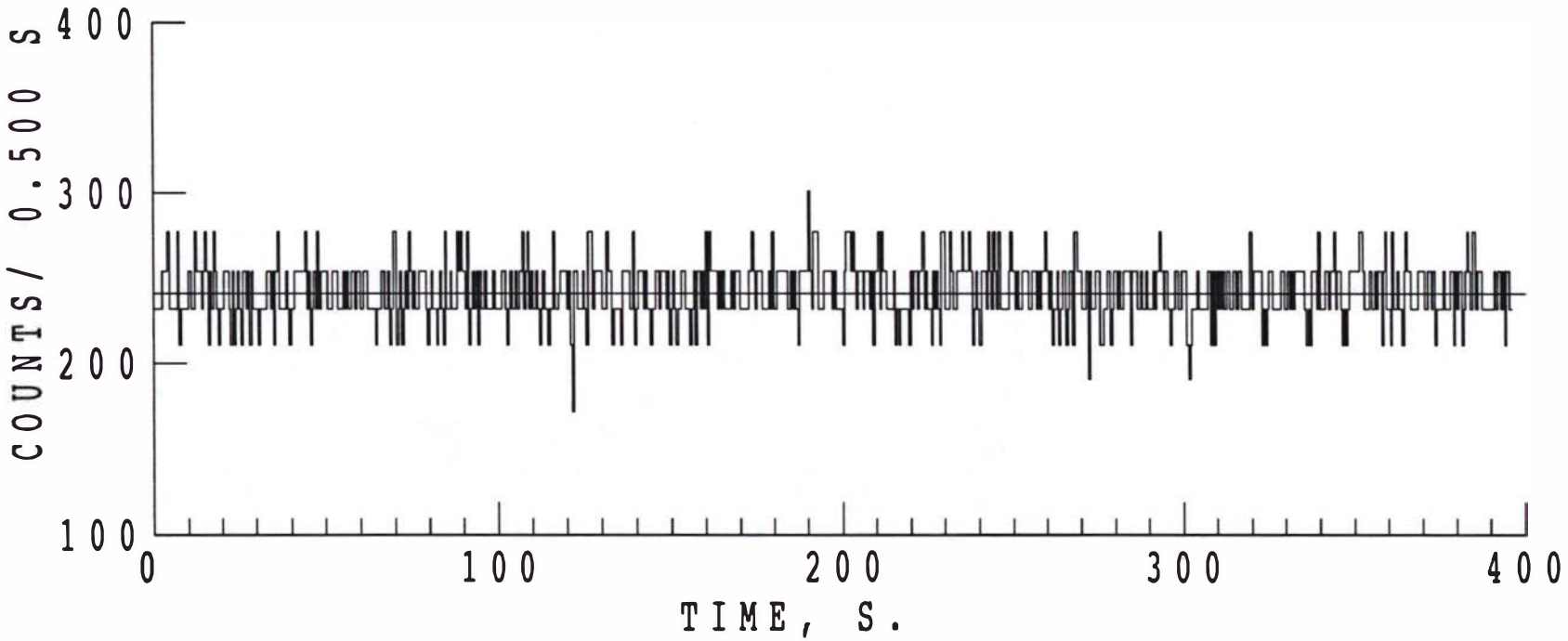
ULYSSES RT 8/12/97

6/12/97 66996.406 s

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



SAX 79064s

HUS DATA

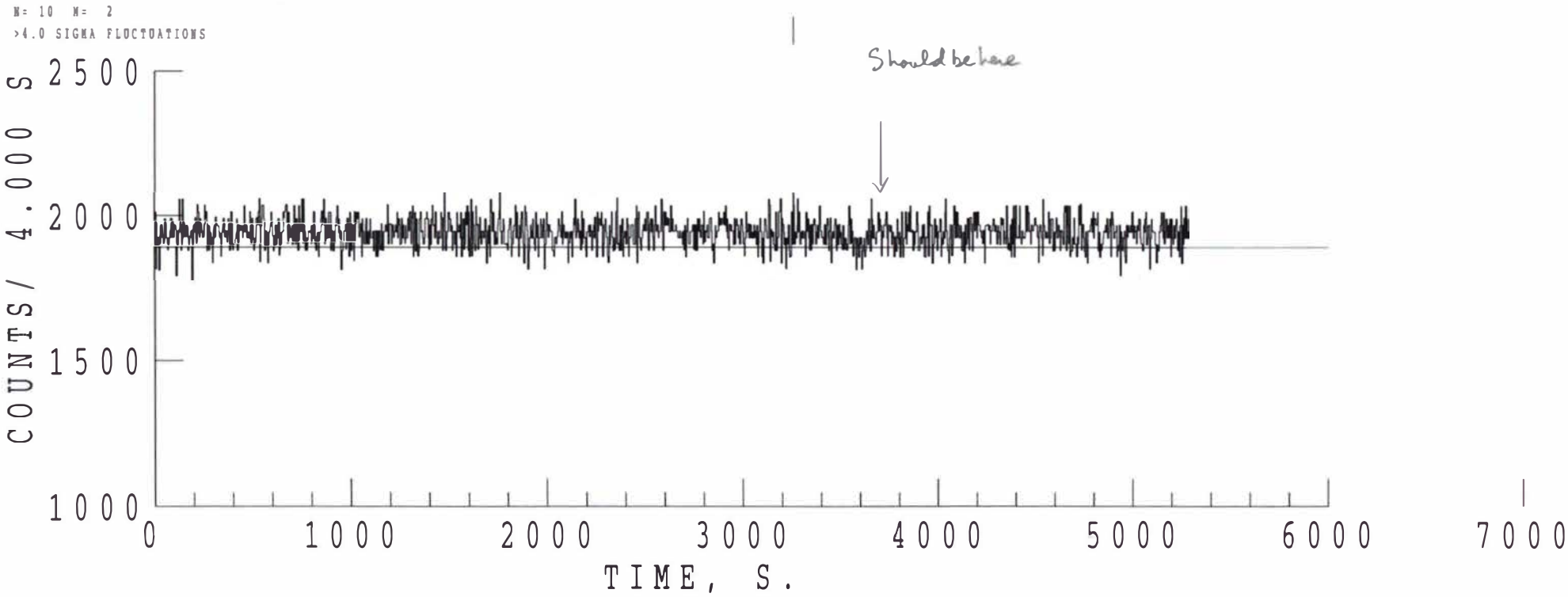
19/07/05

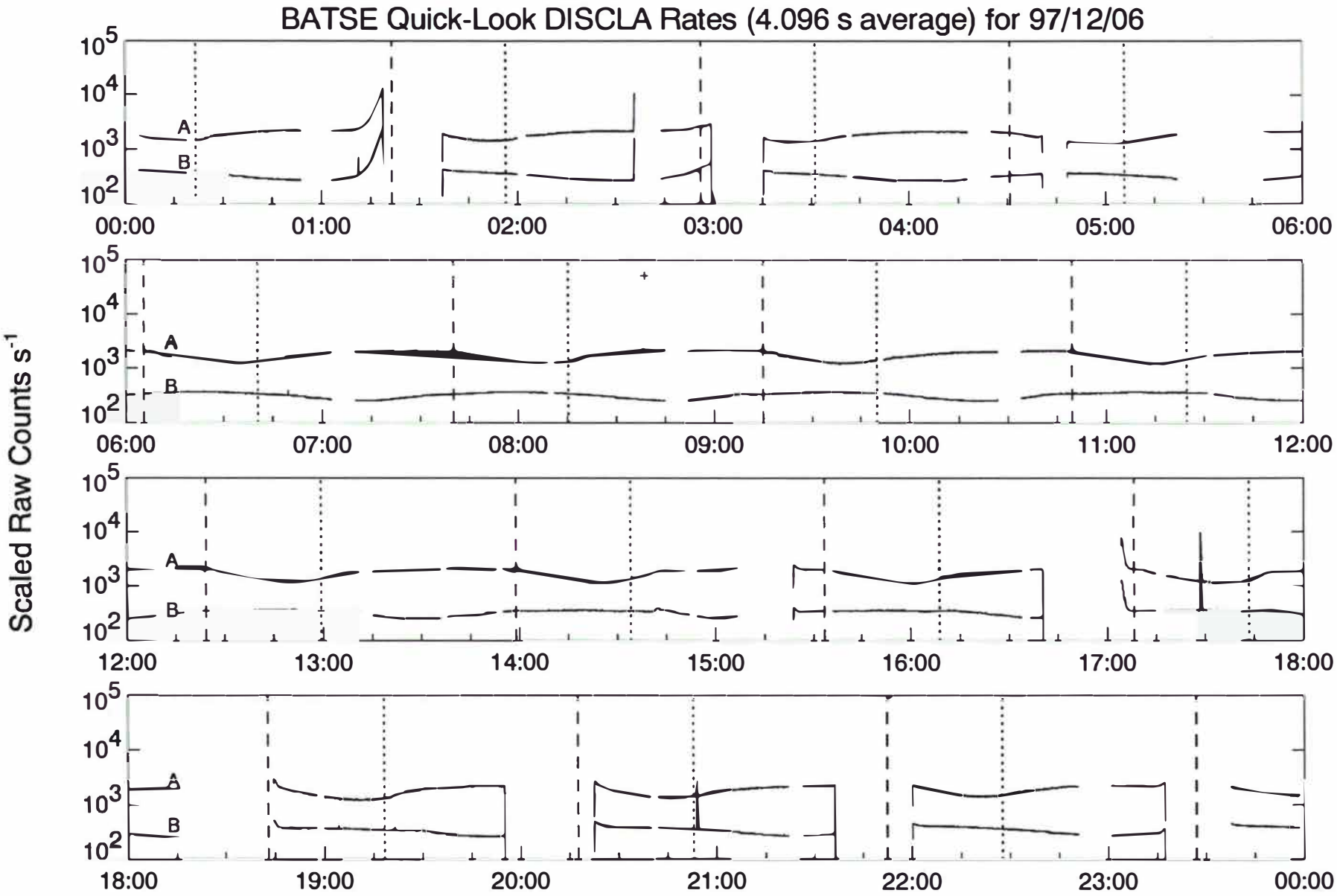
ULYSSES RT

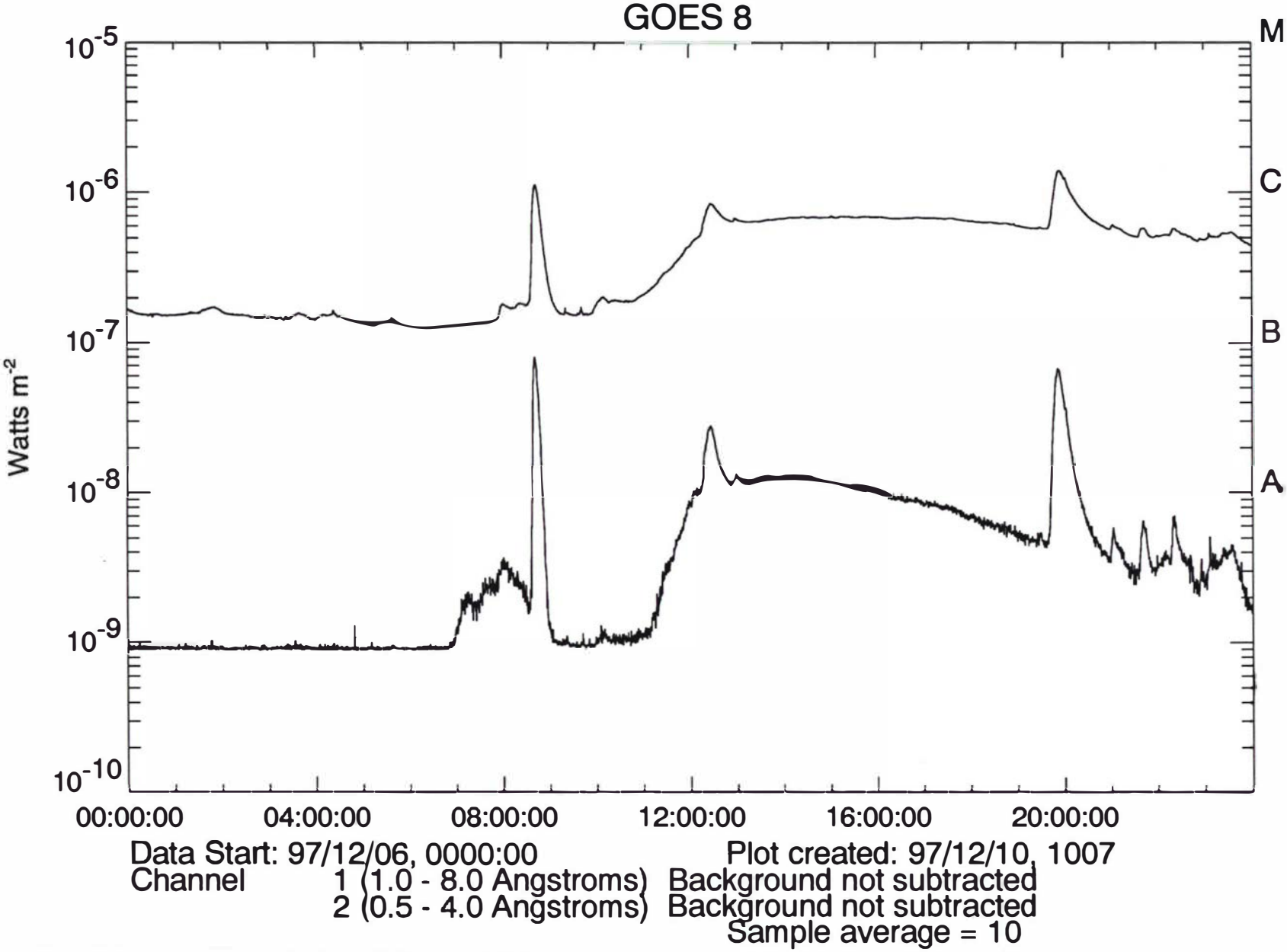
06/12/97 76428.016 s

0.500 S INTERVALS REGROUPED BY 8

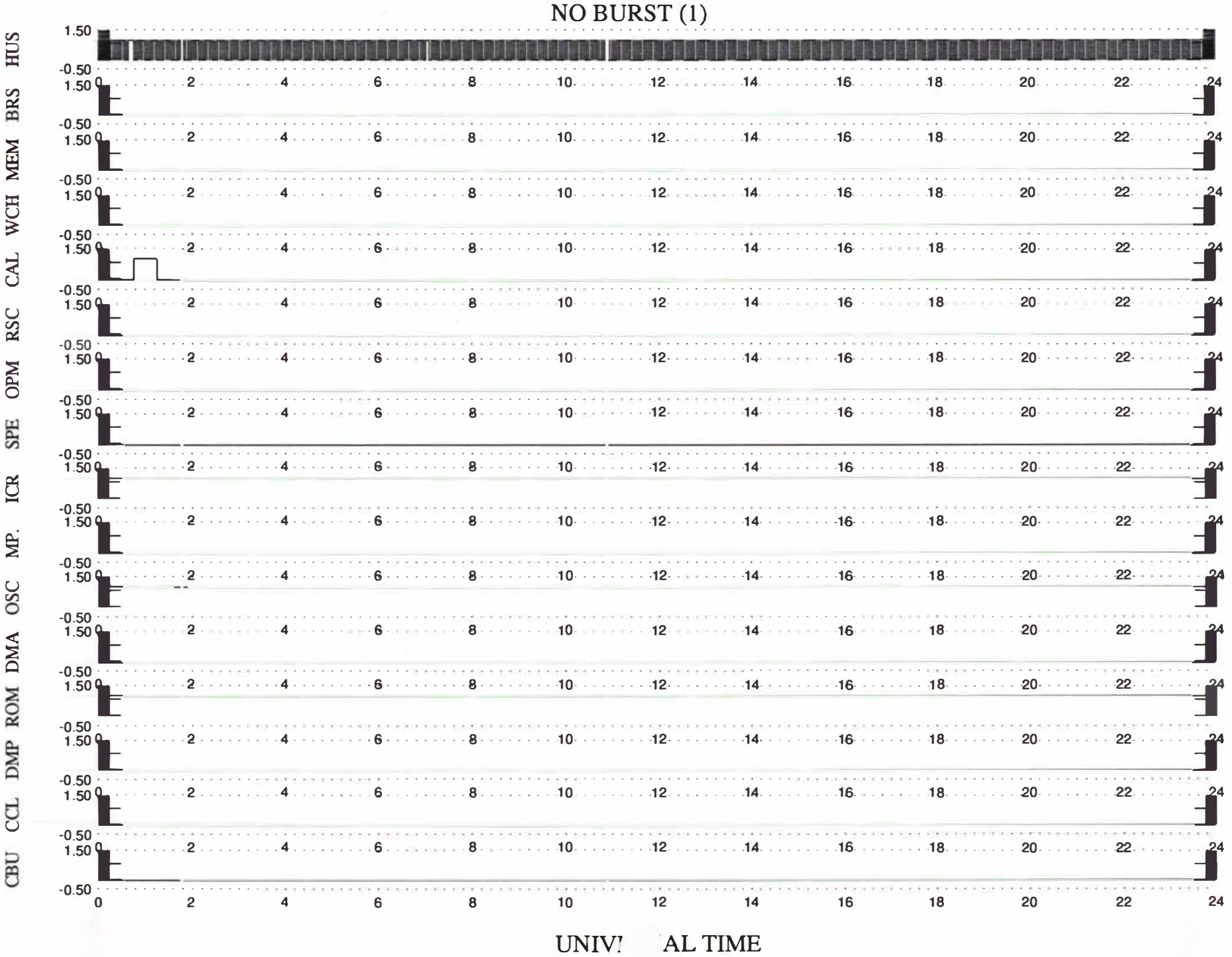
0- 0 keV




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/06
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/10, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

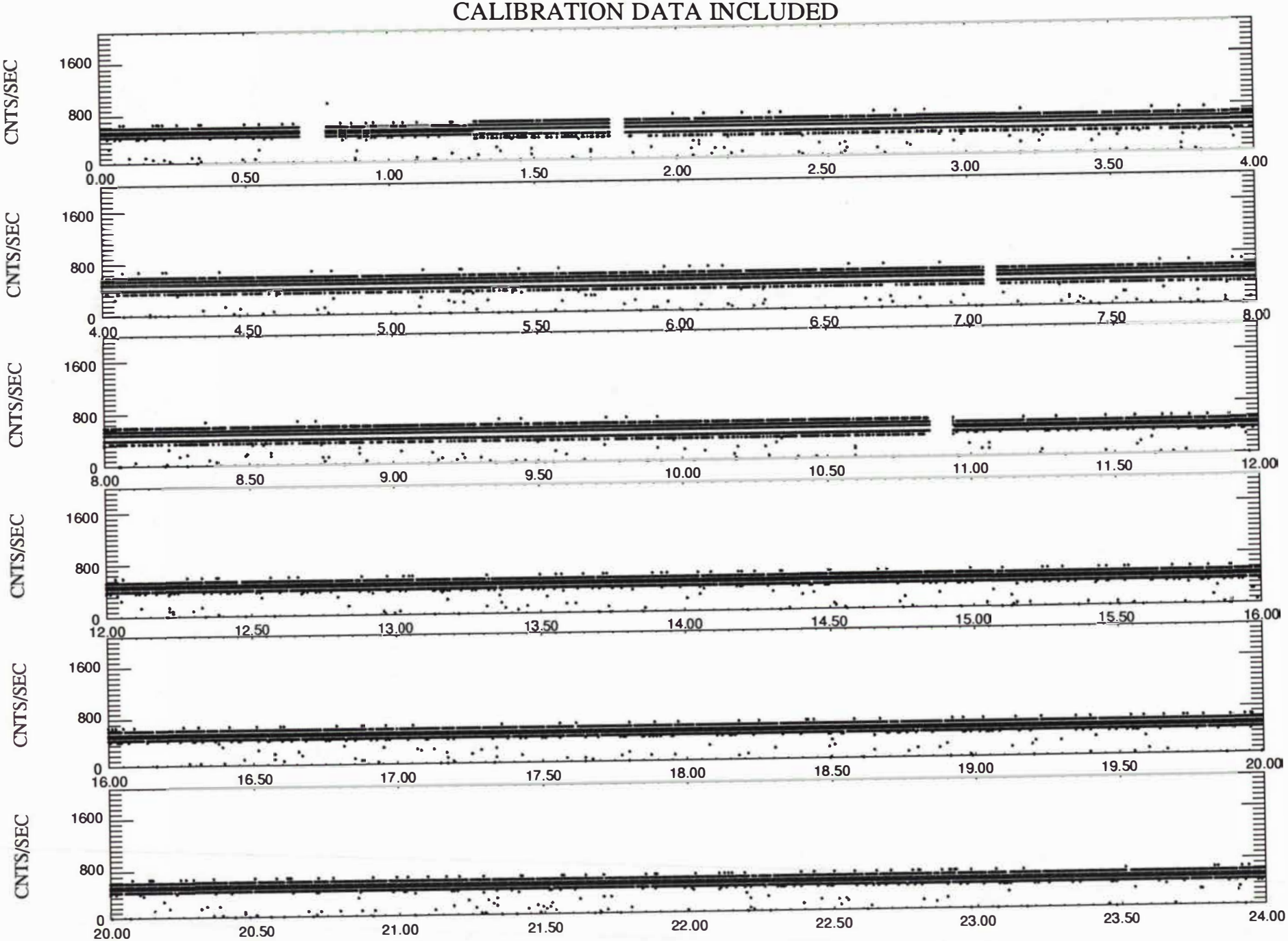

GOES 8
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/06, 0000:00
Plot created: 97/12/10, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 340, year 1997 to day 340, year 1997 3/12/98



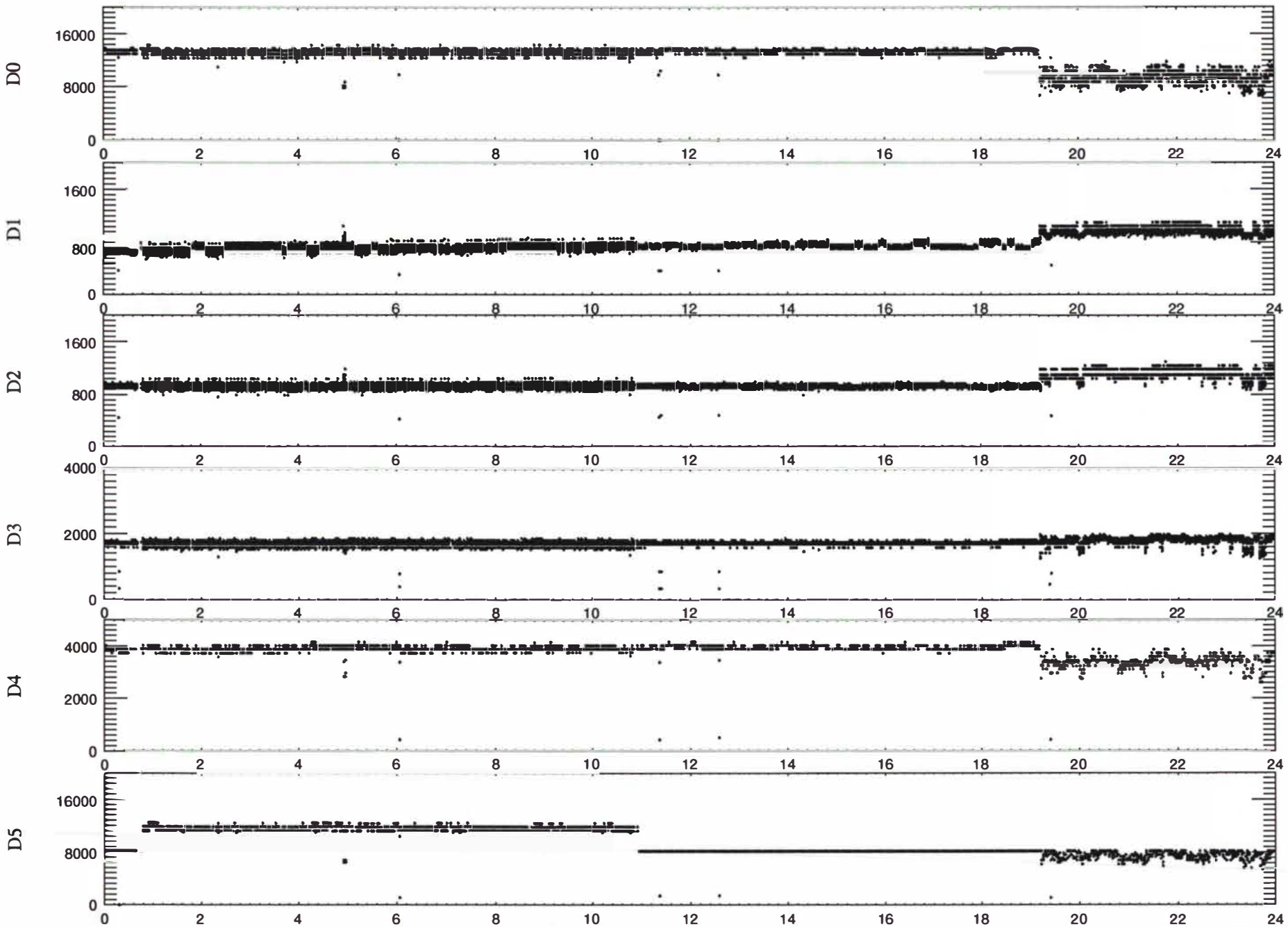
HUS 2A, MODE 1, NOT AVERAGED EDR day 340, year 1997 to day 340, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV AL TIME

HUS 2B COUNTS / SEC EDR day 340, year 1997 to day 340, year 1997 3/12/98



From SURASAK@SSLLES.MSFC.NASA.GOV Tue Dec 9 11:46:57 1997
Return-Path: <SURASAK@SSLMOR.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA14210; Tue, 9 Dec 1997 11:46:51 -0800
Received: from SSLMOR.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA26940; Tue, 9 Dec 1997 11:46:45 -0800
Date: Tue, 9 Dec 1997 13:46:28 -0600 (CST)
From: SURASAK@SSLLES.MSFC.NASA.GOV
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971209134628.23403ed7@SSLLES.MSFC.NASA.GOV>
Subject: Crossing Windows for BATSE Burst 6522
Content-Length: 1135
X-Lines: 26
Status: RO

Spike at 21809s,
1676s from BATSE window center
Not the same time history

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

BATSE BURST # 6522
EVENT OF 1997 DEC 7 DAY OF YEAR=341
EVENT CROSSING TIME AT BATSE : 23238. S. OR 06:27:18.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 265.000 -6.000
BATSE PEAK COUNTING RATE: 9000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 7/12/ 97 IS:
RA= 170.761 DEC= 12.151 DIST= 5.285 AU
BATSE-ULYSSES DISTANCE = 790638973. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 84.61 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 247.54 SECS.
CROSSING TIME AT ULYSSES IS 23486. S. OR 06:31:25 +/- 509.61 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 7/12/ 97 IS:
RA= 293.156 DEC= -22.998 DIST= 2.053 AU
MARS-BATSE DISTANCE = 307201600. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=147.99 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -868.94 SECS.
CROSSING TIME AT MARS IS 22369. S. OR 06:12:49 +/- 81.10 SECONDS

BATSE BURST TRIGGER

NO.: 6522

TIME: TJD=0789 SECONDS=23238

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=15.1 AZIMUTH=8.0 ERROR=1.742 DEGREES

COMMENTS:
GRB. COMPLEX DURATION ABOUT 6.7S. STARTS AT ABOUT T-0.5S. NOT VISIBLE
ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6522 | 971207 | 10789 | 23238 | 9000 | 265 | -06 | 6.8 |

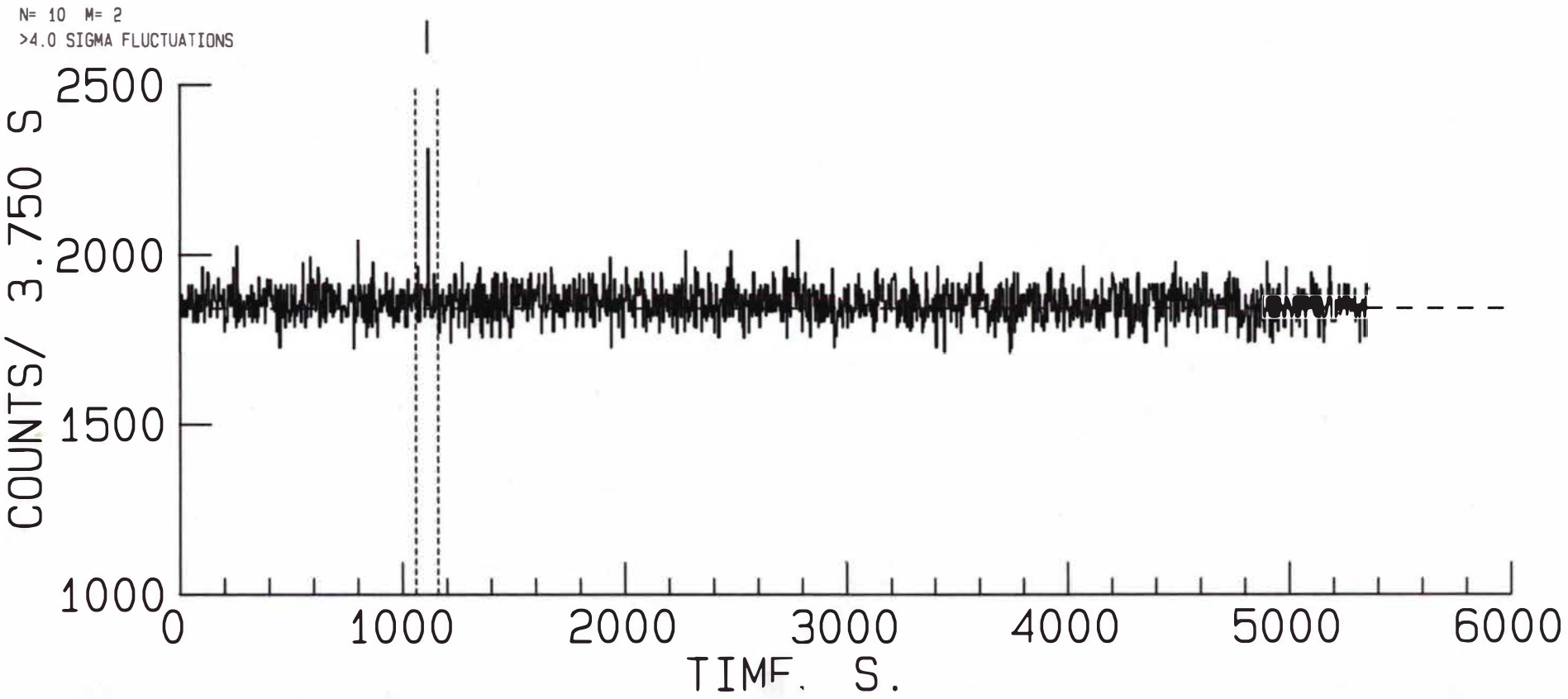
ULYSSES RT

9/ 2/ 0

7/12/97 20664.110 s

0.250 S INTERVALS REGROUPED BY 15

22- 148 keV



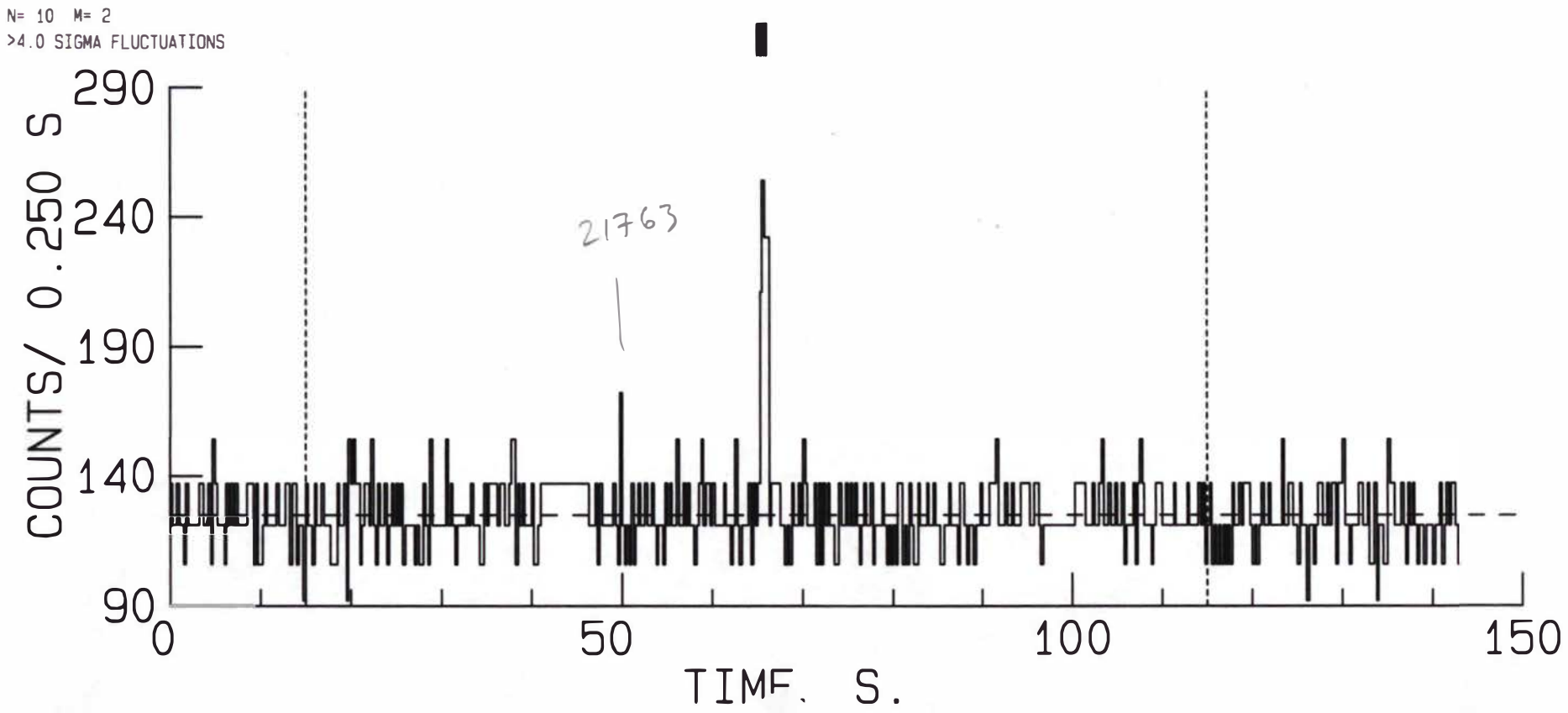
# ULYSSES RT

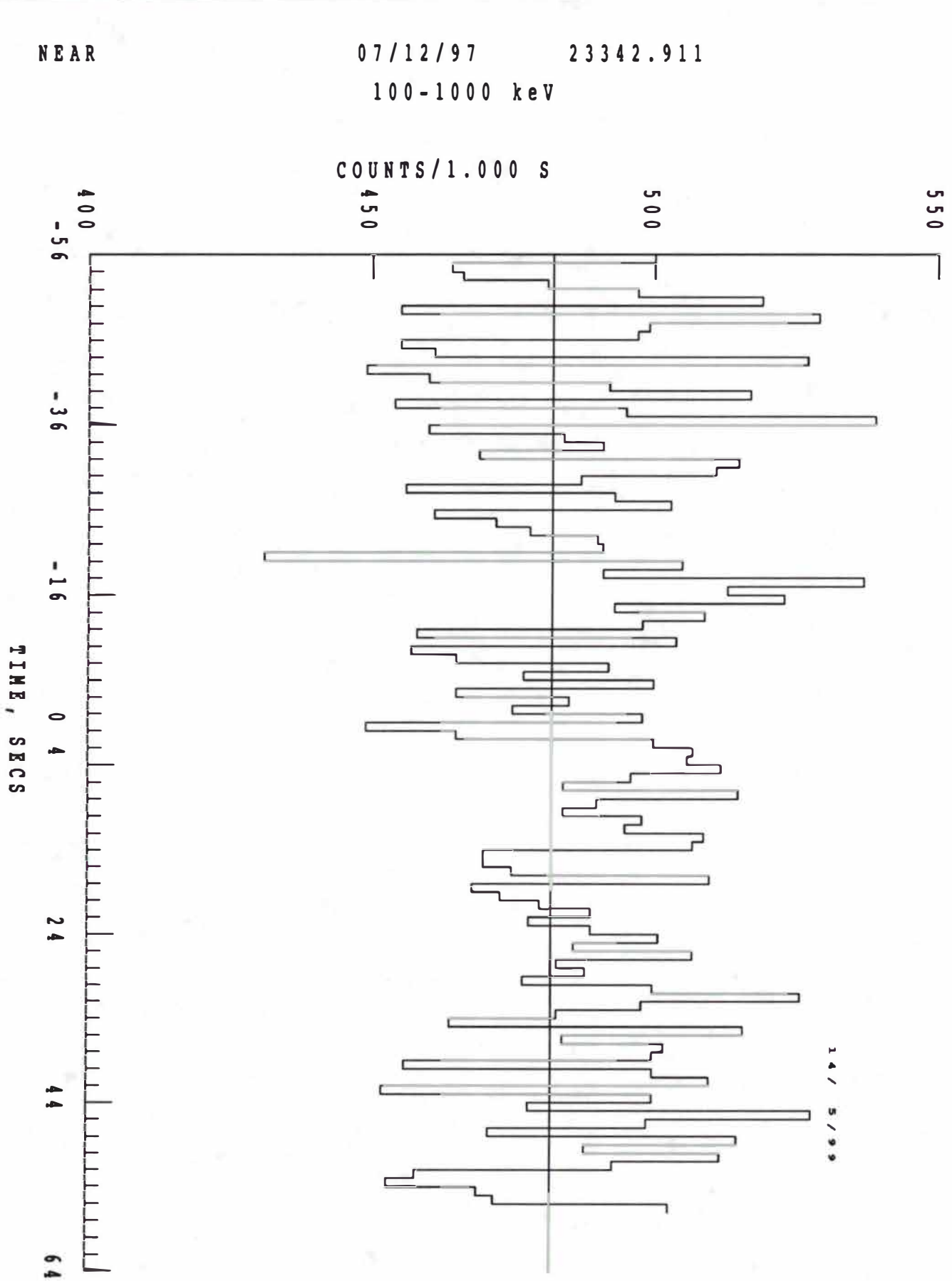
9/ 2/ 0

7/12/97 21713.872 s

22- 148 keV

1099 - 1150




NEAR
07/12/97
23342.911
100-1000 keV
COUNTS/1.000 S
400
450
500
550
-56
-36
-16
0 4
24
44
64
TIME, SECS
14/ 5/99

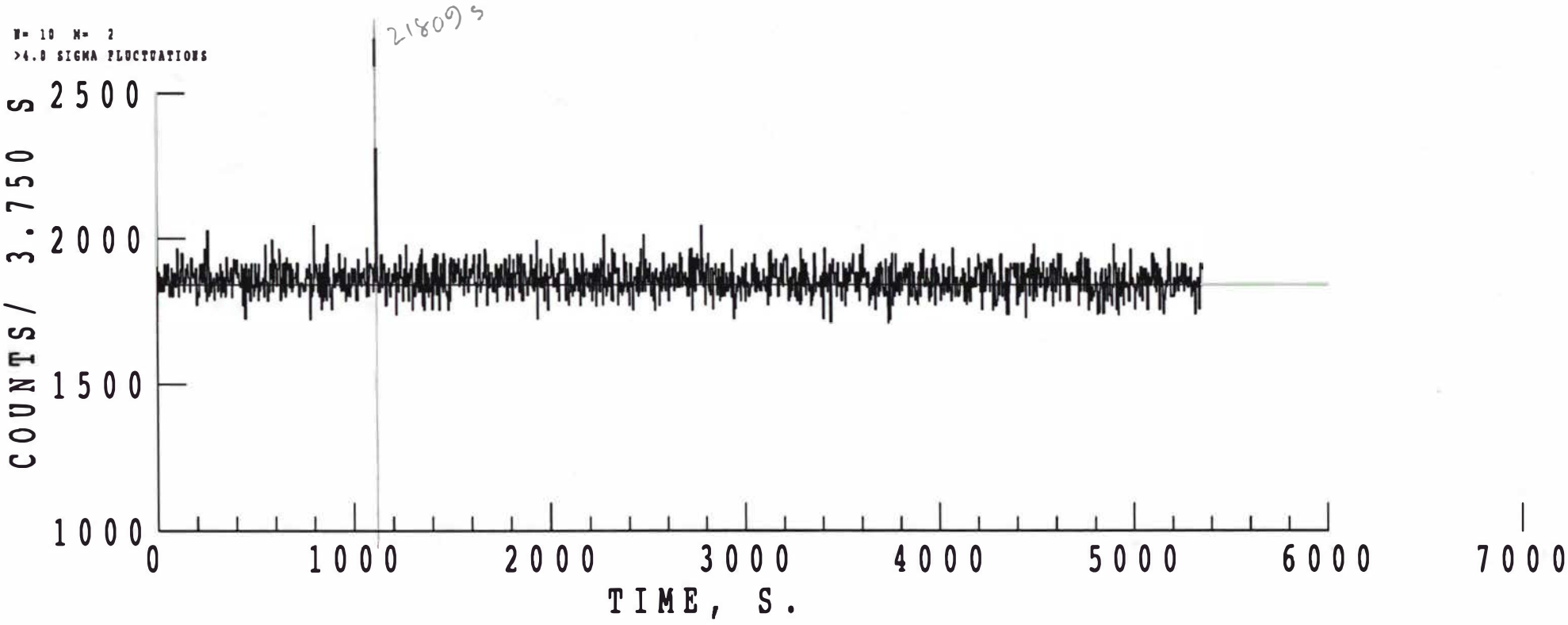
KNEAR GRS 19971207 23342

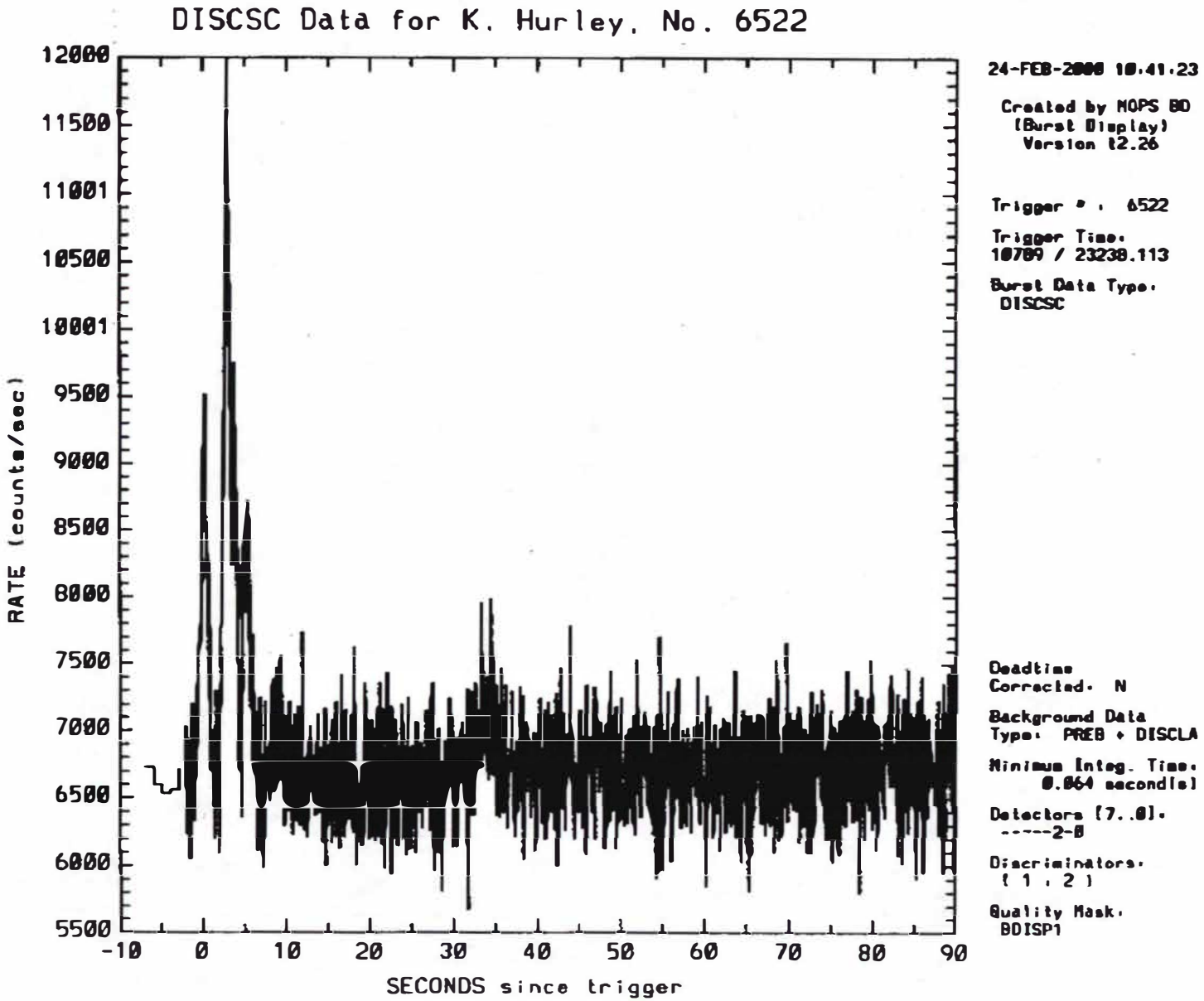
ULYSSES RT 14/ 5/99

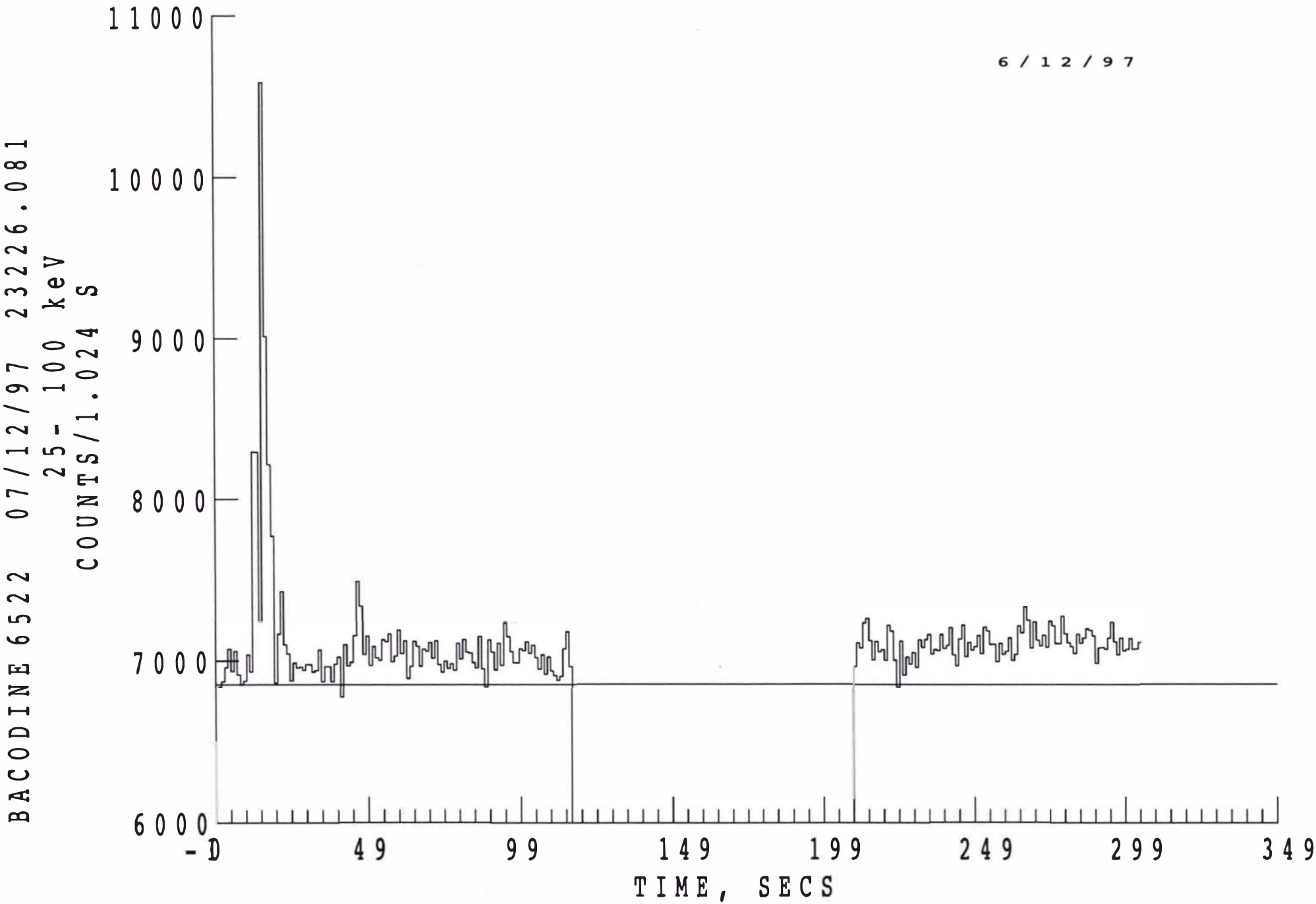
7/12/97 20664.109 s

0.250 S INTERVALS REGROUPED BY 15

0- 0 keV




DISCSC Data for K. Hurley, No. 6522
RATE (counts/sec)
12000
11500
11001
10500
10001
9500
9000
8500
8000
7500
7000
6500
6000
5500
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
24-FEB-2000 10.41.23
Created by MOPS BD
(Burst Display)
Version 12.26
Trigger # : 6522
Trigger Time:
10709 / 23238.113
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 seconds
Detectors [7..0]:
-----2-0
Discriminators:
( 1 , 2 )
Quality Mask:
BDISP1


BACODINE 6522 07/12/97 23226.081
25- 100 keV
COUNTS/1.024 S
11000
10000
9000
8000
7000
6000
6/12/97
-D
49
99
149
199
249
299
349
TIME, SECS

BATSE BURST# 6522

ULYSSES RT 9/12/97

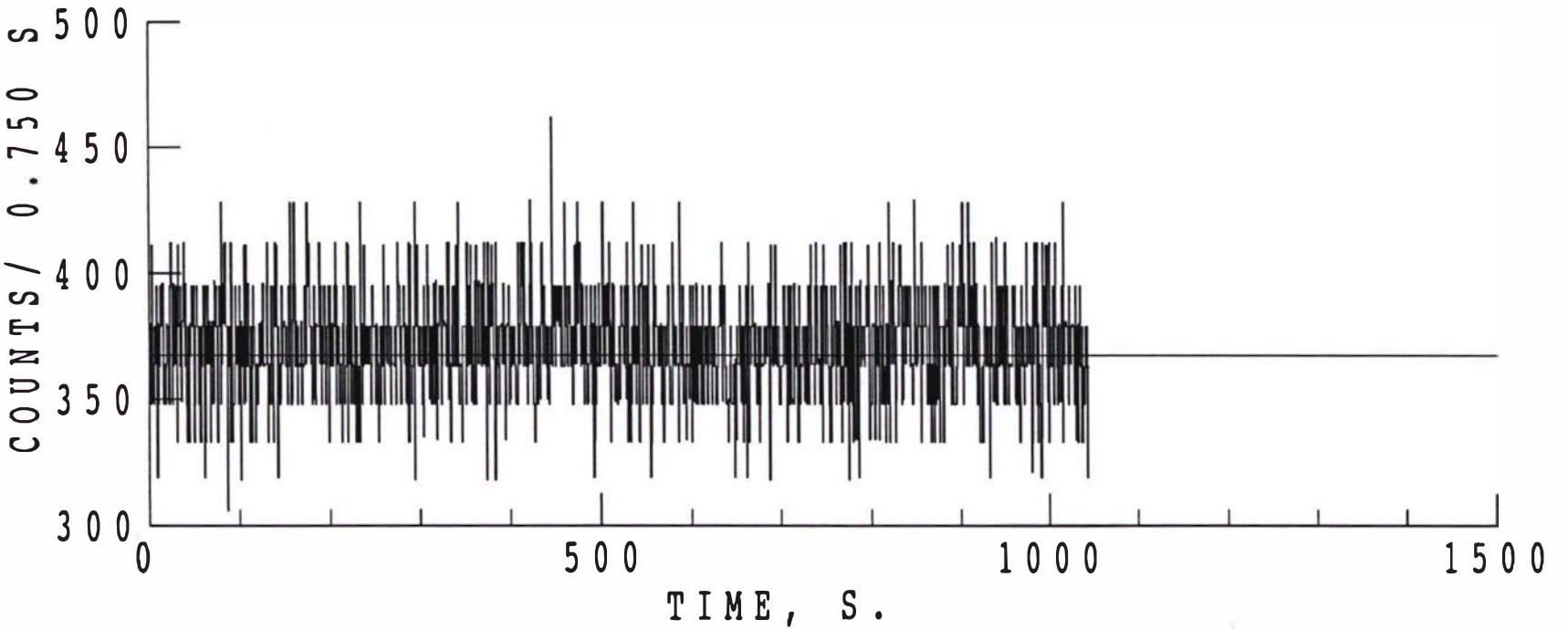
7/12/97 22968.137 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From SAHI@fender.msfc.nasa.gov Tue Dec 9 10:35:14 1997
Return-Path: <SAHI@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id KAA13255; Tue, 9 Dec 1997 10:35:08 -0800
From: SAHI@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id KAA26267; Tue, 9 Dec 1997 10:34:59 -0800
Date: Tue, 9 Dec 1997 12:34:10 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971209123410.22440f24@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6523
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6523
EVENT OF 1997 DEC 7 DAY OF YEAR=341
EVENT CROSSING TIME AT BATSE : 37493. S. OR 10:24:53.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 95.000 3.000
BATSE PEAK COUNTING RATE: 5600 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 7/12/ 97 IS:
RA= 170.761 DEC= 12.146 DIST= 5.282 AU
BATSE-ULYSSES DISTANCE = 790229440. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=104.55 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -661.98 SECS.
CROSSING TIME AT ULYSSES IS 36831. S. OR 10:13:51 +/- 482.92 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 7/12/ 97 IS:
RA= 293.156 DEC= -22.998 DIST= 2.053 AU
MARS-BATSE DISTANCE = 307201600. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 26.63 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 916.04 SECS.
CROSSING TIME AT MARS IS 38409. S. OR 10:40:09 +/- 93.65 SECONDS

BATSE BURST TRIGGER
NO.: 6523

TIME: TJD=0789 SECONDS=37493

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

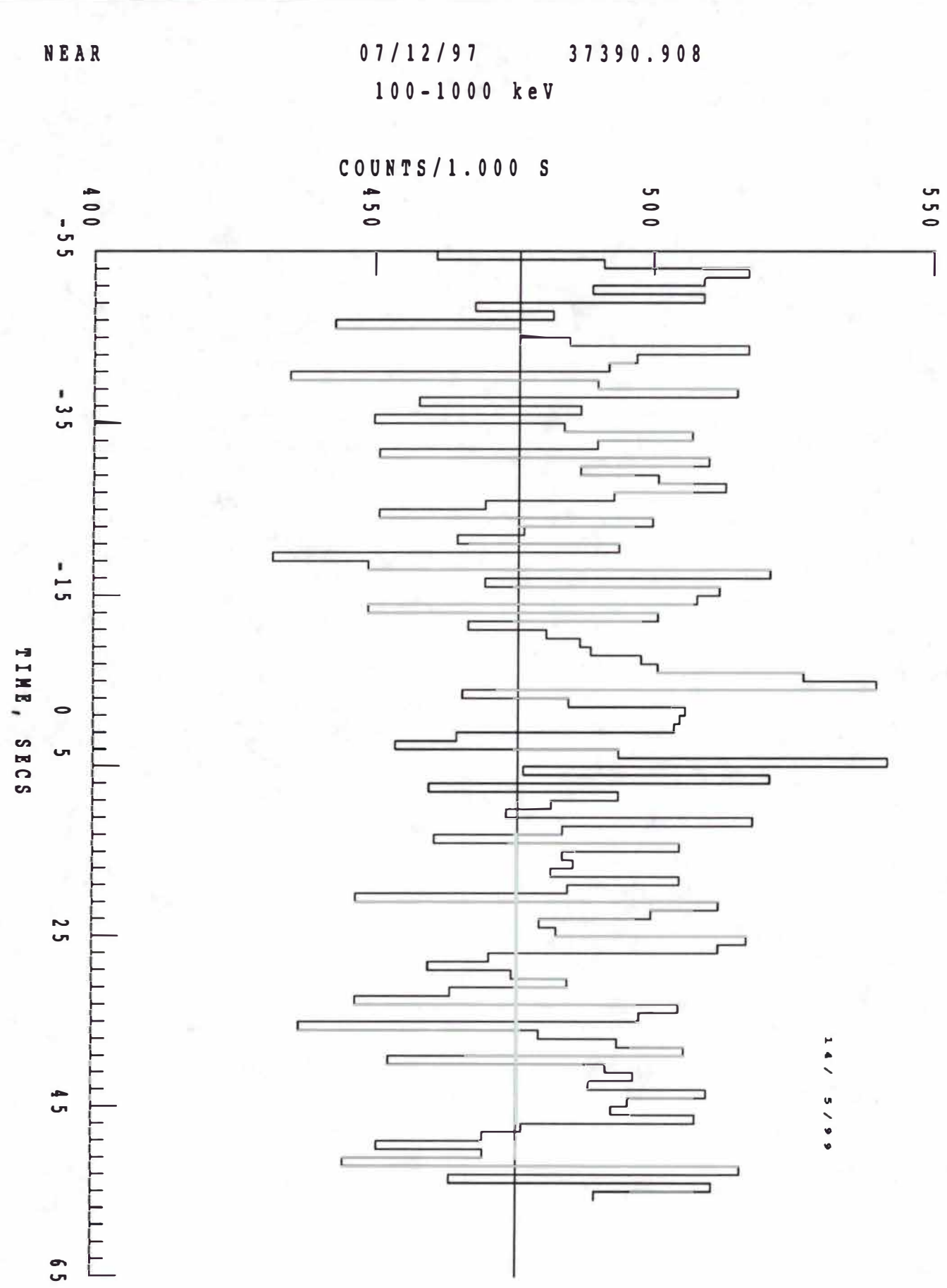
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=168.2 AZIMUTH=231.9 ERROR=1.4 DEGREES

COMMENTS:
BURST, MULTI-PEAKED, DUR. APRROX. 40 SECS, STARTS AT APPROX. T-10 SECS, MAX. AT APPROX. T+4.5 SECS, POSSIBLE PRECURSOR AT APPROX. T-28 SECS. NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6523 | 971207 | 10789 | 37493 | 5600 | 095 | +03 | 40 |


NEAR
07/12/97
37390.908
100-1000 keV
COUNTS/1.000 S
400
450
500
550
-55
-35
-15
0
5
25
45
65
TIME, SECS
14/ 5/99

BATSE BURST# 6523

ULYSSES RT 9/12/97

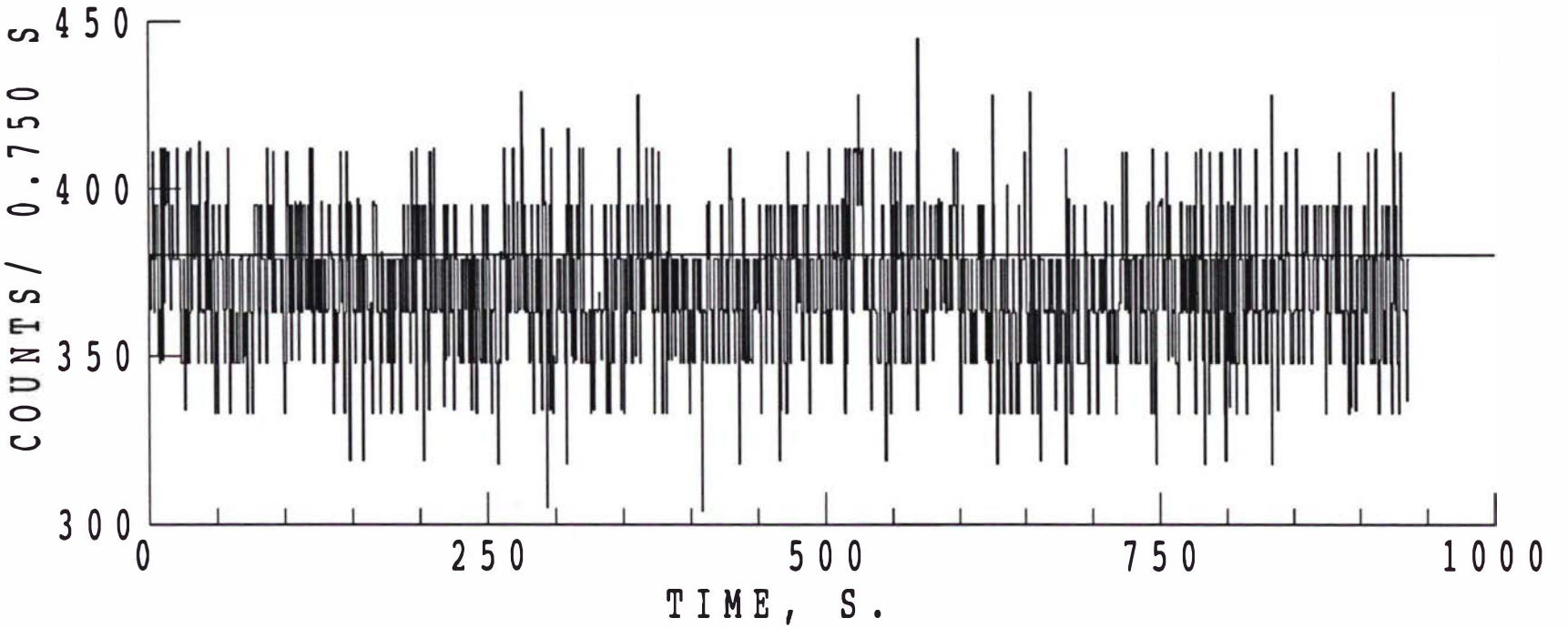
7/12/97 36360.039 s

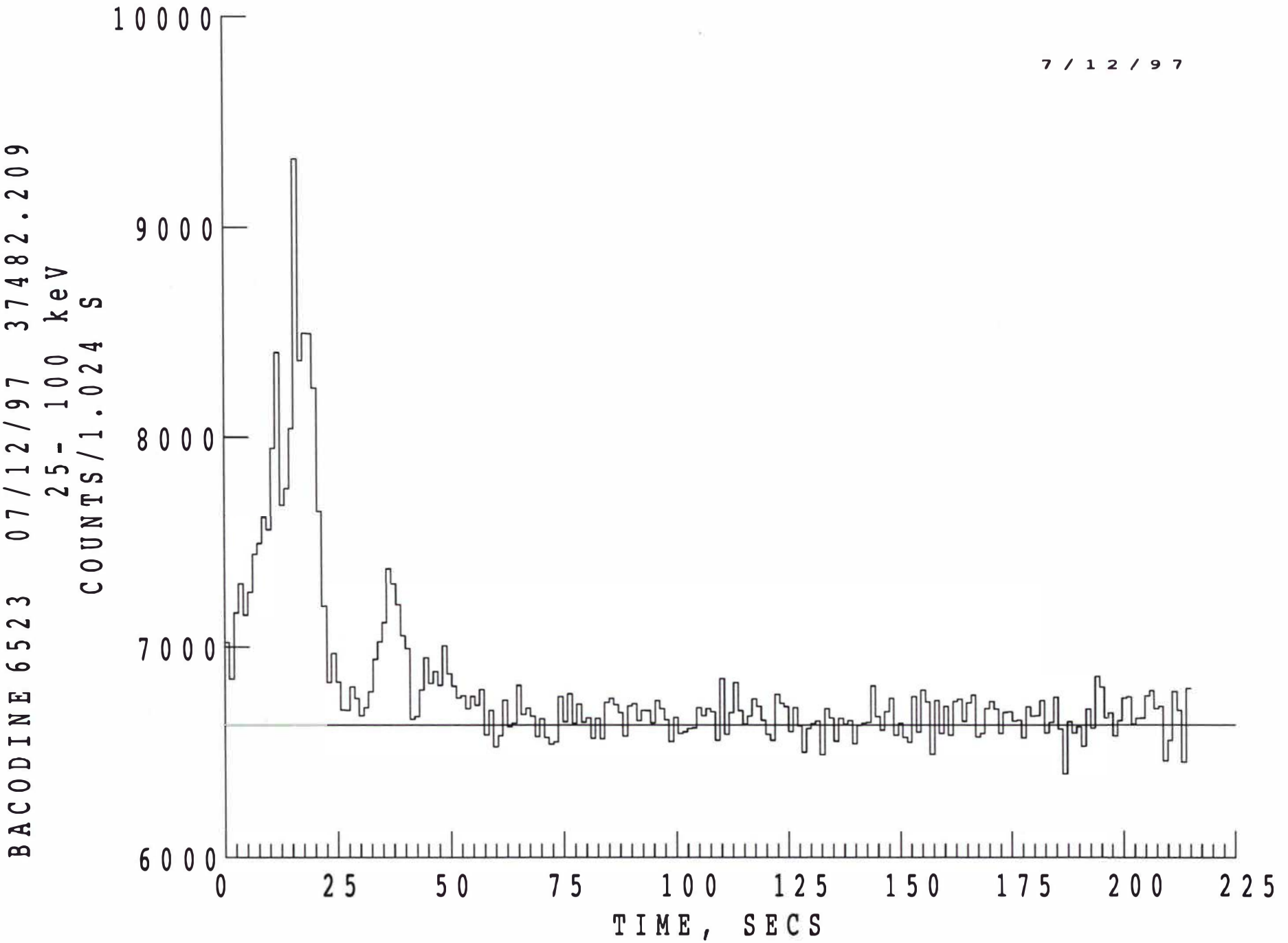
0.250 S INTERVALS REGROUPED BY 3

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS




BACODINE 6523 07/12/97 37482.209
25- 100 keV
COUNTS/1.024 S
10000
9000
8000
7000
6000
0
25
50
75
100
125
150
175
200
225
TIME, SECS
7/12/97

November 17 1997 02:08  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

November 18 1997 11:22  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

November 29 1997 20:25  Ulysses time; weak burst, 100 ms long

This event was not detected by Konus.

---

December 7 1997 11:24  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

December 11 1997 20:22  Ulysses time; weak burst, 32 ms long

s event was not detected by Konus.

---

December 14 1997 08:44  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.

---

December 19 1997 21:33  Ulysses time; moderate burst, 15 s long

Konus triggered at 22:12:54.241 in the North-facing detector.  The event consisted of a single broad soft peak lasting 10 seconds, with a 50-200 keV spike 4 seconds after the trigger and lasting 0.5 seconds.

---

December 25 1997 17:23  Ulysses time; weak burst, 32 ms long

Konus waiting-mode data records a couple of events during the period of interest.  There was a weak to moderate North-facing detector soft event
sting 60 seconds, with a peak at 18:00:35.  A single 3-second timebin

---

North-facing detector soft event occurred at 17:40:22.

From kraken@rosserv.gsfc.nasa.gov Wed Dec 17 14:05 PST 1997
X-Sender: kraken@kangaroo.gsfc.nasa.gov
Mime-Version: 1.0
Date: Wed, 17 Dec 1997 17:07:14 -0500
    khurley@sunspot.ssl.berkeley.edu (Kevin Hurley)
From: Peter Kurczynski <kraken@rosserv.gsfc.nasa.gov>
Subject: Ulysses bursts and TGRS
Cc: TEEGARDEN@tgrs2.gsfc.nasa.gov

Hi Kevin,

Here are the results of a search through TGRS data for recent Ulysses bursts. We cannot report the detection of any of the bursts listed below. Three bursts had interesting anomalies within a 6000 second window centered on the Ulysses trigger time. Such events are under investigation, but are probably not GRB's.

November 17 1997 02:08 Ulysses time; weak burst, 100 ms long
        TGRS sees a single high data channel at 7100s between 100-300 keV

November 18 1997 11:22 " " ; weak burst, 64 ms long
November 29 1997 20:25 Ulysses time; weak burst, 100 ms long
December 7 1997 11:24 Ulysses time; weak burst, 64 ms long
December 11 1997 20:22 Ulysses time; weak burst, 32 ms long
        TGRS sees a single high data channel at 75700s between 35-100 keV

December 14 1997 08:44 Ulysses time; weak burst, 32 ms long
        TGRS sees a single high data channel at 35100s between 100-300 keV

Take care, and Happy Holidays.

Pete

From HENZE@BATSE.MSFC.NASA.GOV Mon Dec 8 14:26:35 1997
Date: Mon, 8 Dec 1997 16:25:43 -0600 (CST)
From: Bill Henze (205-544-7616) <HENZE@BATSE.MSFC.NASA.GOV>
To: burst@comptel.sr.unh.edu, grobad@estsa2.estec.esa.nl,
cline@lheavx.gsfc.nasa.gov, barthelmy@lheavx.gsfc.nasa.gov,
bacodine@lheawww.gsfc.nasa.gov, scott@circe.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, band@cass09.ucsd.edu,
gruber@cass09.ucsd.edu, matteson@cass09.ucsd.edu,
PACIESAS@BATSE.MSFC.NASA.GOV, HORACK@BATSE.MSFC.NASA.GOV,
khurley@sunspot.ssl.berkeley.edu, lmm@egret.gsfc.nasa.gov,
mops@osse.nrl.navy.mil, grove@osse.nrl.navy.mil,
matz@osse.nrl.navy.mil, share@osse.nrl.navy.mil,
messina@osse.nrl.navy.mil, sandora@osse.nrl.navy.mil,
park@kabul.llnl.gov
Subject: Burst Trigger Message

BATSE BURST TRIGGER

NO.: 6524

TIME: TJD=0789 SECONDS=54202

TYPE: PARTICL SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
PARTICLE EVENT, AFTER SAA EXIT.

67200 event

Date: Jul 8 2003

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

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

## 2. BATSE Data

☐ BATSE ephemeris for $T_0$? N/A

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

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

## 3. NEAR Data

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

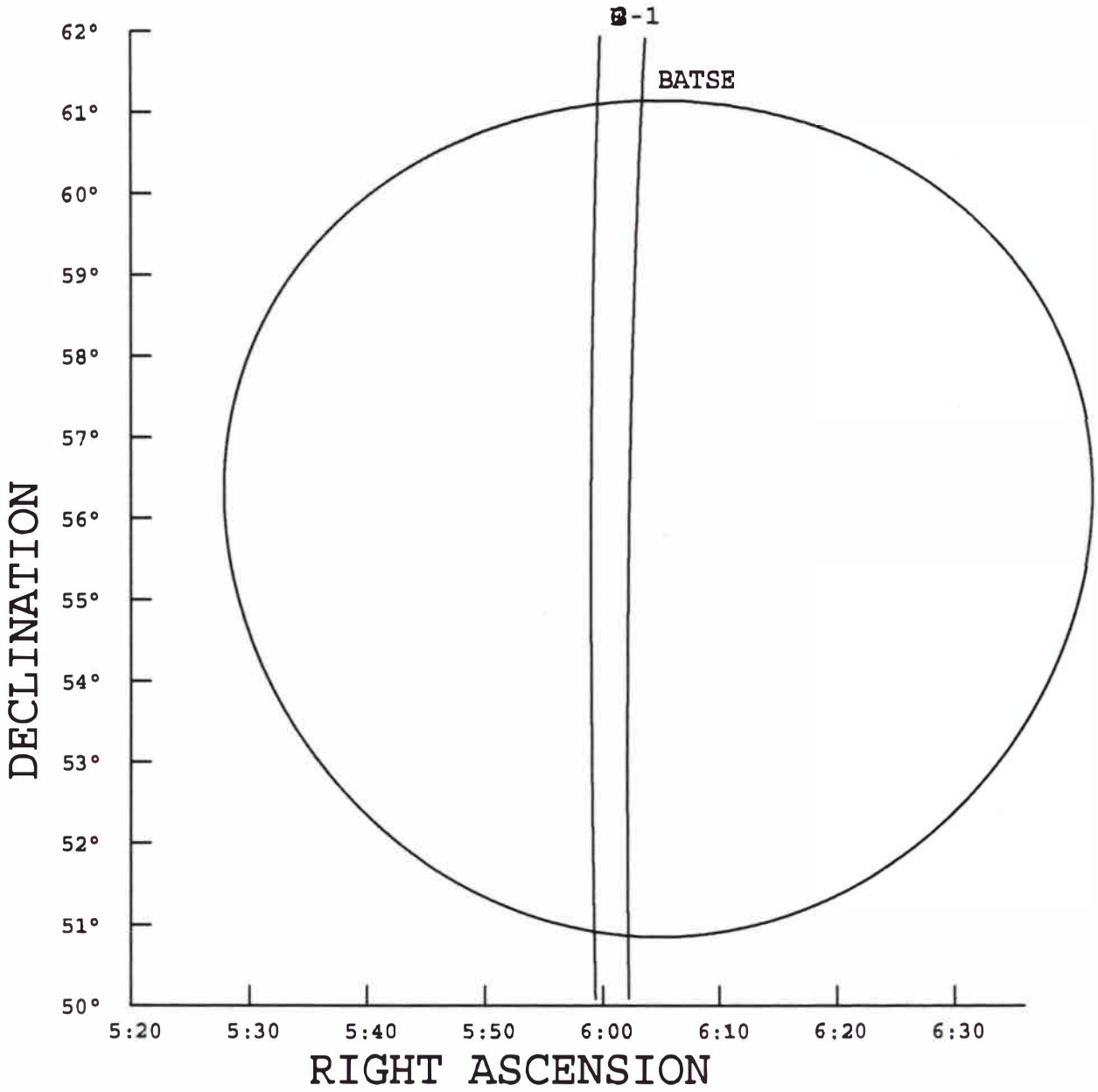
☐ BATSE >100 keV data used for NEAR correlation?

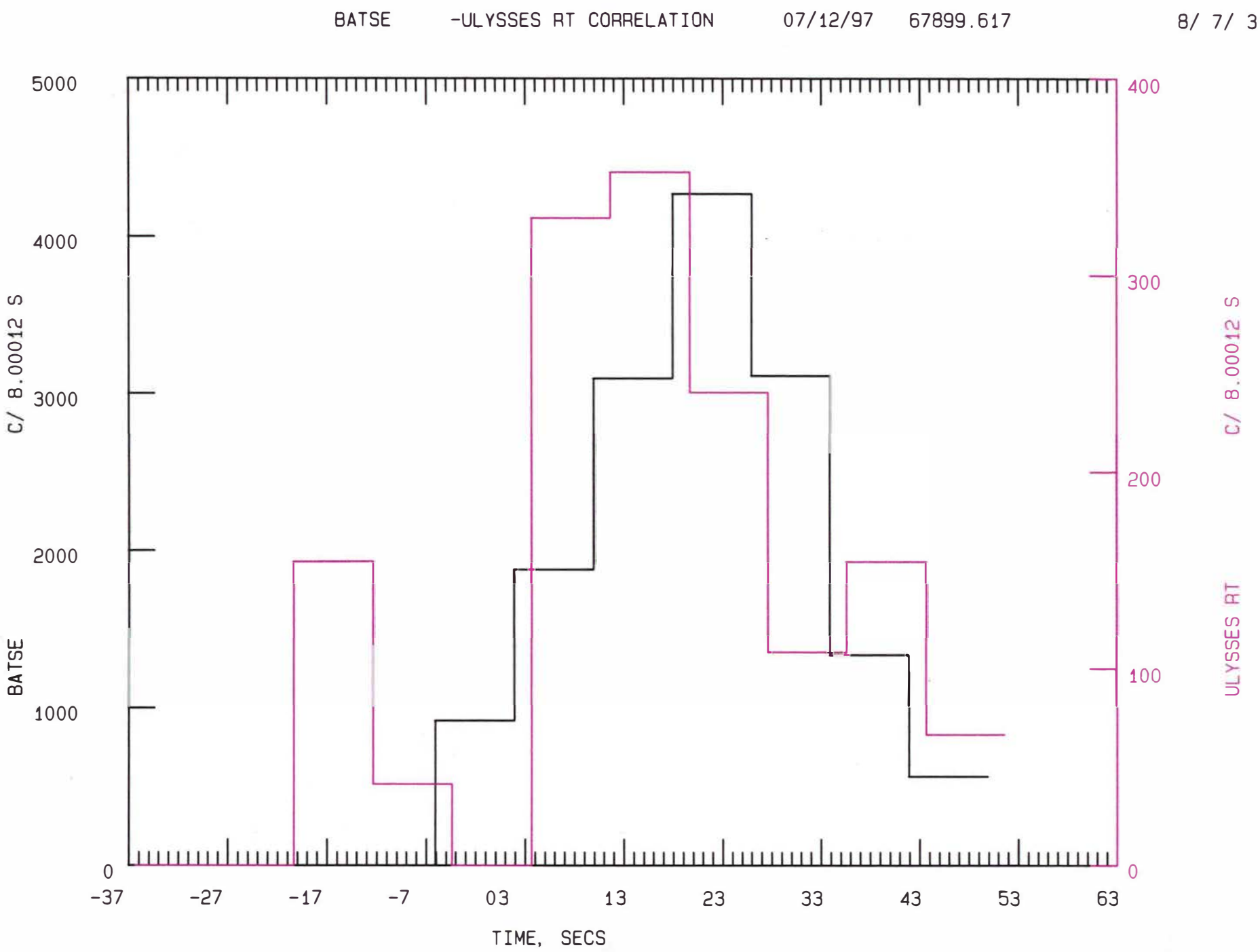
☑ ACCESS database updated?

EVENT OF DEC 7, 1997 18:51

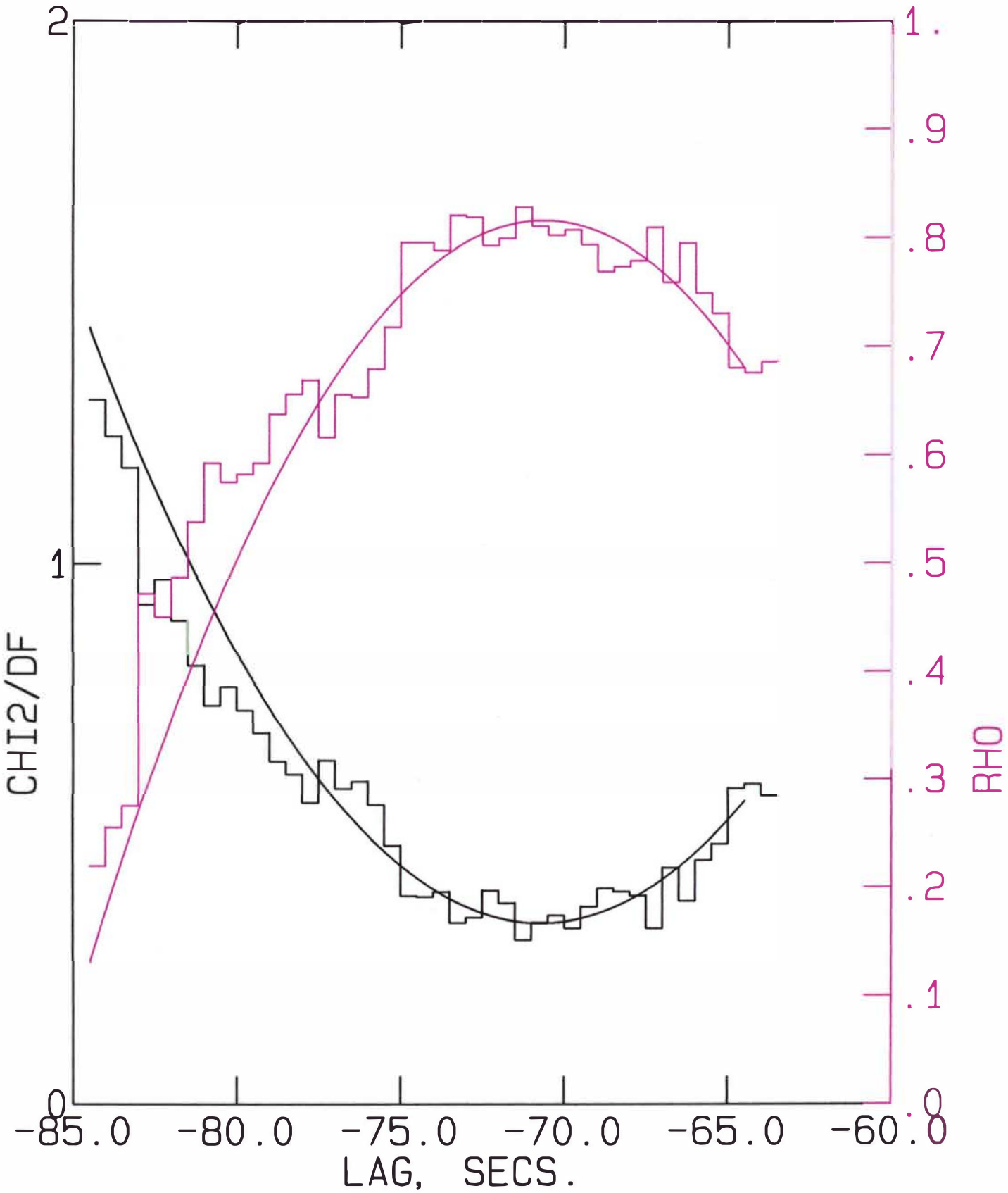
8/ 7/ 3

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




BATSE -ULYSSES RT CORRELATION 07/12/97 67899.617 8/ 7/ 3
5000
4000
3000
2000
1000
0
C/ 8.00012 S
BATSE
400
300
200
100
0
C/ 8.00012 S
ULYSSES RT
-37
-27
-17
-7
03
13
23
33
43
53
63
TIME, SECS

BATSE -ULYSSES RT CORRELATION 07/12/97 67899.617



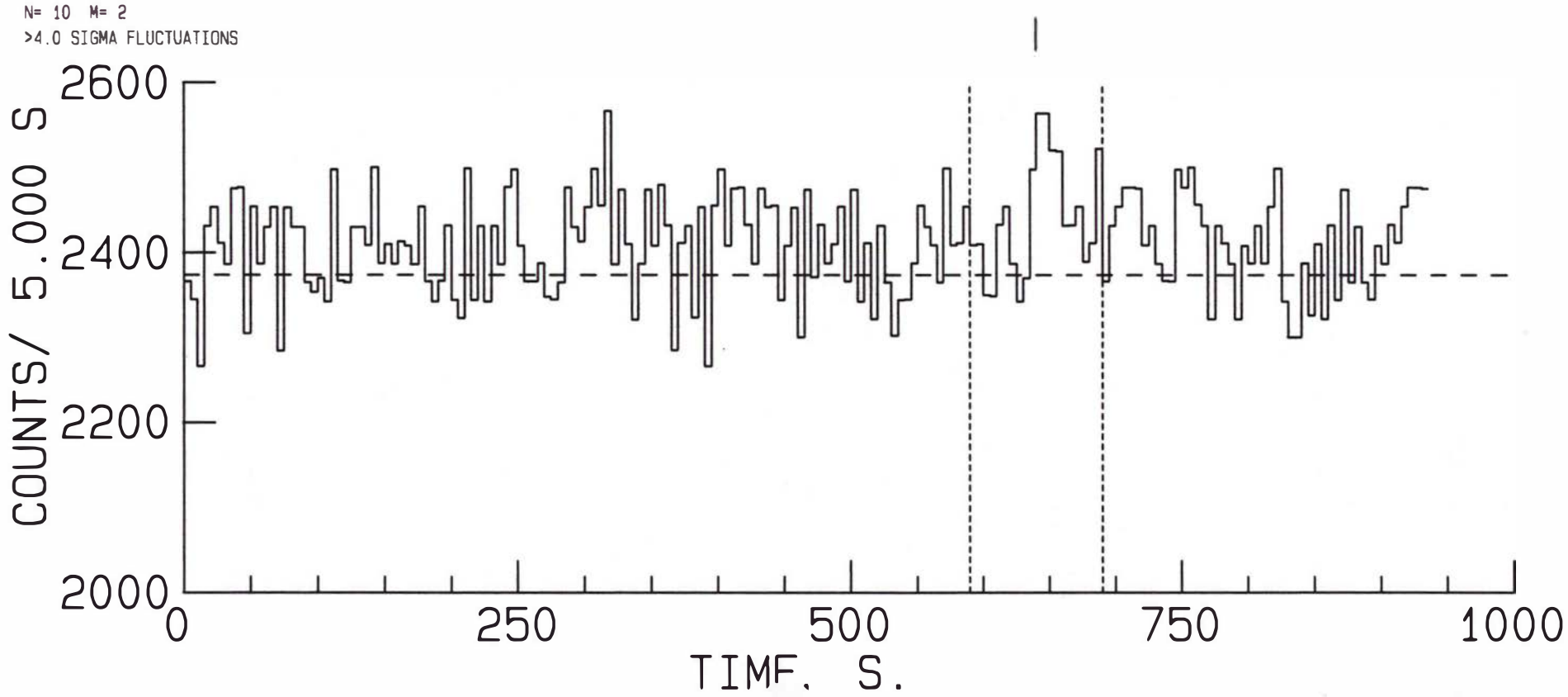
ULYSSES RT

8/ 7/ 3

7/12/97 66600.375 s

0.500 S INTERVALS REGROUPED BY 10

22- 148 keV



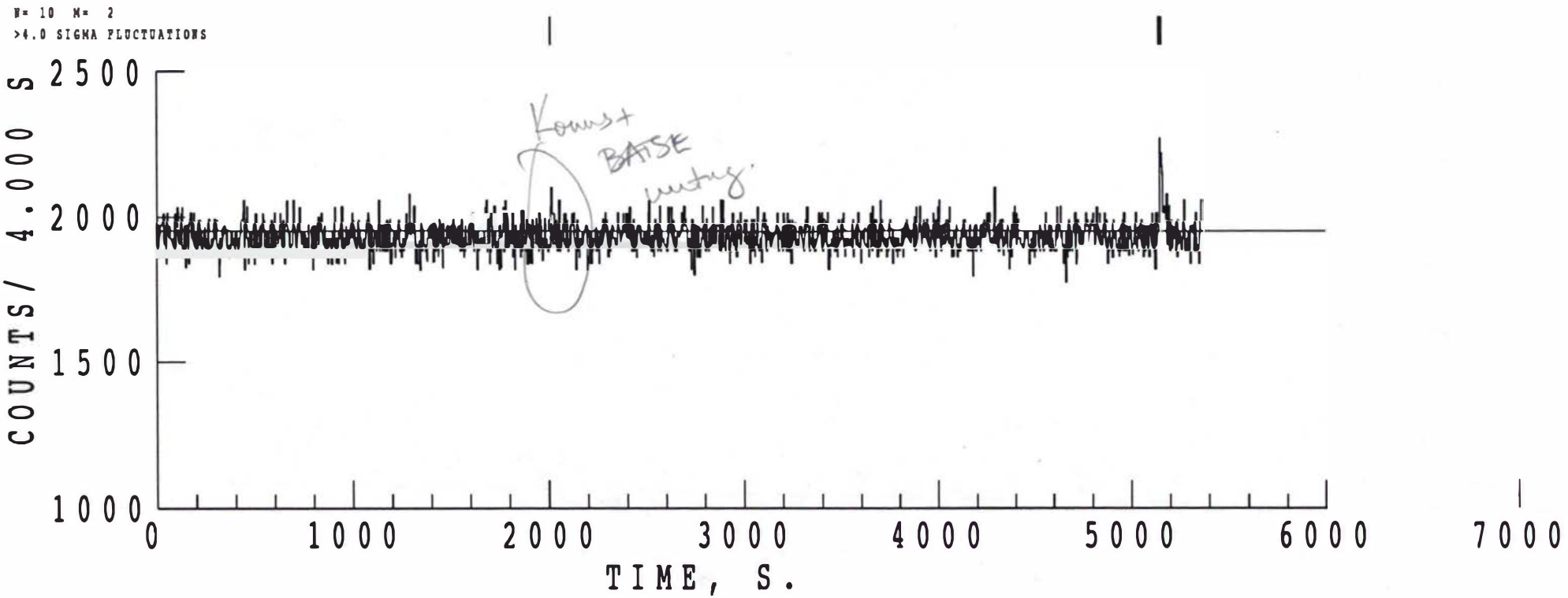
KONUS

ULYSSES RT 07/02/00

07/12/97 65232.355 s

0.500 S INTERVALS REGROUPED BY 8

0- 0 keV



Date: Jan 10 2012

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

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

## 2. For Konus events

☑ Konus ecliptic latitude used with latest calibration?

## 2. For Odyssey events

☐ Was CHECKMO run to eliminate data gaps?

☐ Did the Odyssey ephemeris correspond to the event time? (When there is data in the database, the ephemeris is for the start of record, usually ~1320 s prior to the request time; when there is no data in the database, the ephemeris is for the request time in the e-mail, so the request time in mosearch should be equal to the GRB time. Note that the time in the return e-mail will be ~1320 s prior to the time requested, in the line "no HEND data…")

☐ Was Mars-blocking used?

☐ For cruise phase data (April – October 2001), was the updated data used? (Old data has timing errors)

☐ GRS database searched for triggered data? Database data between August 2005 and January 2006 should be re-extracted, due to timing errors. (E-mailed data should be OK).

☐ GRS and HEND data cross-correlated to check timing?

## 2. For 3 or More Spacecraft events

☐ $\Sigma$ $3\Delta t$'s calculated, and/or BMAPSUM executed?

## 3. For INTEGRAL events

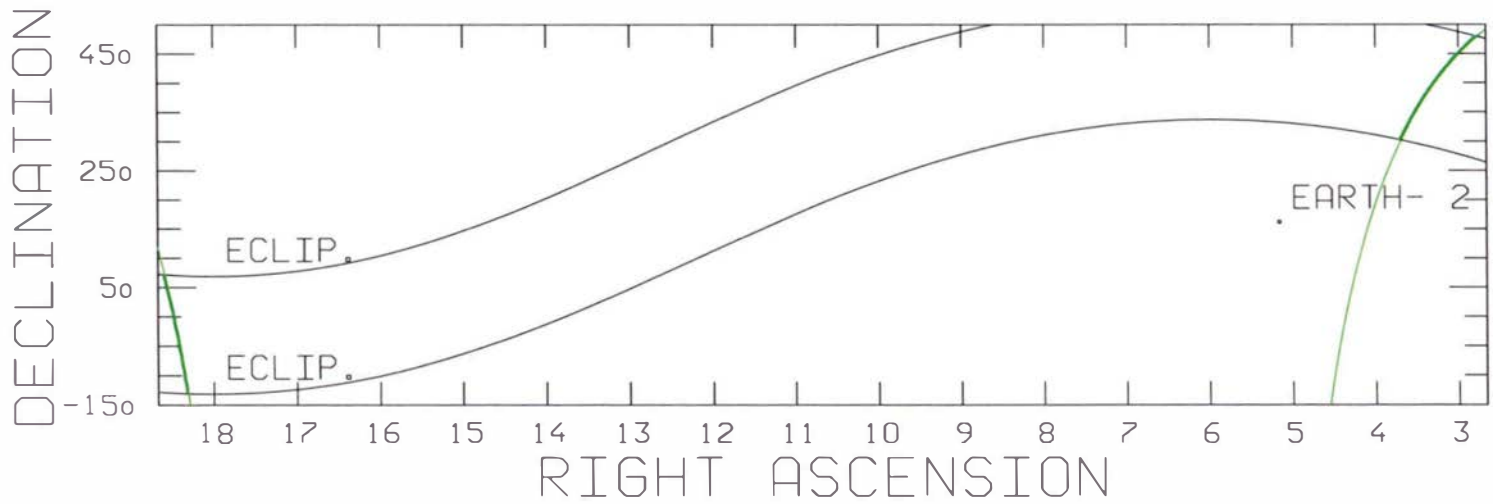
☐ INTEGRAL SPI-ACS website checked for bursts that weren't transmitted automatically?

☐ 125 ms added to INTEGRAL SPI-ACS time for bursts prior to April 2 2004 11:00 UT?

☐ Updated ephemeris used for bursts prior to September 30, 2003?

---

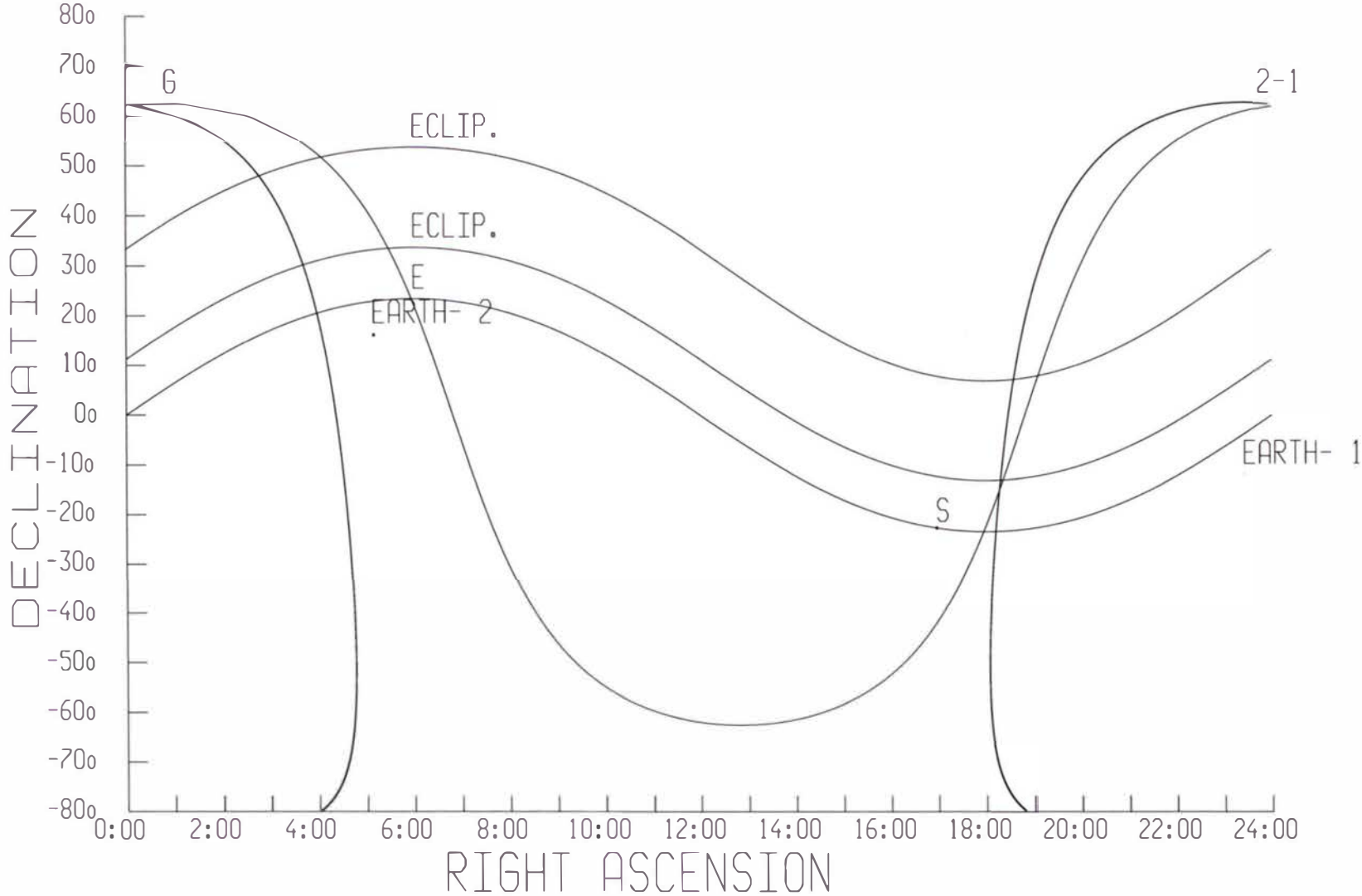
☑ ACCESS and MBL4 databases updated with identical times?


DECLINATION
45o
25o
5o
-15o
ECLIP.
ECLIP.
EARTH- 2
18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3
RIGHT ASCENSION

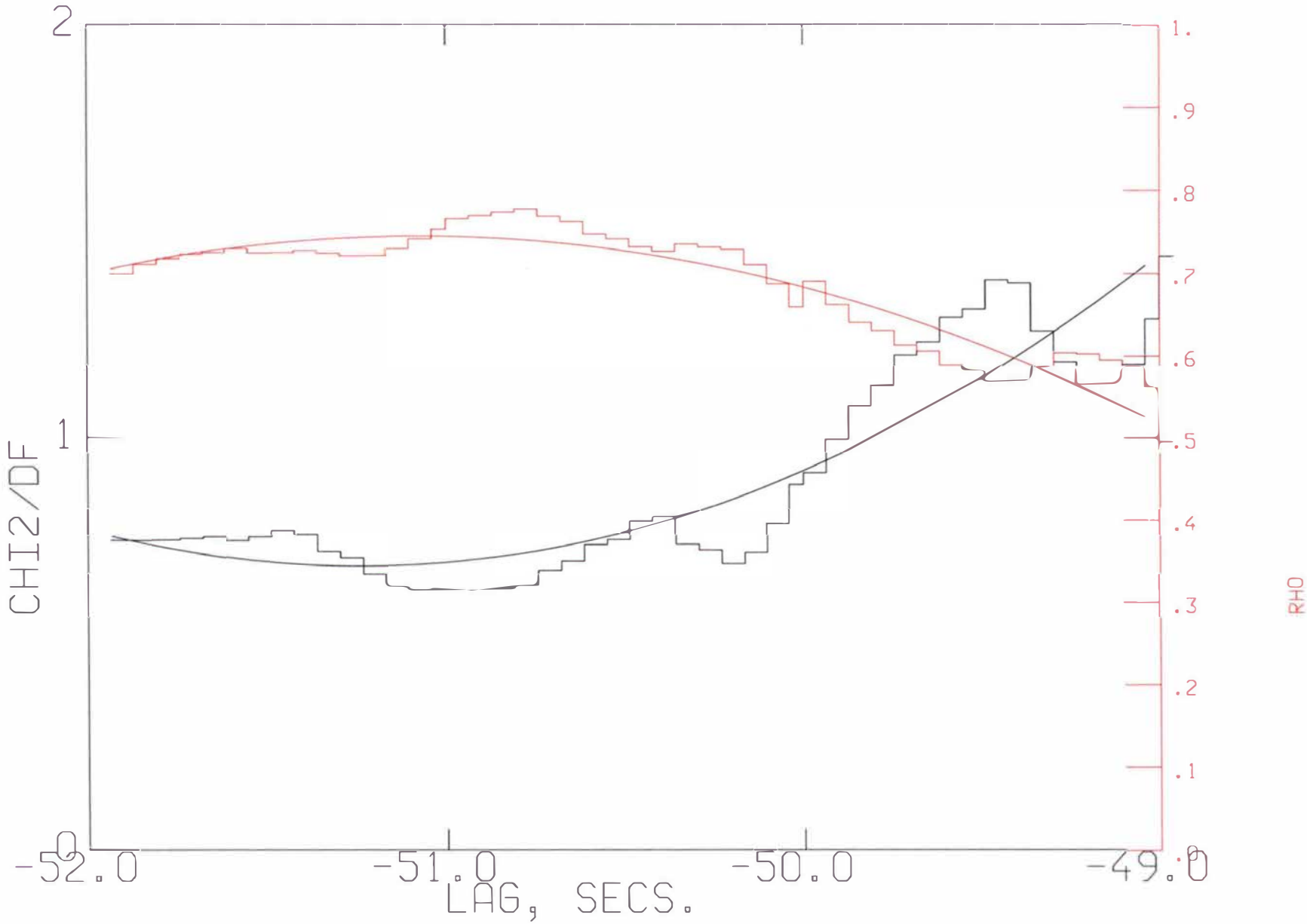
# EVENT OF DEC 7, 1997 20:09

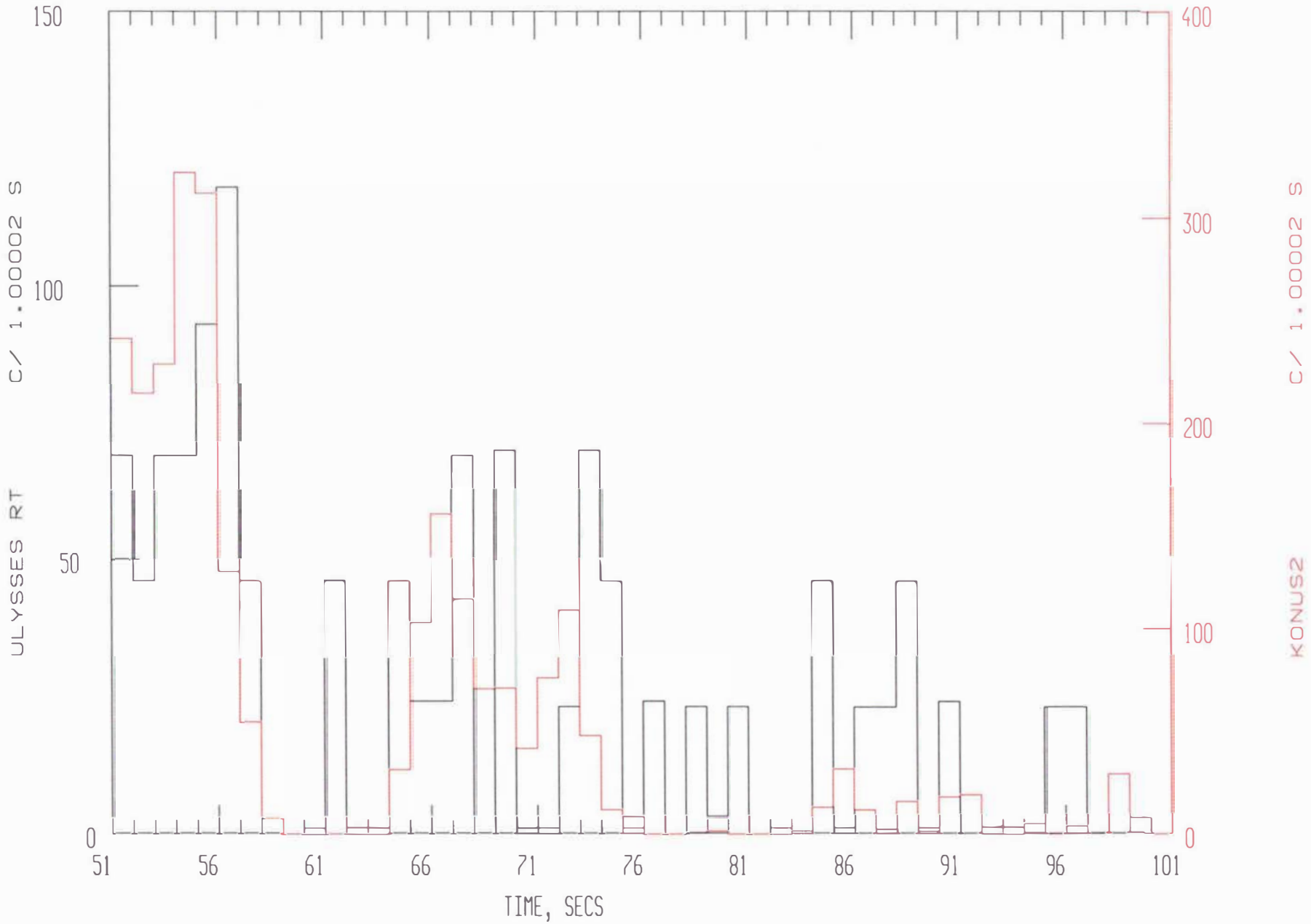
10/01/2012

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 KONUS2



ULYSSES RT-KONUS2 CORRELATION 7/12/97 72558.408




150
100
50
0
ULYSSES RT C/ 1.00002 S
400
300
200
100
0
KONUS2 C/ 1.00002 S
51
56
61
66
71
76
81
86
91
96
101
TIME, SECS

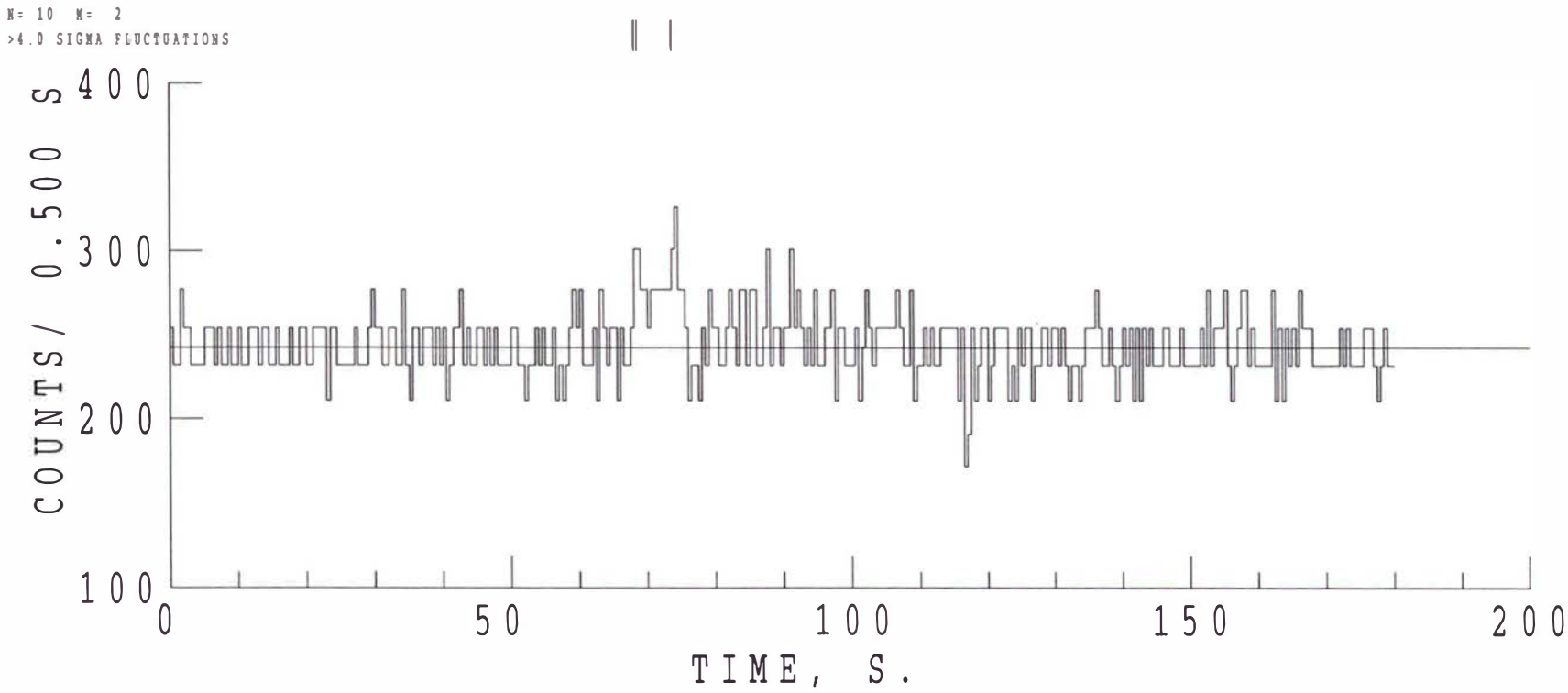
KONUS 19971207 72628

ULYSSES RT

09/01/12

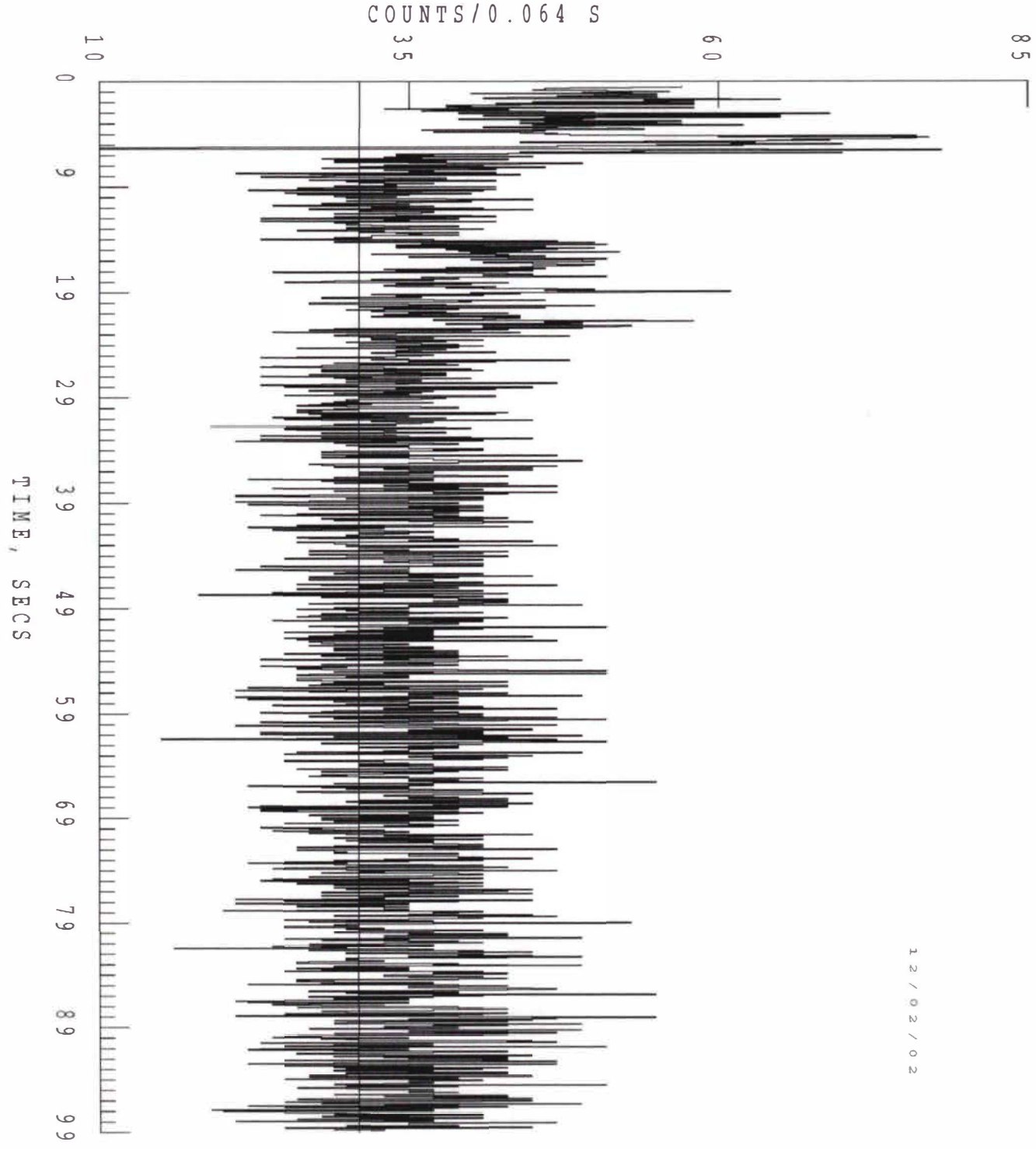
07/12/97 72540.438 s

0- 0 keV



KONUS2 07/12/97 71911.224

50- 200 keV



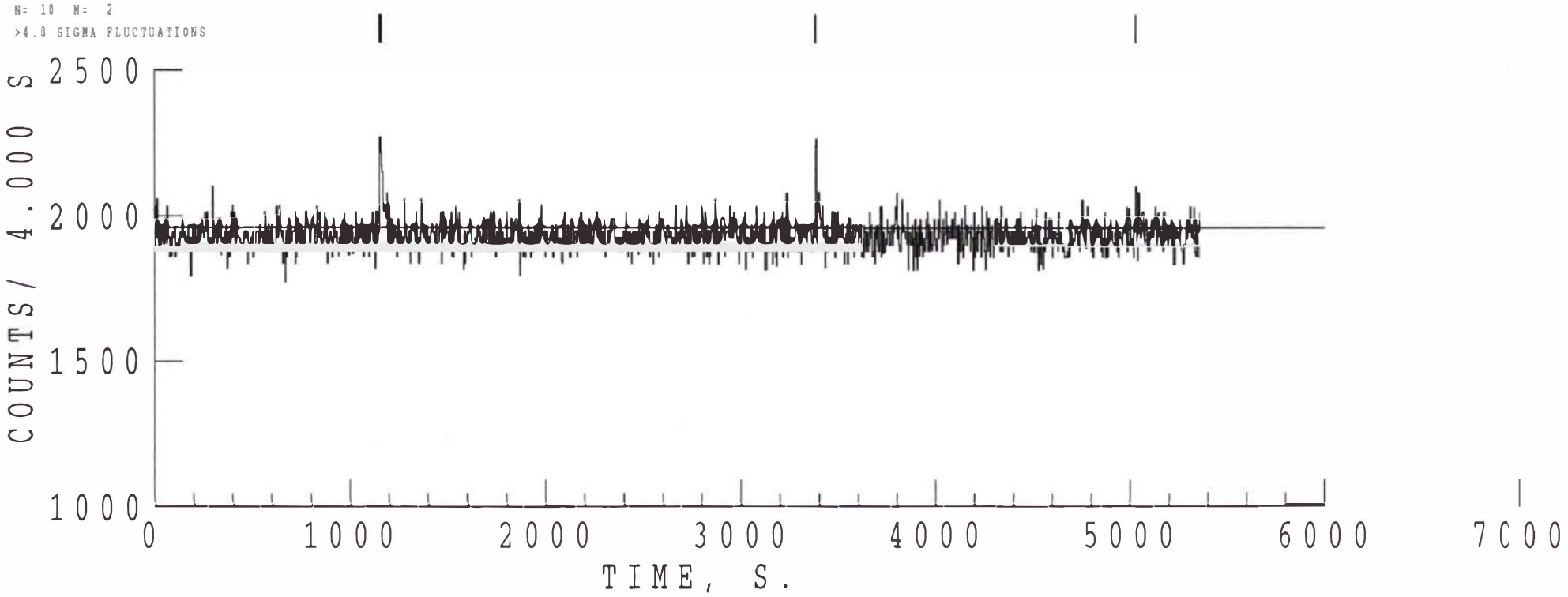
KONUS2 19971207 71911

ULYSSES RT 12/02/02

07/12/97 69228.398 s

0.500 S INTERVALS REGROUPED BY 8

0- 0 keV



From HENZE@SSLMOR.msfc.nasa.gov Tue Dec 9 12:11:14 1997
Return-Path: <HENZE@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA14431; Tue, 9 Dec 1997 12:11:05 -0800
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA27130; Tue, 9 Dec 1997 12:10:52 -0800
Date: Tue, 9 Dec 1997 14:10:43 -0600 (CST)
From: HENZE@SSLMOR.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971209141043.21e11b46@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6525
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6525
EVENT OF 1997 DEC 7 DAY OF YEAR=341
EVENT CROSSING TIME AT BATSE : 72232. S. OR 20:03:52.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 134.000 -5.000
BATSE PEAK COUNTING RATE: 19500 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 7/12/ 97 IS:
RA= 170.760 DEC= 12.135 DIST= 5.276 AU
BATSE-ULYSSES DISTANCE = 789246517. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=139.64 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-2005.91 SECS.
CROSSING TIME AT ULYSSES IS 70226. S. OR 19:30:26 +/- 315.56 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 7/12/ 97 IS:
RA= 293.156 DEC= -22.998 DIST= 2.053 AU
MARS-BATSE DISTANCE = 307201600. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 34.62 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 843.29 SECS.
CROSSING TIME AT MARS IS 73075. S. OR 20:17:55 +/- 113.88 SECONDS

BATSE BURST TRIGGER

NO.: 6525

TIME: TJD=0789 SECONDS=72232

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=137.6 AZIMUTH=300.8 ERROR= 0.6 DEGREES

COMMENTS:
COMPLEX, DUR. APPROX. 60 S. VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6525 | 971207 | 10789 | 72232 | 19500 | 134 | -05 | 60 |

Date: Feb 9 00

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☐ Jim Schmidling's stat file correction applied?

Helio. corr removed

☐ Final ephemeris used?

☐ Final, CDROM data used?

☐ 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

☐ 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 vwx@bocc1, or from Teresa Sheets, have the correct time; files on website have incorrect times)

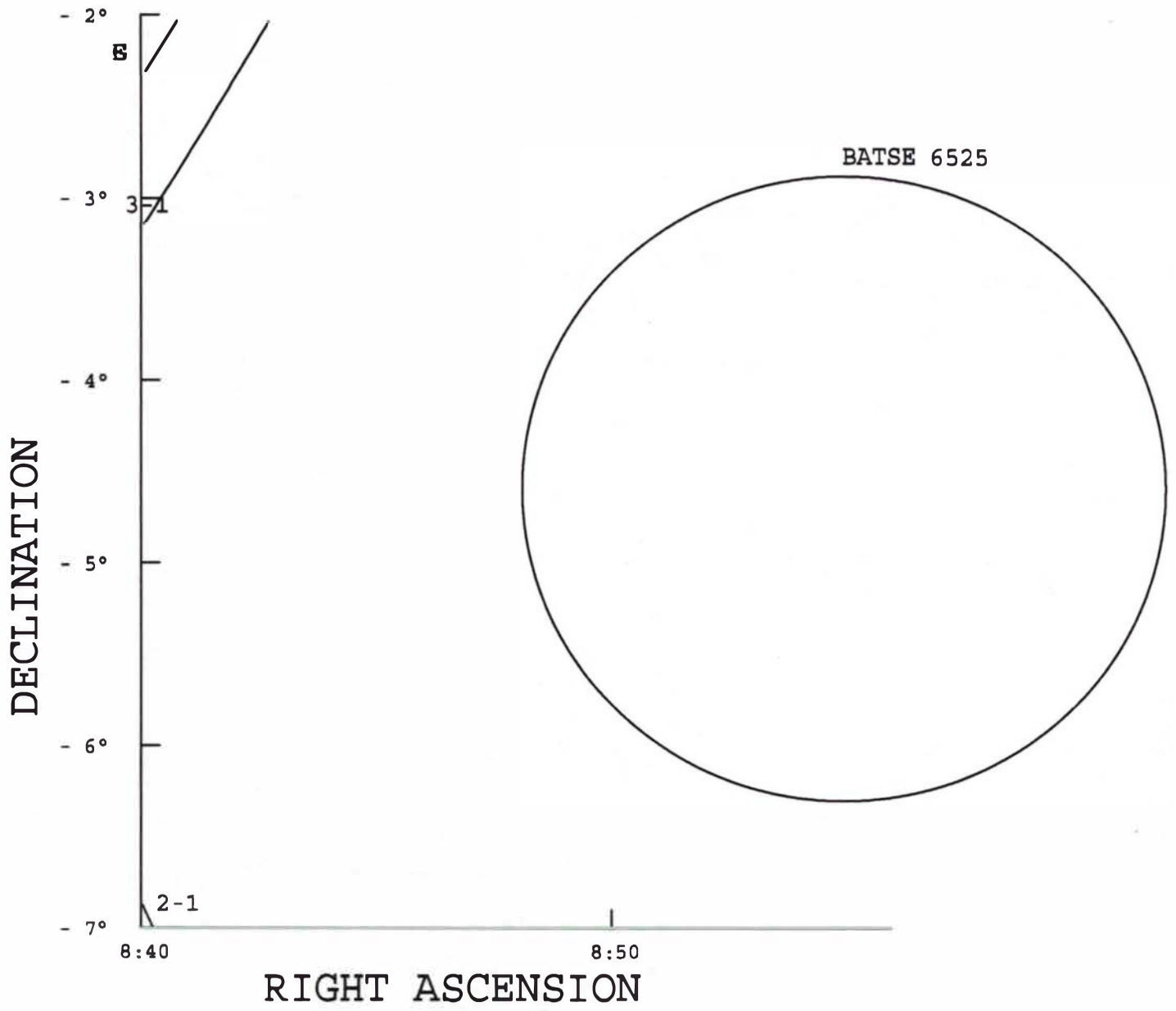
☑ BATSE >100 keV data used for NEAR correlation?

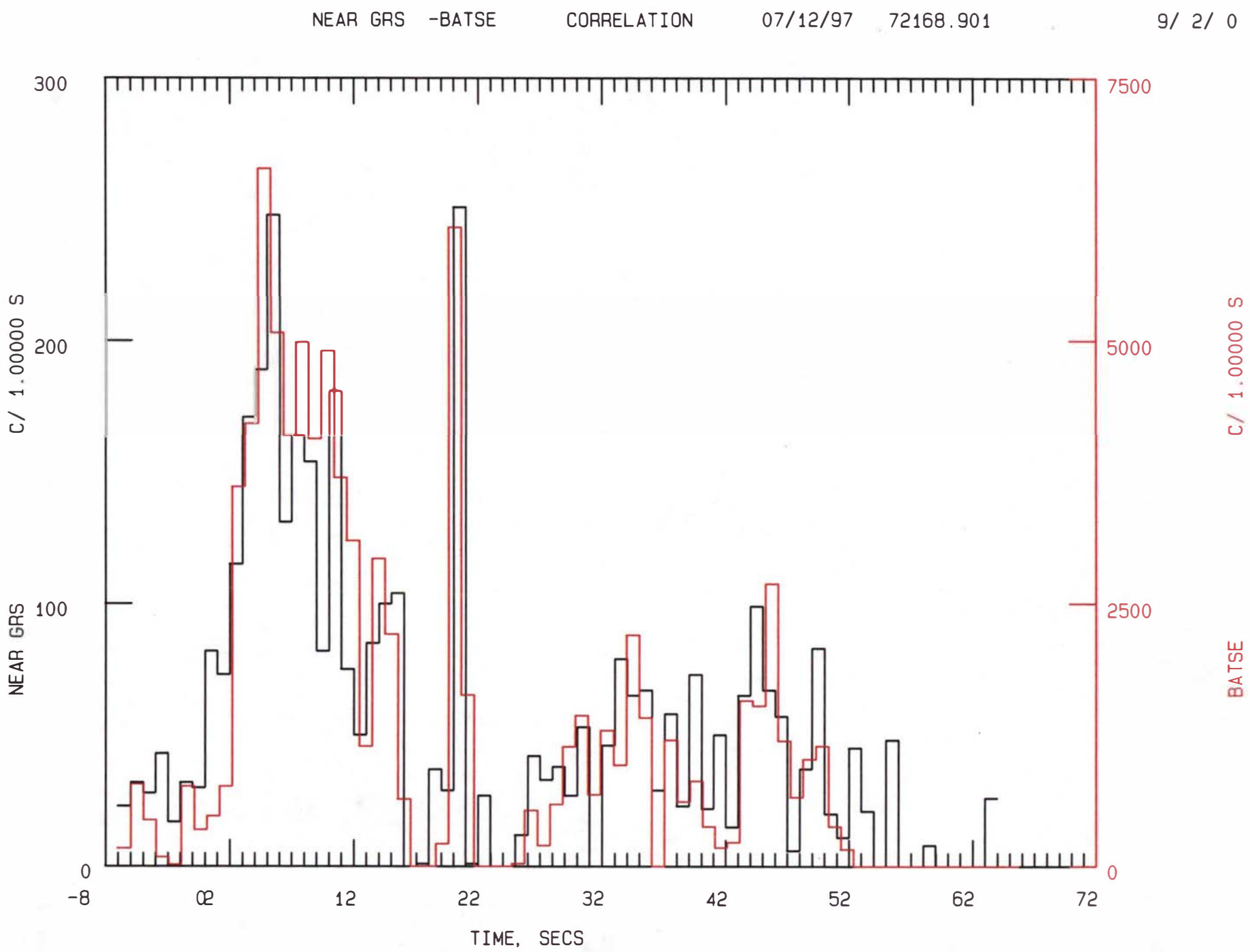
☐ ACCESS database updated?

# EVENT OF DEC 7, 1997 20:03

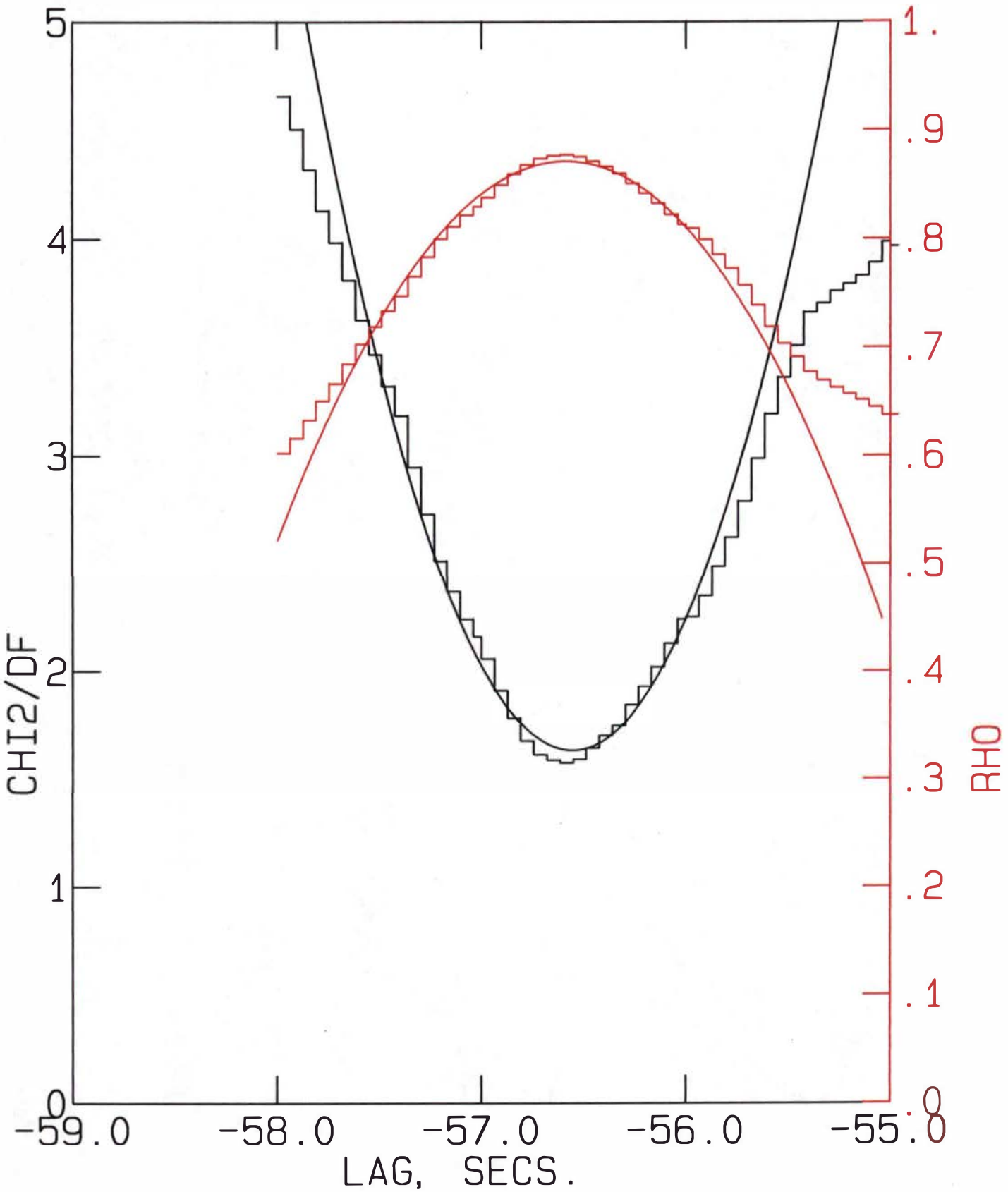
9/ 2/ 0

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 3 NEAR



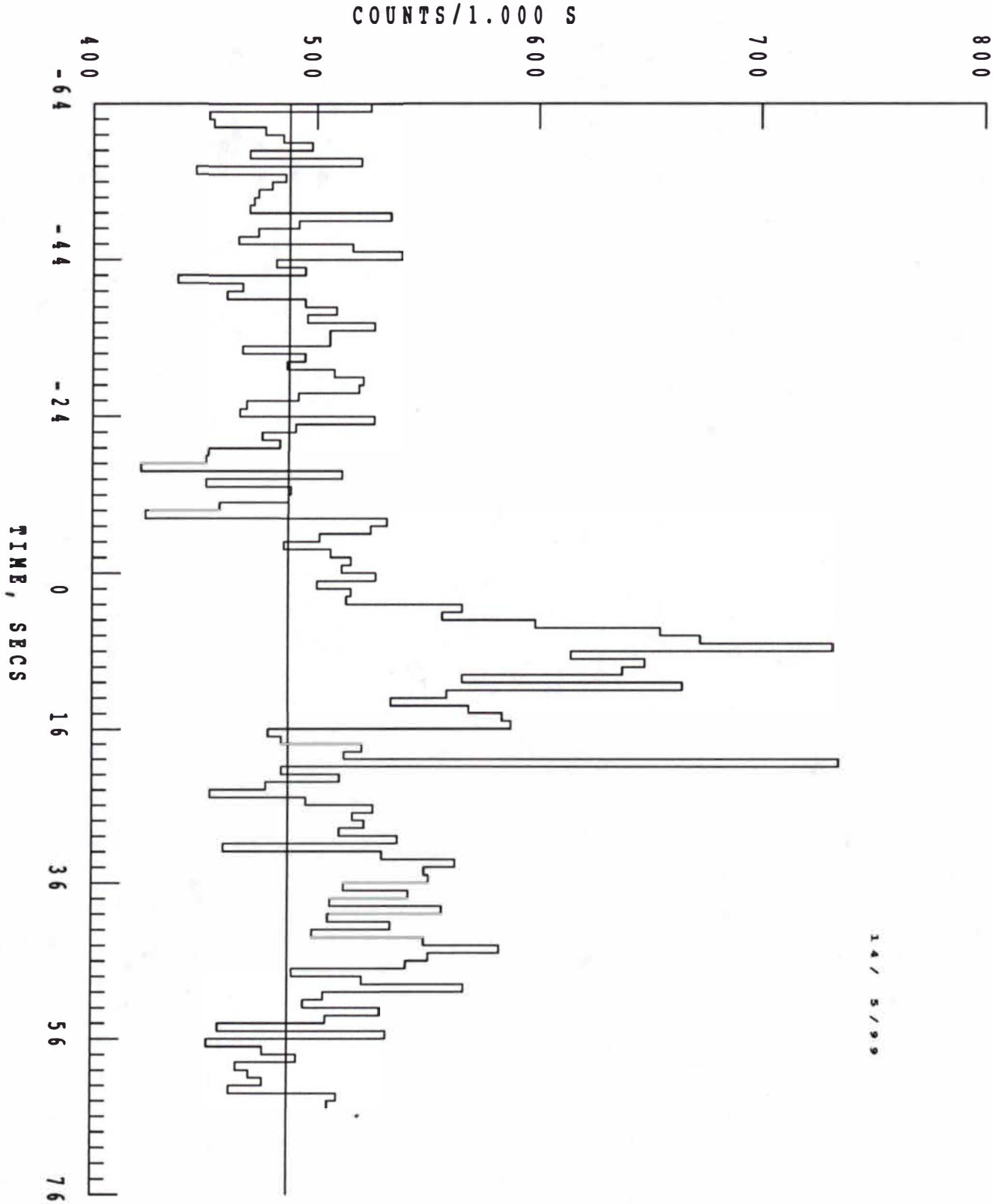

NEAR GRS -BATSE CORRELATION 07/12/97 72168.901 9/ 2/ 0
300
200
100
0
7500
5000
2500
0
C/ 1.00000 S
NEAR GRS
C/ 1.00000 S
BATSE
-8
02
12
22
32
42
52
62
72
TIME, SECS

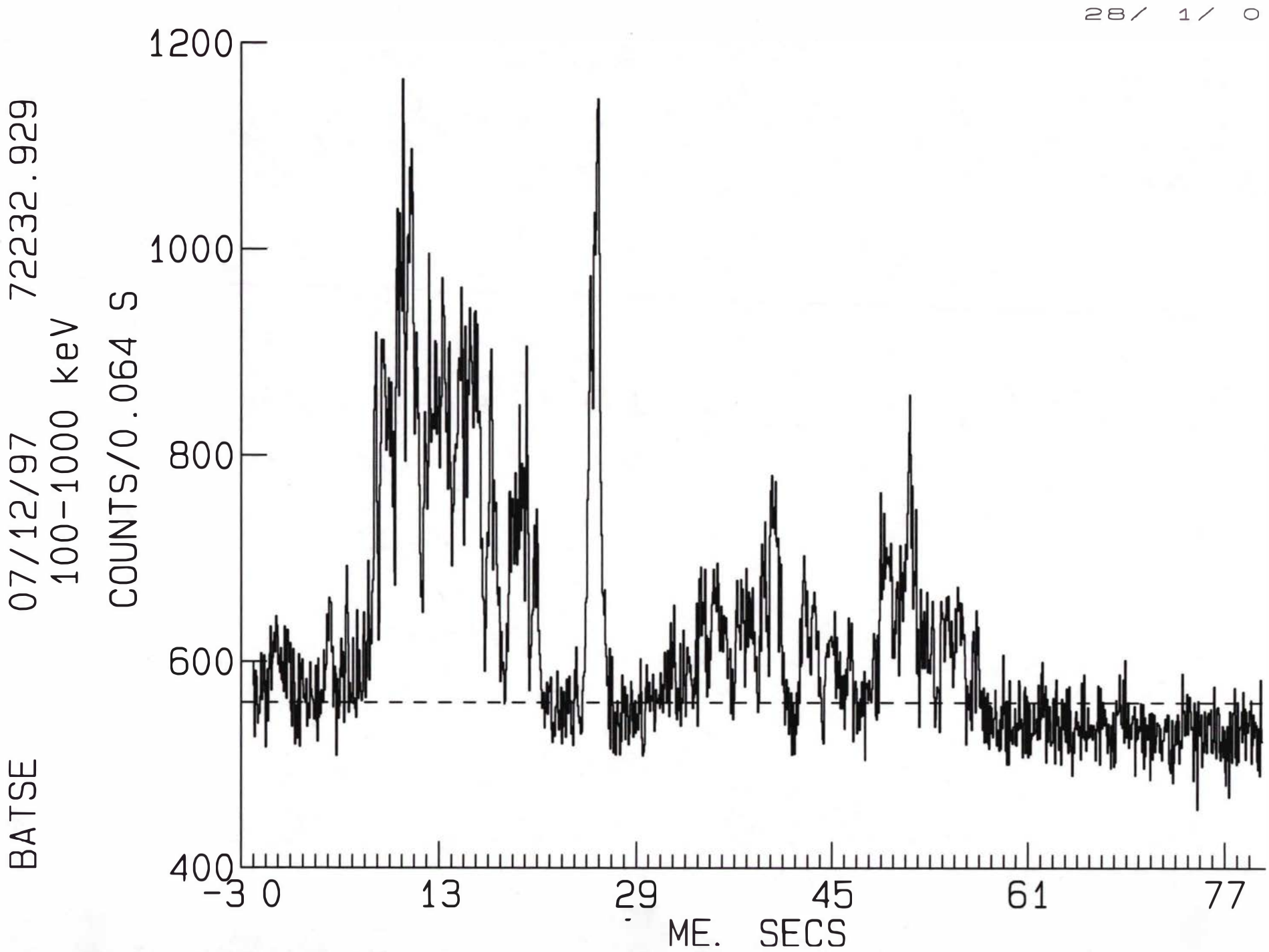
NEAR GRS -BATSE CORRELATION 07/12/97 72168.901

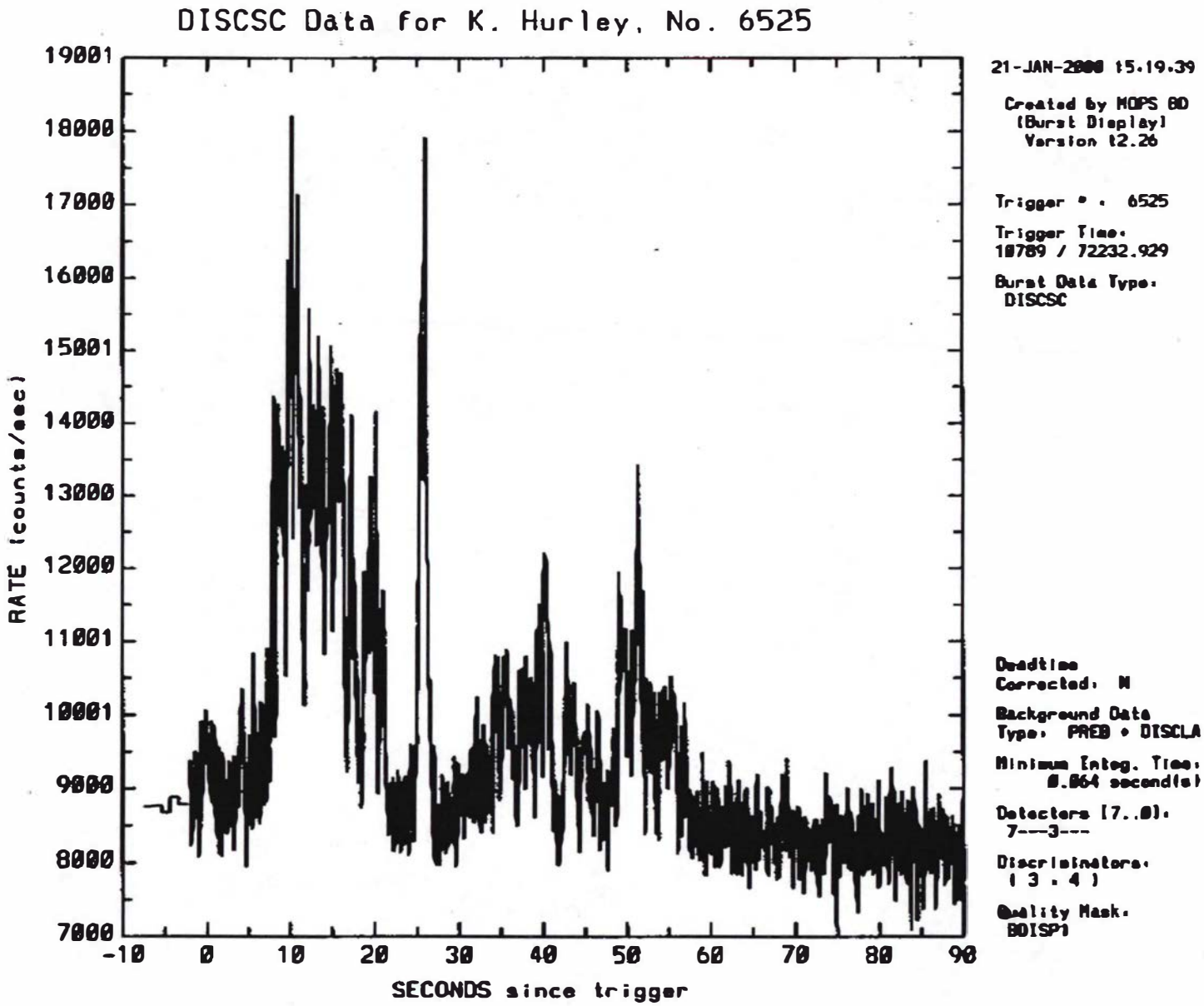


NEAR 07/12/97 72168.901

100-1000 keV




28/ 1/ 0
BATSE 07/12/97 72232.929
100-1000 keV
COUNTS/0.064 S
1200
1000
800
600
400
-3 0
13
29
45
61
77
ME. SECS


DISCSC Data for K. Hurley, No. 6525
RATE (counts/sec)
19001
18000
17000
16000
15001
14000
13000
12000
11001
10001
9000
8000
7000
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
21-JAN-2000 15:19:39
Created by MOPS BD
(Burst Display)
Version 12.26
Trigger # : 6525
Trigger Time:
10789 / 72232.929
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
7---3---
Discriminators:
( 3 , 4 )
Quality Mask:
BDISP1

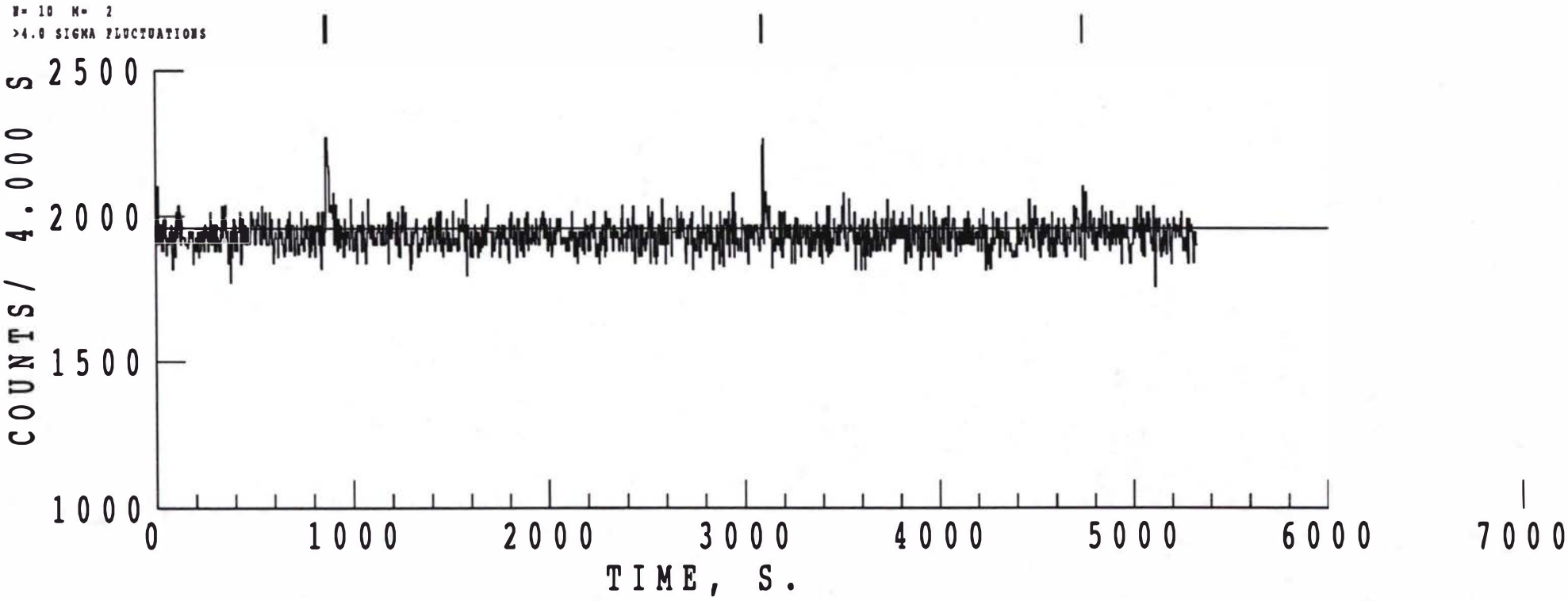
KNEAR GRS 19971207 72168

ULYSSES RT 14/ 5/99

7/12/97 69516.406 s

0.500 S INTERVALS REGROUPED BY 8

0- 0 keV



```
          262 65663.9 KONUS 30S,HARD,2PKS (+UL@63120,3100LS,MOD,20S)(13NO,14NO)

970922    265  2888.4 BATSE#6392,32880/SEC
       13 265  2894.4 PEAK(50/S),2910.5(110),@97DEG,ONE-SIDED,EDGE SR. DUBIOUS
       14 265  2894.6 PKS(200/S),2910.6(500/S),@109,ONE-SIDED,EDGE SAA.DUBIOUS

970925    268 81795.8 BATSE#6397,9551/SEC
       14 268 81798.3 PEAK (70/S,<10S) @ 42DEG (13SAA)

971009    282 68215.8 BATSE#6422,10861/S@1.8S+UL@69240,3050LS,MOD+KONUS@68215.0
       14 282 68217.2 PEAK(180/S,<2S)@83 (TRIGGER PEAK 68215.64) (13NO@145)

971019    292 53754.2 KONUS,10S (+UL@51000,2950LS,MOD,10S)
       14 292 53752.6 RISE,~50SEC,SOFT,NO TRIG (13 NO)

971029    302  5318.4 BATSE#6453,4717/S@35.8S (KONUS@5351.8,120S)(UL WEAK@2820)
       14 302  5326.0 PKS, 44.0,66.0,NO TRIG,@102DEG (13NO@49DEG)

971101    305 23484.5 KONUS (10SEC,FRED)(UL@26040,MOD,10S@2950LS)
       14 305 23483.8 PEAK (200/S,<2S) (13SR) TRIGGER PEAK 23483.0

971110    314 68141.3 KONUS,100SEC (UL@67080 @2950LS,MOD)(13 SR)
       14 314 68161.3 PEAKS, 213.3, MULT PEAKS,HARD,TRIGGER PKS 68213.19,213.91

971127    331 47595.8 BATSE#6509 (139968/S)
       13 331 47595.8 PKS,613.8,759.8(240),767.8(140)
       14 331 47760.5 PKS(3000/S),47768.5(2000), INTENSE, NOTRIG

971201    335  9295.6 BATSE#6515 (8768/S)
       14 335  9306.4 PK(SOFT)+9310.4(160)+9316.4(220)+9328.4(150),NOTRIG(13NR)

971207    341 72232.9 BATSE#6525 (7892/S@12.0)
       14 341 72244.2 PK(270),268.2,284.2 (@80DEG),TRIG PK 72244.28 (13NR)

971218    352 52499.9 BATSE#6535 (9181/S@+2.3S)
       13 352 52500.2 PK(70),52536.2(?)(SOFT,@38DEG)    (14SAA)

971219    353 79974.5 KONUS,10S,SPIKE@+4 (UL 77580,15SEC,MOD) (13SAA,14NR)

980109    009  4345.6 BATSE#6564(1401/S)+SAX,25S(IAU6805)(13NO@74,14NA@144)

980113    013 14845.7 BATSE#6570 (9376/S,COMPLEX,DUR60S)
       13 013 14869.2 PKS(50),879.2(50),883.2(50) (ONE-SIDED,@119DEG)
       14 013 14848.3 PEAK(60/S,<4S), NO TRIGGER

980119    019U 5100   ULYSSES MOD(32MS) @2350LS
       14 019  5375.9 PEAK (900/S,<8S,SOFT) (TRIG PEAKS 5372.9,5374.6)(13NO)

980124    024 23673.0 BATSE#6576, 16971/S @7.7S,SPIKY,MAX@+42.5,DUR100S)
       13 024 23679.1 PEAK(90/S,<8S),23707.1,23717.1 (LAST 2 WEAK,ONE-SIDED)
       14 024 23679.6 PEAK(300/S,<10S),707.6WEAK,715.6WEAK
       14 024 23679.1 TRIGGER PKS 679.07,679.99 (.1024S); 12.8MS PEAK 23678.43

980125    025 74368.7 BATSE#6581, 34996/S,MULT PKS,MAIN PK@+40,270S
       13 025 74416.4 PEAK @108DEG(220/S,<8S) (14NO@125)

  ,202    033U37380   ULYSSES MODERATE, 10SEC@2265LS
       13 033 35713.6 PEAK(80/S),35717.6(70),<8SEC OVERALL
       14 033 35712.9 PEAK(200/S),35718.9(400/S),<10SEC OVERALL, NO TRIGGER
```

From TERRELL@nisdp0.lanl.gov Fri Feb 27 15:11 PST 1998
From: TERRELL@nisdp0.lanl.gov
Date: Fri, 27 Feb 1998 16:11:55 -0700
To: khurley@sunspot.ssl.berkeley.edu, bonnard@milkyway.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, cline@lheavx.gsfc.nasa.gov,
henze@fender.msfc.nasa.gov, filippo@botes1.tesre.bo.cnr.it,
kmarar@isac.ernet.in
X-Vmsmail-To: @MAILOUTUL.DIS
Subject: DMSP GRB: 1997(many),980109,980113,980119,980124,980125,980202,980203

From: jterrell@lanl.gov (James Terrell) 980227
To: khurley@sunspot.ssl.berkeley.edu, bonnard@milkyway.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, cline@lheavx.gsfc.nasa.gov,
filippo@botes1.tesre.bo.cnr.it, henze@fender.msfc.nasa.gov,
kmarar@isac.ernet.in, kraken@rosserv.gsfc.nasa.gov,
scott@milkyway.gsfc.nasa.gov, teegarden@lheavx.gsfc.nasa.gov,
vnp@isac.ernet.in, yosimori@rikkyo.ac.jp
Subj: DMSP GRB detections: 1997(many),980109,980113,980119,980124,980125,980202,980203

The following GRB were detected by DMSP13 or DMSP14 (or NOT detected, if indicated).
No detection can occur for bursts more than 118 degrees from spacecraft zenith,
or if in the presence of very high counting rates (SAA,SR,NR).
Data are normally in 2-sec counts, except when the DMSP14 trigger circuit is
tripped, giving 12.8ms data, usually reported here as 102.4ms counts.
Numerous other BATSE GRB were also detected, but not reported here; numerous
weak detections by Ulysses have not been checked because of low counting
rates expected at an indefinite time.

---

| DATE | FL | DAY | TIME | NOTES---(ND=NO DATA,NA=NOT APPARENT & NOT ANALYZED)------REPORTED (NO=DATA CHECKED--SHOWS NO DETECTION)(SR=S. RADIATION BELT) (NR=NORTH RADIATION BELT)(SAA=SOUTH ATLANTIC ANOMALY) | |
|---|---|---|---|---|---|
| 970111 | | 011 | 35040.2 | BATSE GRB#5773 (8727CTS/2S) (SEE IAU6569,6571,6574,6598) | |
| | | 011 | 35040.2 | BEPPO SAX TRIG,INTENSE,50S,3 PEAKS(232.10,19.67J) IAU6533 | |
| | 13 | 011 | 35040.0 | PEAKS(40/S),48.0(50/S),58.0(60/S),@24DEG,@848KM,SOFT | REP0313 |
| 970111 | | 011 | 85744.6 | KONUS (HARD,SLOW RISE) +TGR (UL:NO) (DMSP13:NO) | |
| 970117 | | 017 | 53211 | TGR+SAX GRB (KONUS INOP)+UL@54420(STRONG,20S) (13:NO) | |
| 970124 | | 024 | 44343.4 | KONUS(MULT PKS)+UL@46253@2100LS,STRONG+TGR (13SAA) | |
| 970201 | | 032 | 57250.7 | BATSE GRB#5989 (53612/SEC) +UL | |
| | 13 | 032 | 57222.1 | PEAK (100/S,~30S,SOFT,BROAD) (@111DEG) UNCONVINCING | |
| 970218 | | 049 | 50996.1 | KONUS (STRONG,5SEC) +UL@51274,2000LS (STRONG,8SEC) | |
| | 13 | 049 | 51001.0 | PEAK (320/S,<6S) | REP0624 |
| 970222 | | 053 | 86006.6 | KONUS (MOD.STRONG,SEV.SEC) +UL@85873,2000LS,MOD,2S(13NO) | |
| 970226 | | 057 | 31585.9 | KONUS (STRONG,SOFT PK@+39) +UL@30547,2000LS(V.INT,40S) | |
| | 13 | 057 | 31595.8 | PEAK (270/S,10SEC) (MODERATELY STRONG) | REP0313 |
| 970228 | | 059 | 10680.8 | BEPPOSAX(IAU6572)MOD.INT.,80S,4 PKS (75.46,11.75J)IAU6578 | |
| | | 059 | 10680.8 | INT.X-RAY,RADIO(IAU6576,6577),OPTICAL(6584),MOTION(6629) | OPTICAL |
| | 13 | 059 | 10659.1 | PKS,667.1(60/S,ONE-SIDED,SOFT,@74DEG) DOUBTFUL (+UL,WIND) | |
| 970313 | | 072 | 30096.5 | KONUS(MOD.STRONG,PK@+11,40S)+UL@28380,2000LS(MOD.INT,10S) | |
| | 13 | 072 | 28355.8 | PEAK (180/S,<2S,SOFT) (NO PEAK AT 30096!) (CONFLICT) | REP0501 |

Date: May 5 '98

# 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? N/A

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

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

## 2. BATSE Data

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

☑ BATSE ephemeris for $T_0$?

☑ Error circle position and radius from public catalog used?

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

## 3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

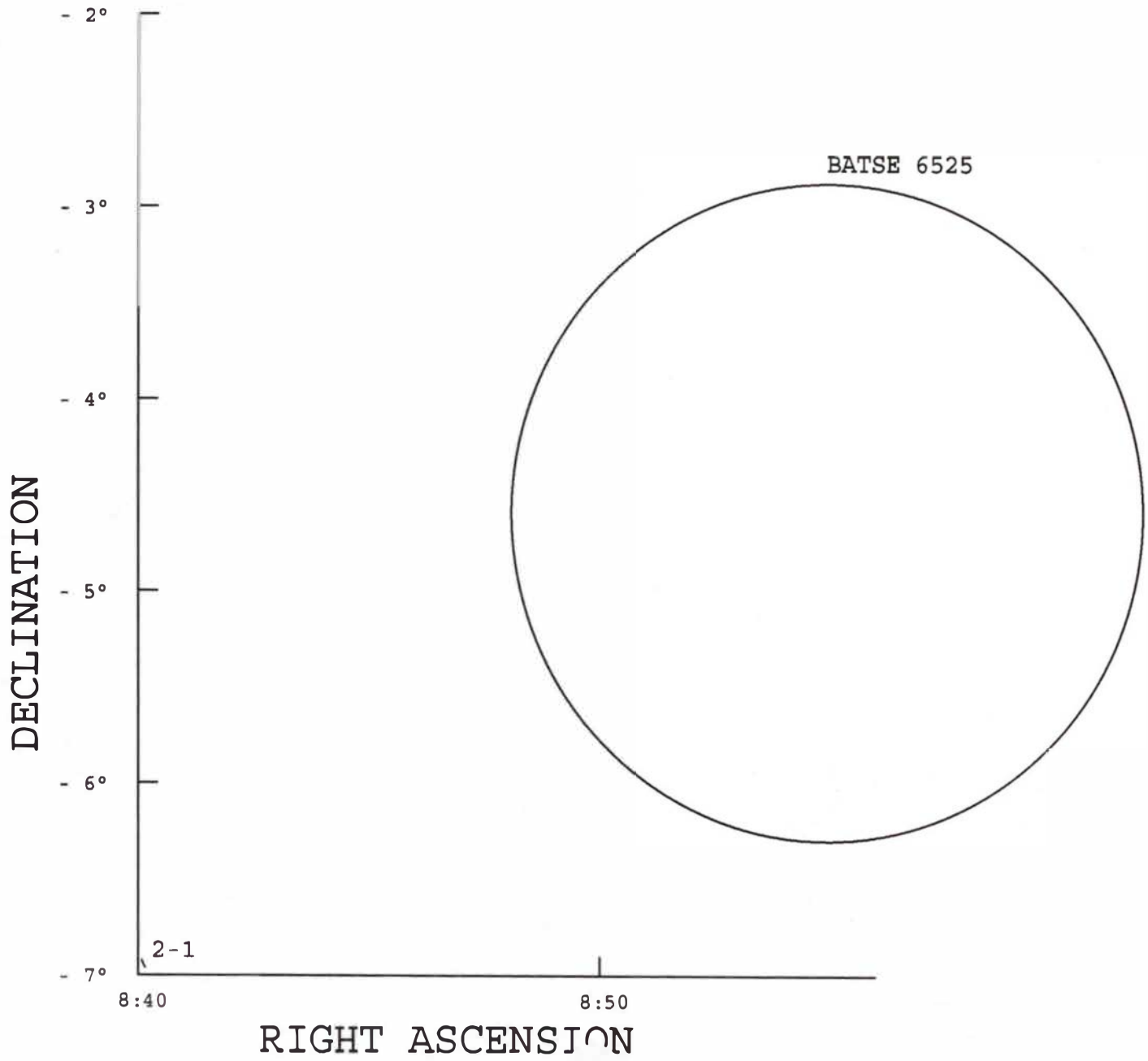
☐ Geocentric time used?

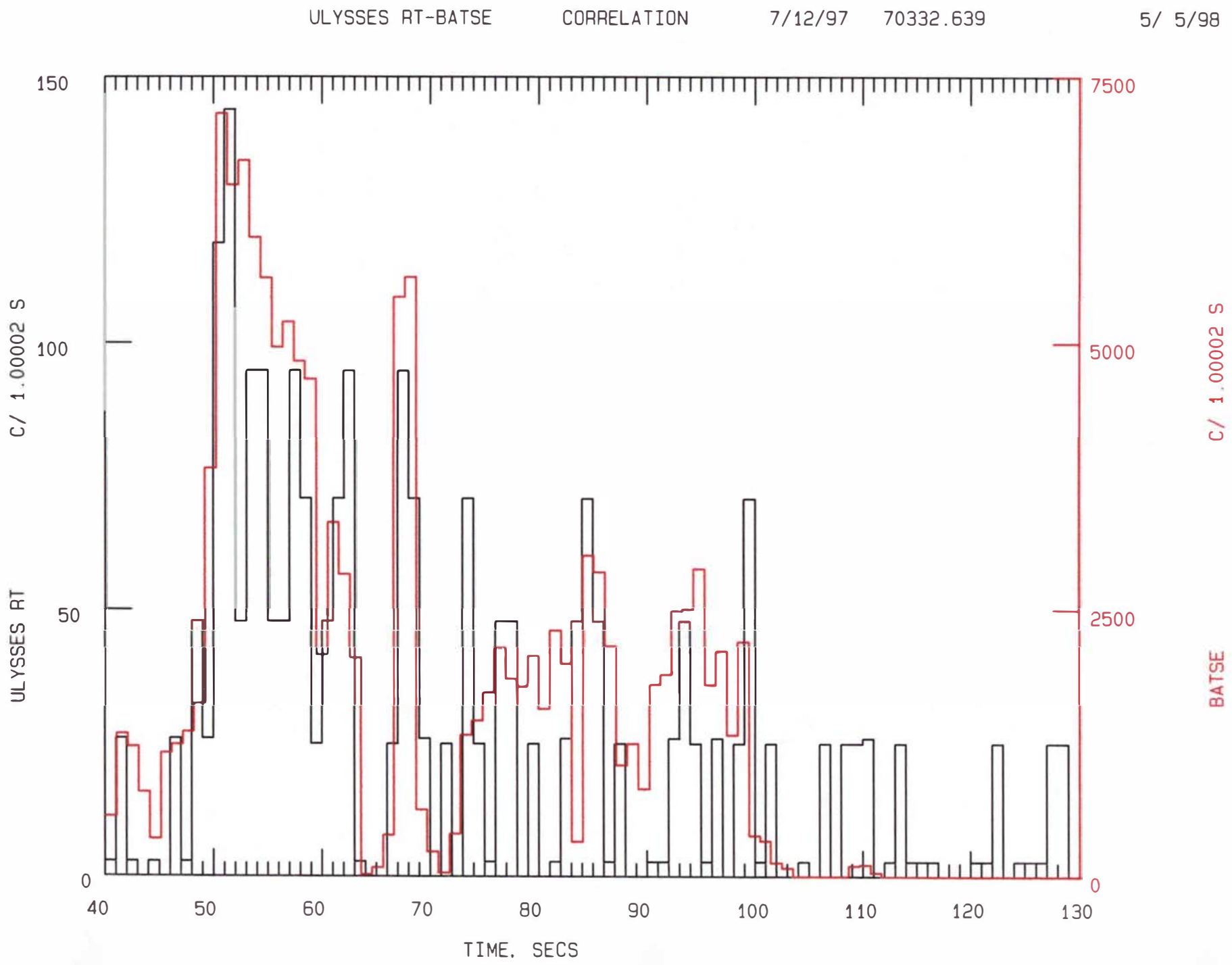
☑ ACCESS database updated?

# EVENT OF DEC 7, 1997 19:32

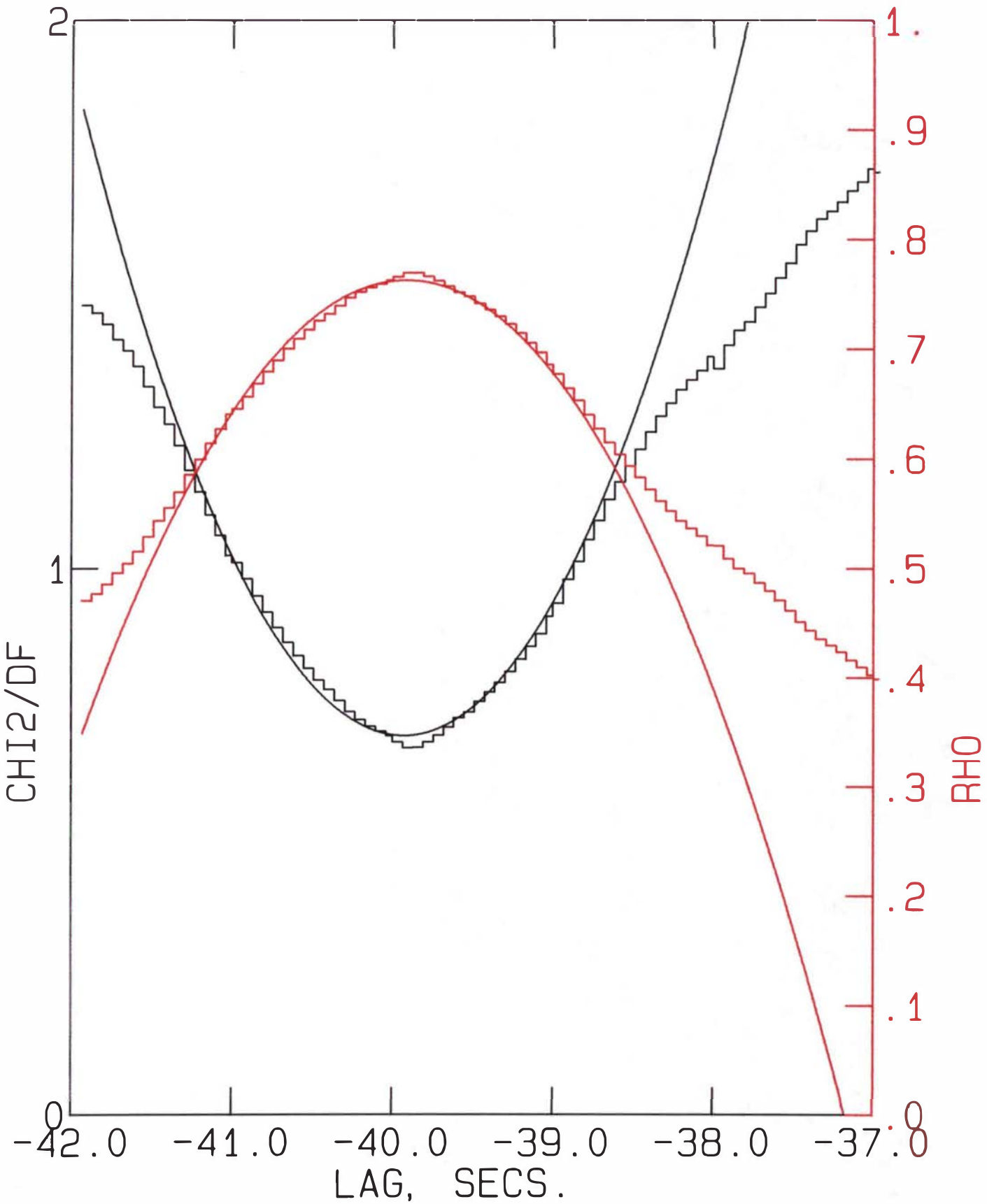
5/ 5/98

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




ULYSSES RT-BATSE CORRELATION 7/12/97 70332.639 5/ 5/98
150
100
50
0
C/ 1.00002 S
ULYSSES RT
7500
5000
2500
0
C/ 1.00002 S
BATSE
40
50
60
70
80
90
100
110
120
130
TIME. SECS

ULYSSES RT-BATSE CORRELATION 7/12/97 70332.639

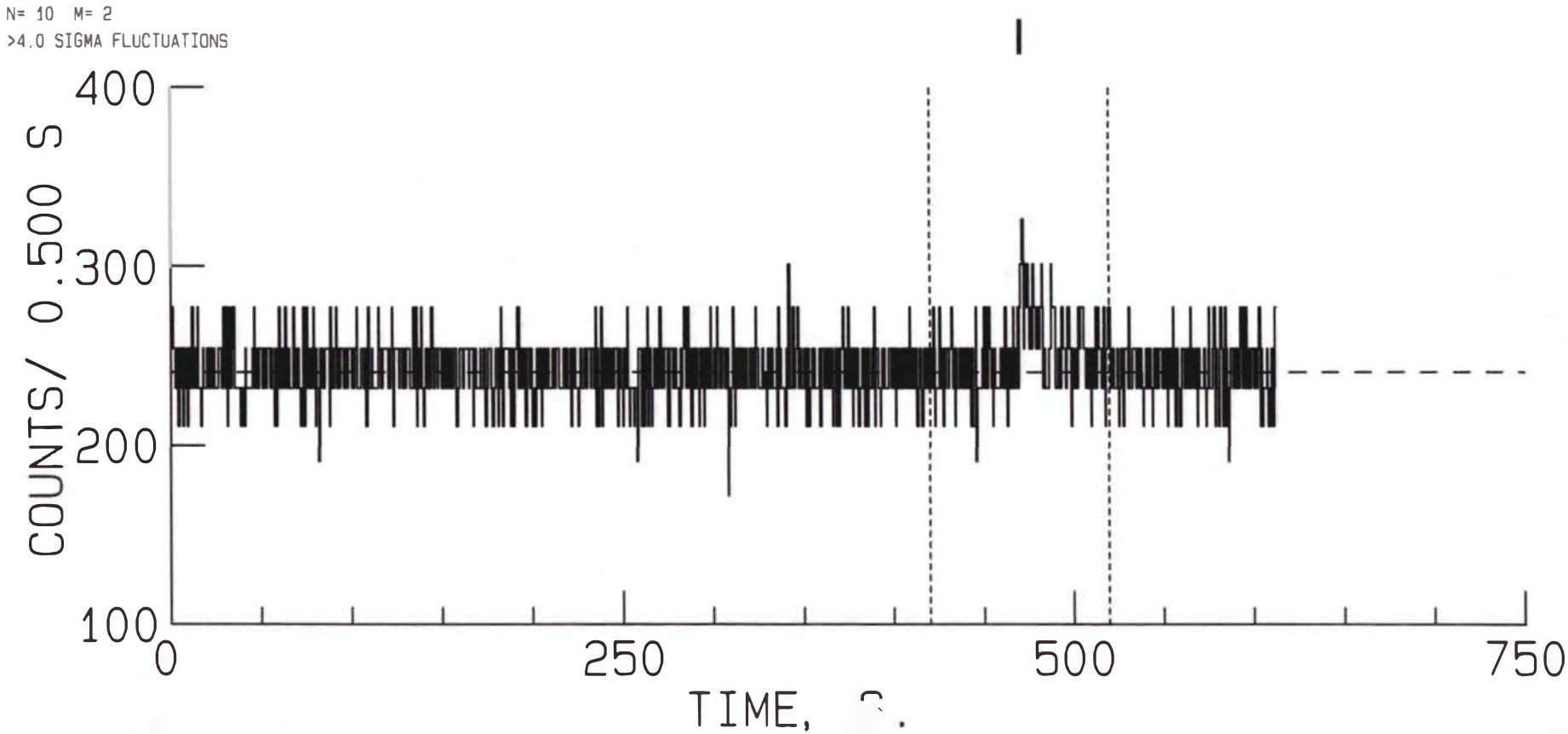


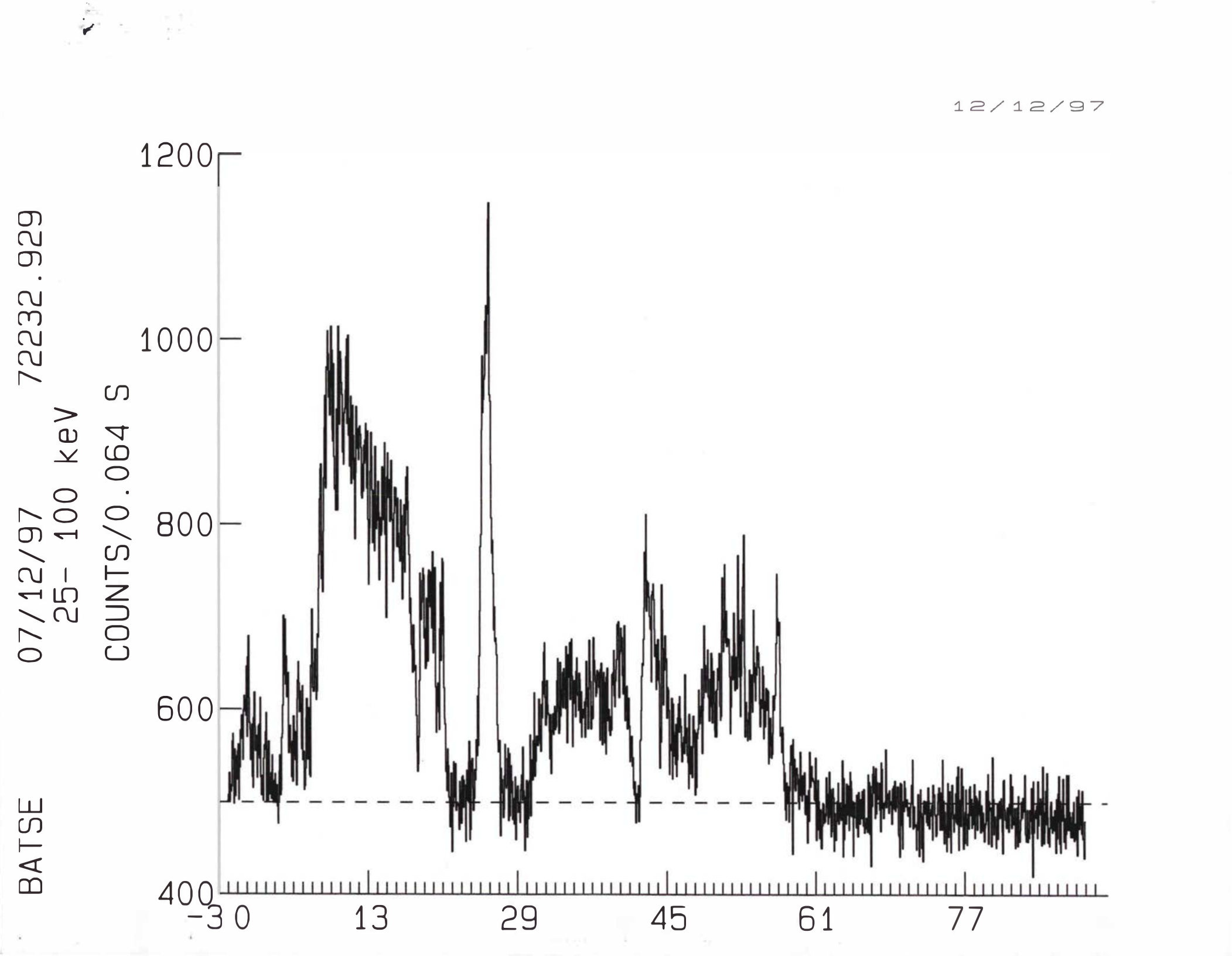
ULYSSES RT

5/ 5/98

7/12/97 69912.408 s

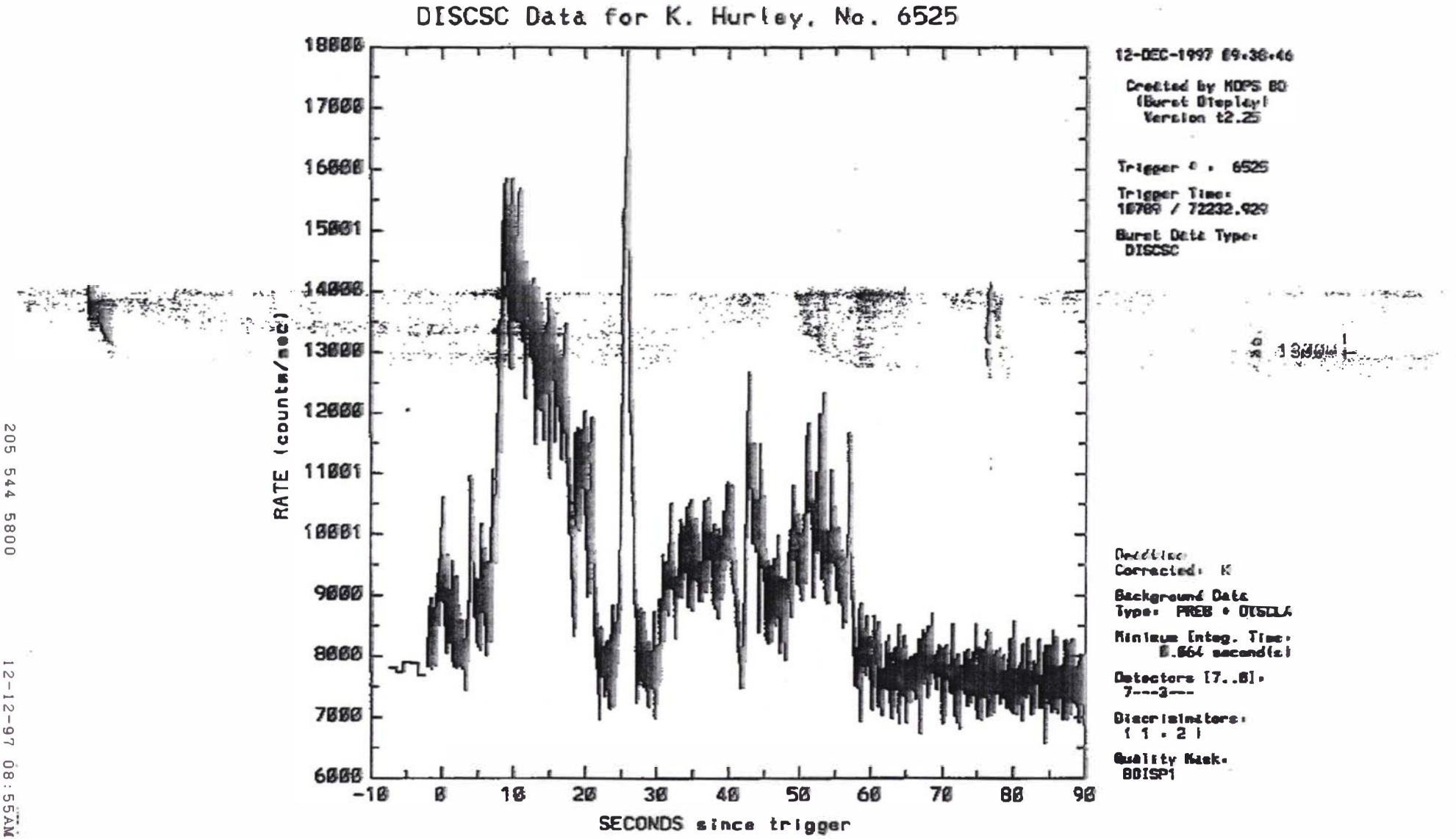
22- 148 keV




12/12/97
BATSE 07/12/97 72232.929
25- 100 keV
COUNTS/0.064 S
1200
1000
800
600
400
-30
13
29
45
61
77

R=95%

12-12-1997 09:49 205 544 5800 BATSE P.02




205 544 5800 12-12-97 08:55AM P002 #26

75492 event

Date: Oct 3 2002

**BURST TRIANGULATION CHECKLIST**

| 1. Ulysses Data |
|---|

☑ ~~Jim~~ Schmidling's stat file correction applied?

☑ ~~Fi~~nal ephemeris used?

☑ ~~Fi~~nal, 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 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. NEAR Data |
|---|

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

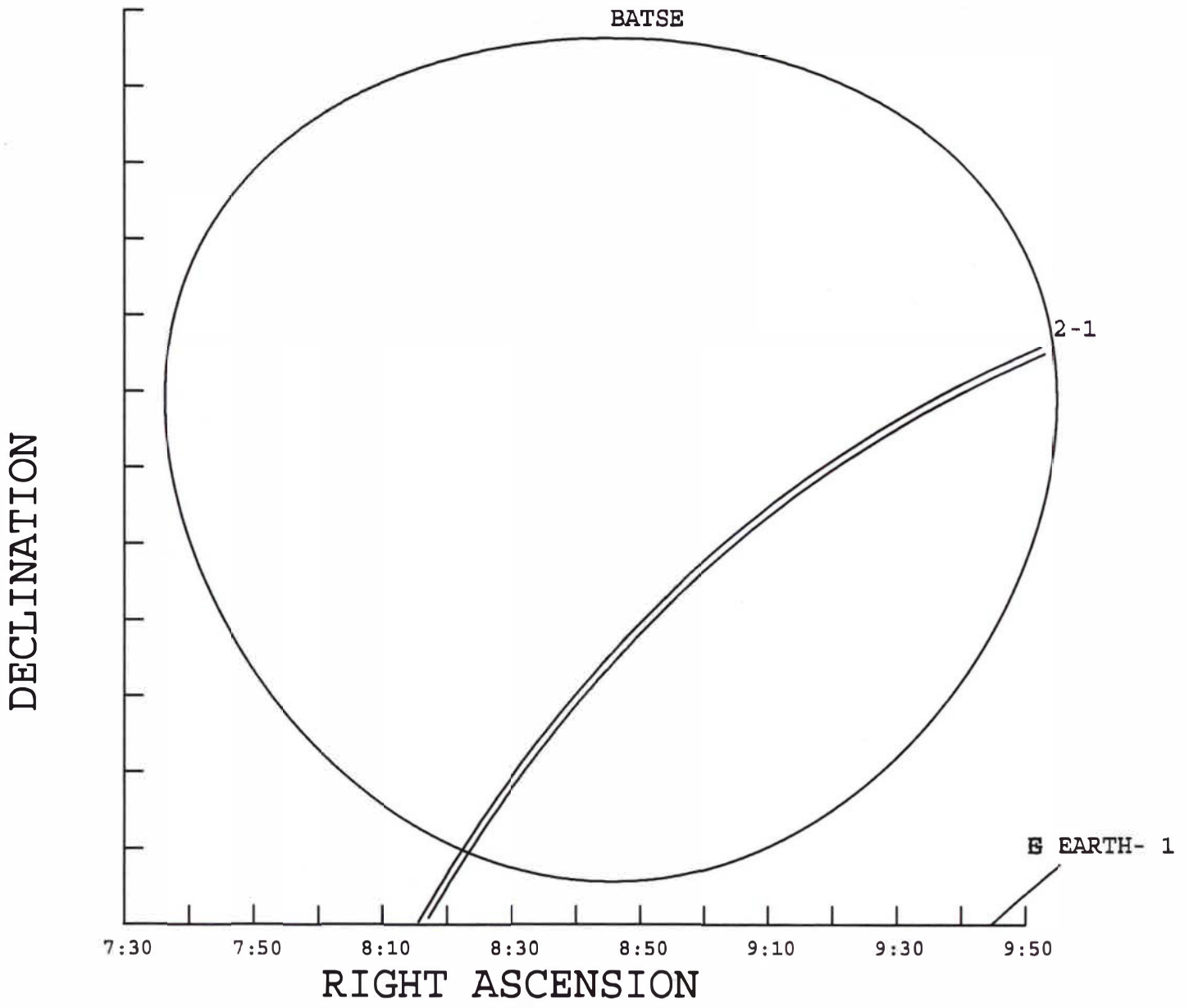
☐ BATSE >100 keV data used for NEAR correlation?

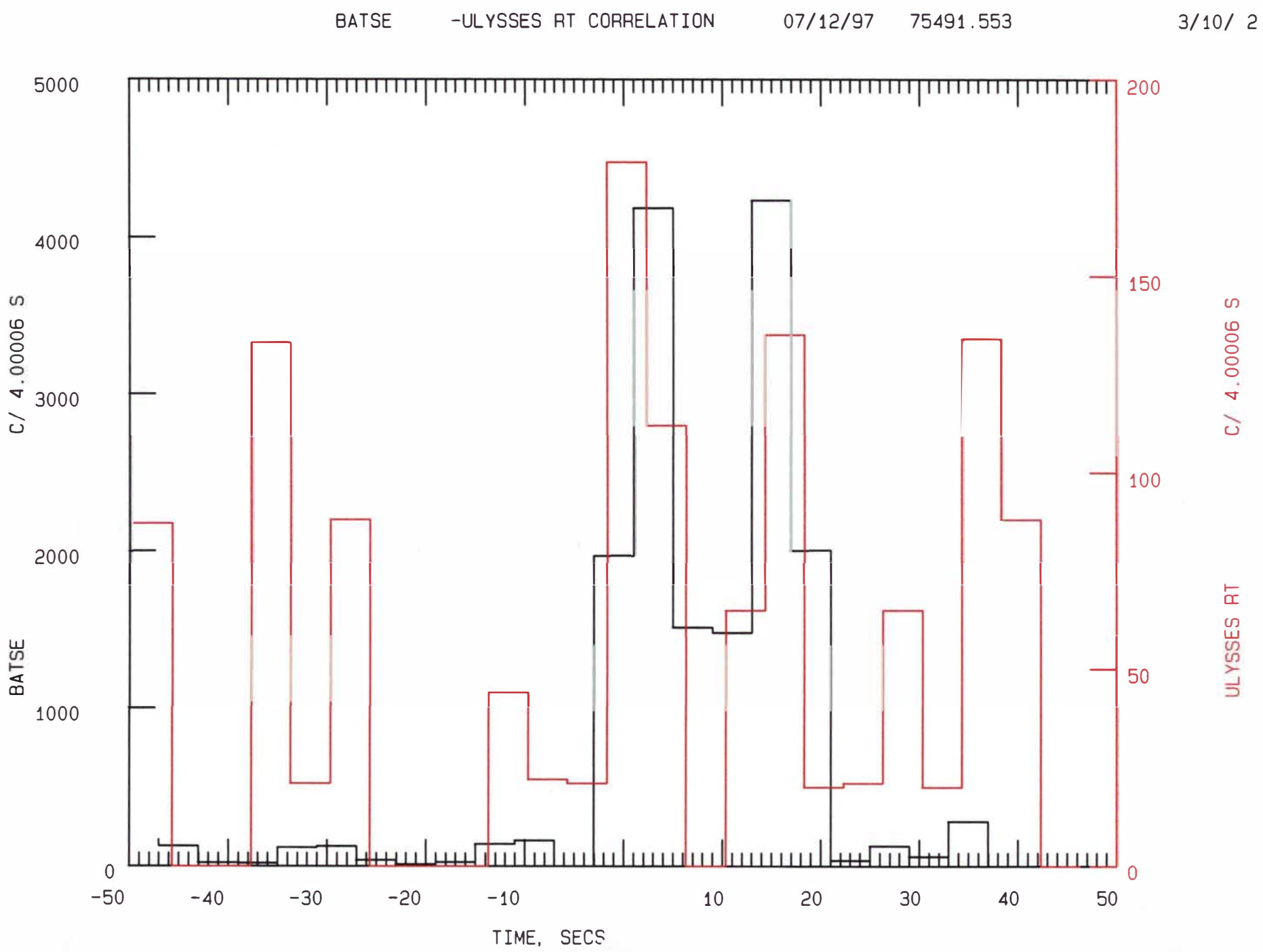
☑ ACCESS database updated?

# EVENT OF DEC 7, 1997 20:58

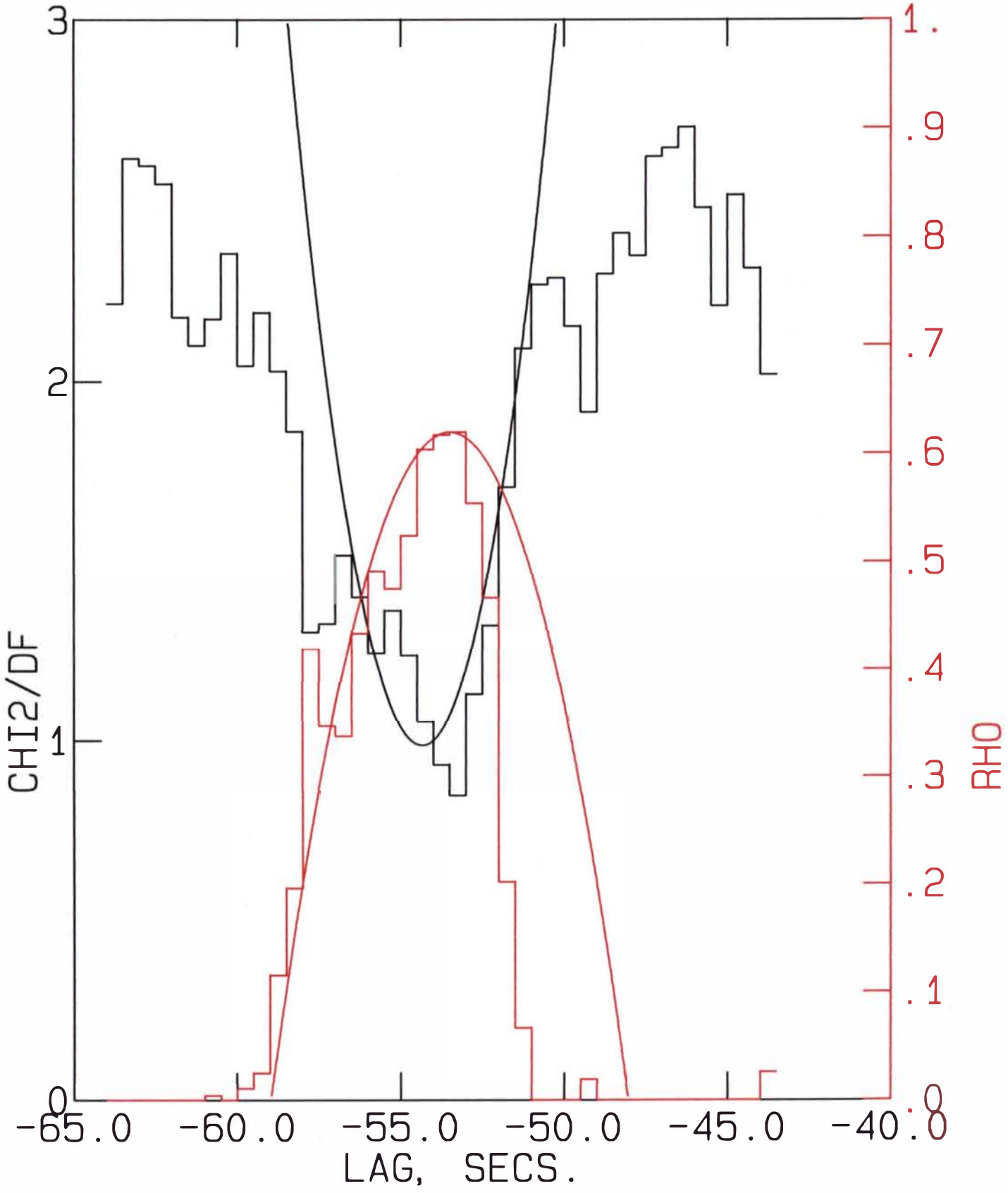


N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 BATSE 2 ULYSSES




BATSE -ULYSSES RT CORRELATION 07/12/97 75491.553 3/10/ 2
5000
4000
3000
2000
1000
0
C/ 4.00006 S
BATSE
200
150
100
50
0
C/ 4.00006 S
ULYSSES RT
-50
-40
-30
-20
-10
10
20
30
40
50
TIME, SECS

BATSE -ULYSSES RT CORRELATION 07/12/97 75491.553

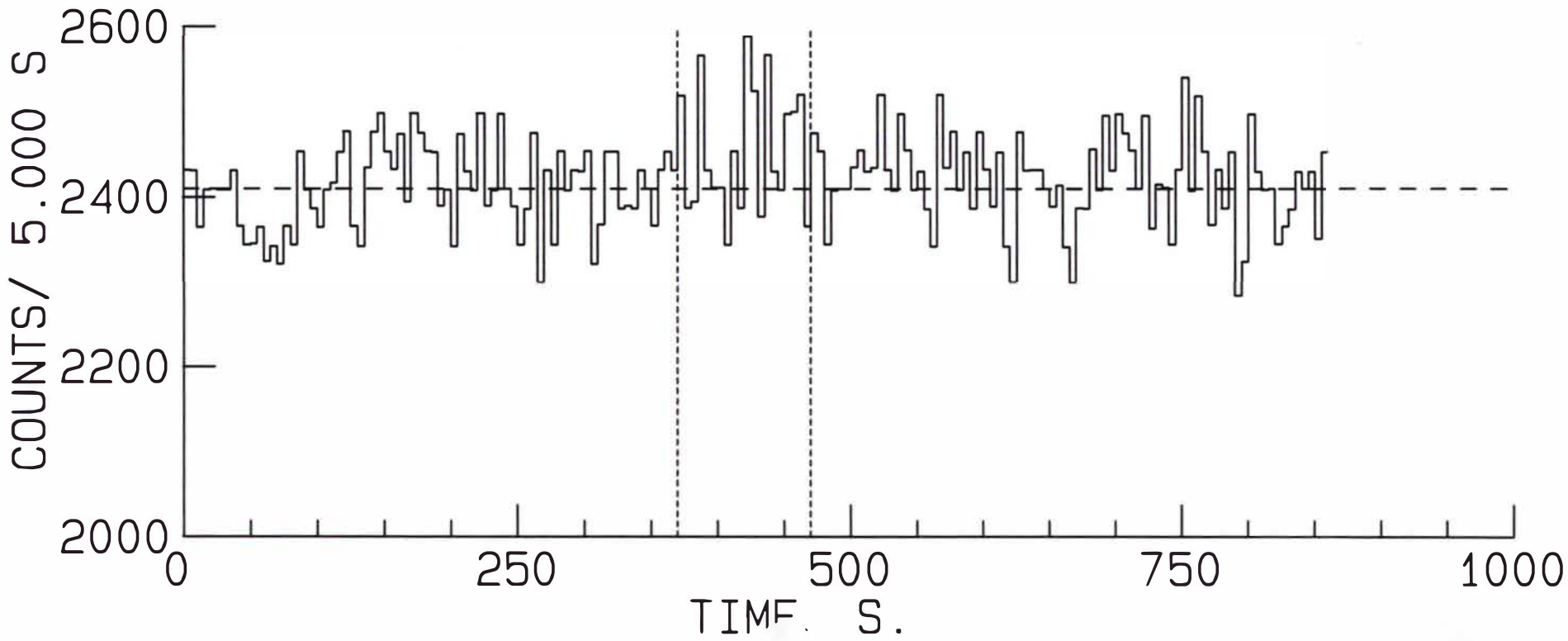


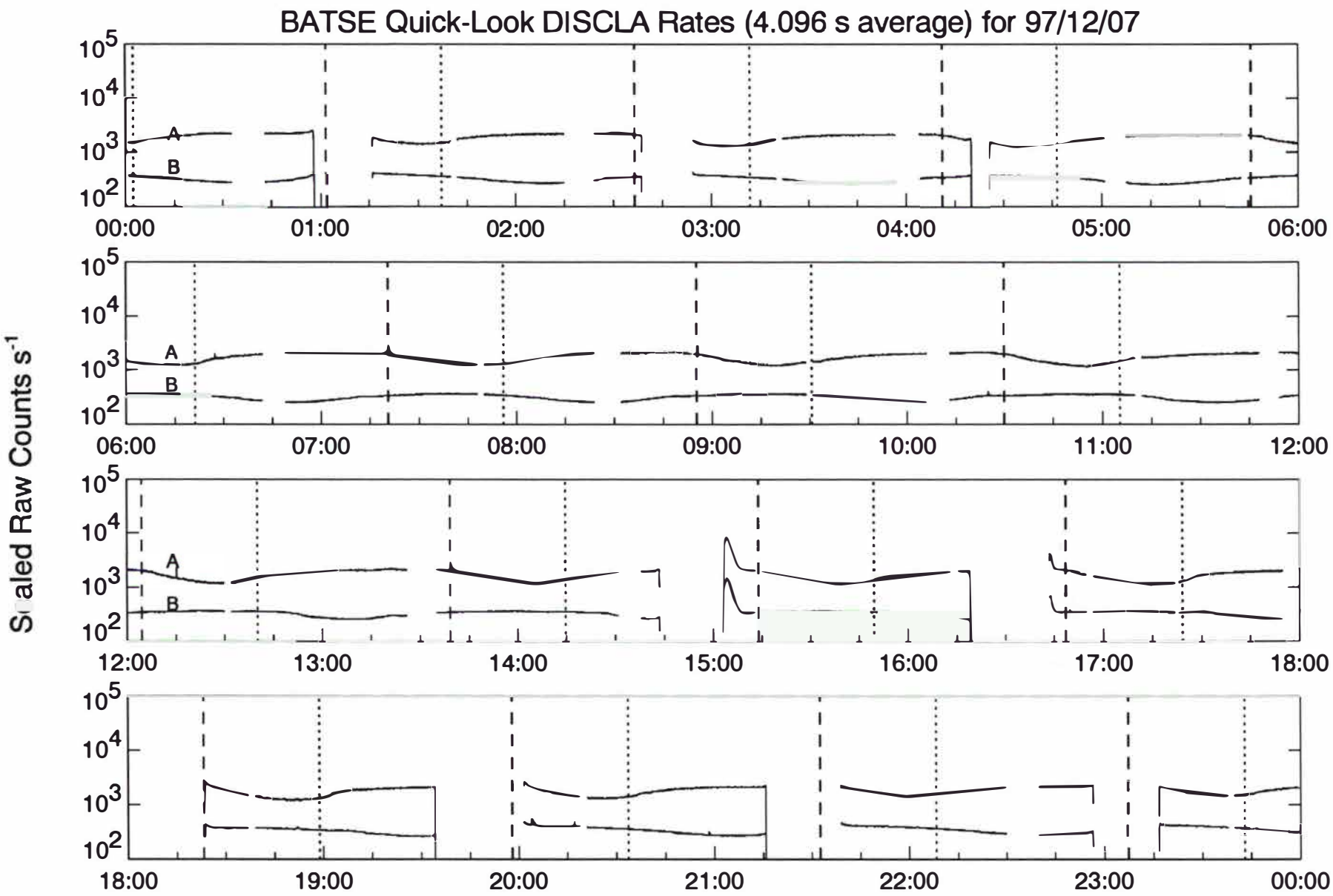
ULYSSES RT 3/10/ 2

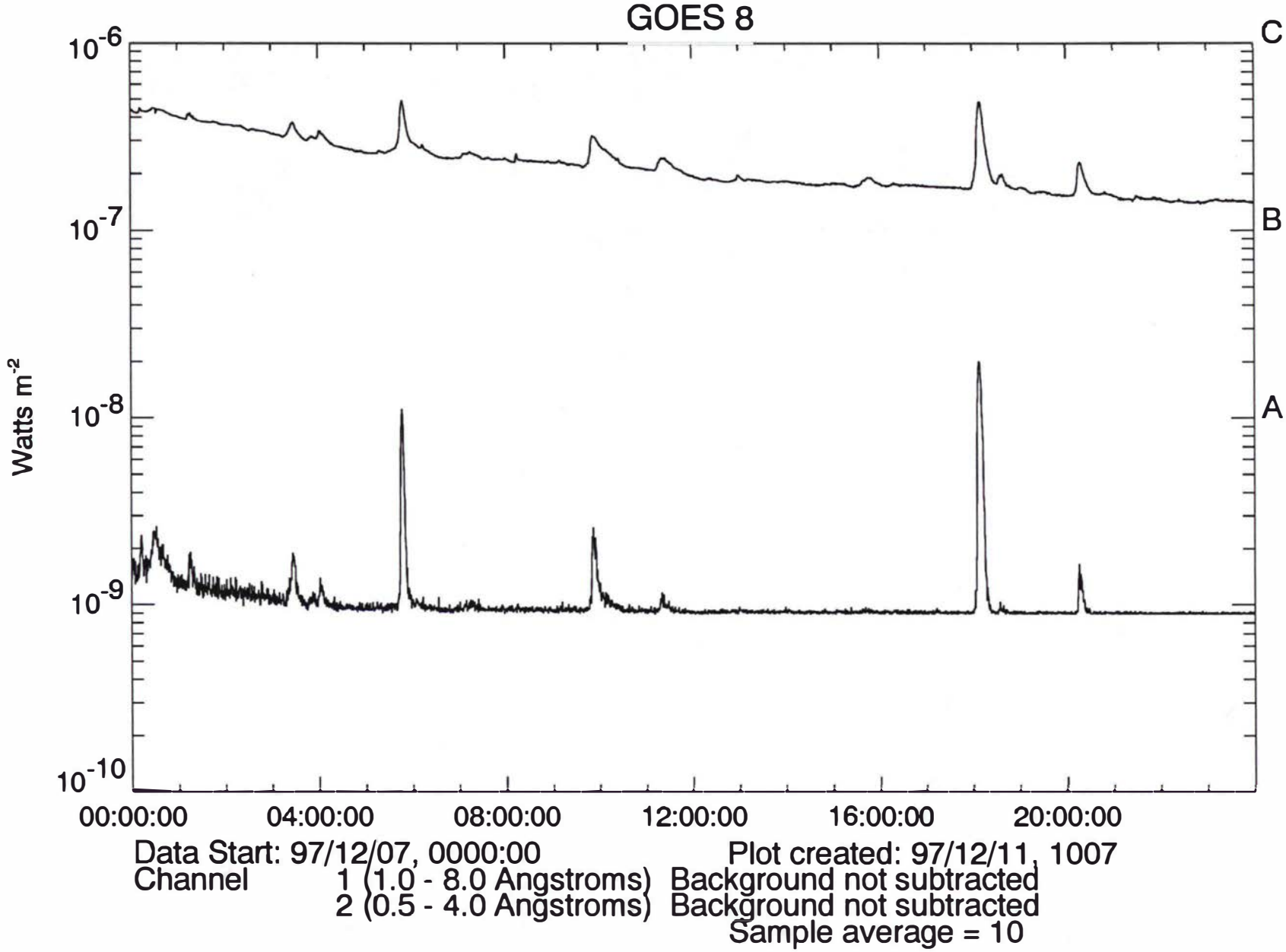
7/12/97 73836.453 s

0.500 S INTERVALS REGROUPED BY 10

22- 148 keV

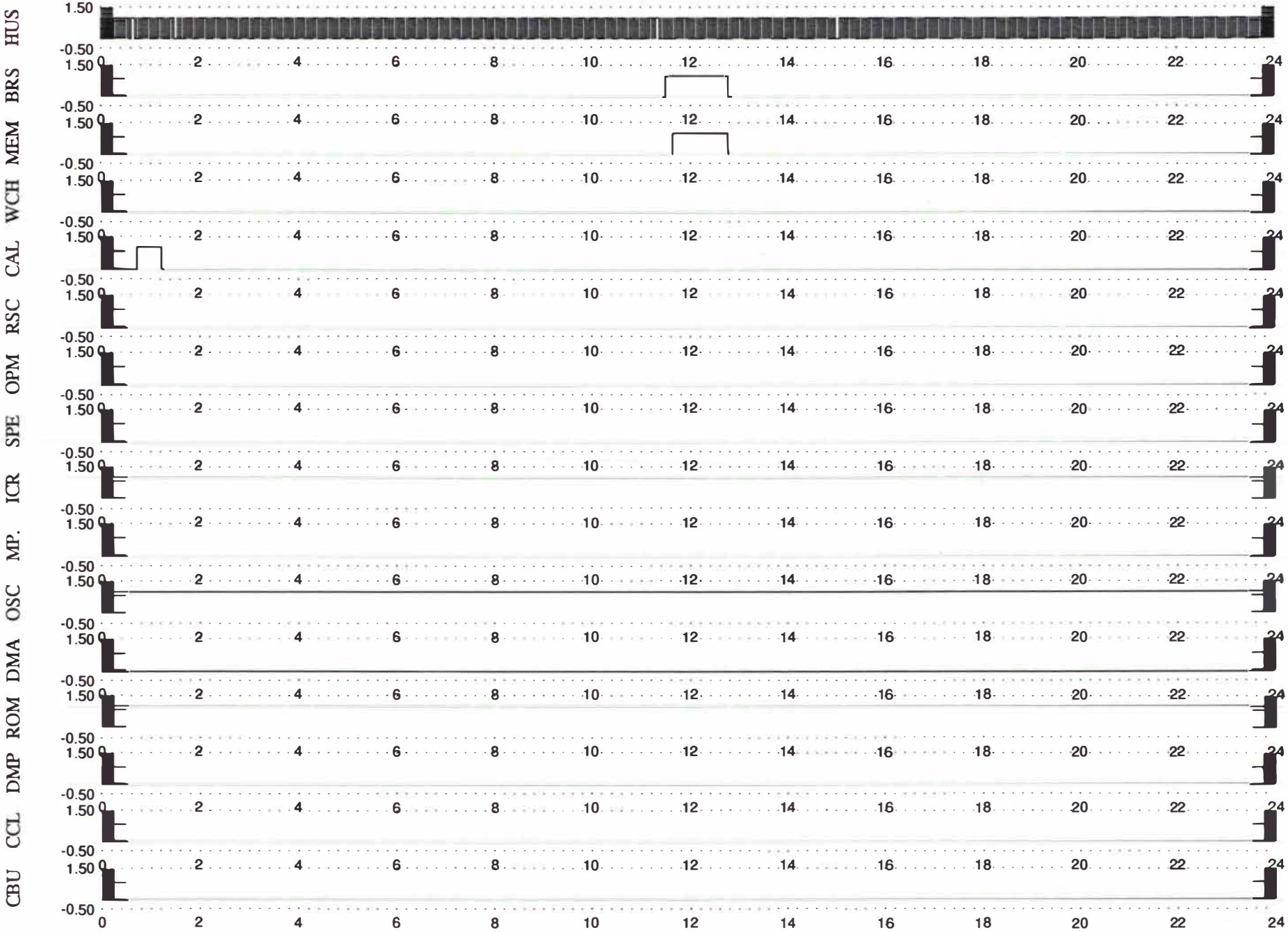



BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/07
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/11, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare


GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/07, 0000:00
Plot created: 97/12/11, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

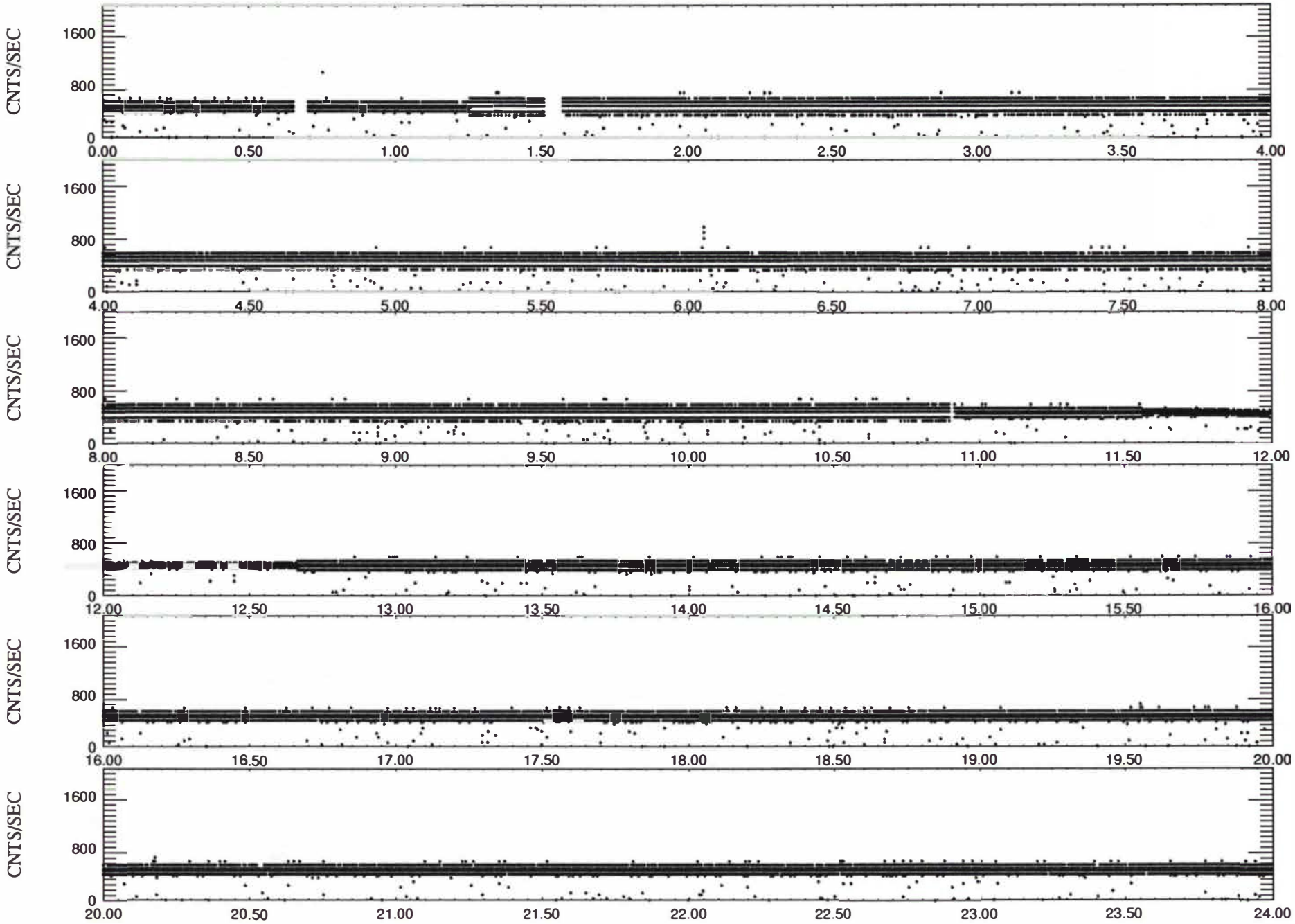
HUS MODES EDR day 341, year 1997 to day 341, year 1997 3/12/98

BURST NUMBER 2



HUS 2A, MODE 1, NOT AVERAGED EDR day 341, year 1997 to day 341, year 1997 3/12/98

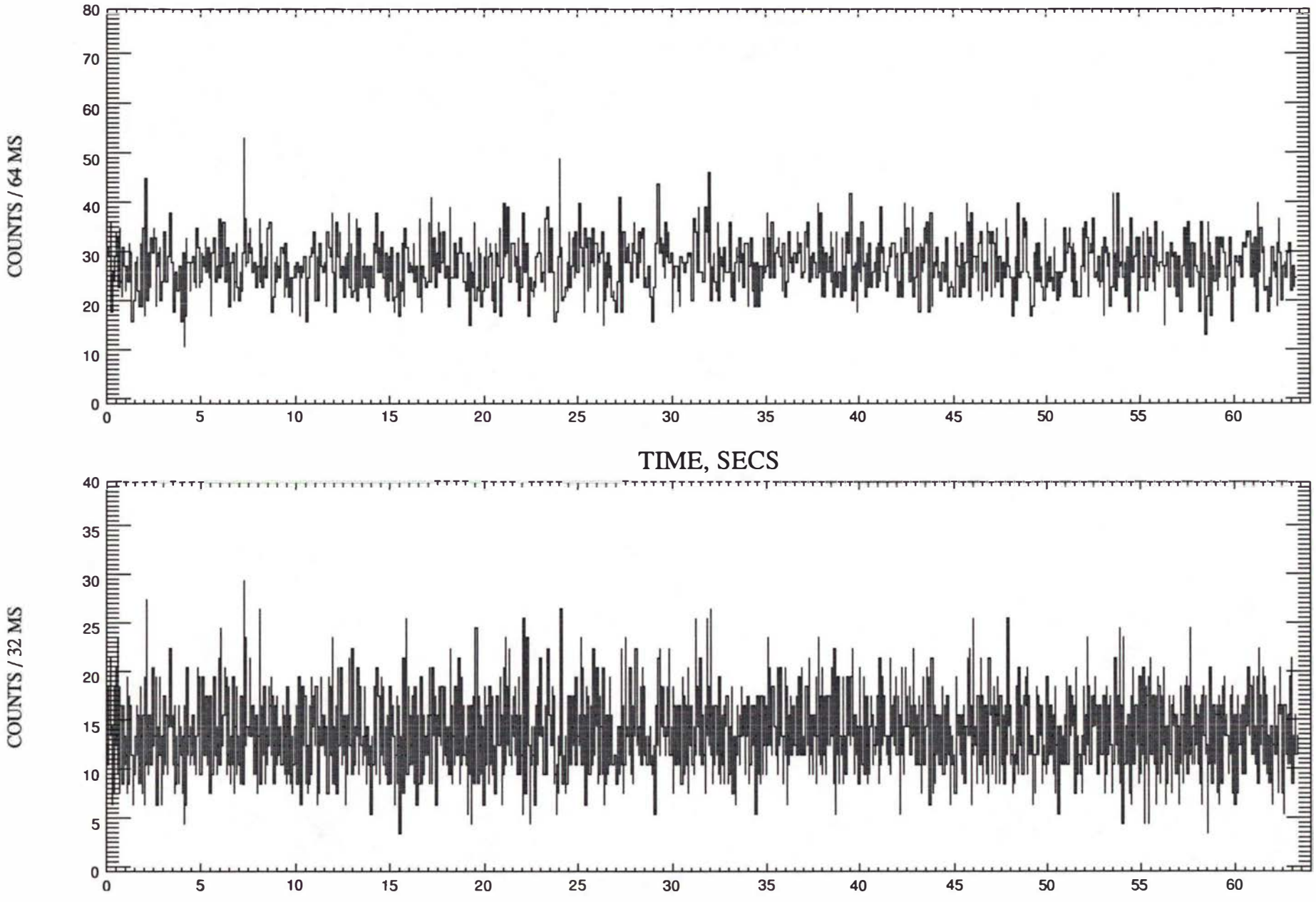
CALIBRATION DATA INCLUDED




UNIV' 'AL TIME

HUS 2A TRIGGERED DATA EDR day 341, year 1997 3/11/98

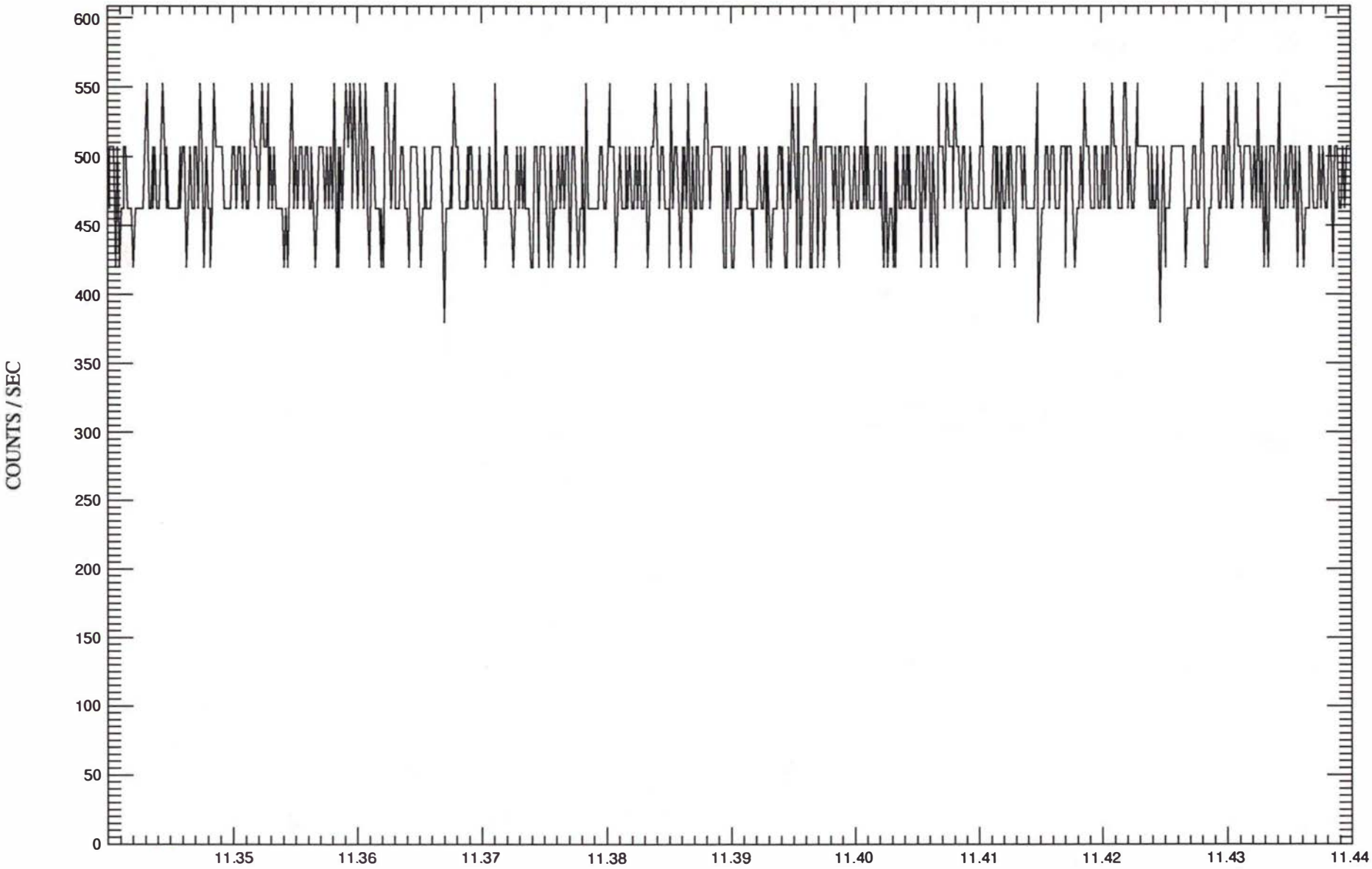
Burst Counter 2 at UT=11.391237466600 h=41008.455 s 11:23:28.455



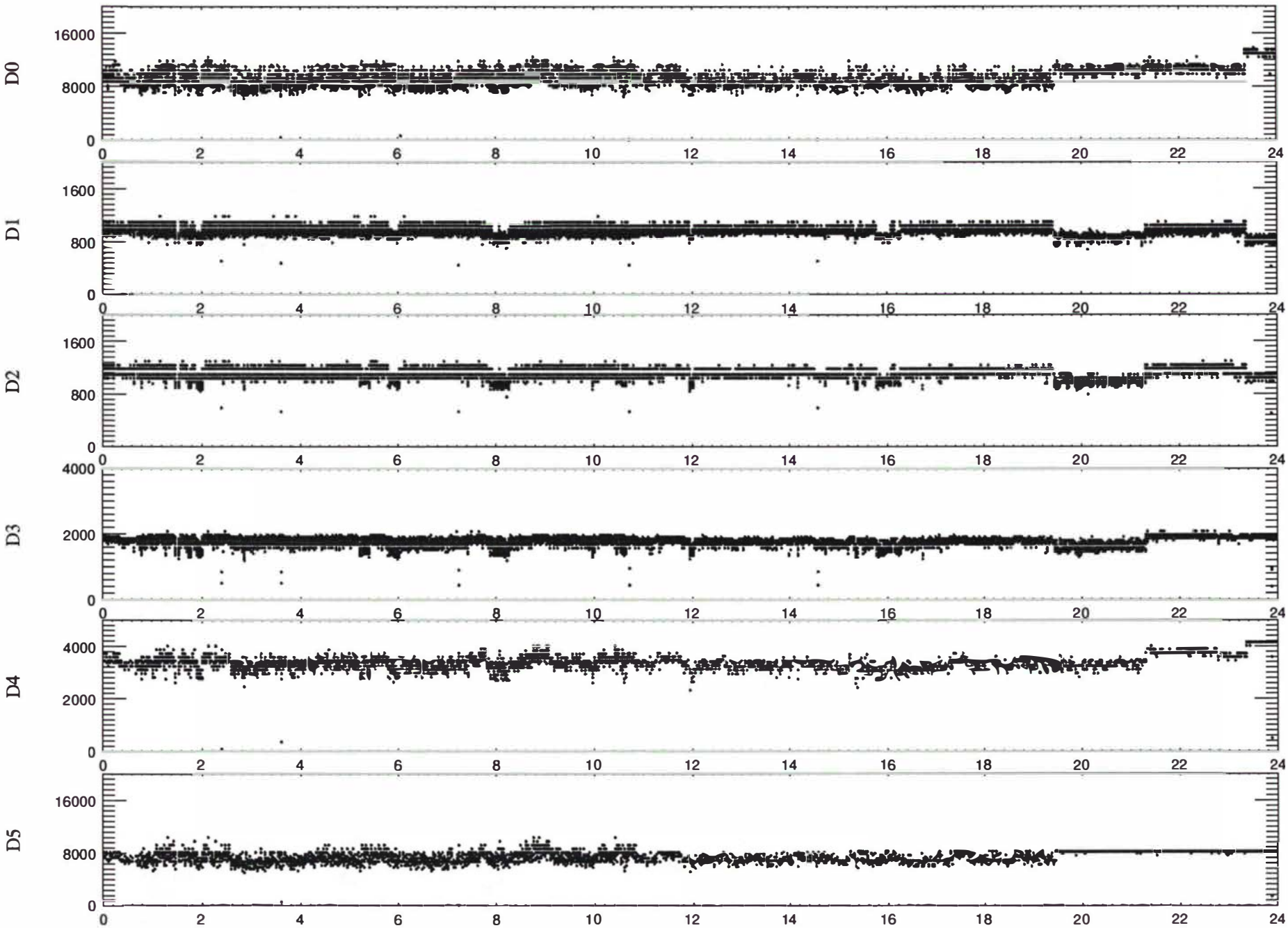

B# 1

HUS 2A, MODE 1, NOT AVERAGED EDR day 341, year 1997 to day 341, year 1997 3/11/98

CALIBRATION DATA INCLUDED



HUS 2B COUNTS / SEC EDR day 341, year 1997 to day 341, year 1997 3/12/98



Date: Mar 30 2007

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

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

## 2. For Konus events

☑ Konus ecliptic latitude used with latest calibration?

## 2. For Odyssey events N/A

□ Was CHECKMO run to eliminate data gaps?

□ Did the Odyssey ephemeris correspond to the event time? (When there is data in the database, the ephemeris is for the start of record, usually ~1320 s prior to the request time; when there is no data in the database, the ephemeris is for the request time in the e-mail, so the request time in mosearch should be equal to the GRB time. Note that the time in the return e-mail will be ~1320 s prior to the time requested, in the line "no HEND data…")

□ Was Mars-blocking used?

□ For cruise phase data (April – October 2001), was the updated data used? (Old data has timing errors)

□ GRS database searched for triggered data? Database data between August 2005 and January 2006 should be re-extracted, due to timing errors. (E-mailed data should be OK).

□ GRS and HEND data cross-correlated to check timing?

## 2. For 3 or More Spacecraft events N/A

□ Σ 3Δt's calculated, and/or BMAPSUM executed?

## 3. For INTEGRAL events N/A

□ INTEGRAL SPI-ACS website checked for bursts that weren't transmitted automatically?

□ 125 ms added to INTEGRAL SPI-ACS time for bursts prior to April 2 2004 11:00 UT?

□ Updated ephemeris used for bursts prior to September 30, 2003?

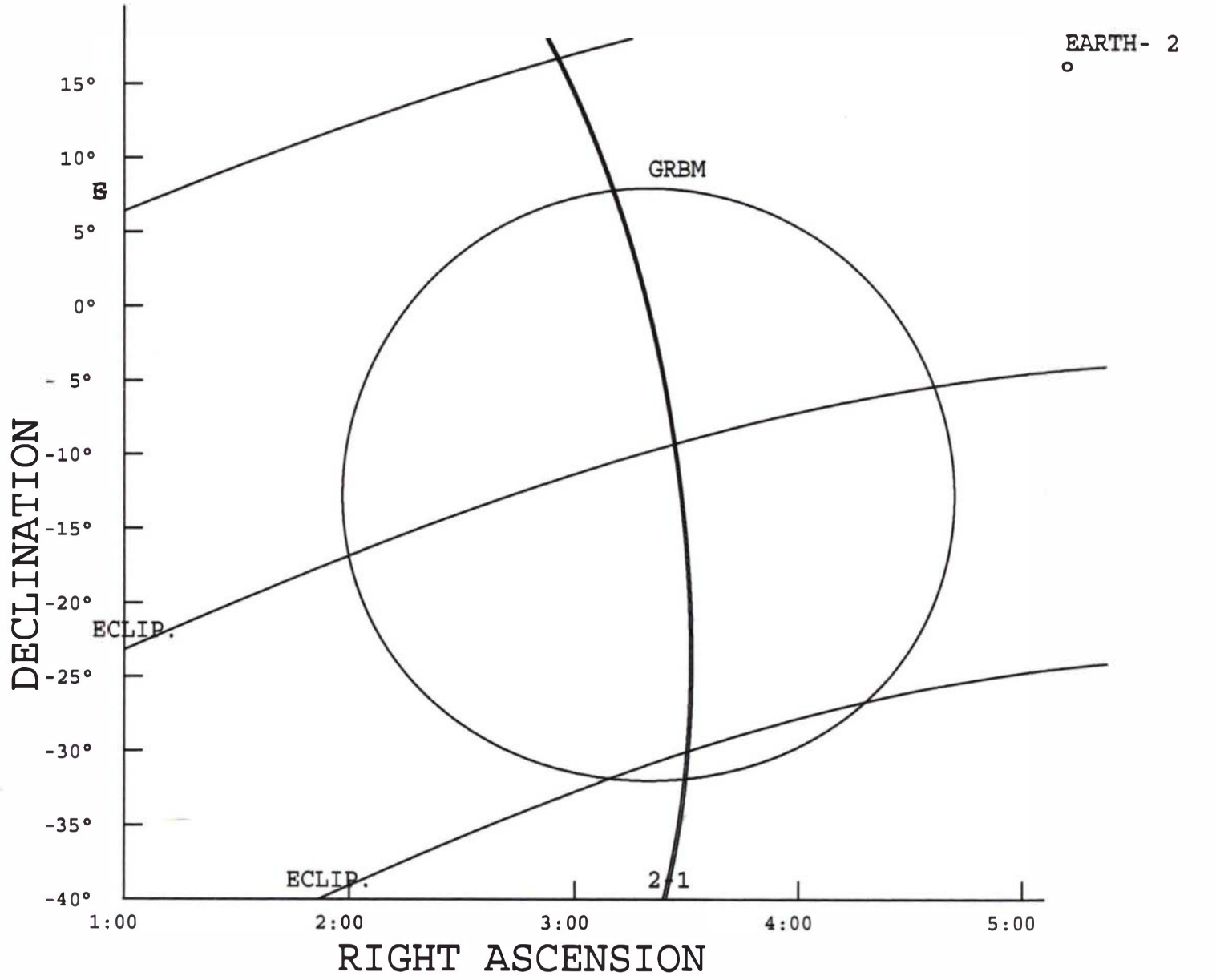
---

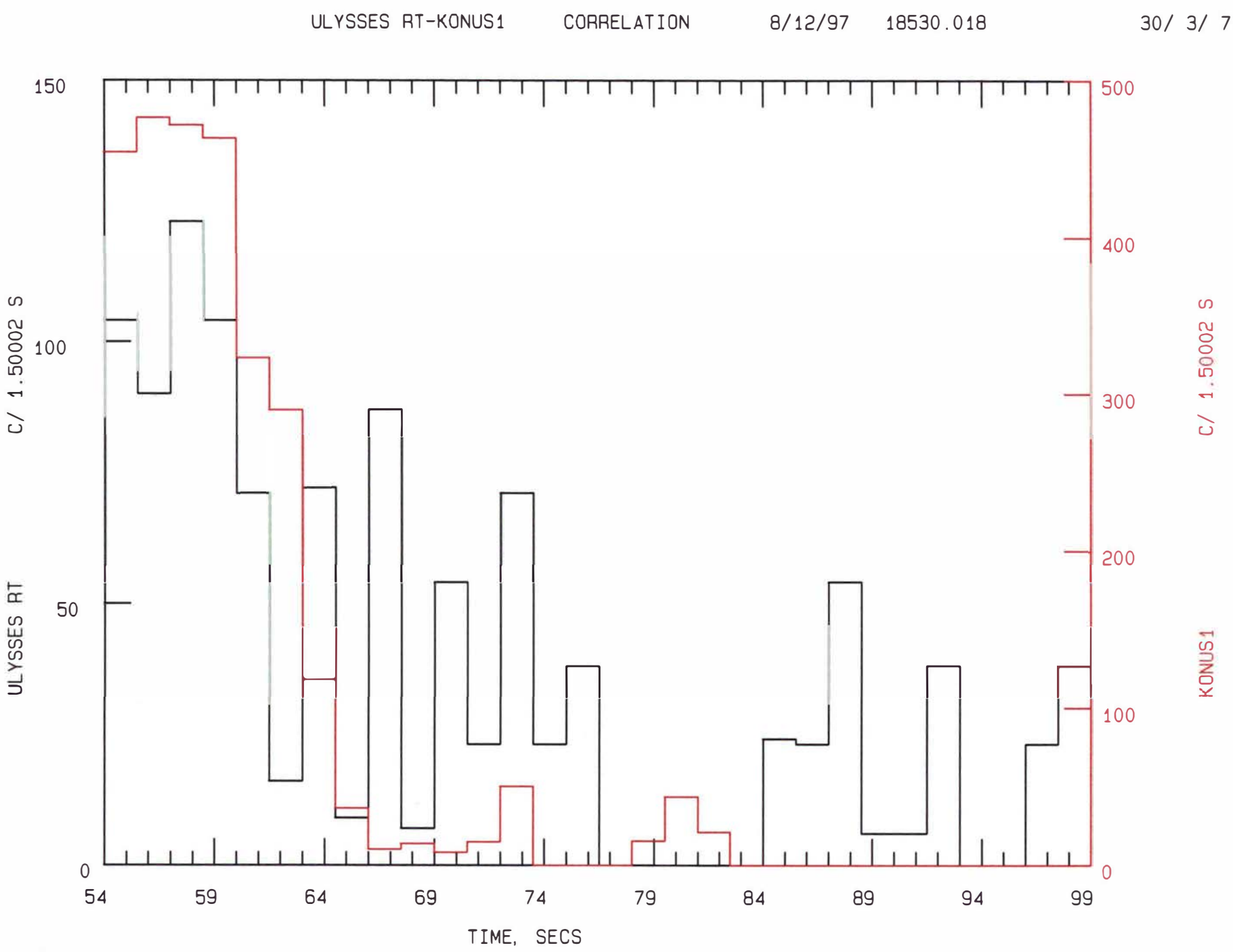
☑ ACCESS and MBL4 databases updated?

# EVENT OF DEC 8, 1997 5:08

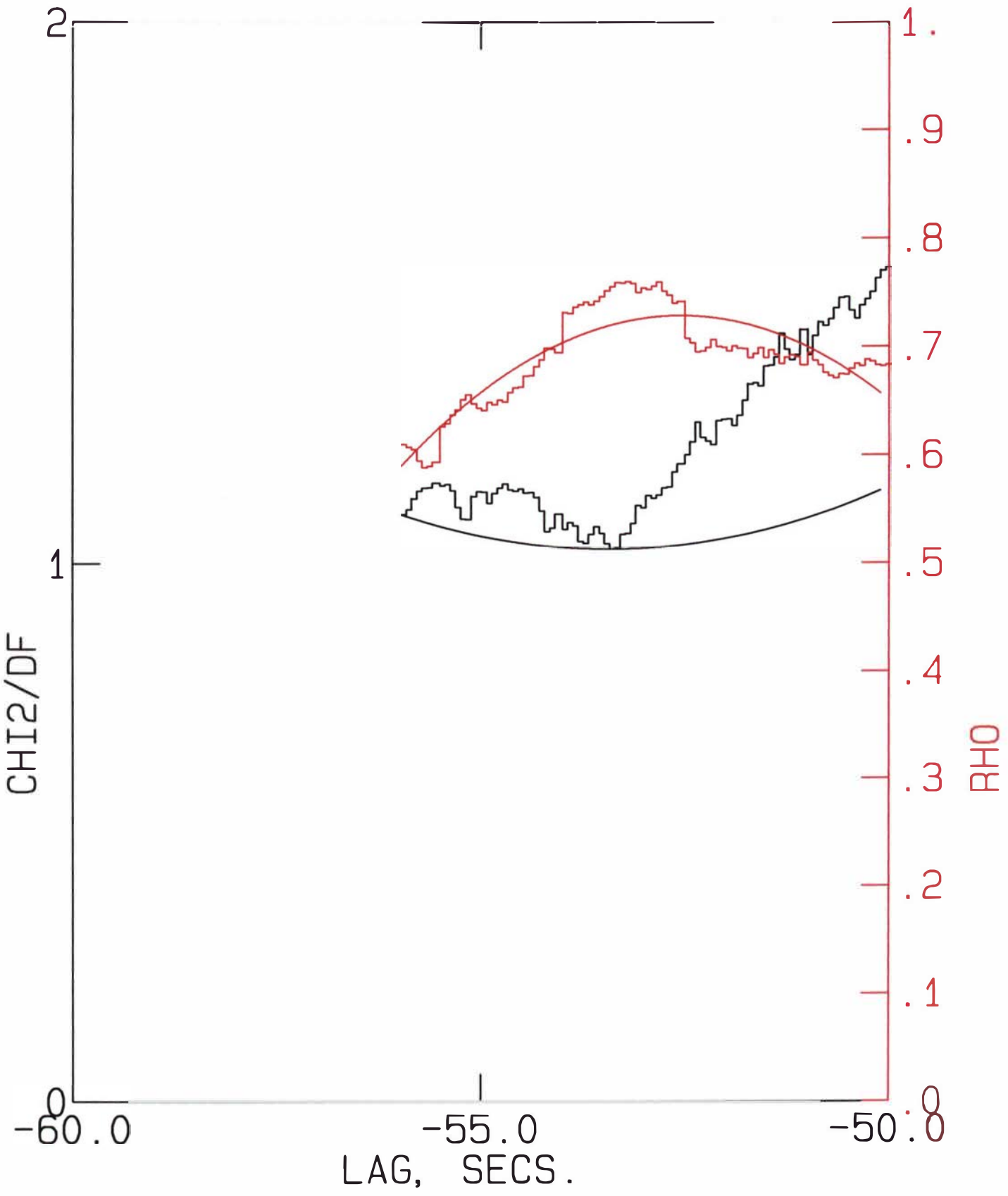
30/ 3/ 7

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 KONUS1




ULYSSES RT-KONUS1 CORRELATION 8/12/97 18530.018 30/ 3/ 7
150
100
50
0
C/ 1.50002 S
ULYSSES RT
500
400
300
200
100
0
C/ 1.50002 S
KONUS1
54
59
64
69
74
79
84
89
94
99
TIME, SECS

ULYSSES RT-KONUS1 CORRELATION 8/12/97 18530.018

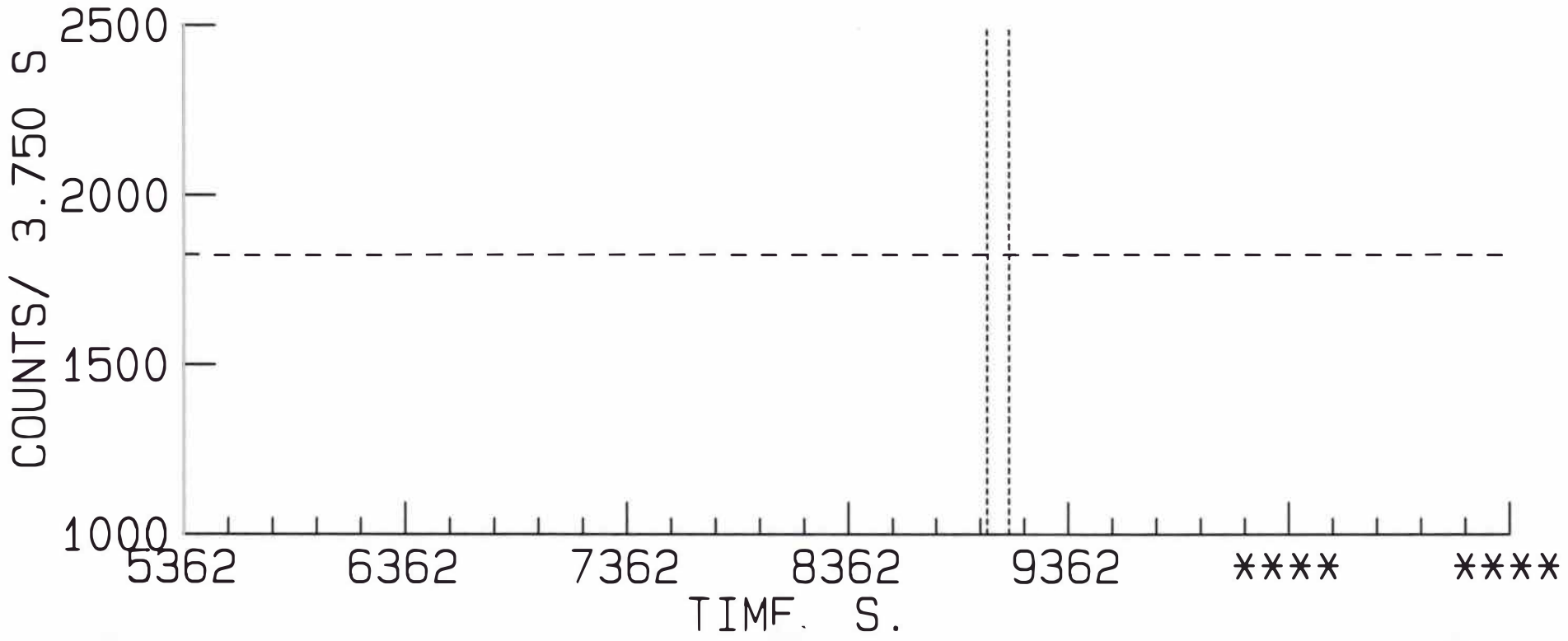


ULYSSES RT 30/ 3/ 7

8/12/97 14544.009 s

0.250 S INTERVALS REGROUPED BY 15

22- 148 keV

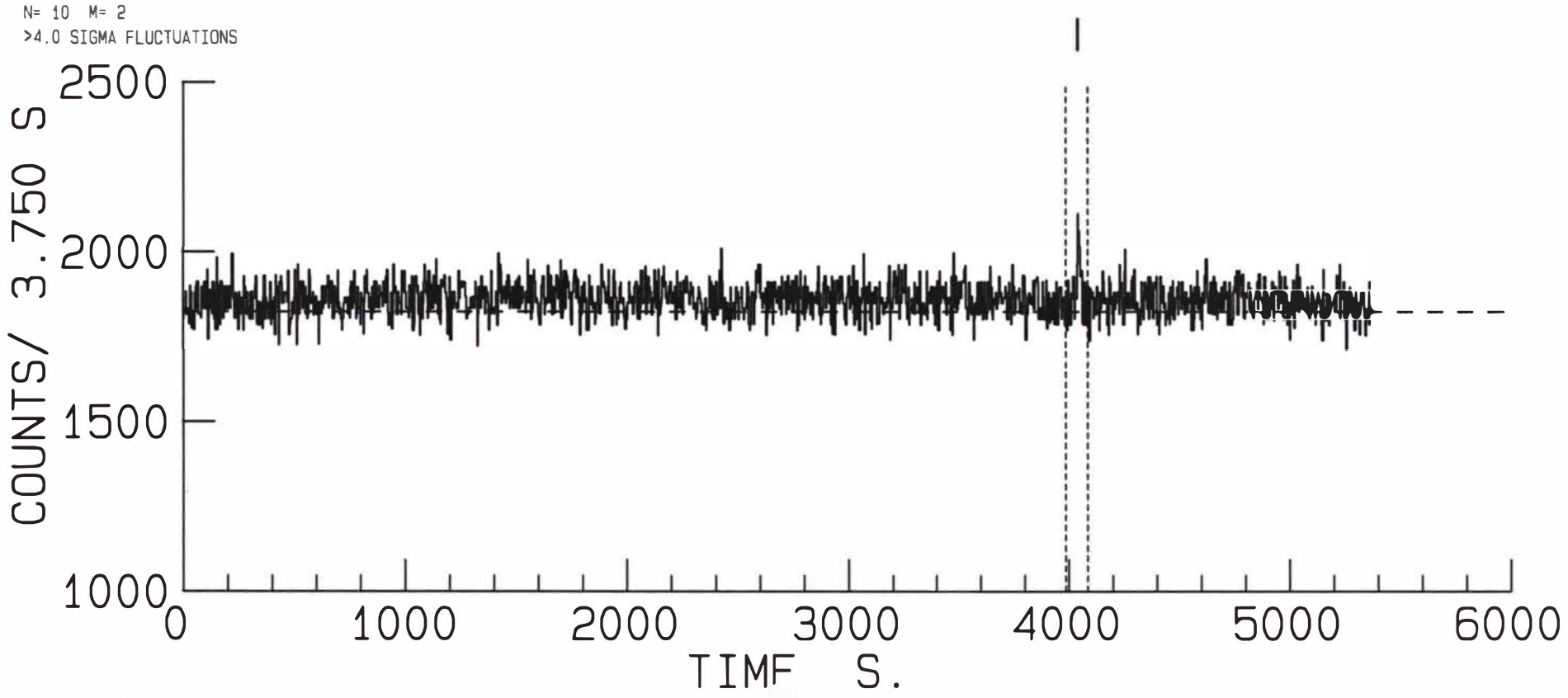


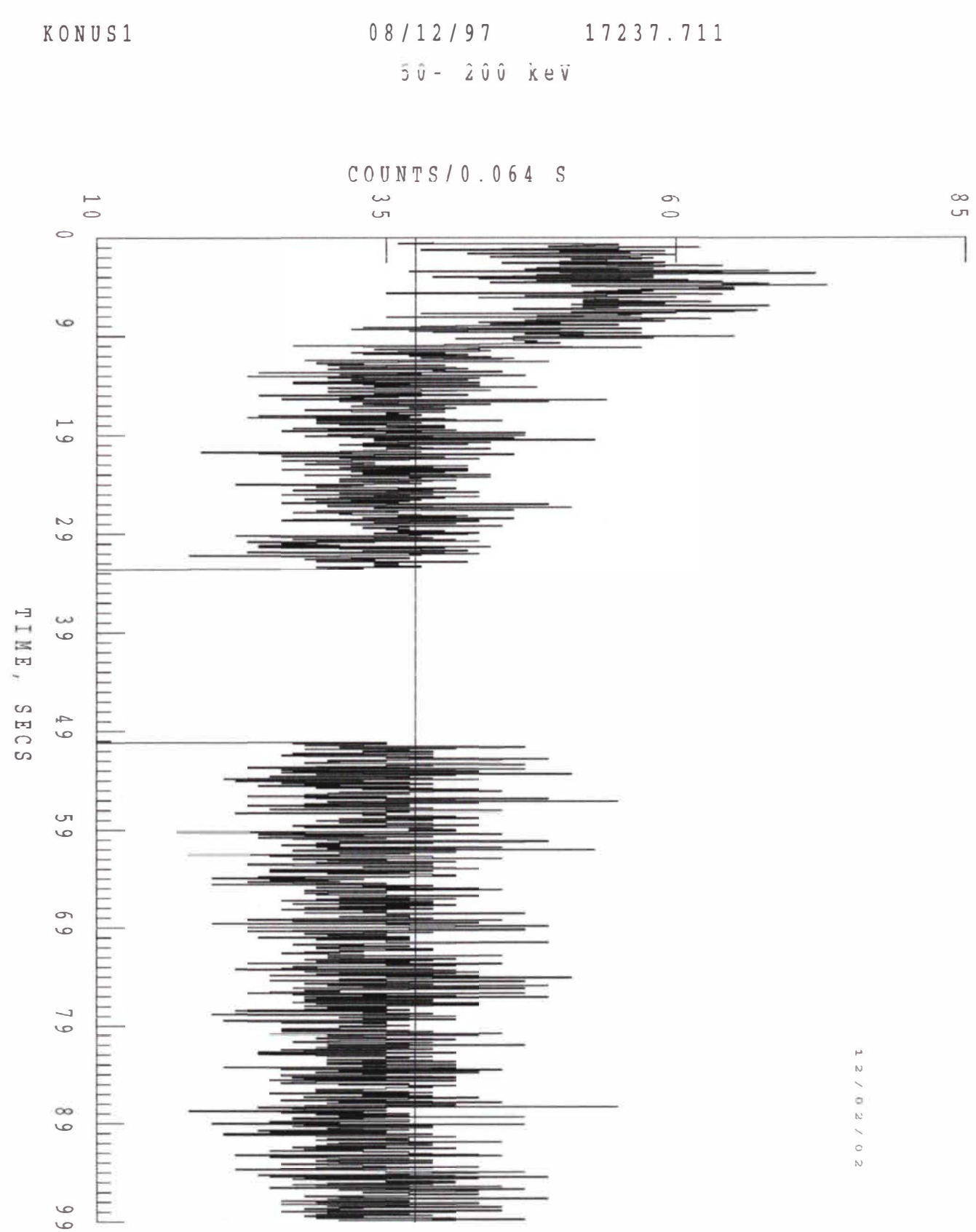
ULYSSES RT 30/ 3/ 7

8/12/97 14544.009 s

0.250 S INTERVALS REGROUPED BY 15

22- 148 keV




KONUS1 08/12/97 17237.711
50- 200 keV
COUNTS/0.064 S
10
35
60
85
0
9
19
29
39
49
59
69
79
89
99
TIME, SECS
12/02/02

From SURASAK@SSLLES.MSFC.NASA.GOV Tue Dec 9 11:48:22 1997
Return-Path: <SURASAK@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA14222; Tue, 9 Dec 1997 11:48:21 -0800
From: SURASAK@SSLLES.MSFC.NASA.GOV
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA26971; Tue, 9 Dec 1997 11:48:15 -0800
Date: Tue, 9 Dec 1997 13:47:57 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971209134757.23403ed7@SSLLES.MSFC.NASA.GOV>
Subject: Crossing Windows for BATSE Burst 6526
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6526
EVENT OF 1997 DEC 8 DAY OF YEAR=342
EVENT CROSSING TIME AT BATSE : 28092. S. OR 07:48:12.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 357.000 78.000
BATSE PEAK COUNTING RATE: 9000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 8/12/ 97 IS:
RA= 170.758 DEC= 12.123 DIST= 5.268 AU
BATSE-ULYSSES DISTANCE = 788044168. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 90.19 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -8.78 SECS.
CROSSING TIME AT ULYSSES IS 28083. S. OR 07:48:03 +/- 506.24 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 8/12/ 97 IS:
RA= 293.987 DEC= -22.873 DIST= 2.057 AU
MARS-BATSE DISTANCE = 307712128. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 72.95 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 301.01 SECS.
CROSSING TIME AT MARS IS 28393. S. OR 07:53:13 +/- 174.94 SECONDS

BATSE BURST TRIGGER

NO.: 6526

TIME: TJD=0790 SECONDS=28092

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=81.5 AZIMUTH=200.3 ERROR=1.189 DEGREES

COMMENTS:
GRB. VERY LONG SMOOTH FRED. DURATION ABOUT 800S. VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6526 | 971208 | 10790 | 28092 | 9000 | 357 | +78 | 800 |

Date: Feb 9 00

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☐ Jim Schmidling's stat file correction applied? Helio corr removed

☐ Final ephemeris used?

☐ Final, CDROM data used?

☐ 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

☐ 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 vwx@bocc1, or from Teresa Sheets, have the correct time; files on website have incorrect times)

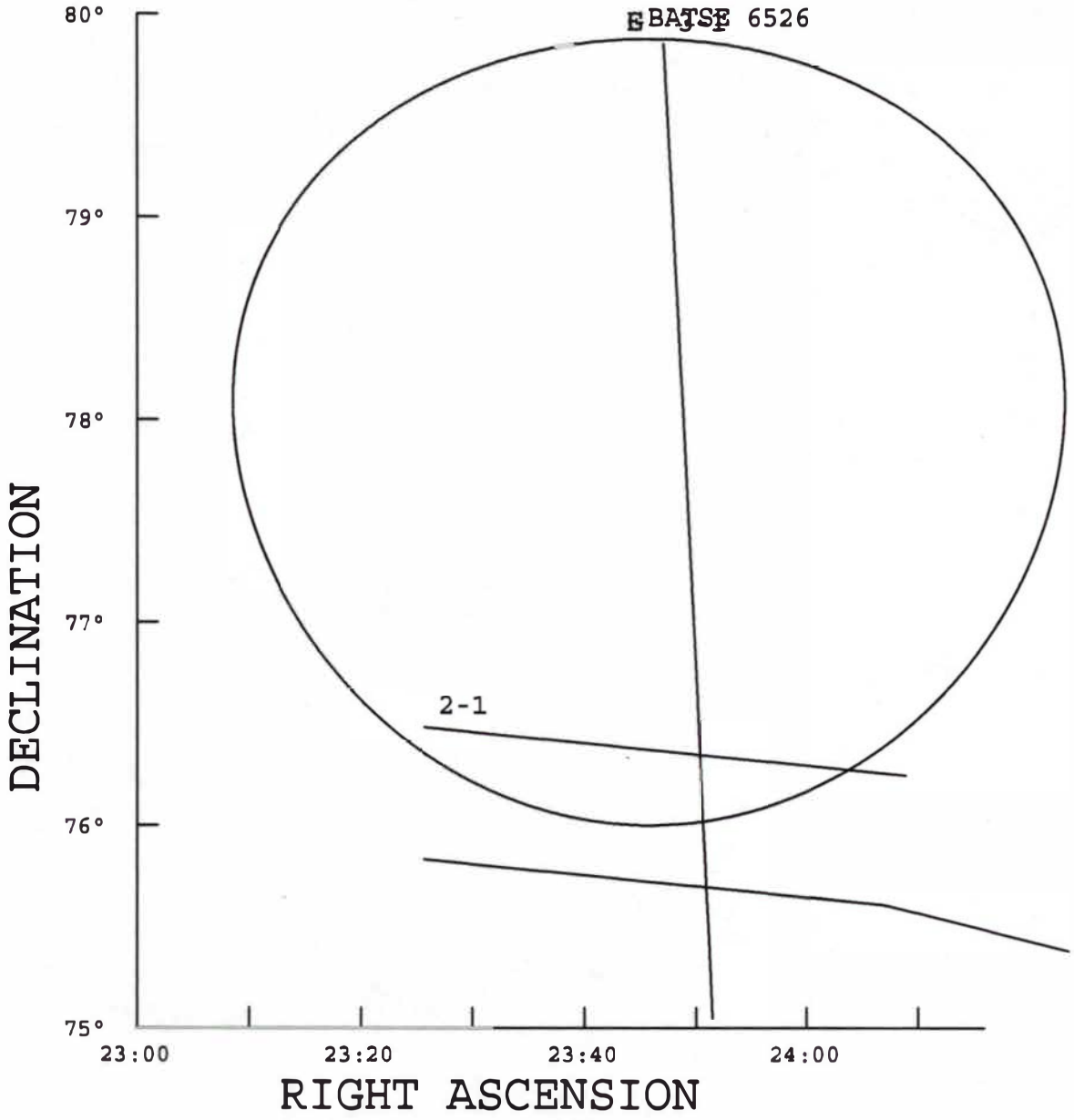
☑ BATSE >100 keV data used for NEAR correlation?

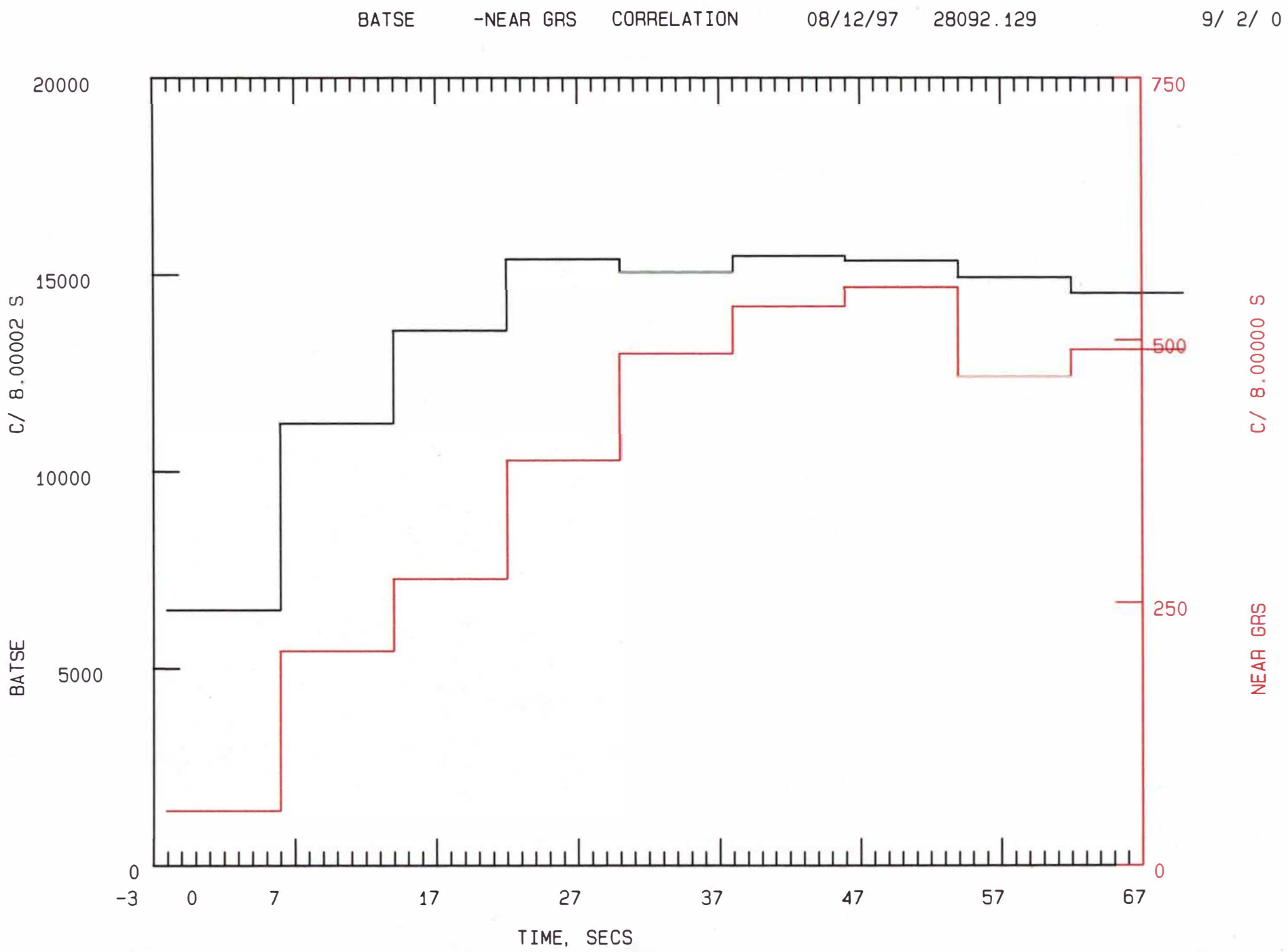
☑ ACCESS database updated?

# EVENT OF DEC 8, 1997 7:48

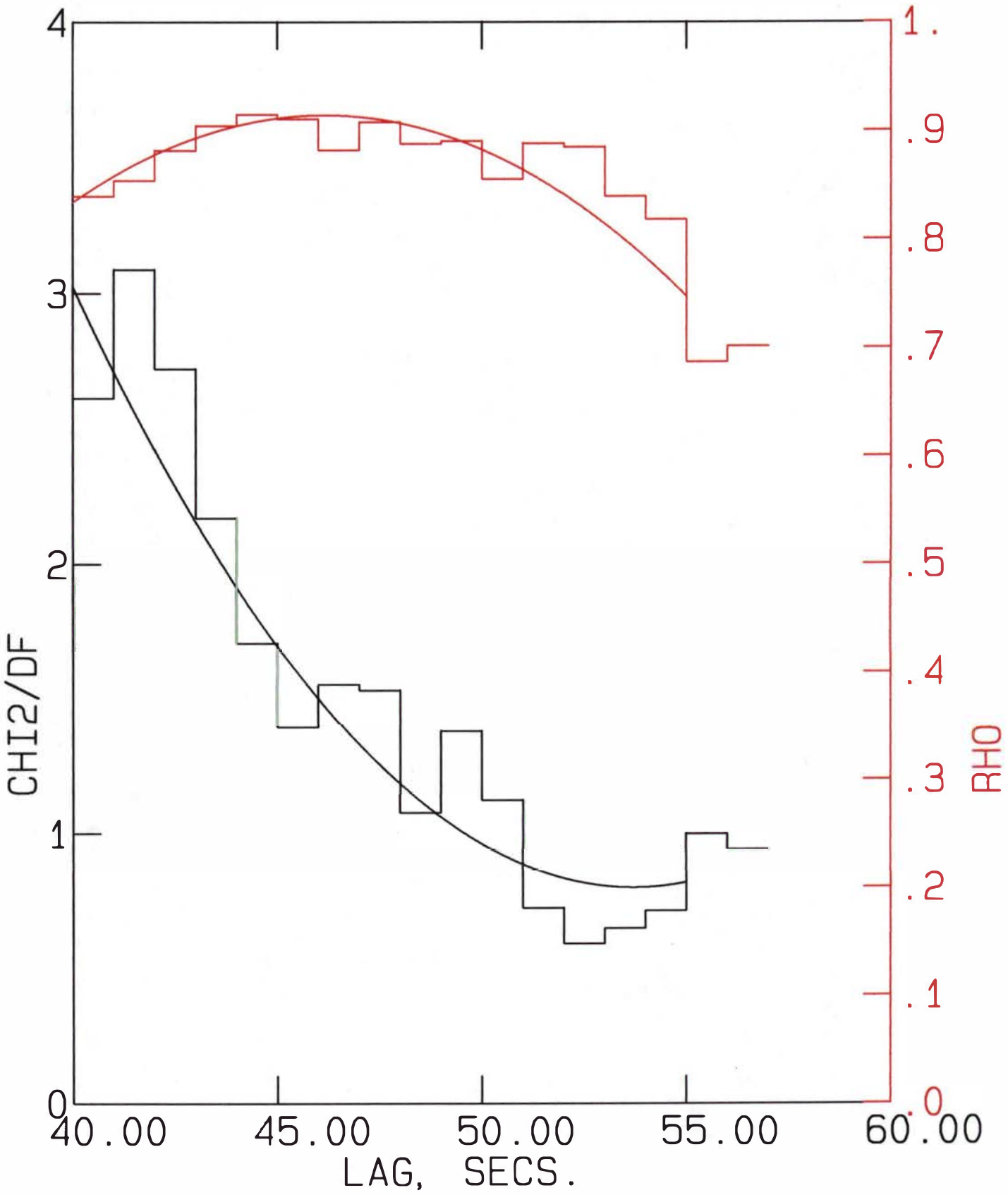


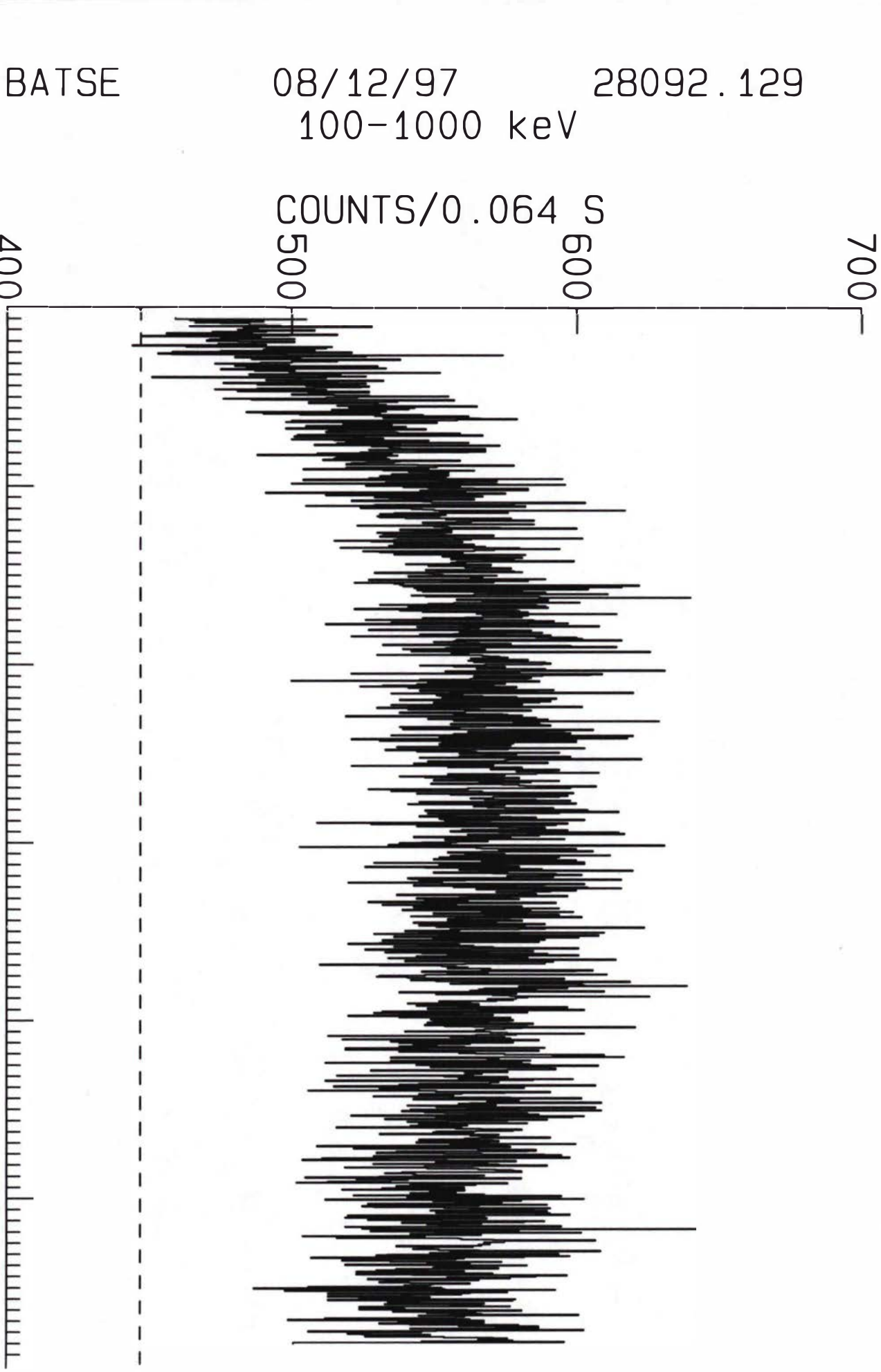
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 BATSE 2 ULYSSES 3 NEAR

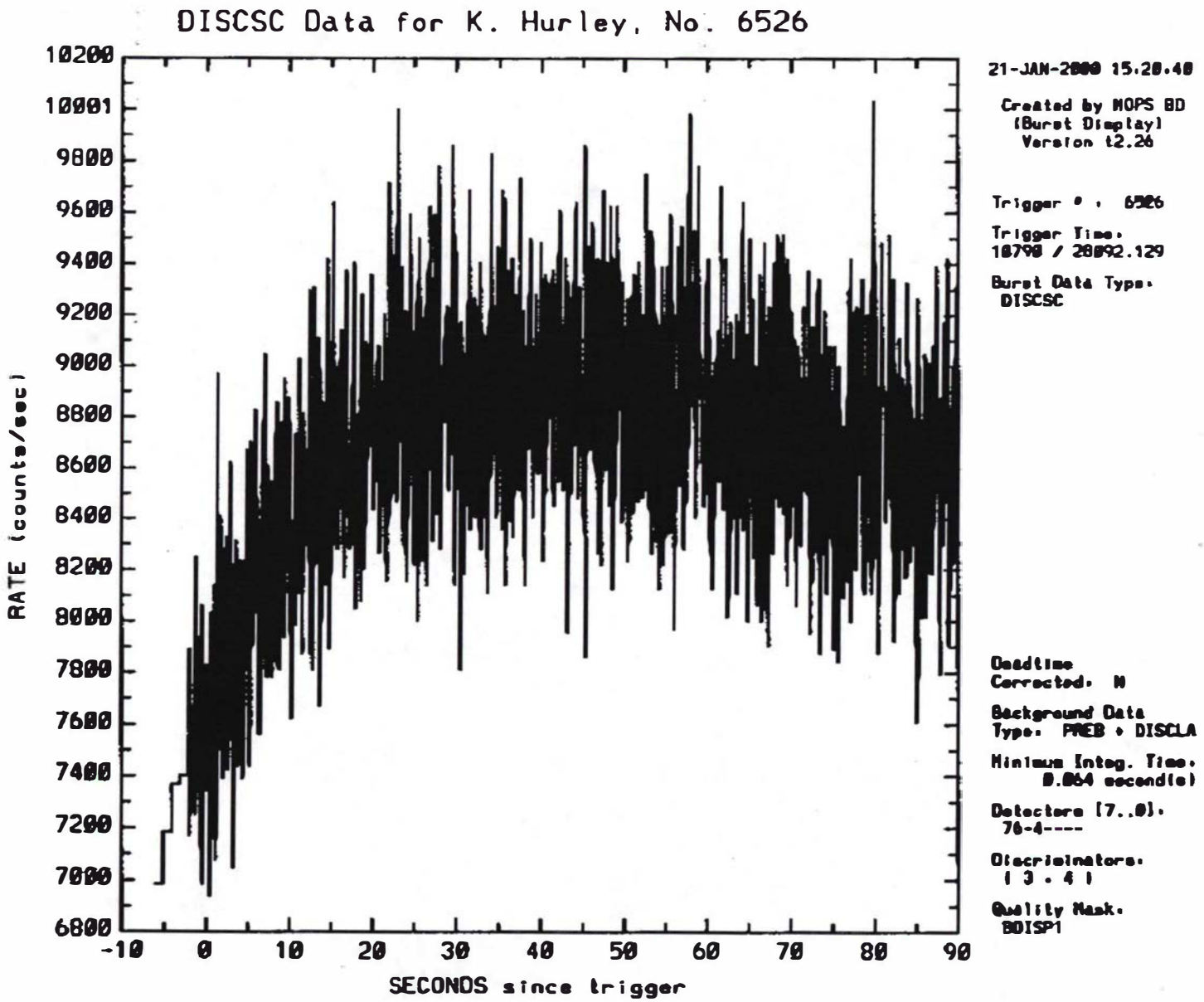


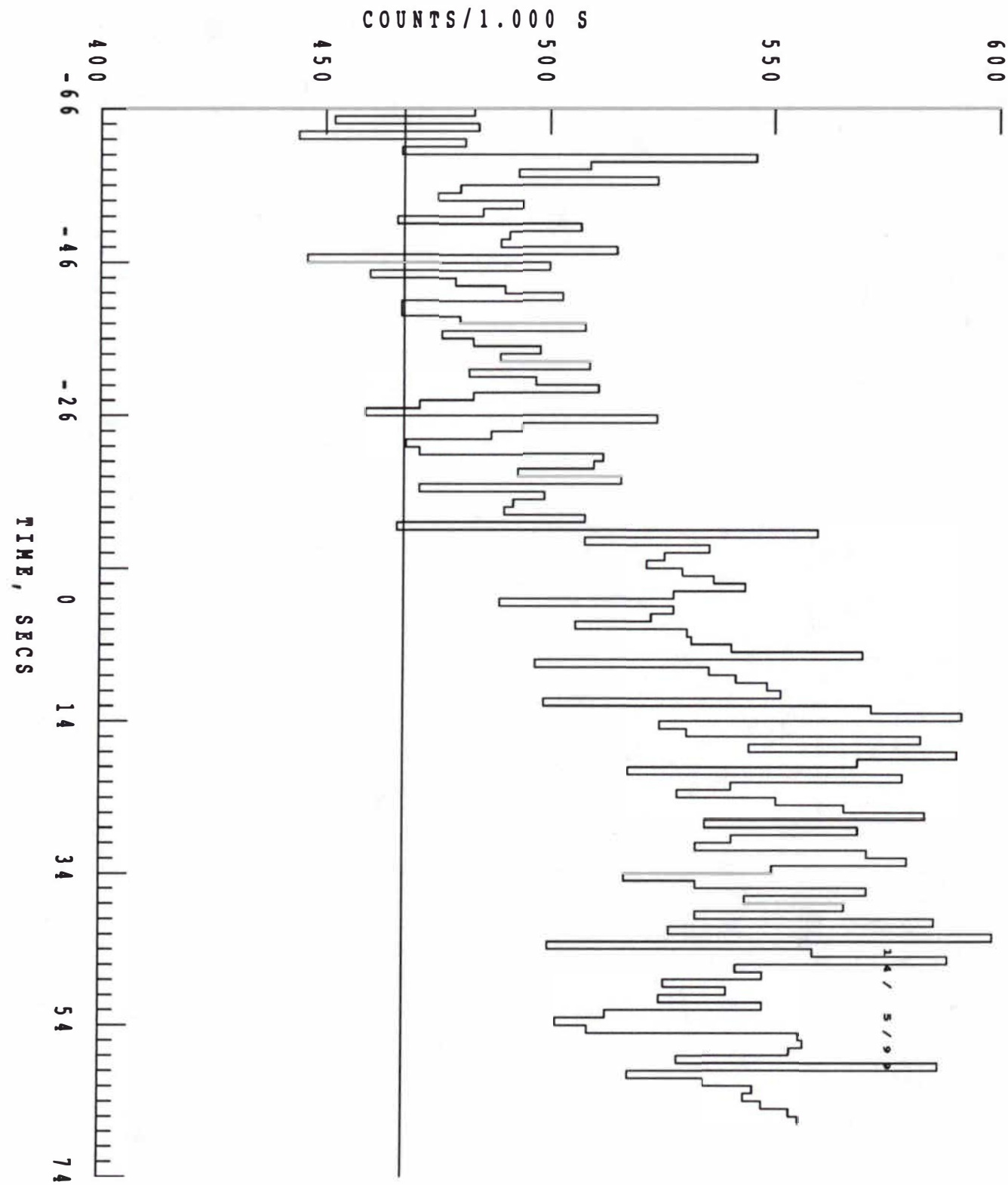

BATSE -NEAR GRS CORRELATION 08/12/97 28092.129 9/ 2/ 0
20000
15000
10000
5000
0
C/ 8.00002 S
BATSE
750
500
250
0
C/ 8.00000 S
NEAR GRS
-3
0
7
17
27
37
47
57
67
TIME, SECS

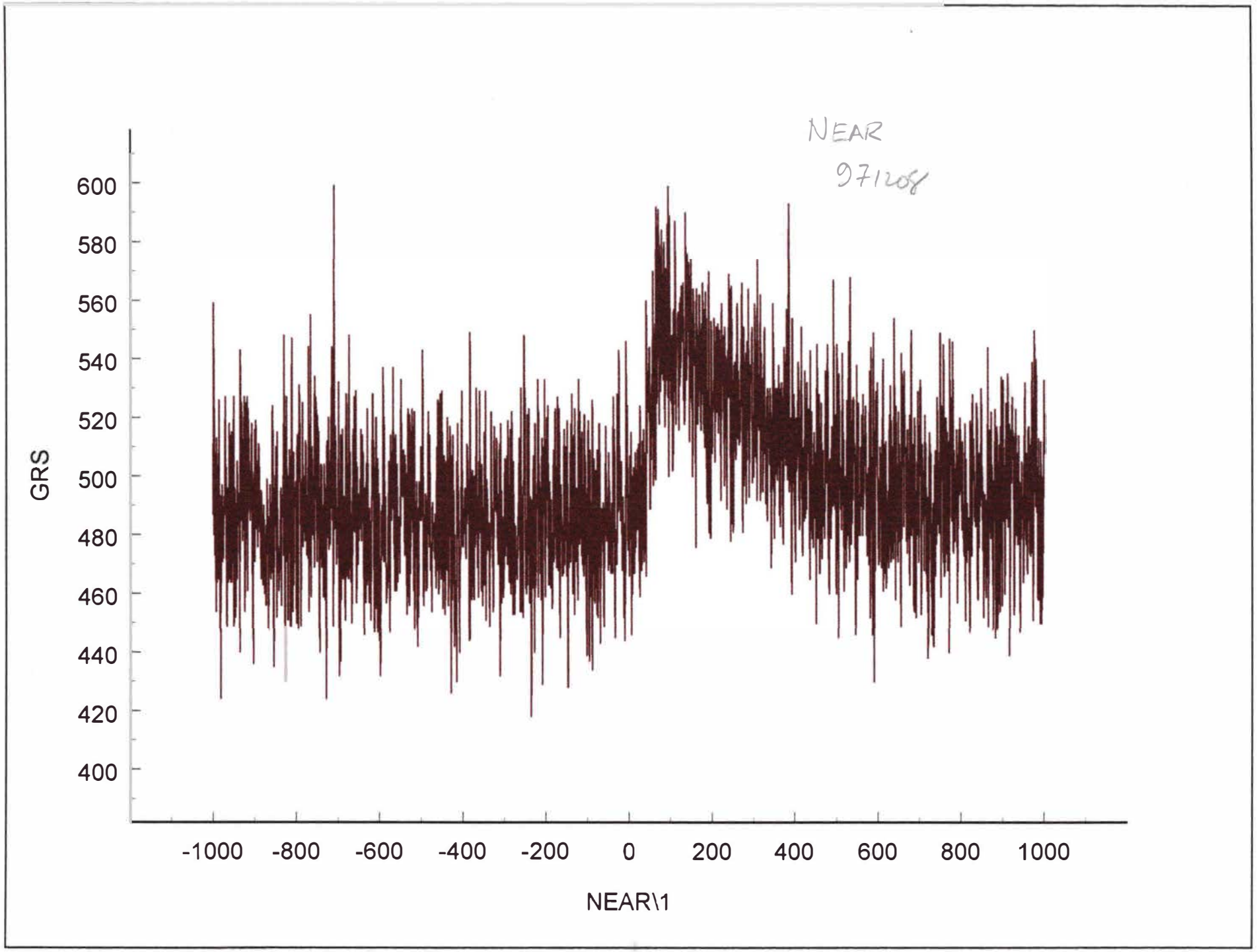
BATSE -NEAR GRS CORRELATION 08/12/97 28092.129

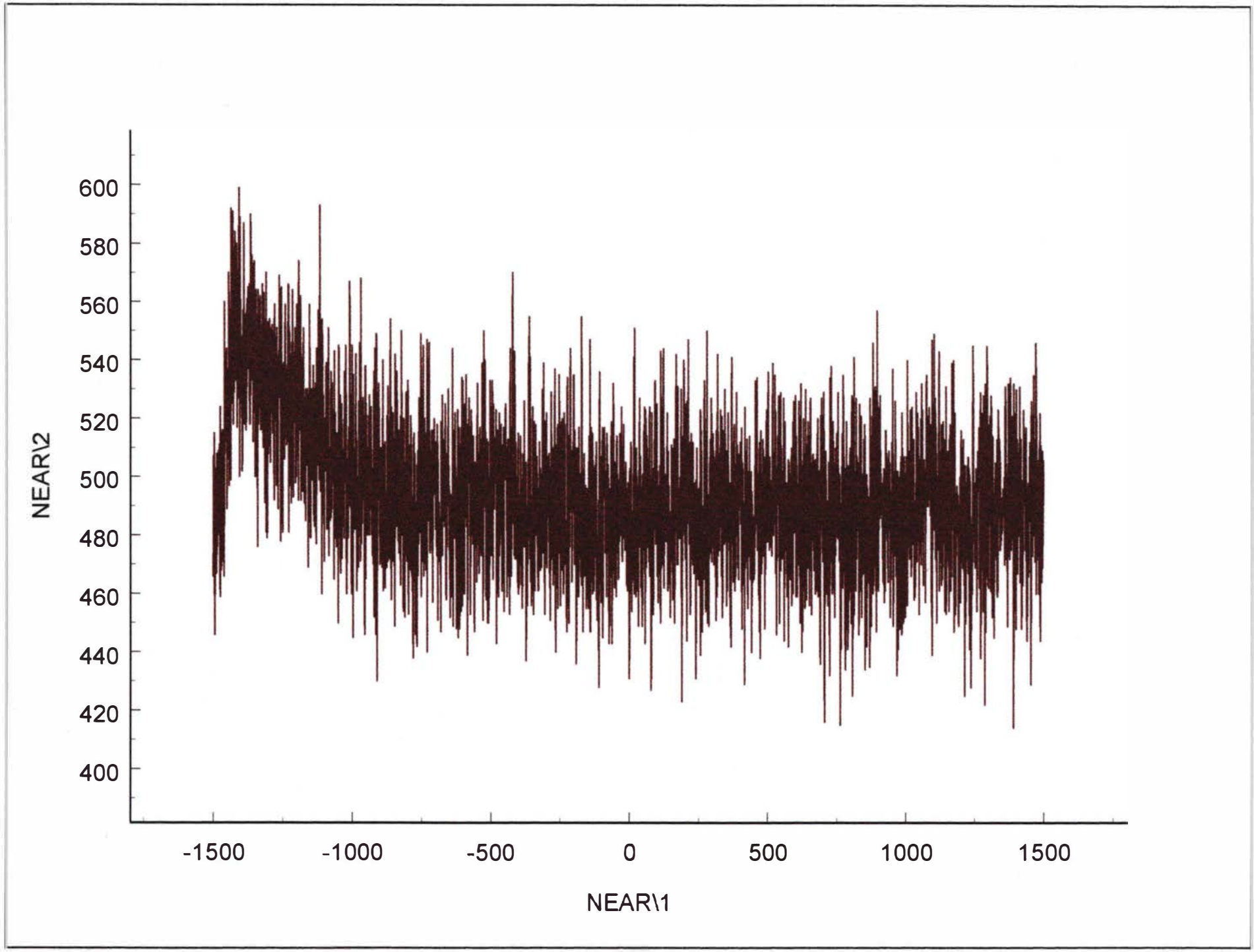



BATSE
08/12/97
28092.129
100-1000 keV
COUNTS/0.064 S
400
500
600
700
-30
0
13
29
45
61
77
ME. SECS
28/ 1/ 0


DISCSC Data for K. Hurley, No. 6526
RATE (counts/sec)
10200
10001
9800
9600
9400
9200
9000
8800
8600
8400
8200
8000
7800
7600
7400
7200
7000
6800
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
21-JAN-2000 15:20:40
Created by MOPS BD
(Burst Display)
Version t2.26
Trigger # : 6526
Trigger Time:
18790 / 28892.129
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
76-4----
Discriminators:
[ 3 . 4 ]
Quality Mask:
BDISP1


NEAR
08/12/97
28052.893
100-1000 keV
COUNTS/1.000 S
400
450
500
550
600
-66
-46
-26
0
14
34
54
74
TIME, SECS
14/ 5/9


NEAR
971208
600
580
560
540
520
500
480
460
440
420
400
GRS
-1000
-800
-600
-400
-200
0
200
400
600
800
1000
NEAR\1


600
580
560
540
520
500
480
460
440
420
400
NEAR\2
-1500
-1000
-500
0
500
1000
1500
NEAR\1

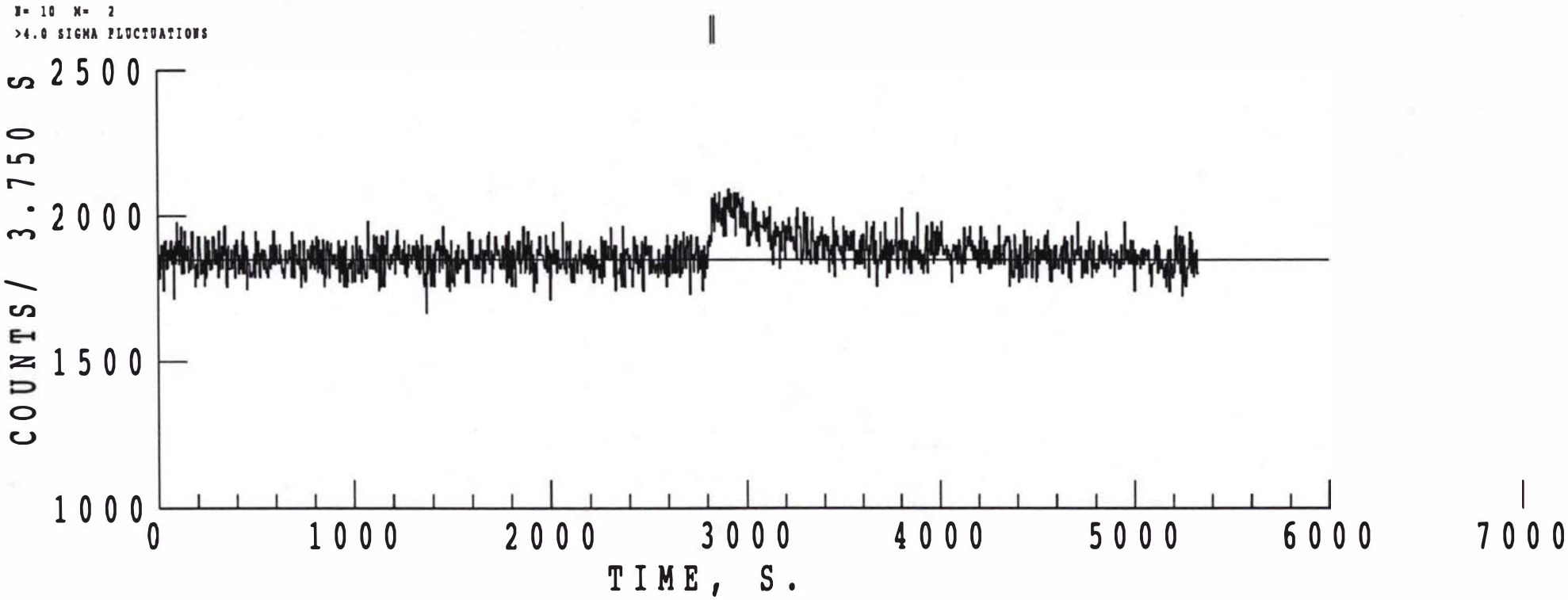
KNEAR GRS 19971208 28052

ULYSSES RT 14/ 5/99

8/12/97 25380.129 s

0.250 S INTERVALS REGROUPED BY 15

0- 0 keV



From xrtpm@leptpm.gsfc.nasa.gov Thu Dec 18 07:11 PST 1997
Date: Thu, 18 Dec 1997 10:05:03 -0500 (EST)
From: Tim McClanahan <xrtpm@leptpm.gsfc.nasa.gov>
To: near-s-xgrs@jhuapl.edu, khurley@sunspot.ssl.berkeley.edu,
cline@apache.gsfc.nasa.gov, butterworth@pizza.gsfc.nasa.gov,
palmer@rosserv.gsfc.nasa.gov
Mime-Version: 1.0
Content-Transfer-Encoding: 7bit
Content-MD5: JYCu3pAUrgdvSbfKIr8mwg==

NEAR Gamma Ray Burst Info:

About 12 days of GRS data have been downloaded during the last week or so. The automated detection system has detected a single transient event at approximately:

1997:348: 23: 20.42

Another low magnitude event was not initially caught in the automated detection system due to rather broad transitions and lasted about 10 mins.

1997:342: 07: 48 (Approx)

Will have to make some modifications to post this to WWW.

WWW address: http://leptpm.gsfc.nasa.gov/near.html

** NOTE:
Clocking is still a problem and algorithms for an automated fix have been specified. I hope to have them put in during the next couple of weeks.

Happy Holidays,

Tim McClanahan
Laboratory for Astrochemistry
NASA/GSFC 691
Greenbelt, MD 20771
301-286-6748

Date: May 5 '98

# 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? N/A

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

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

## 2. BATSE Data

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

☑ BATSE ephemeris for $T_0$?

☑ Error circle position and radius from public catalog used?

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

## 3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

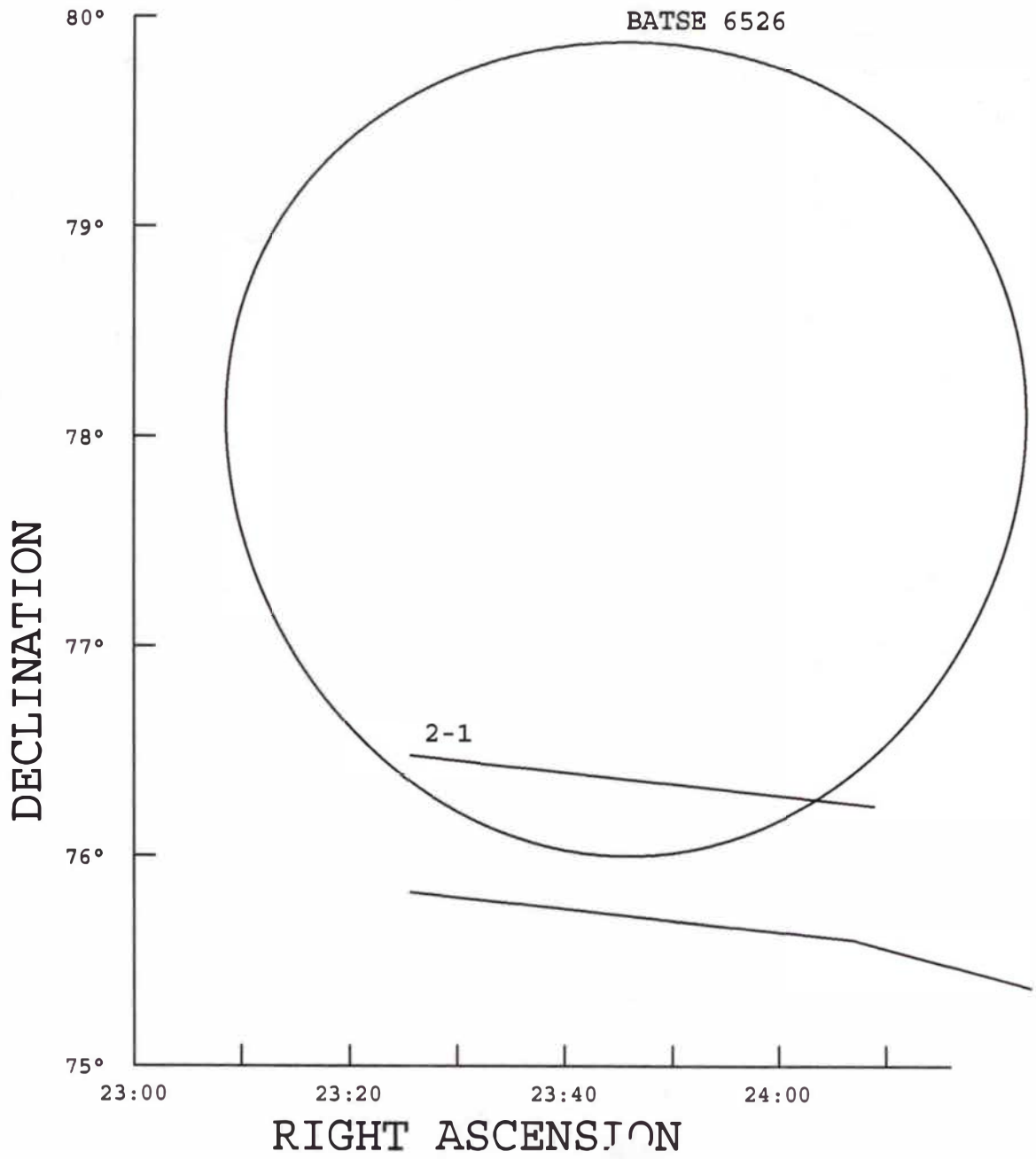
☐ Geocentric time used?

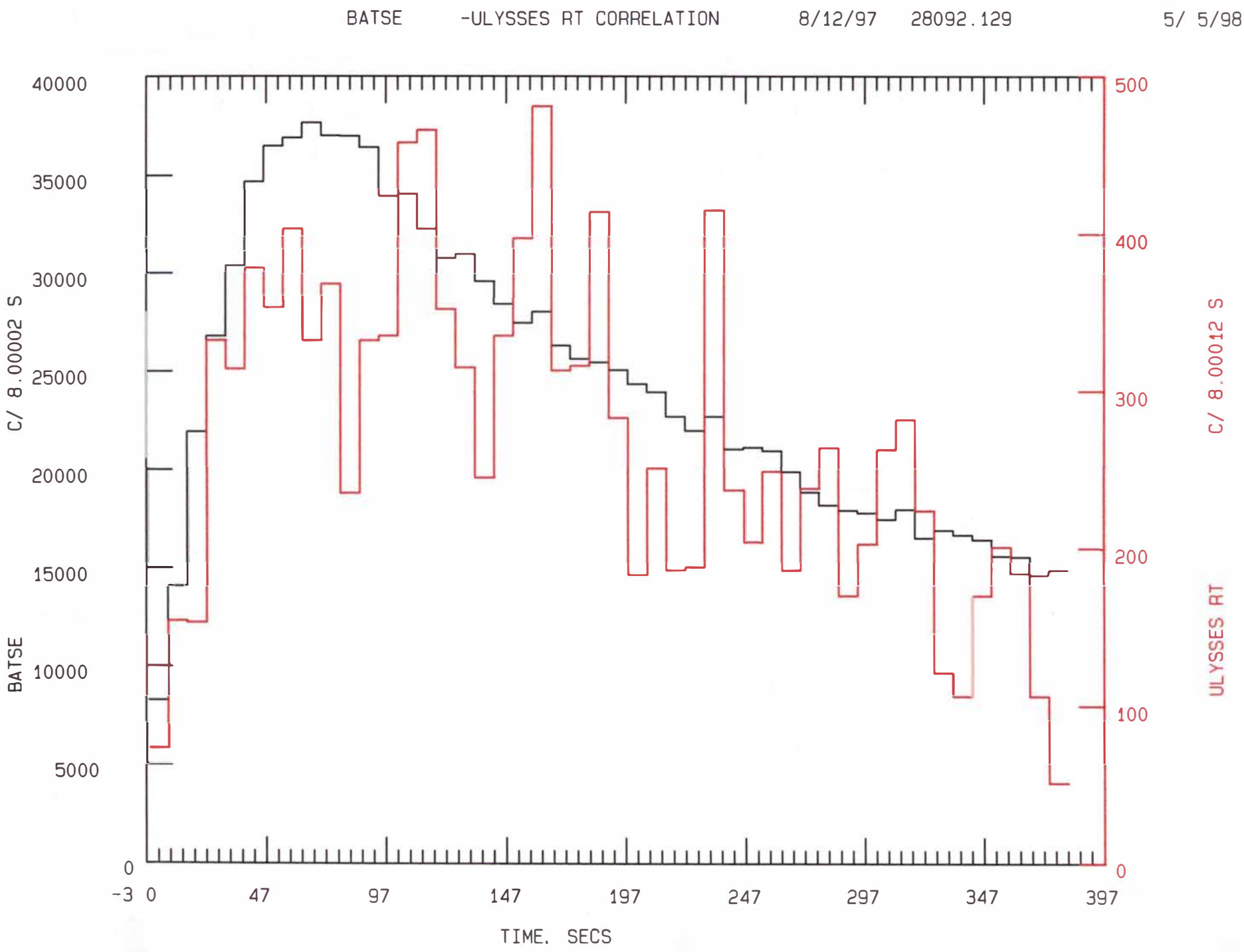
☑ ACCESS database updated?

# EVENT OF DEC 8, 1997 7:47

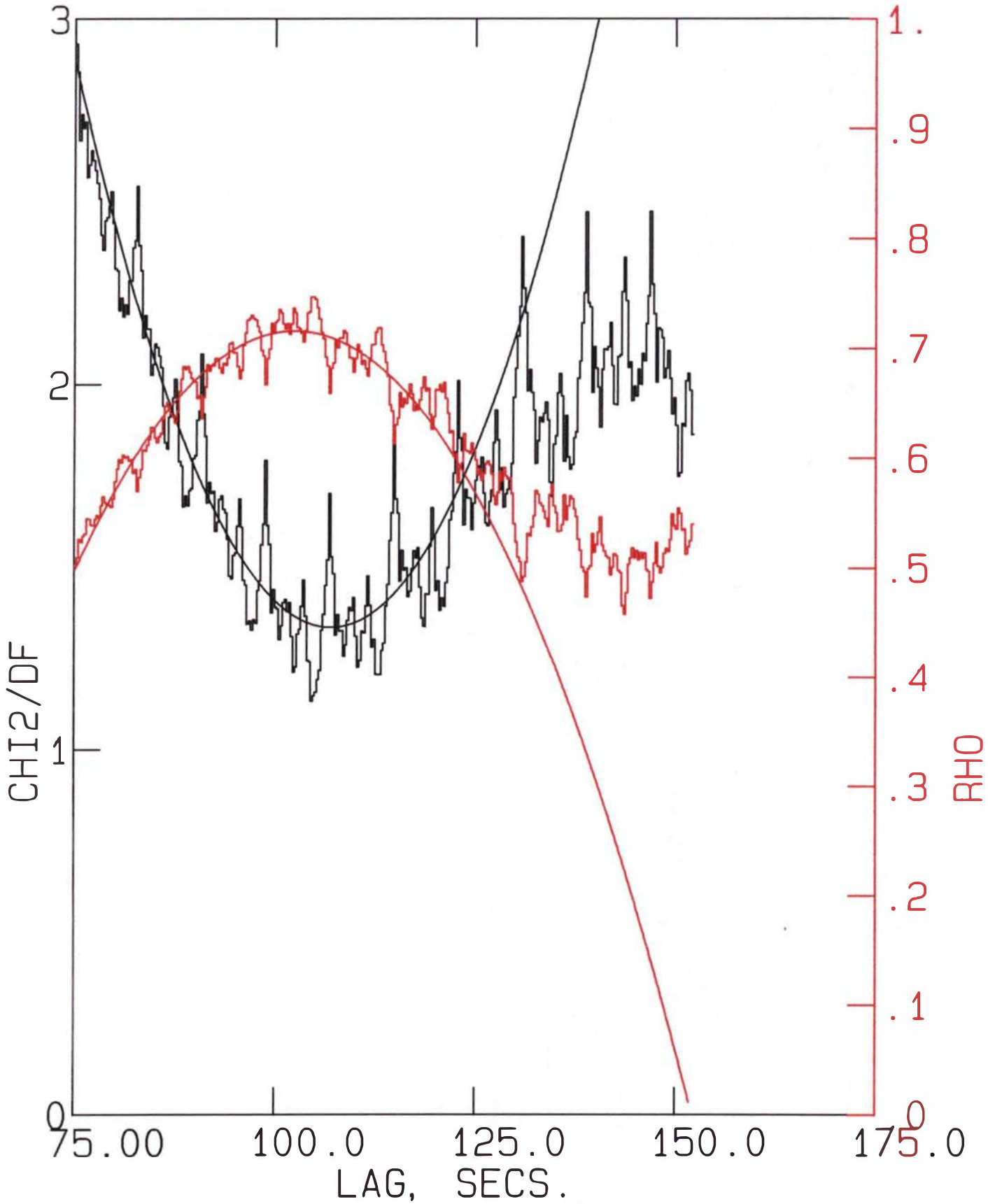
5/ 5/98

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




BATSE -ULYSSES RT CORRELATION 8/12/97 28092.129 5/ 5/98
40000
35000
30000
25000
20000
15000
10000
5000
0
BATSE
C/ 8.00002 S
500
400
300
200
100
0
ULYSSES RT
C/ 8.00012 S
-3
0
47
97
147
197
247
297
347
397
TIME. SECS

BATSE -ULYSSES RT CORRELATION 8/12/97 28092.129

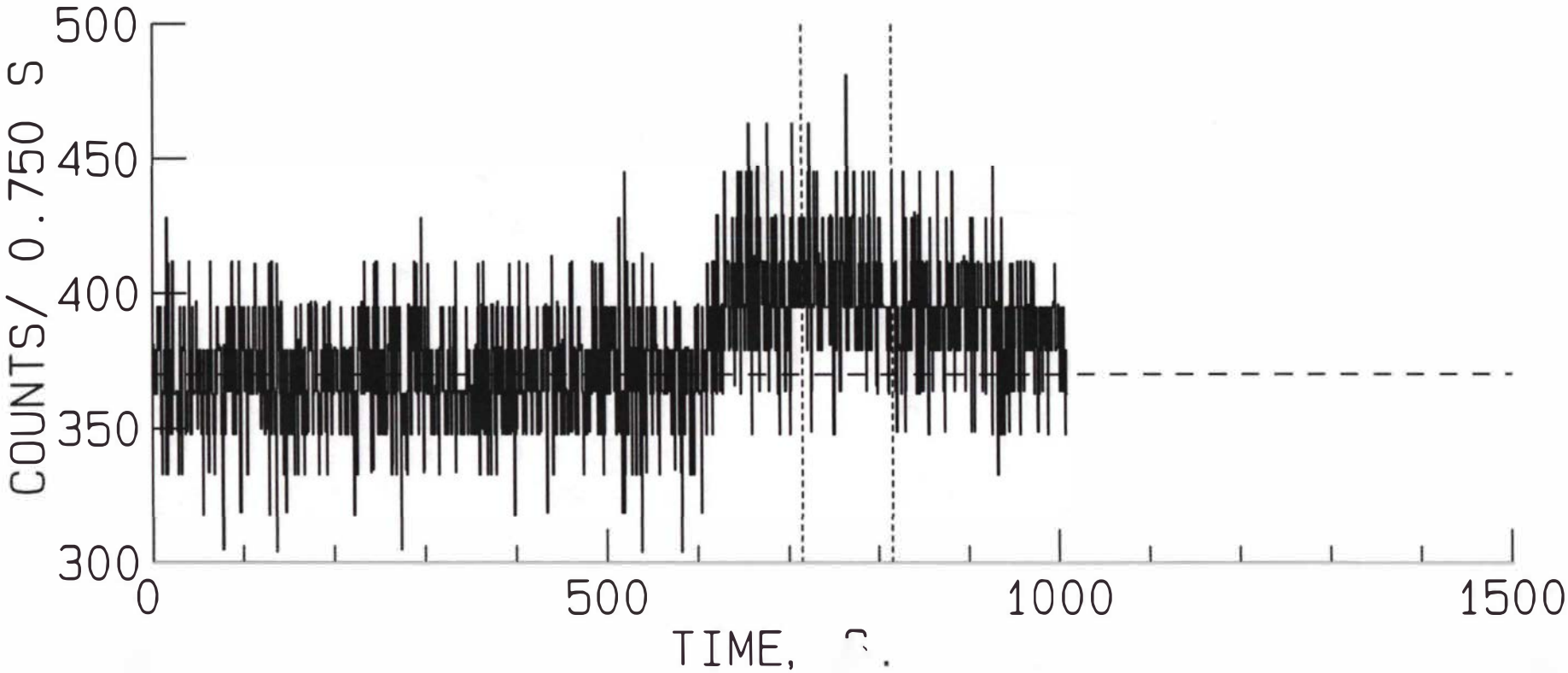


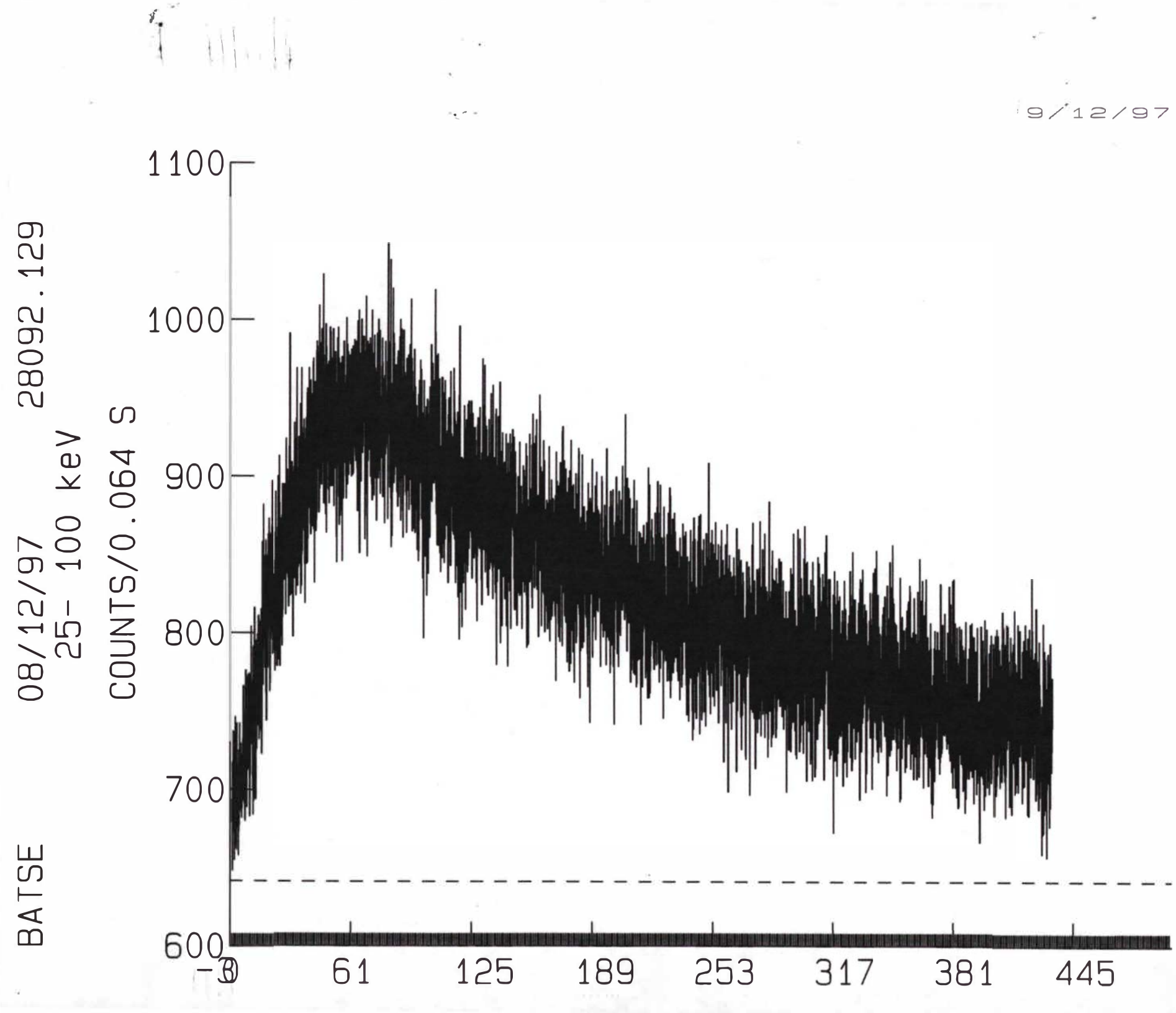
ULYSSES RT 5/ 5/98

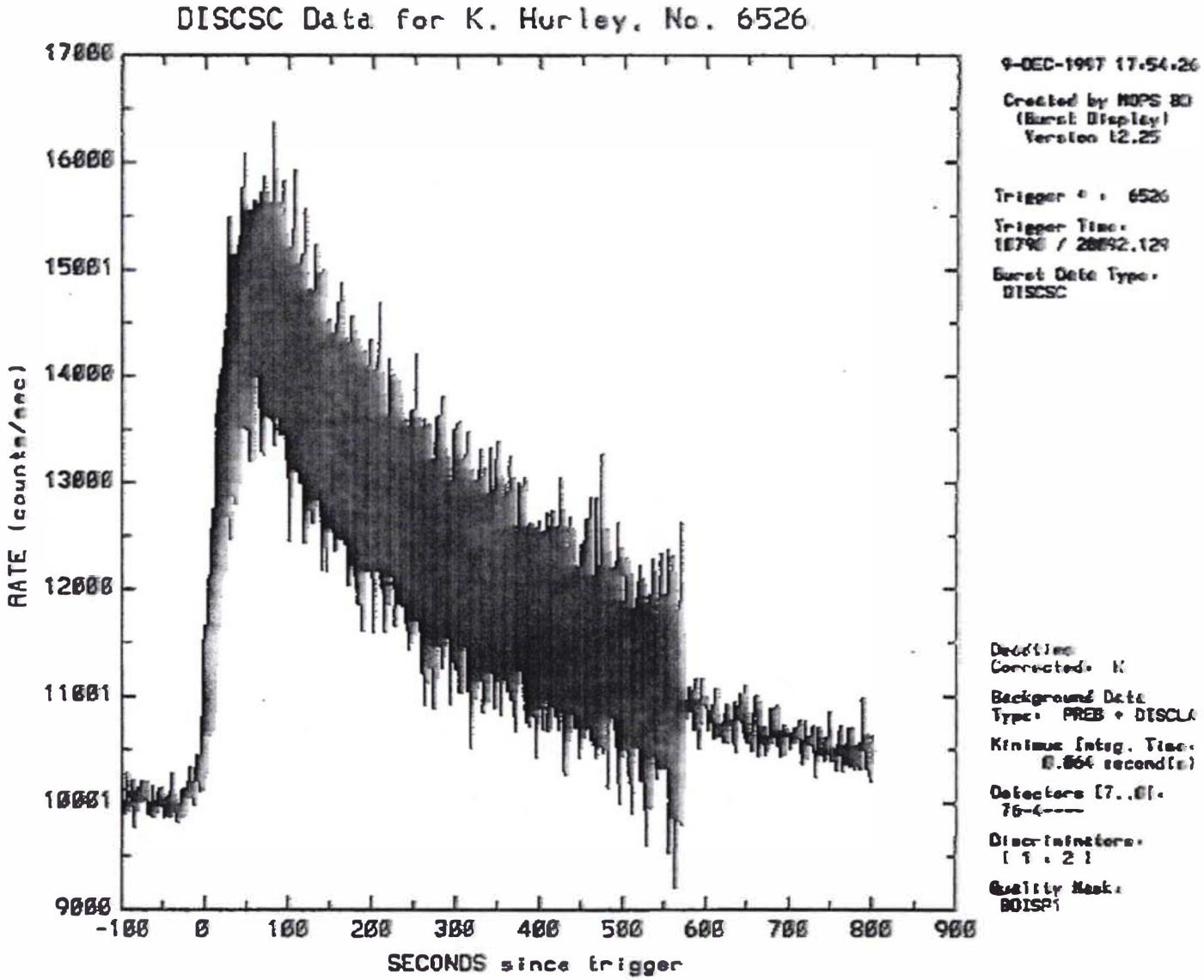
8/12/97 27576.155 s

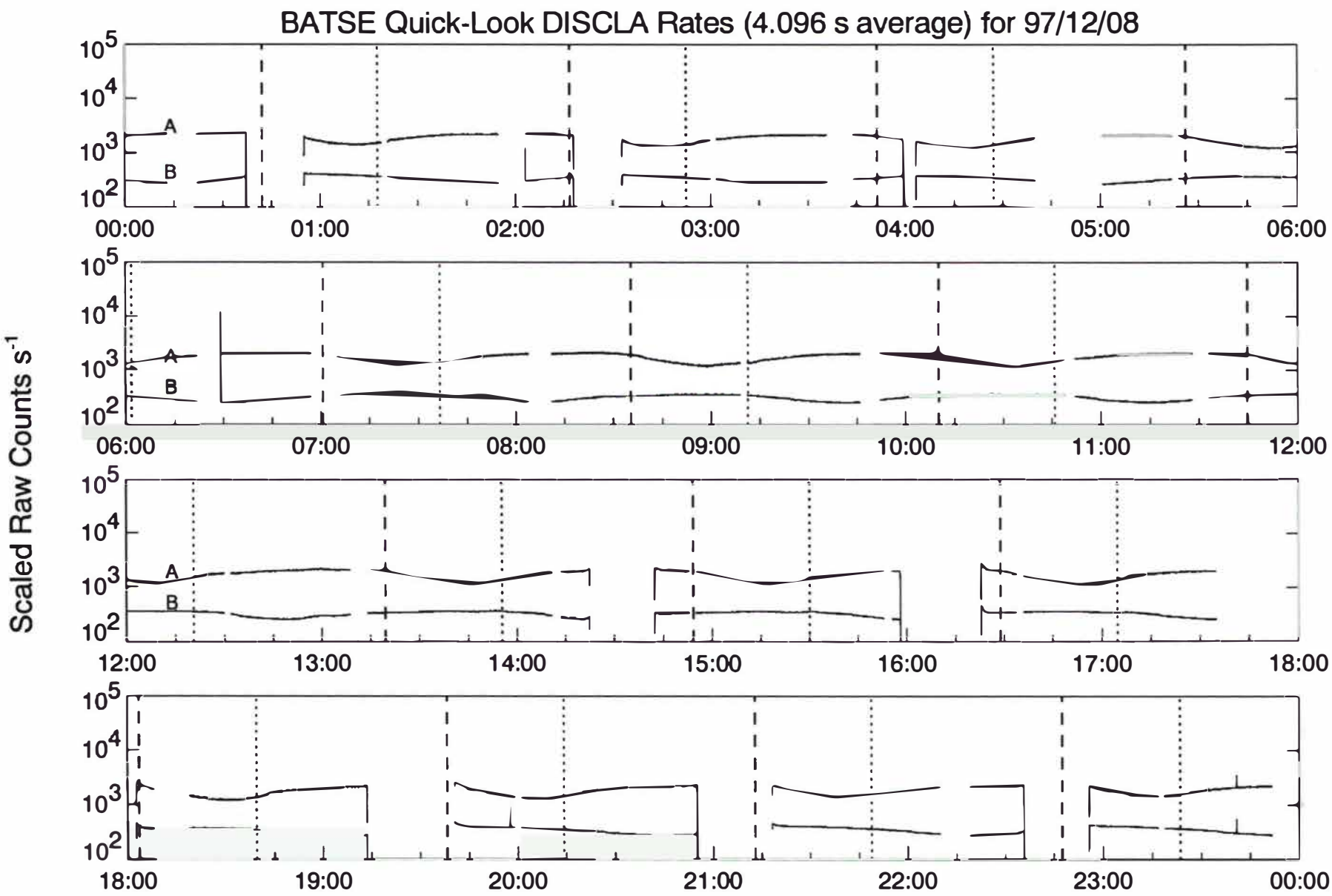
0.250 S INTERVALS REGROUPED BY 3

22- 148 keV




9/12/97
BATSE 08/12/97 28092.129
25- 100 keV
COUNTS/0.064 S
1100
1000
900
800
700
600
-3
0
61
125
189
253
317
381
445

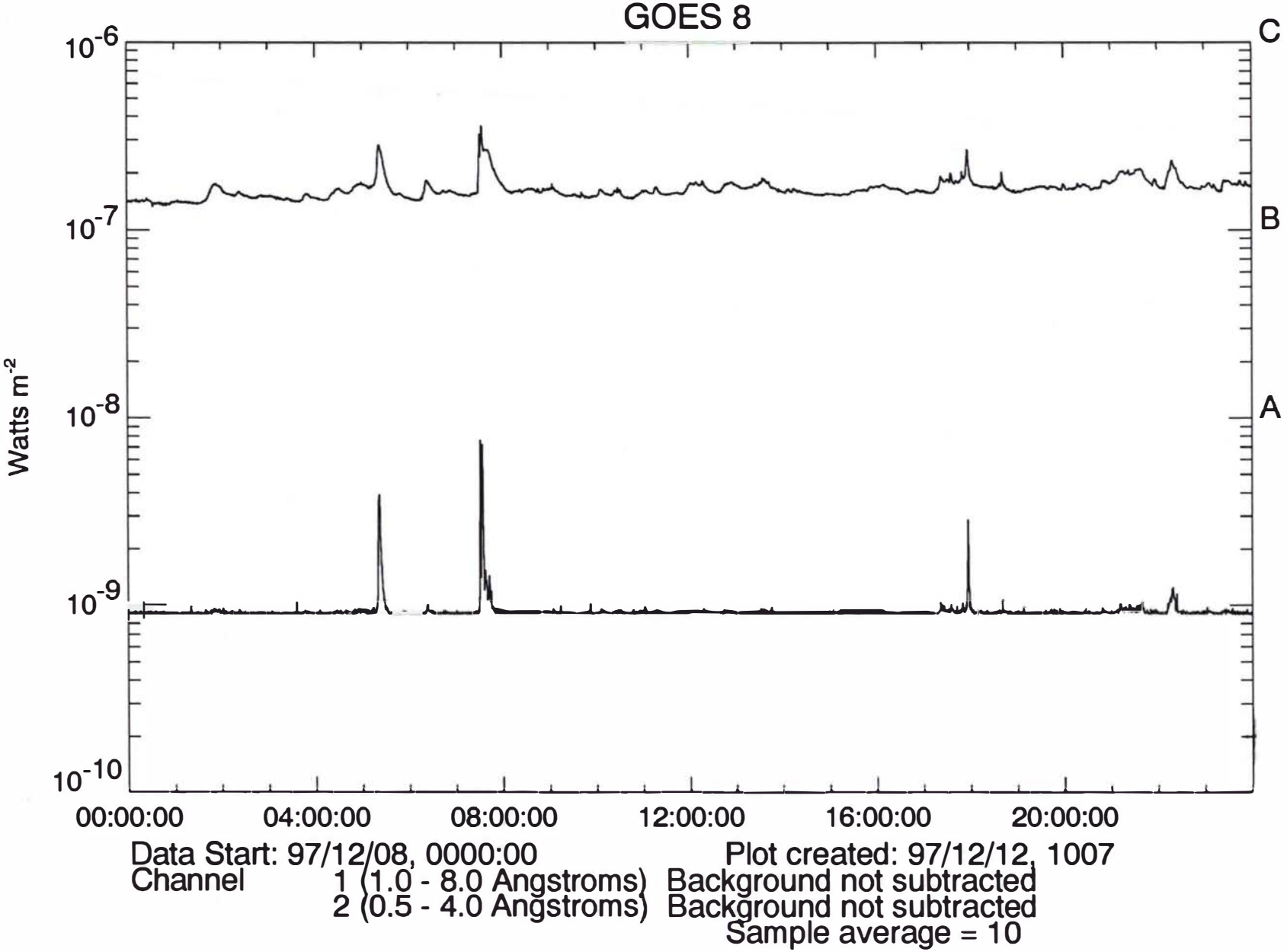

DISCSC Data for K. Hurley, No. 6526
RATE (counts/sec)
17000
16000
15000
14000
13000
12000
11000
10000
9000
-100
0
100
200
300
400
500
600
700
800
900
SECONDS since trigger
9-DEC-1997 17:54:26
Created by MOPS 80
(Burst Display)
Version 12.25
Trigger # : 6526
Trigger Time:
10790 / 28892.129
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Kinimax Integ. Time:
0.064 second(s)
Detectors [7..0]:
76-4----
Discriminators:
[ 1 , 2 ]
Quality Mask:
BDISP1



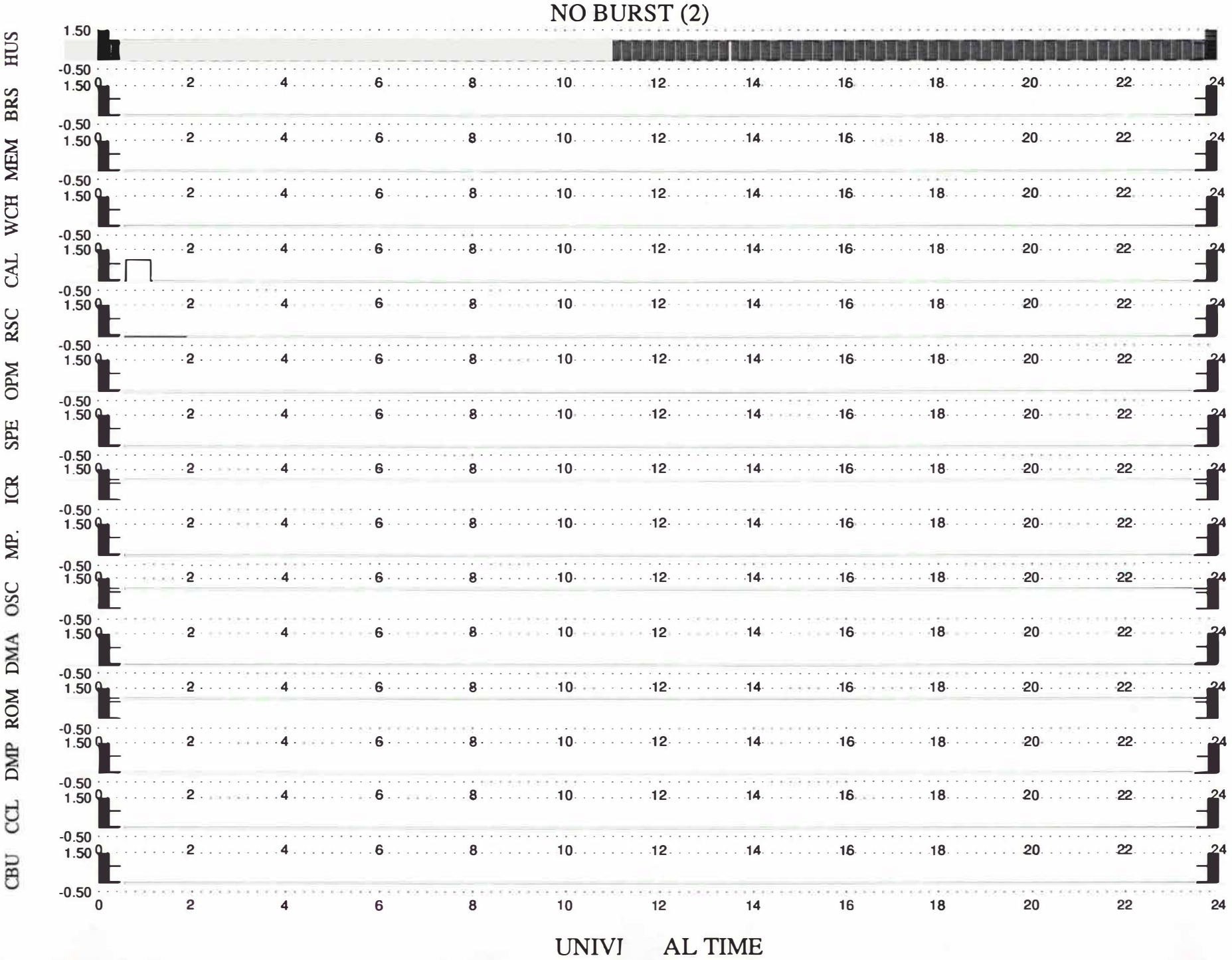

Current Time: 97/12/12, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05

Dotted line: Day entry
Dashed line: Night entry

* Solar Burst Trigger
\+ Solar Flare

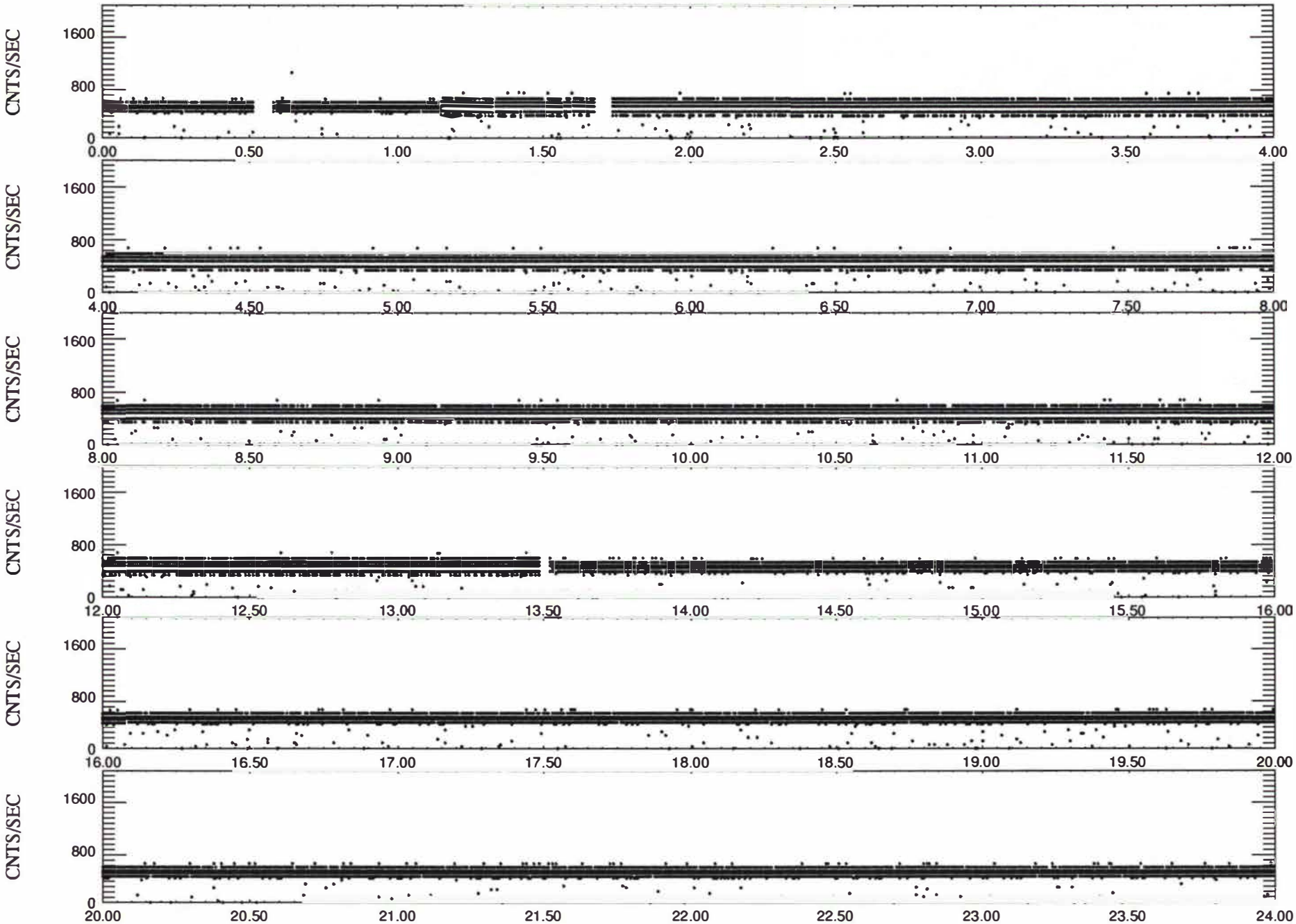

GOES 8
C
B
A
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/08, 0000:00
Plot created: 97/12/12, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 342, year 1997 to day 342, year 1997 3/12/98



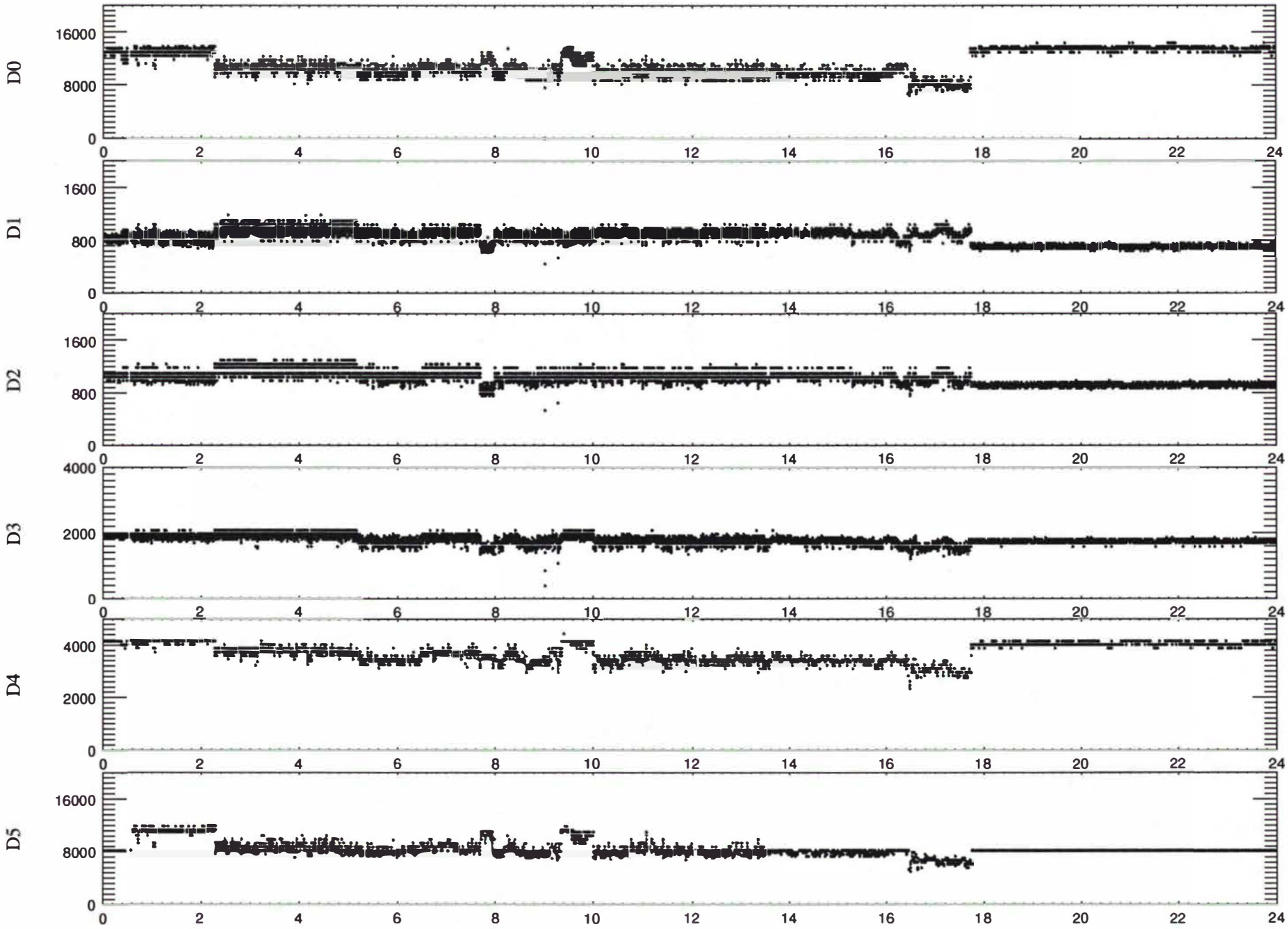
HUS 2A, MODE 1, NOT AVERAGED EDR day 342, year 1997 to day 342, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV AL TIME

HUS 2B COUNTS / SEC EDR day 342, year 1997 to day 342, year 1997 3/12/98



From RICHARDSON@SSLMOR.msfc.nasa.gov Thu Dec 11 12:29:19 1997
Return-Path: <RICHARDSON@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA14569; Thu, 11 Dec 1997 12:29:14 -0800
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA12557; Thu, 11 Dec 1997 12:29:07 -0800
Date: Thu, 11 Dec 1997 14:25:27 -0600 (CST)
From: RICHARDSON@SSLMOR.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971211142527.21e13883@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6527
Content-Length: 1135
X-Lines: 26
Status: RO

Trigger

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

BATSE BURST # 6527
EVENT OF 1997 DEC 9 DAY OF YEAR=343
EVENT CROSSING TIME AT BATSE : 83436. S. OR 23:10:36.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 241.000 62.000
BATSE PEAK COUNTING RATE: 30000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 9/12/ 97 IS:
RA= 170.745 DEC= 12.082 DIST= 5.241 AU
BATSE-ULYSSES DISTANCE = 784020384. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=109.87 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -888.91 SECS.
CROSSING TIME AT ULYSSES IS 82547. S. OR 22:55:47 +/- 463.51 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 9/12/ 97 IS:
RA= 294.817 DEC= -22.743 DIST= 2.060 AU
MARS-BATSE DISTANCE = 308221216. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 85.08 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 88.15 SECS.
CROSSING TIME AT MARS IS 83524. S. OR 23:12:04 +/- 179.18 SECONDS

BATSE BURST TRIGGER
NO.: 6527

TIME: TJD=0791 SECONDS=83436

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=115.0 AZIMUTH=48.8 ERROR=0.8 DEGREES

COMMENTS:
GRB SINGLE PULSE. DURATION APPROX. = 2 SEC. SLIGHTLY VISIBLE ABOVE 300KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6527 | 971209 | 10791 | 83436 | 30000 | 241 | +62 | 2 |

Date: Feb 9 00

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☐ Jim Schmidling's stat file correction applied? Helio corr removed

☐ Final ephemeris used?

☐ Final, CDROM data used?

☐ 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

☐ BATSE ephemeris for $T_0$?

☐ Error circle position and radius from public catalog used?

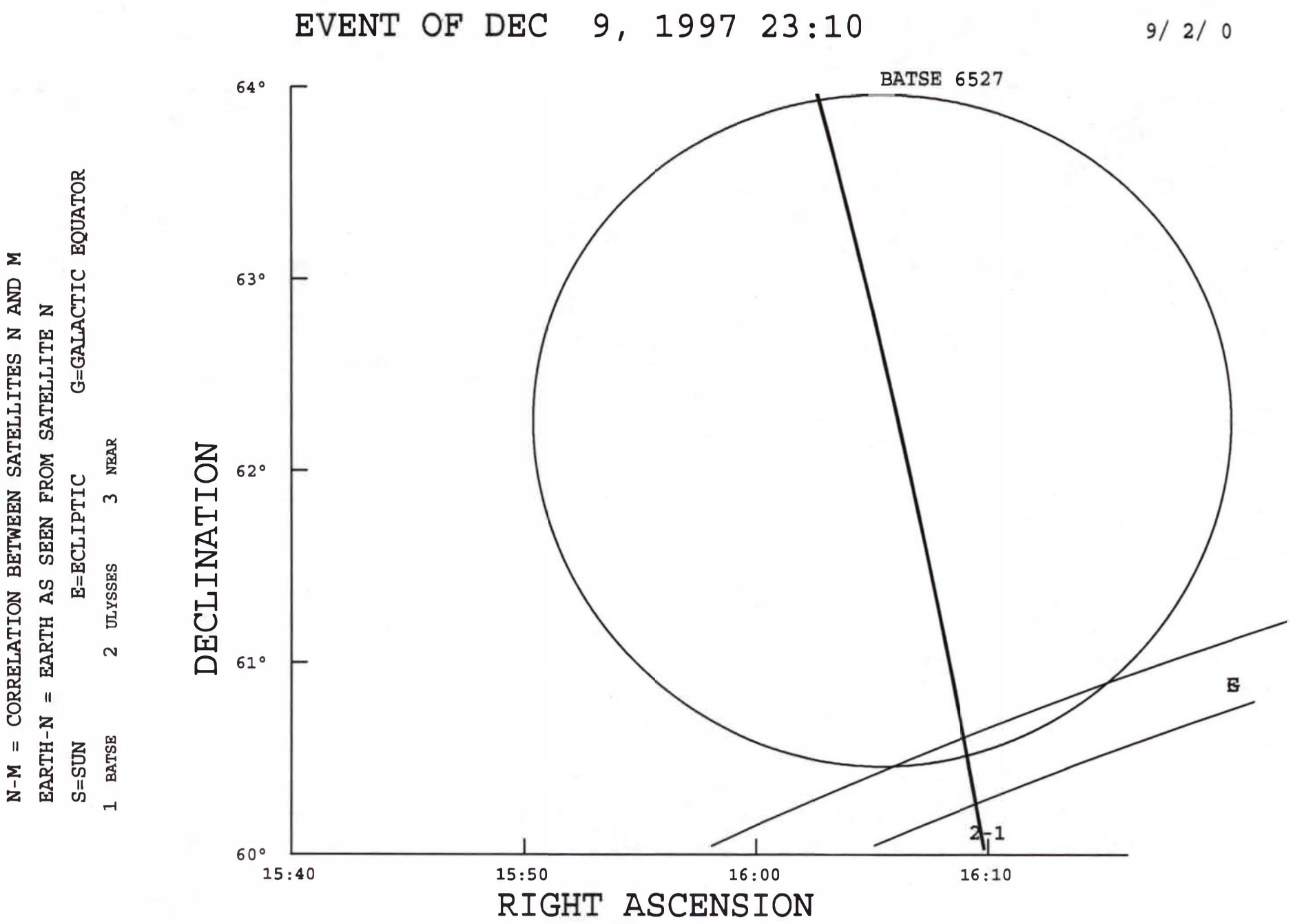
☐ If MER data were used, is a 30 ms systematic error included?

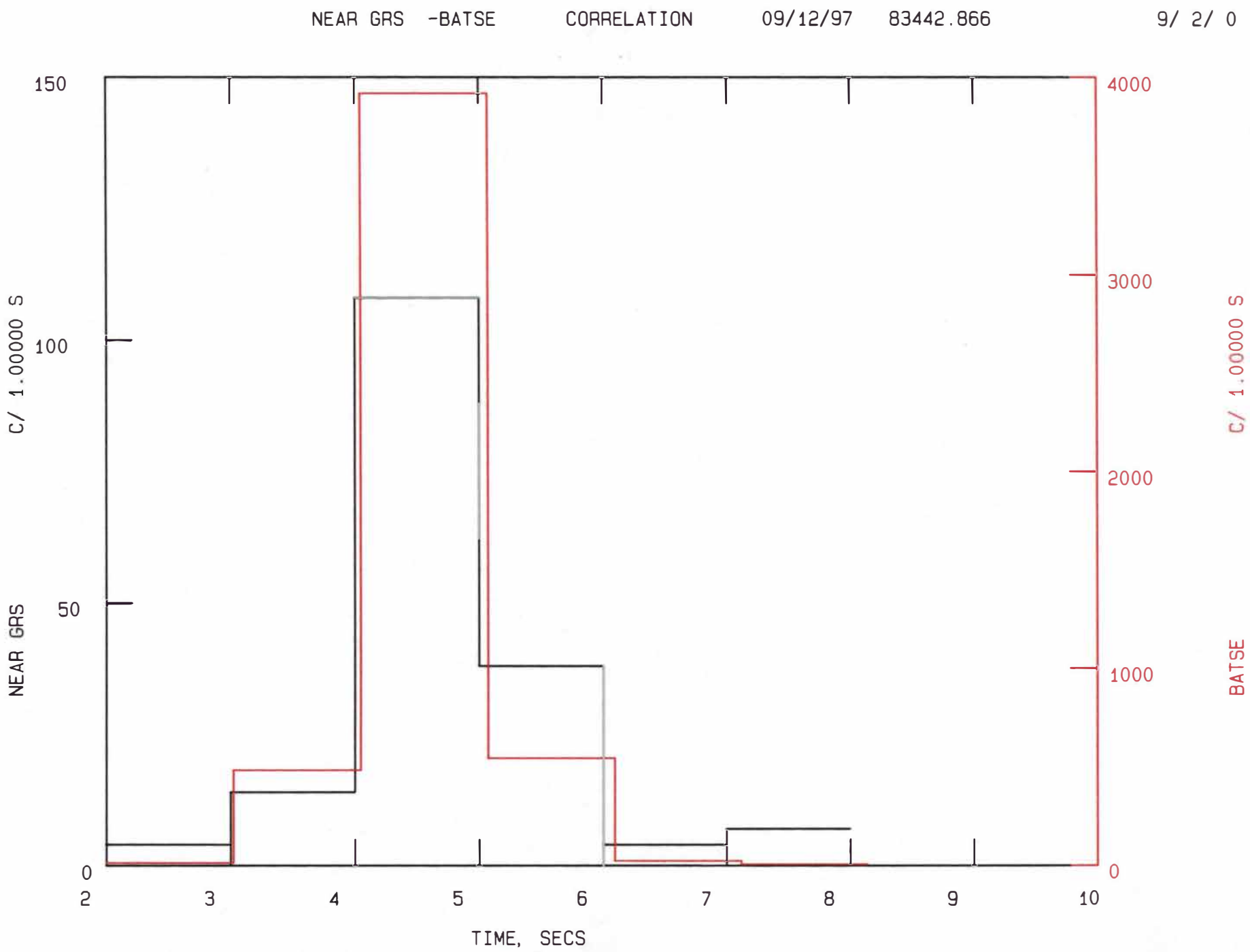
## 3. NEAR Data

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

☑ BATSE >100 keV data used for NEAR correlation?

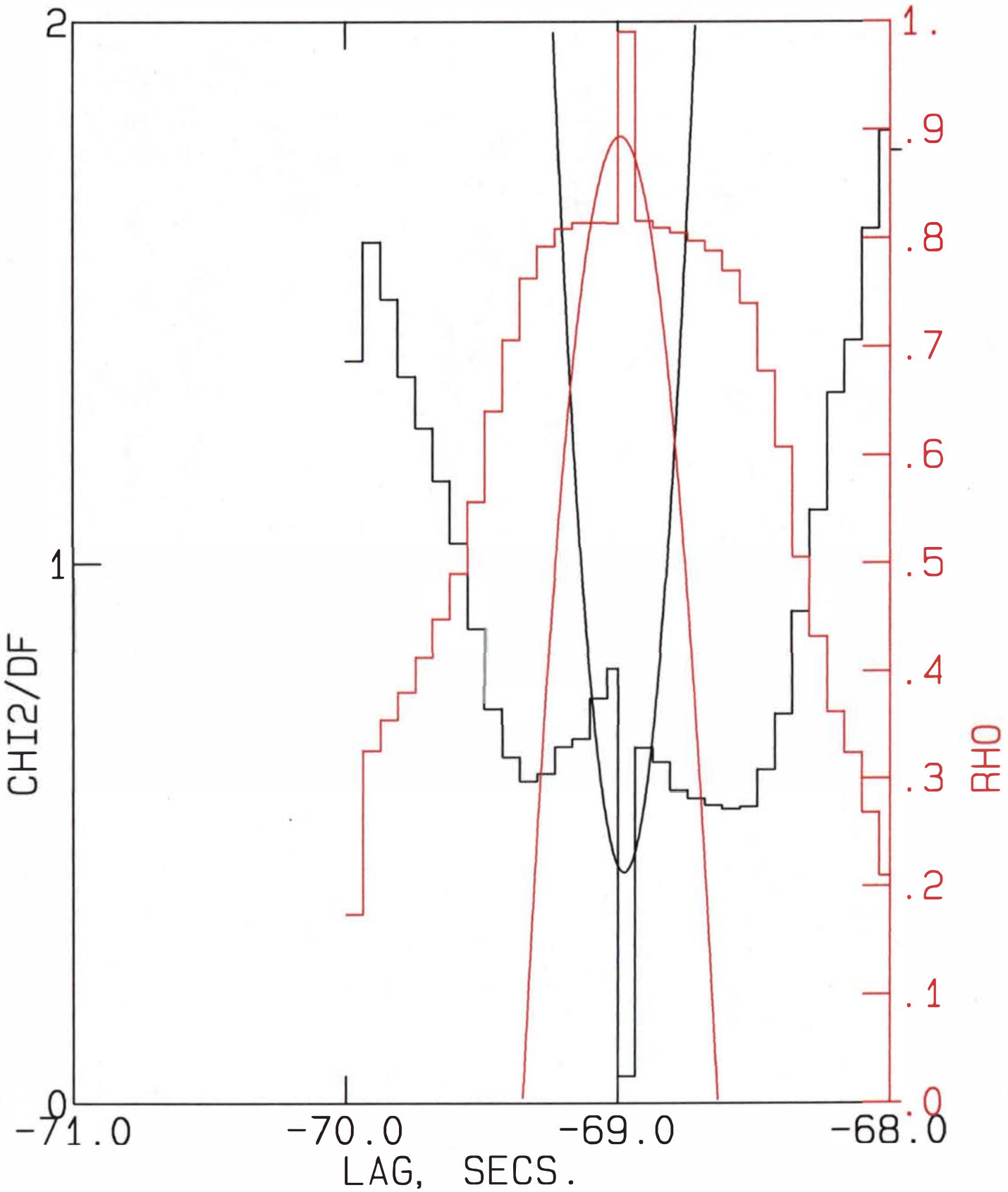
☑ ACCESS database updated?


EVENT OF DEC 9, 1997 23:10
9/ 2/ 0
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 3 NEAR
BATSE 6527
64°
63°
62°
61°
60°
DECLINATION
15:40
15:50
16:00
16:10
RIGHT ASCENSION
E
2-1


NEAR GRS -BATSE CORRELATION 09/12/97 83442.866 9/ 2/ 0
150
100
50
0
C/ 1.00000 S
NEAR GRS
4000
3000
2000
1000
0
C/ 1.00000 S
BATSE
2
3
4
5
6
7
8
9
10
TIME, SECS

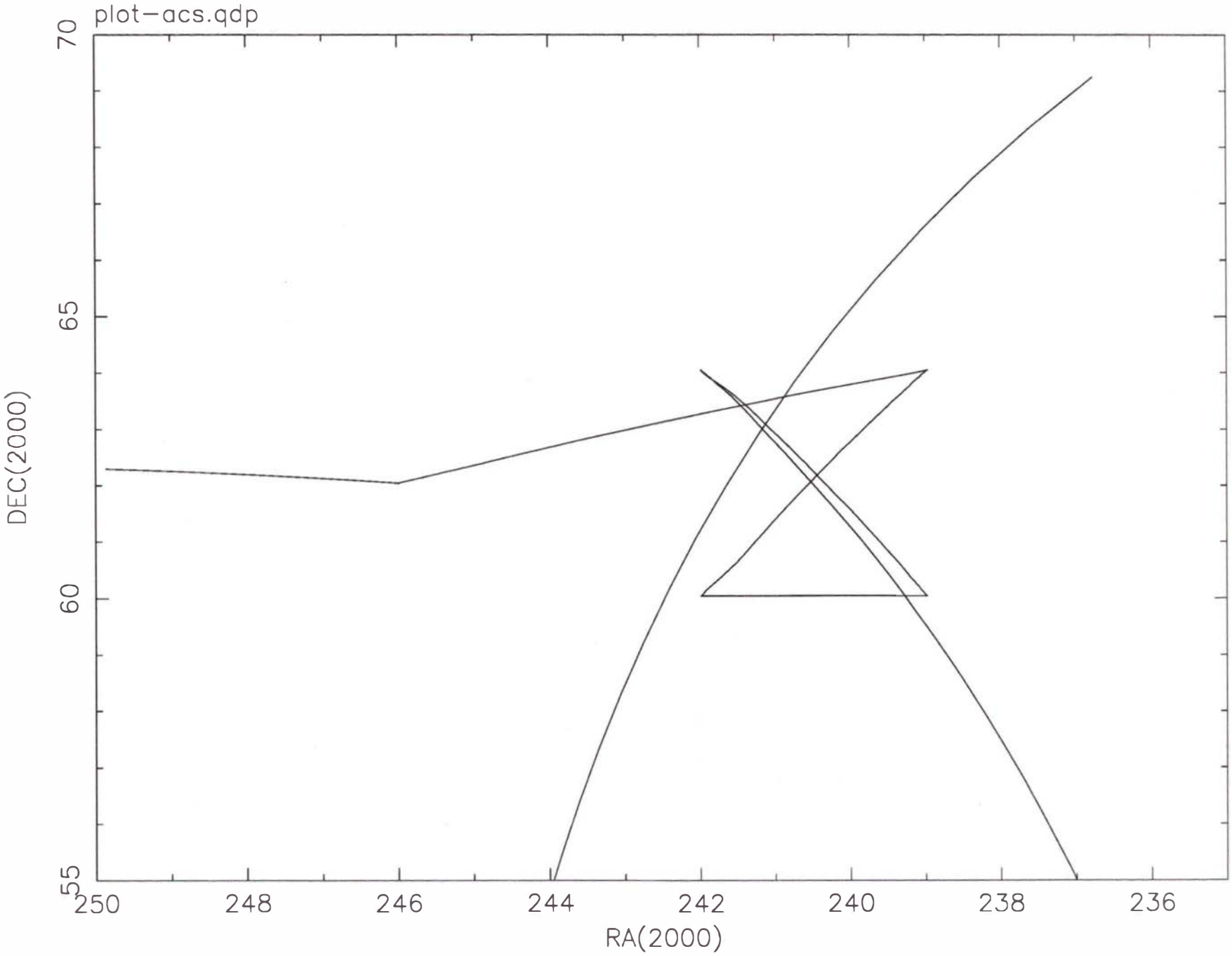
9/ 2/ 0

NEAR GRS -BATSE CORRELATION 09/12/97 83442.866

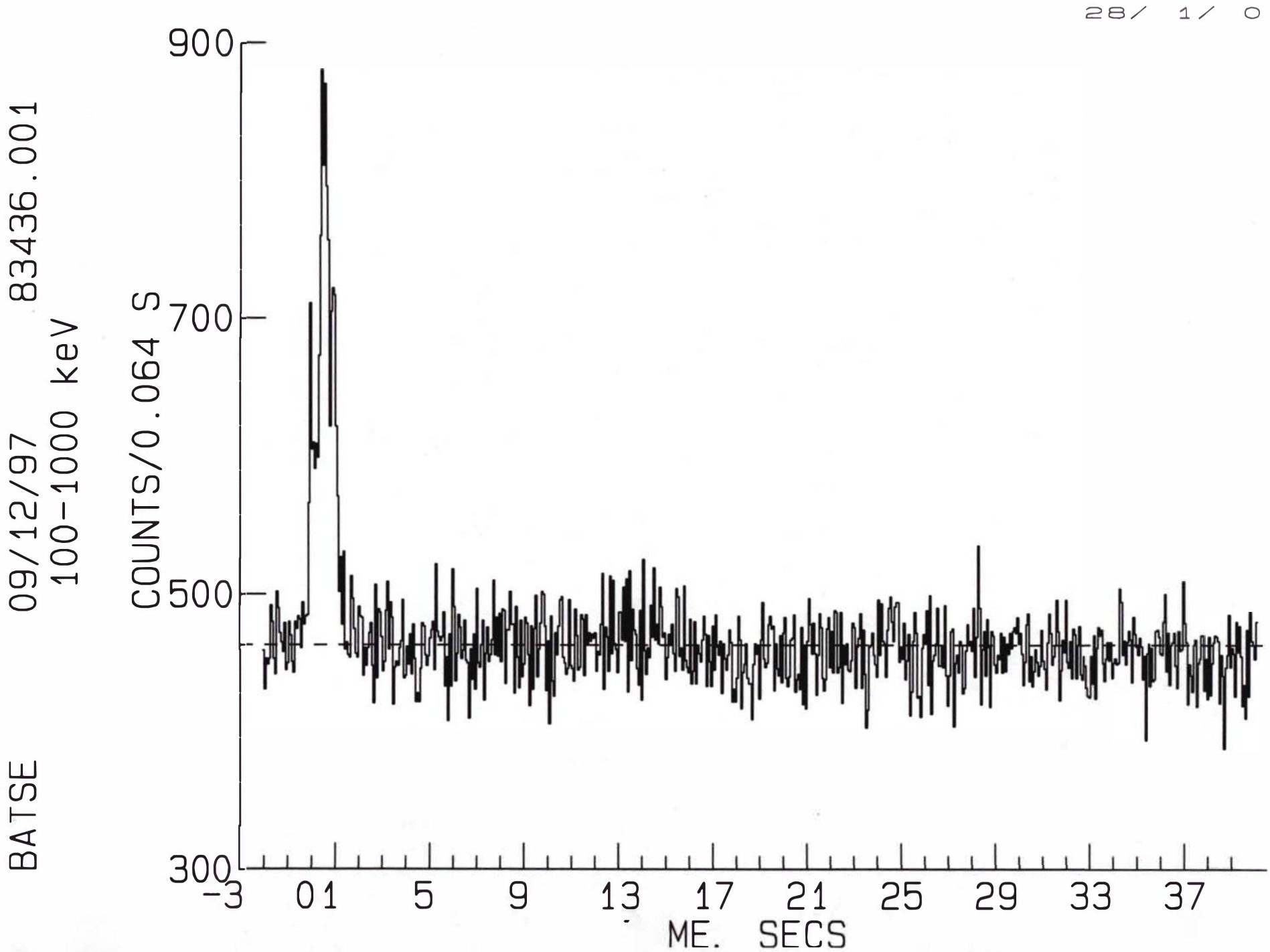


XTE Scan Path

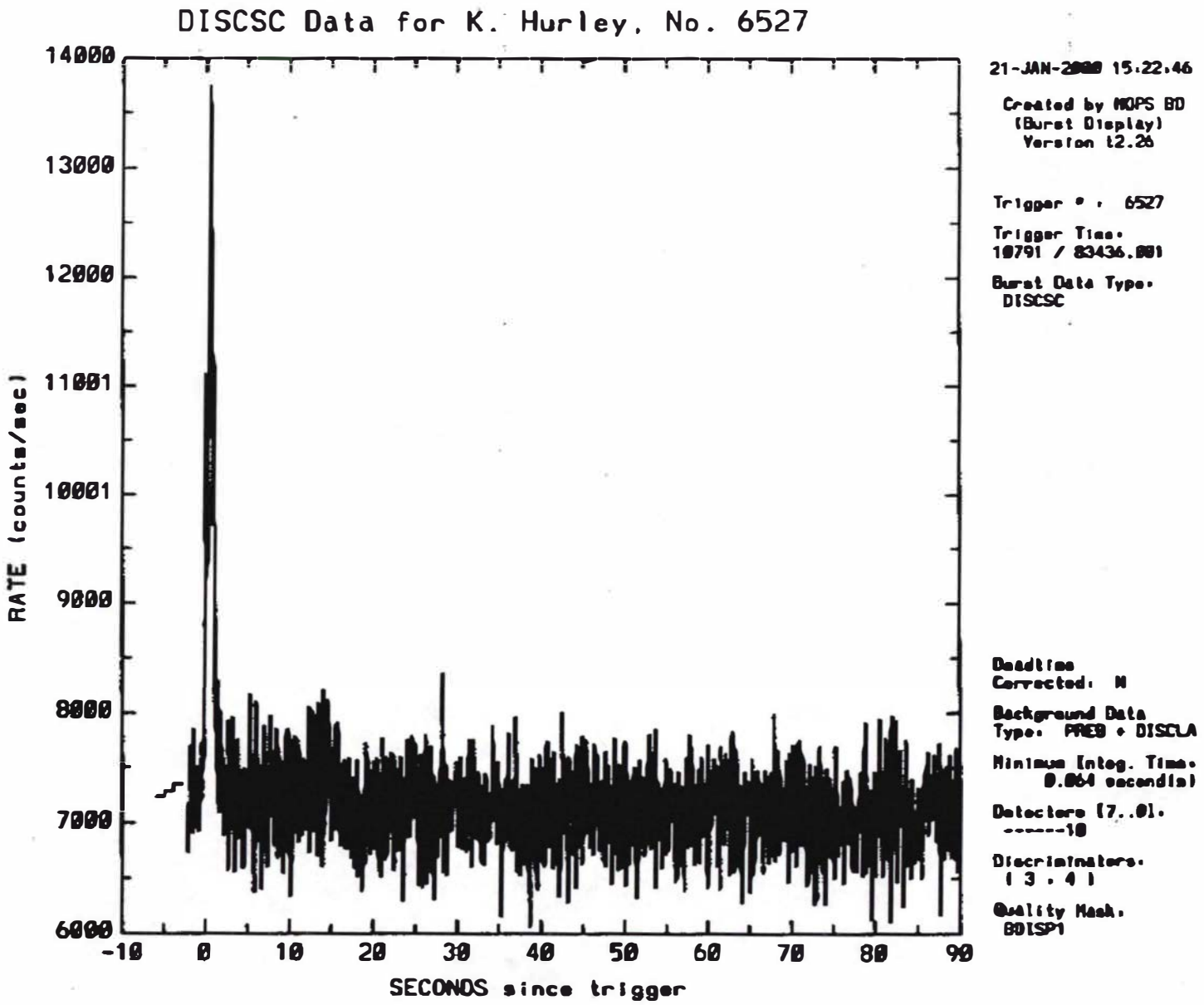
FITS/D1438-23-58-20R/acs/FH0e_7691e1c-7694146

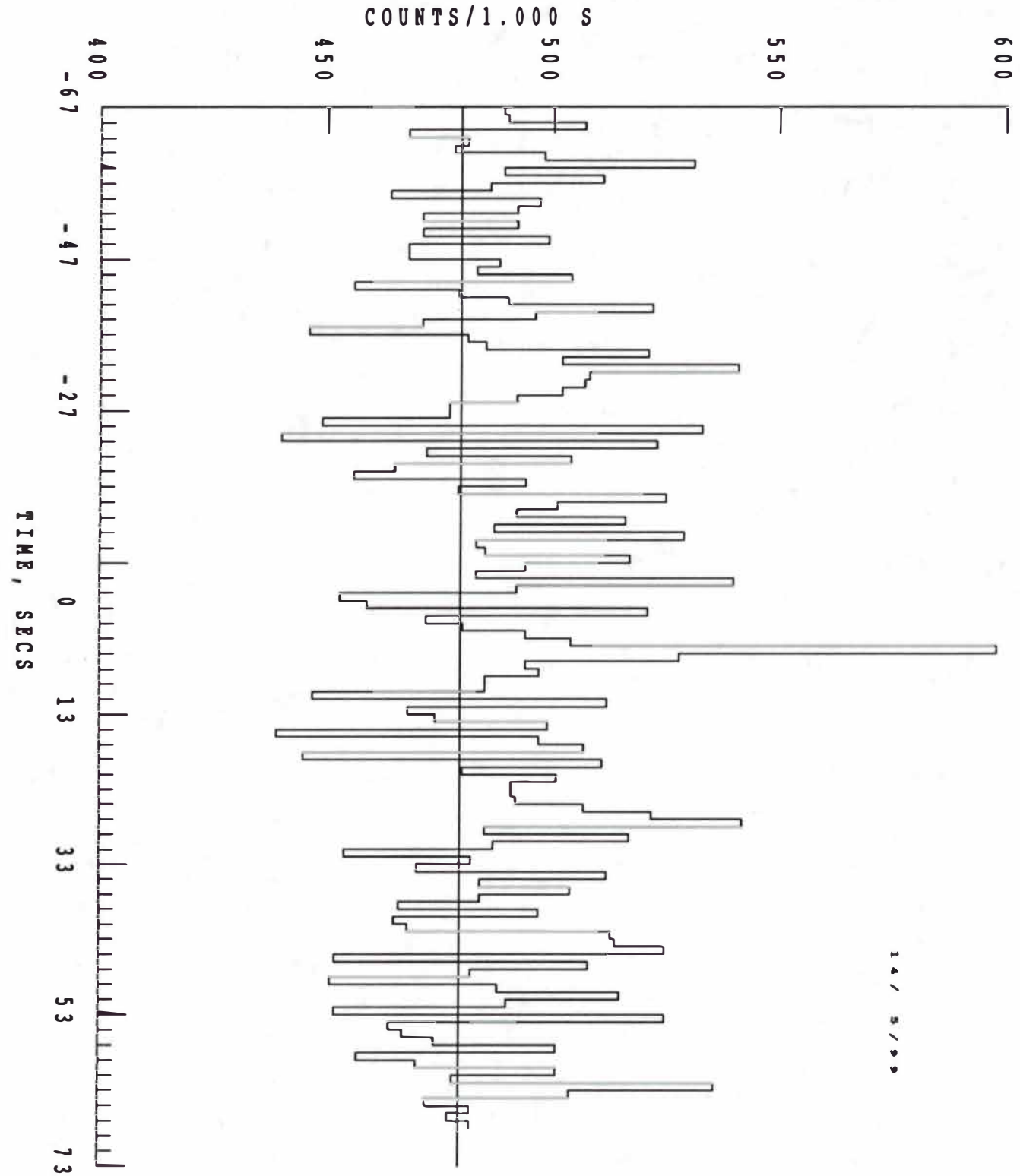



marshall 11-Dec-1997 09:44


28/ 1/ 0
BATSE 09/12/97 83436.001
100-1000 keV
COUNTS/0.064 S
900
700
500
300
-3
01
5
9
13
17
21
25
29
33
37
ME. SECS

BATSE 2565445800 01-21-2000 16:06




NEAR
09/12/97
83442.866
100-1000 keV
COUNTS/1.000 S
400
450
500
550
600
-67
-47
-27
0
13
33
53
73
TIME, SECS
14/ 5/99

Date: May 5 '98

# 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? N/A

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

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

## 2. BATSE Data

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

☑ BATSE ephemeris for $T_0$?

☑ Error circle position and radius from public catalog used?

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

## 3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

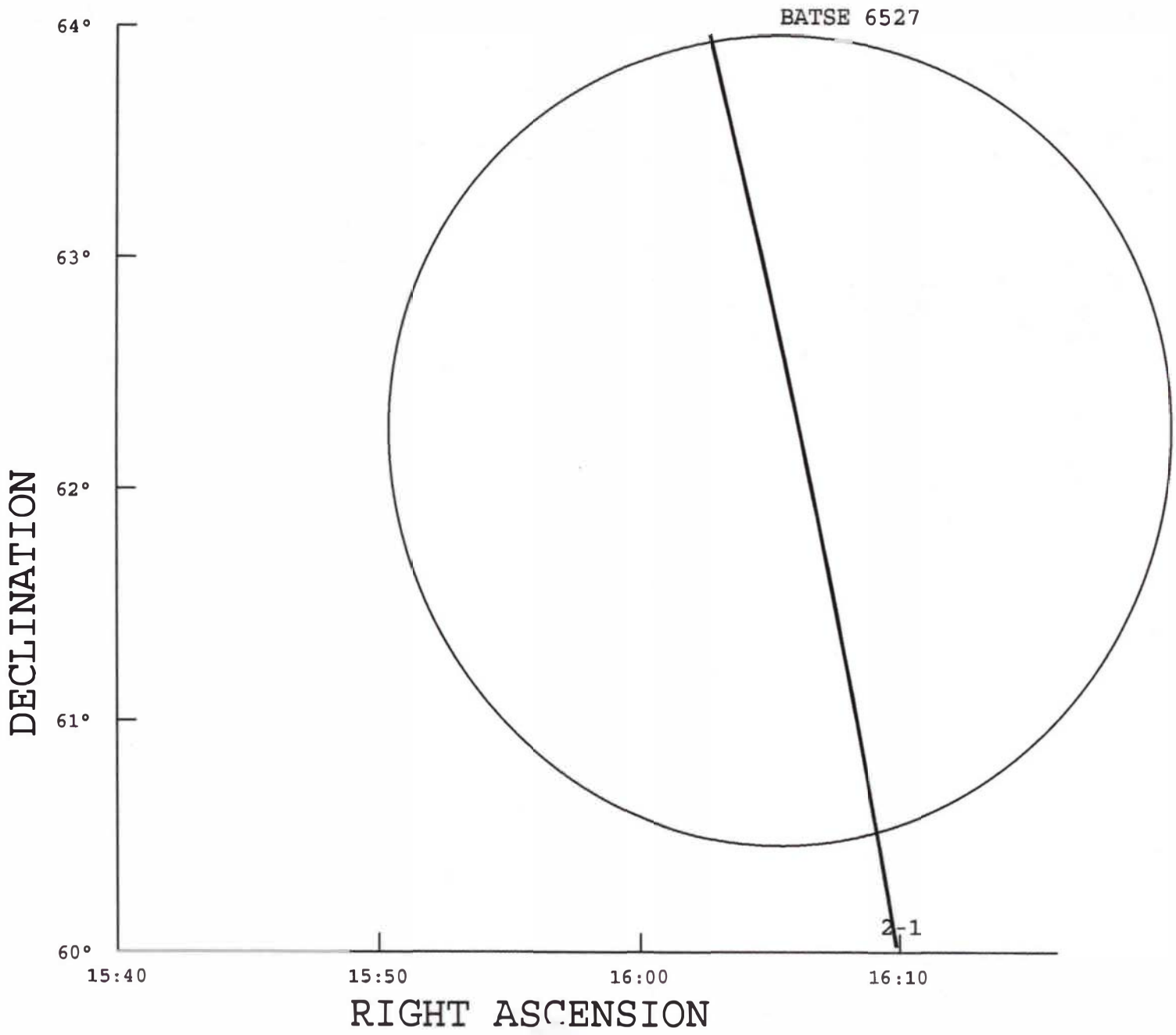
☐ 2000 coordinates used?

☐ Geocentric time used?

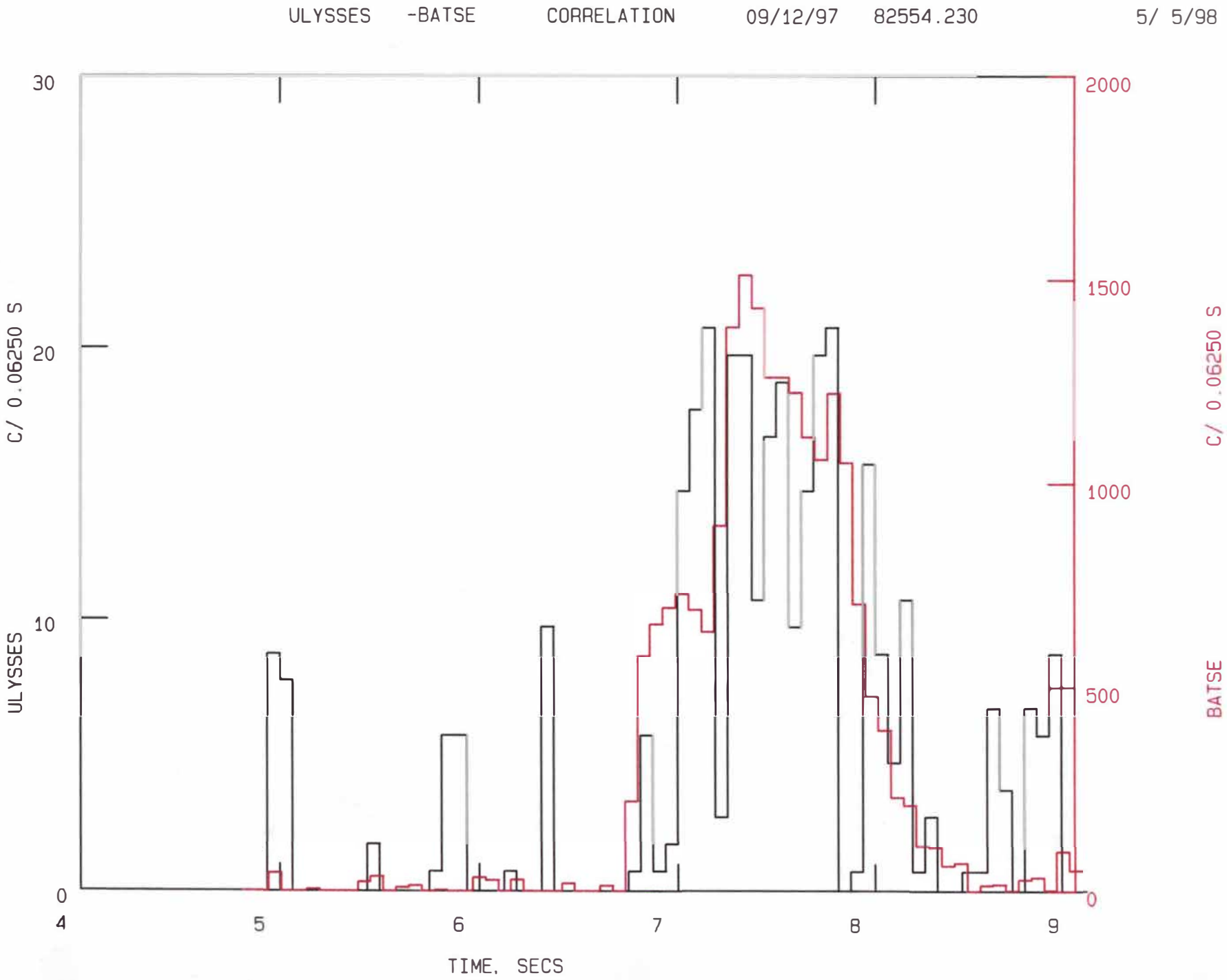
☑ ACCESS database updated?

# EVENT OF DEC 9, 1997 22:55

5/ 5/98

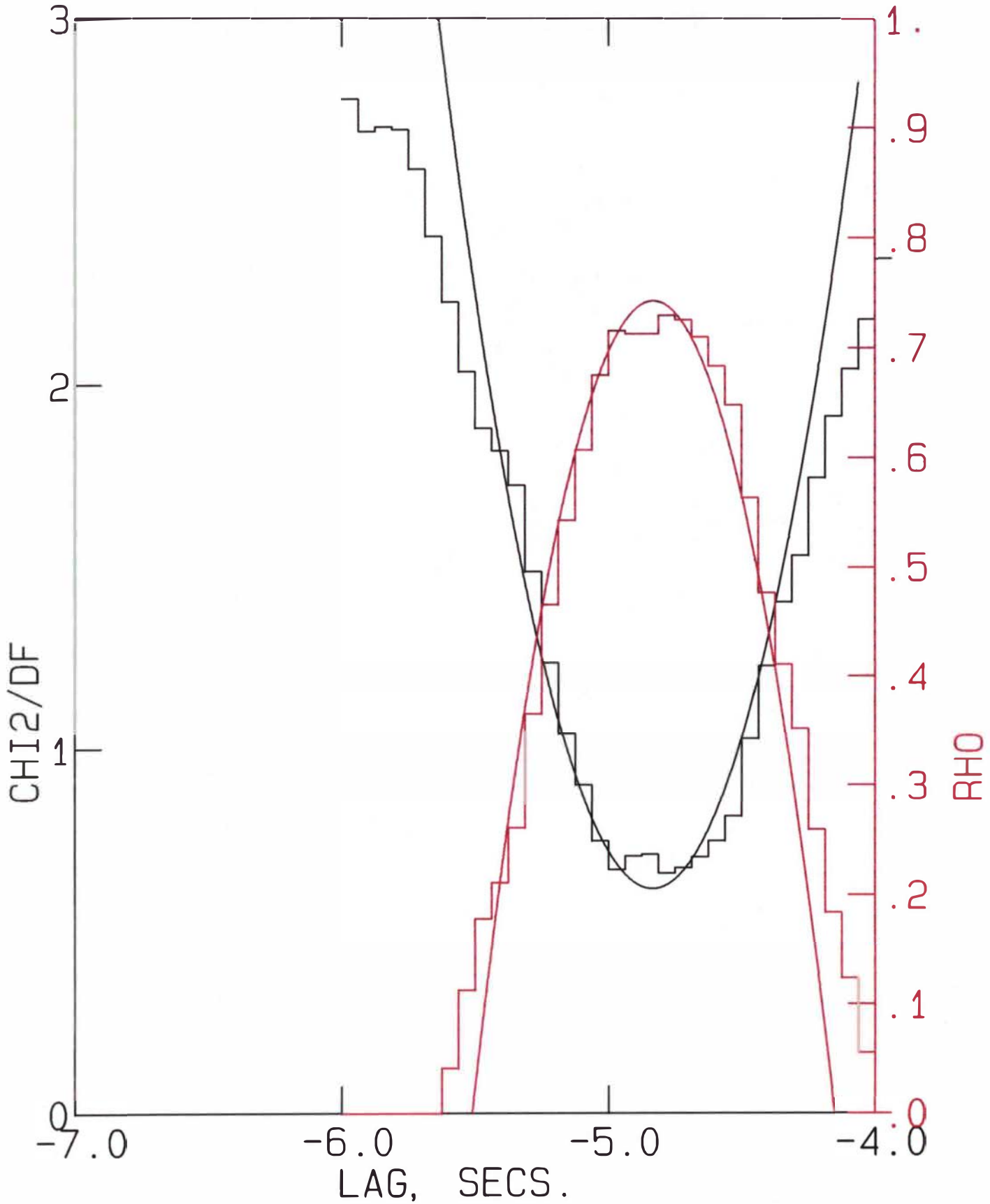


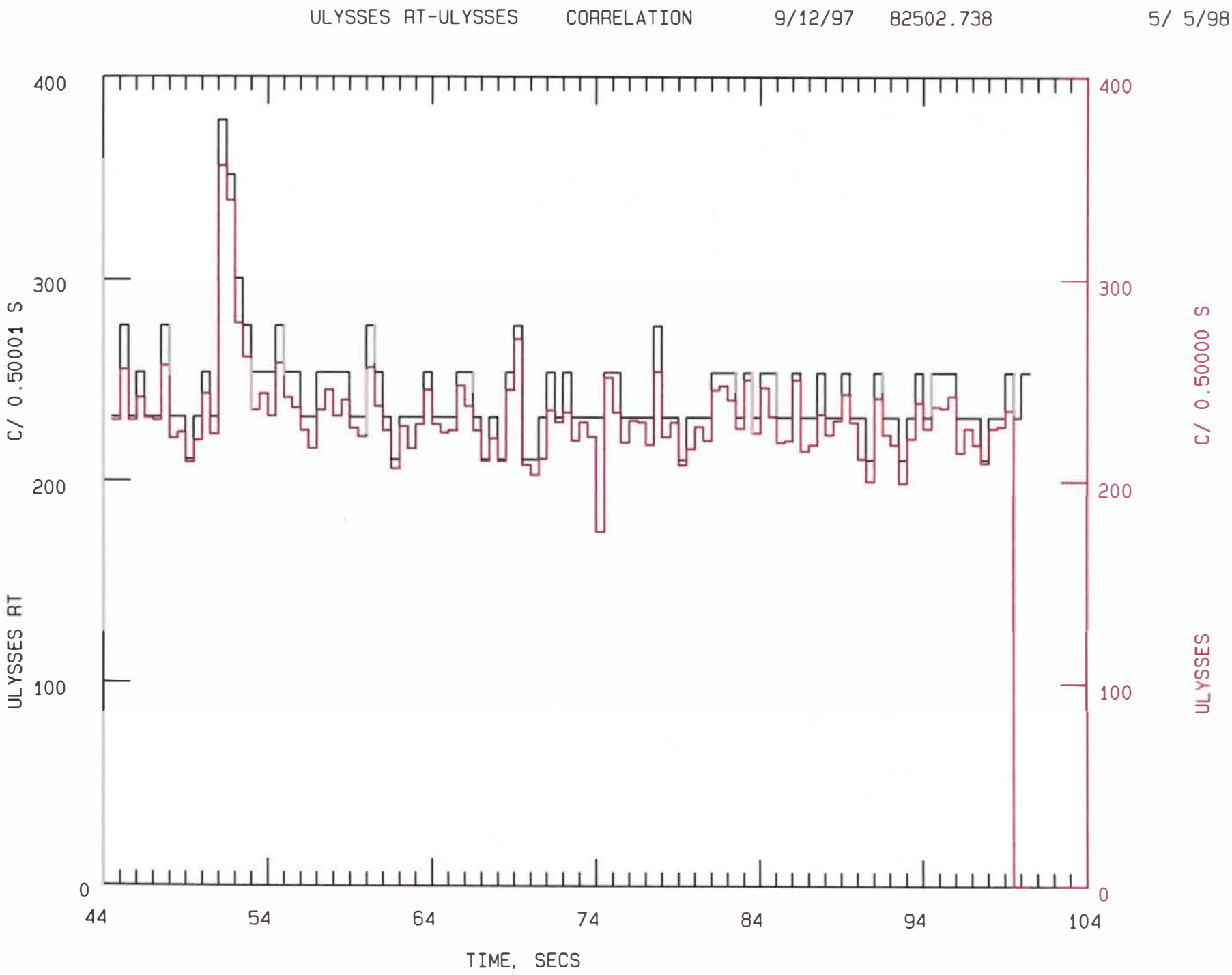

N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE


ULYSSES -BATSE CORRELATION 09/12/97 82554.230 5/ 5/98
30
20
10
0
C/ 0.06250 S
ULYSSES
2000
1500
1000
500
0
C/ 0.06250 S
BATSE
4
5
6
7
8
9
TIME, SECS

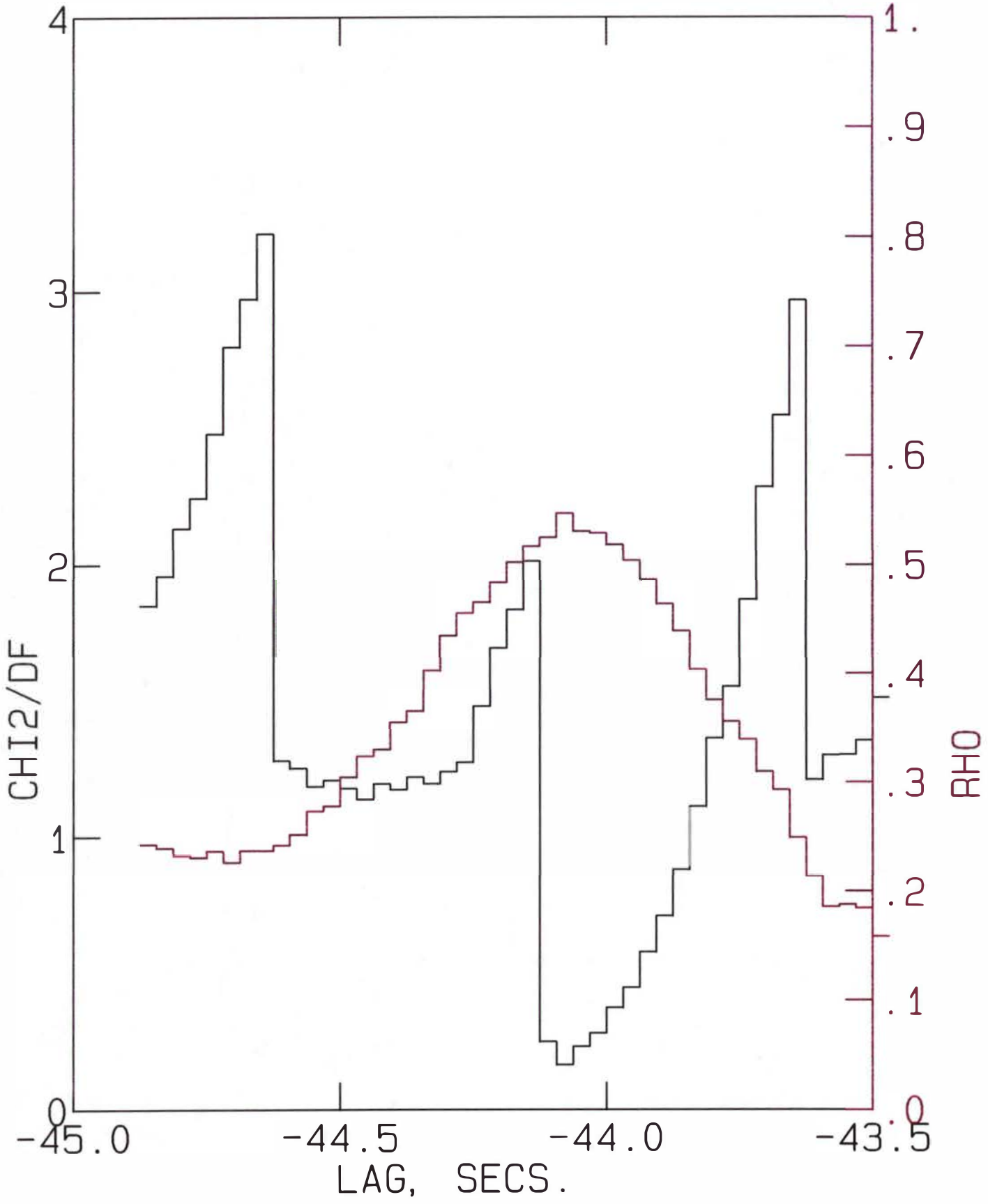
5/ 5/98

ULYSSES -BATSE CORRELATION 09/12/97 82554.230




ULYSSES RT-ULYSSES CORRELATION 9/12/97 82502.738 5/ 5/98
400
300
200
100
0
C/ 0.50001 S
ULYSSES RT
400
300
200
100
0
C/ 0.50000 S
ULYSSES
44
54
64
74
84
94
104
TIME, SECS

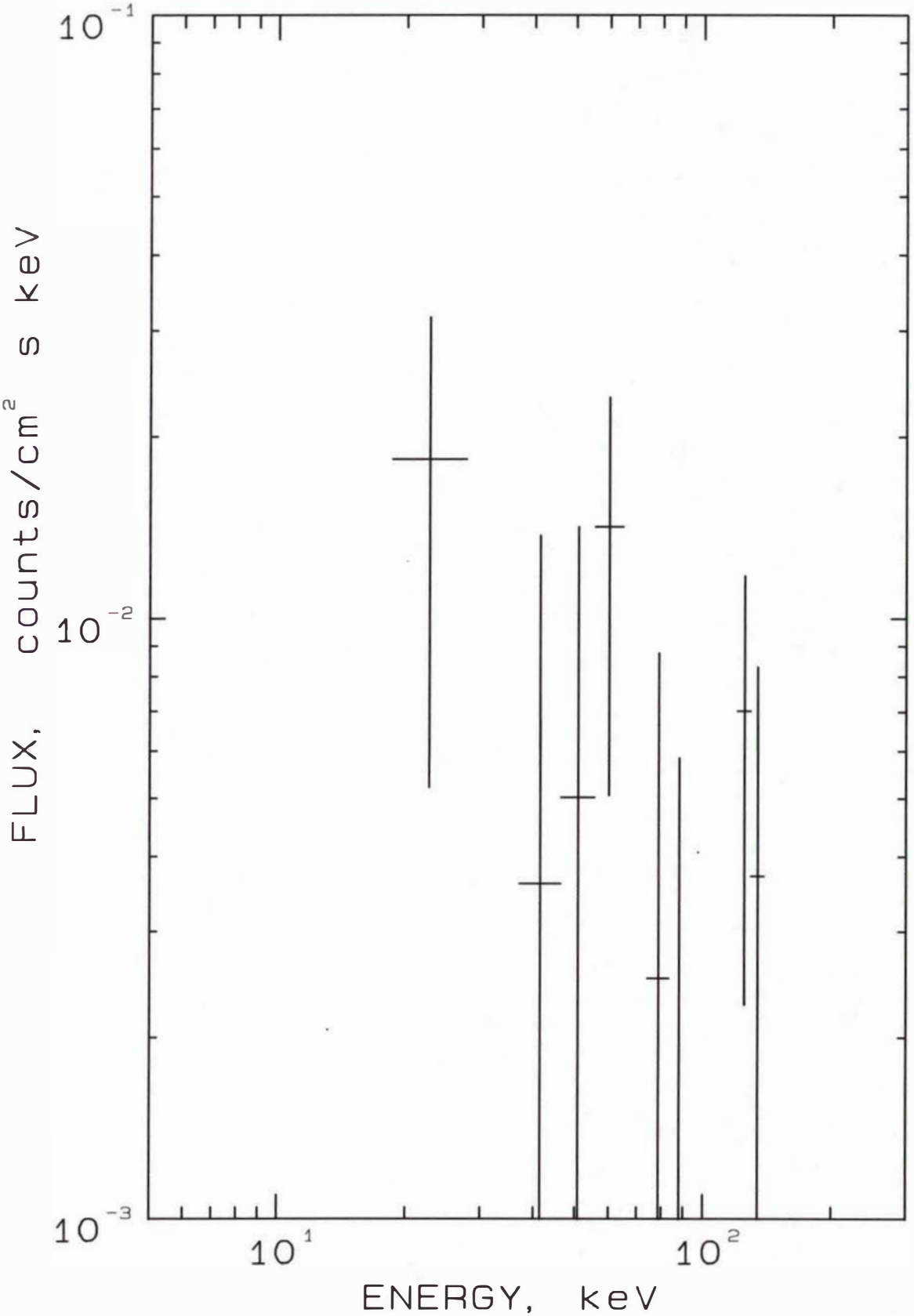
ULYSSES RT-ULYSSES CORRELATION 9/12/97 82502.738

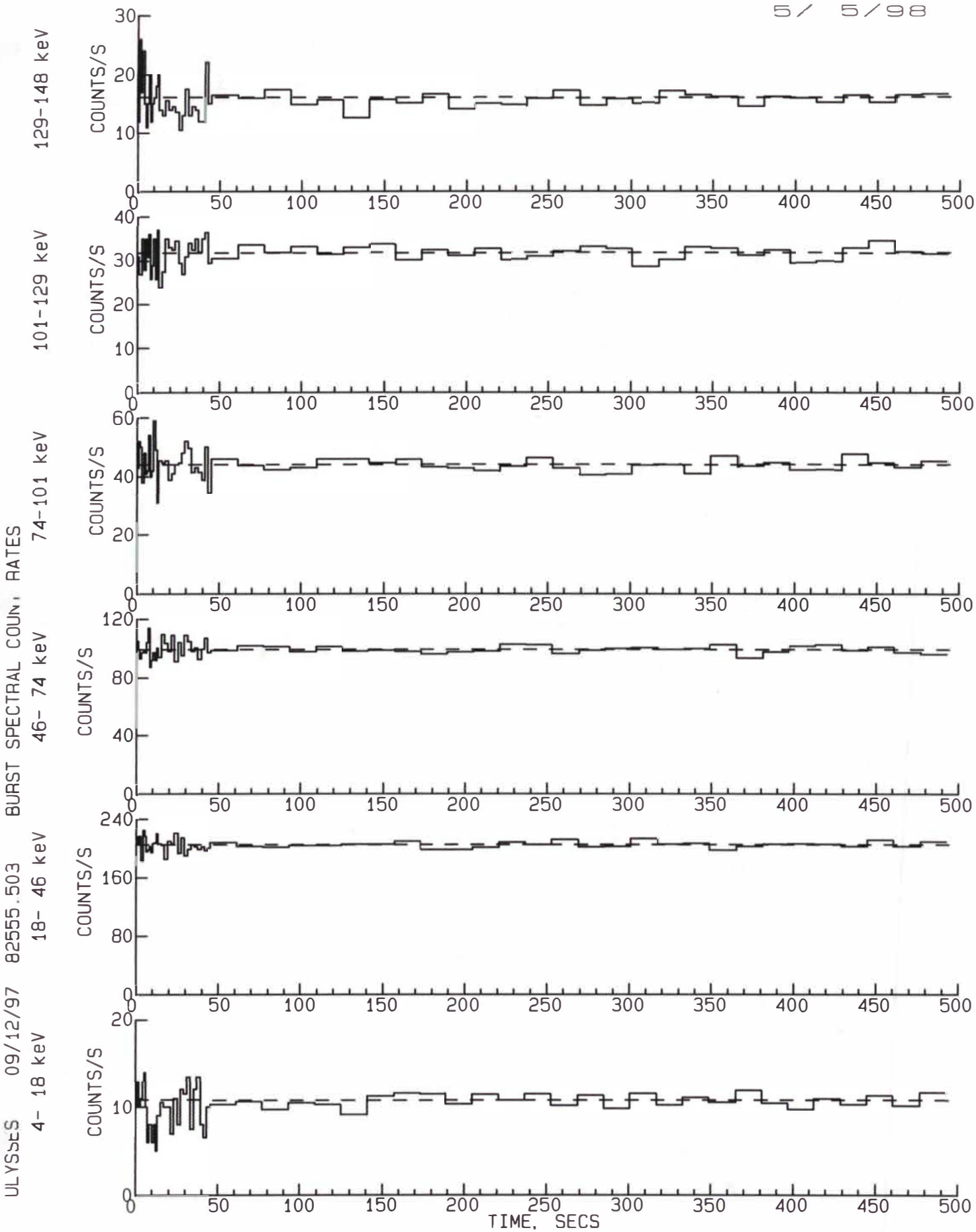


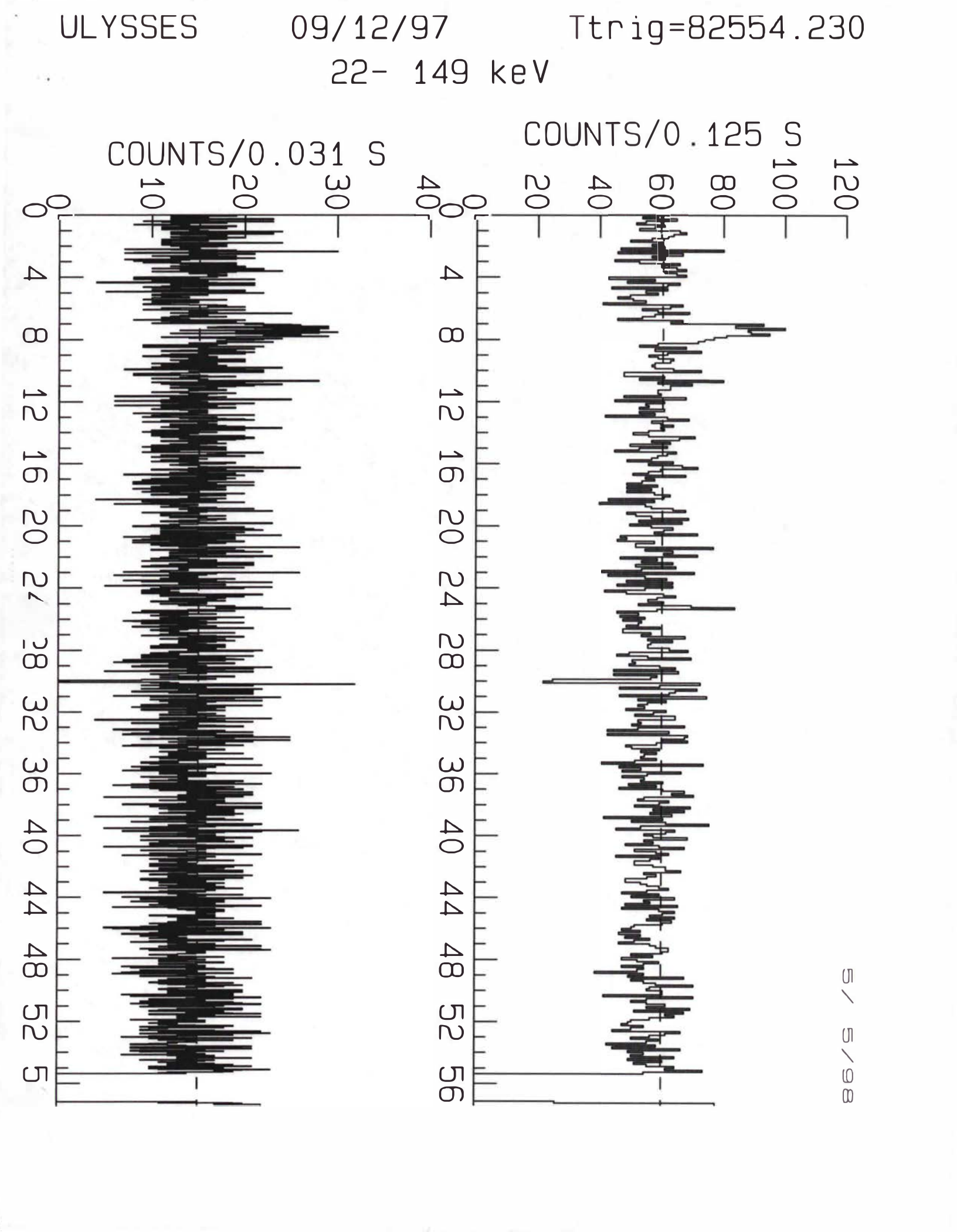
5/ 5/98

# ULYSSES 09/12/97 82555.503

SPECTRUM INTEGRATED OVER 21.0 SECONDS, INTERVALS 2 TO 19




5/ 5/98
ULYSSES 09/12/97 82555.503 BURST SPECTRAL COUNT RATES
129-148 keV
101-129 keV
74-101 keV
46- 74 keV
18- 46 keV
4- 18 keV
COUNTS/S
TIME, SECS

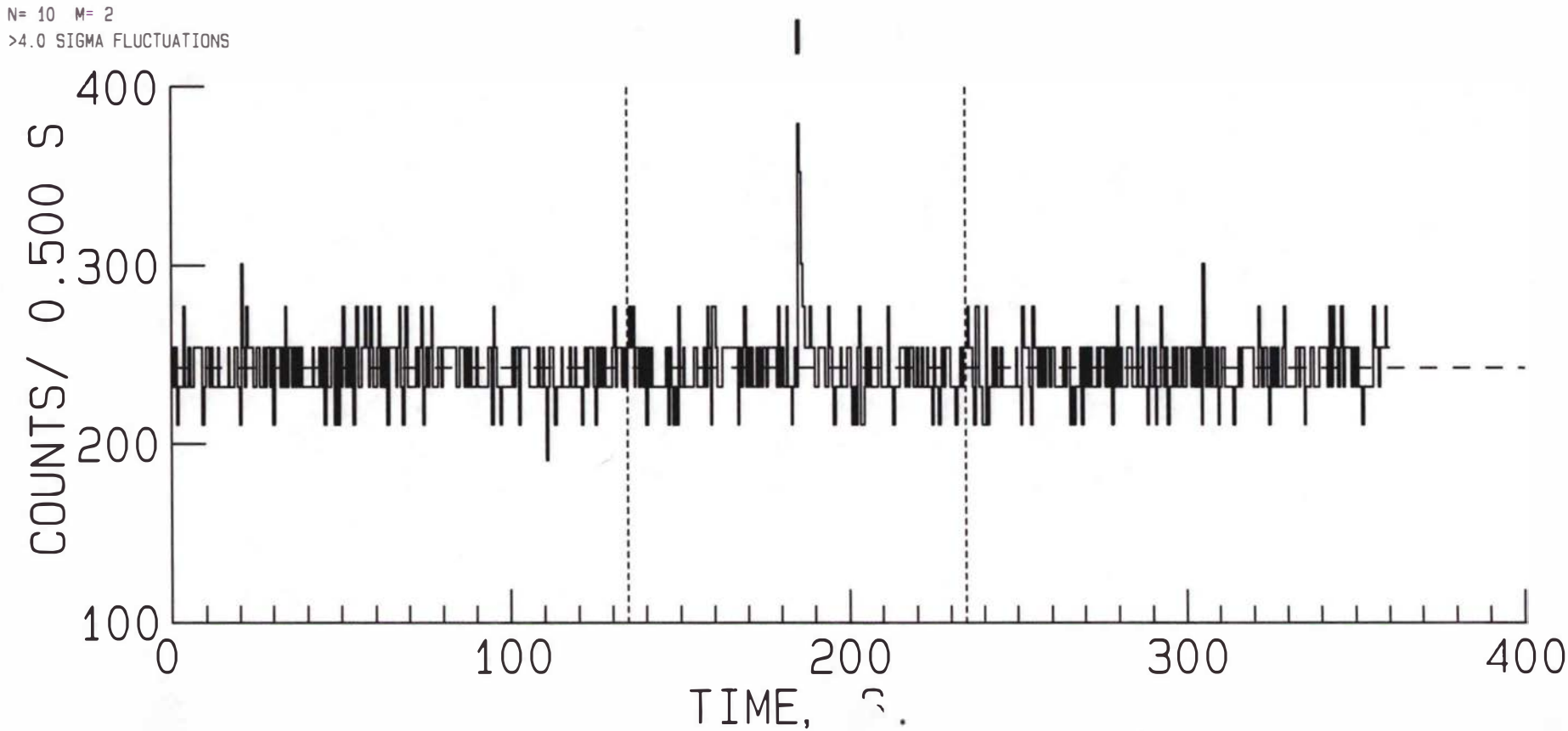

ULYSSES 09/12/97 Ttrig=82554.230
22- 149 keV
COUNTS/0.031 S
COUNTS/0.125 S
5/ 5/98

ULYSSES RT

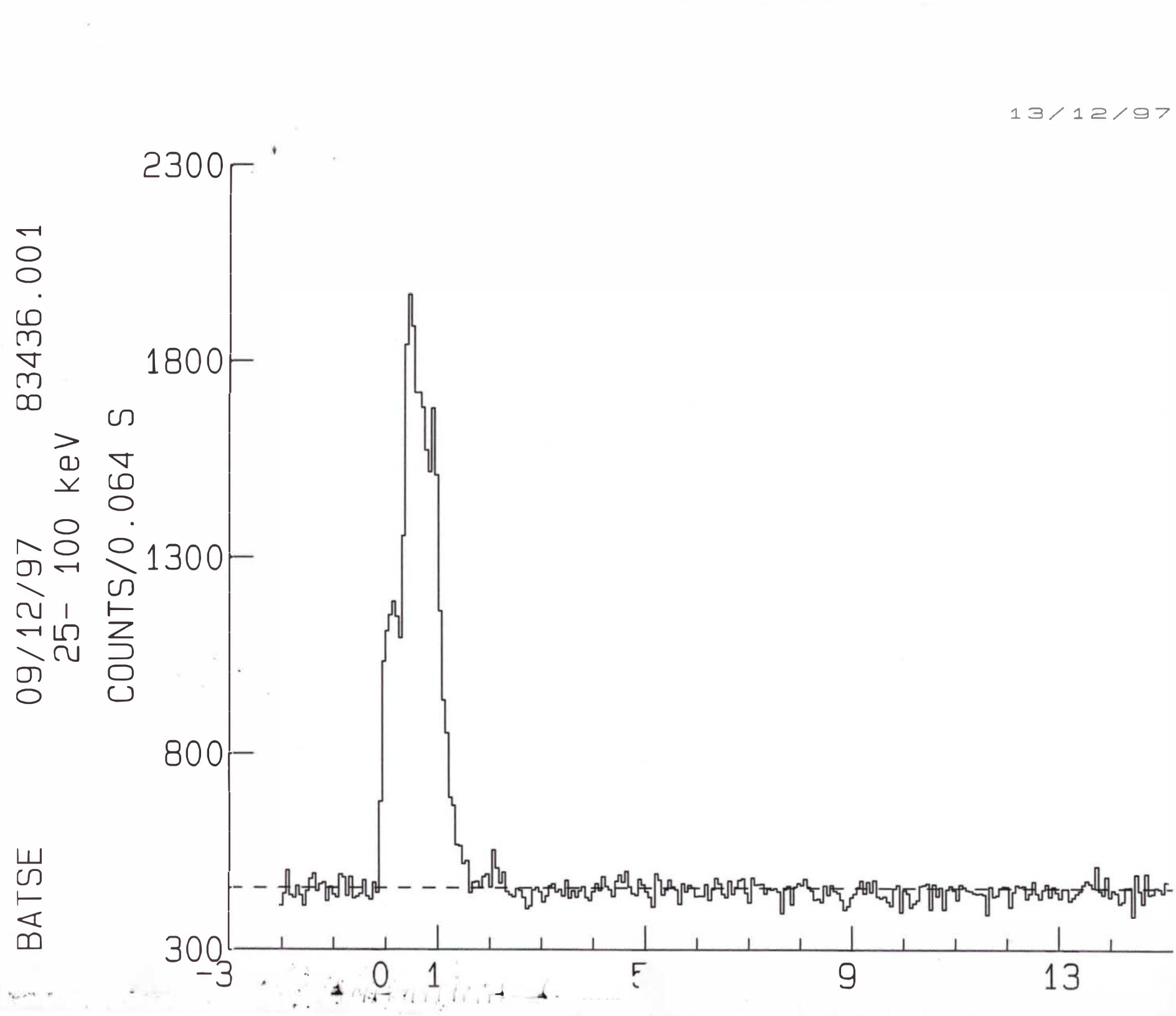
5/ 5/98

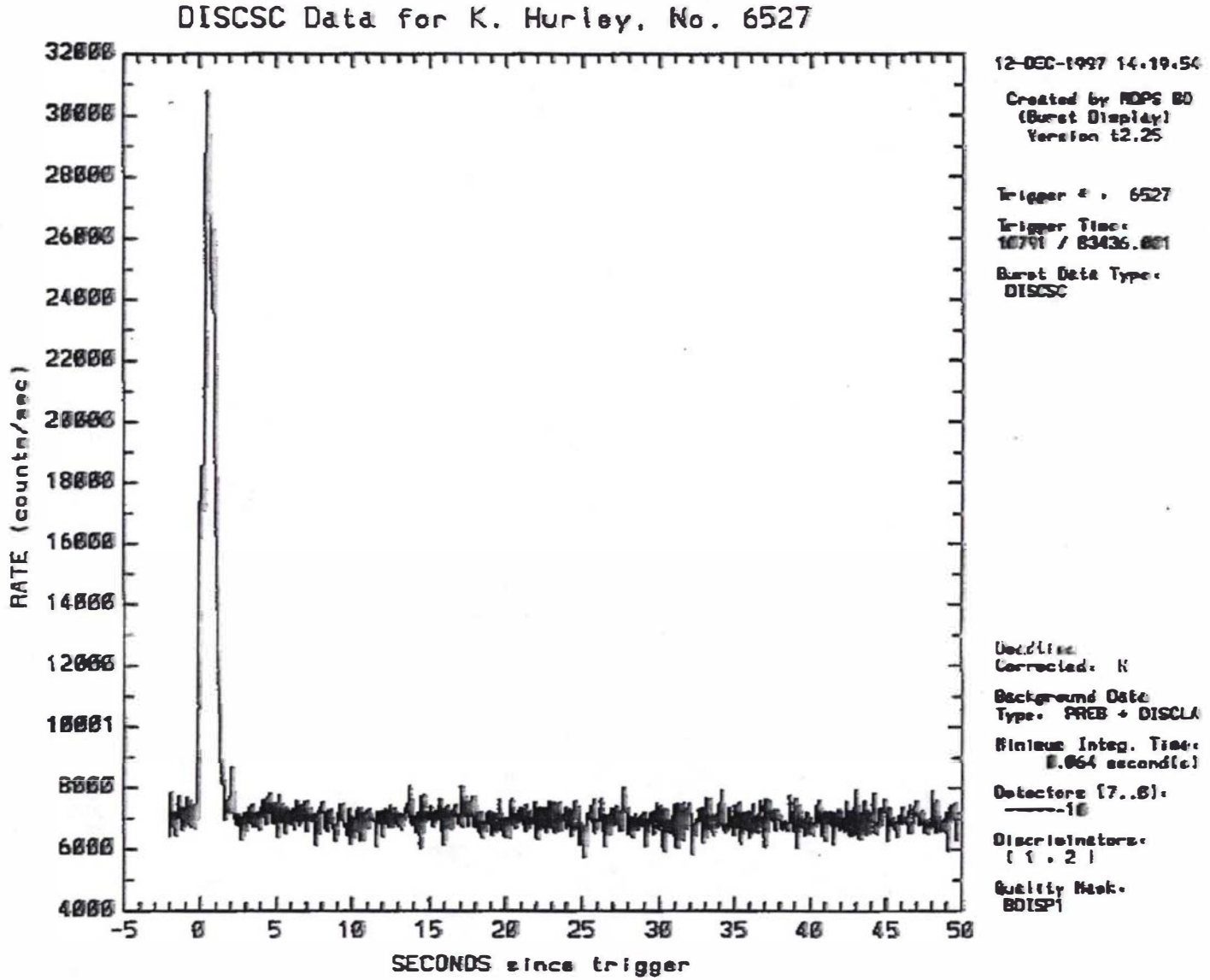
9/12/97 82368.484 s

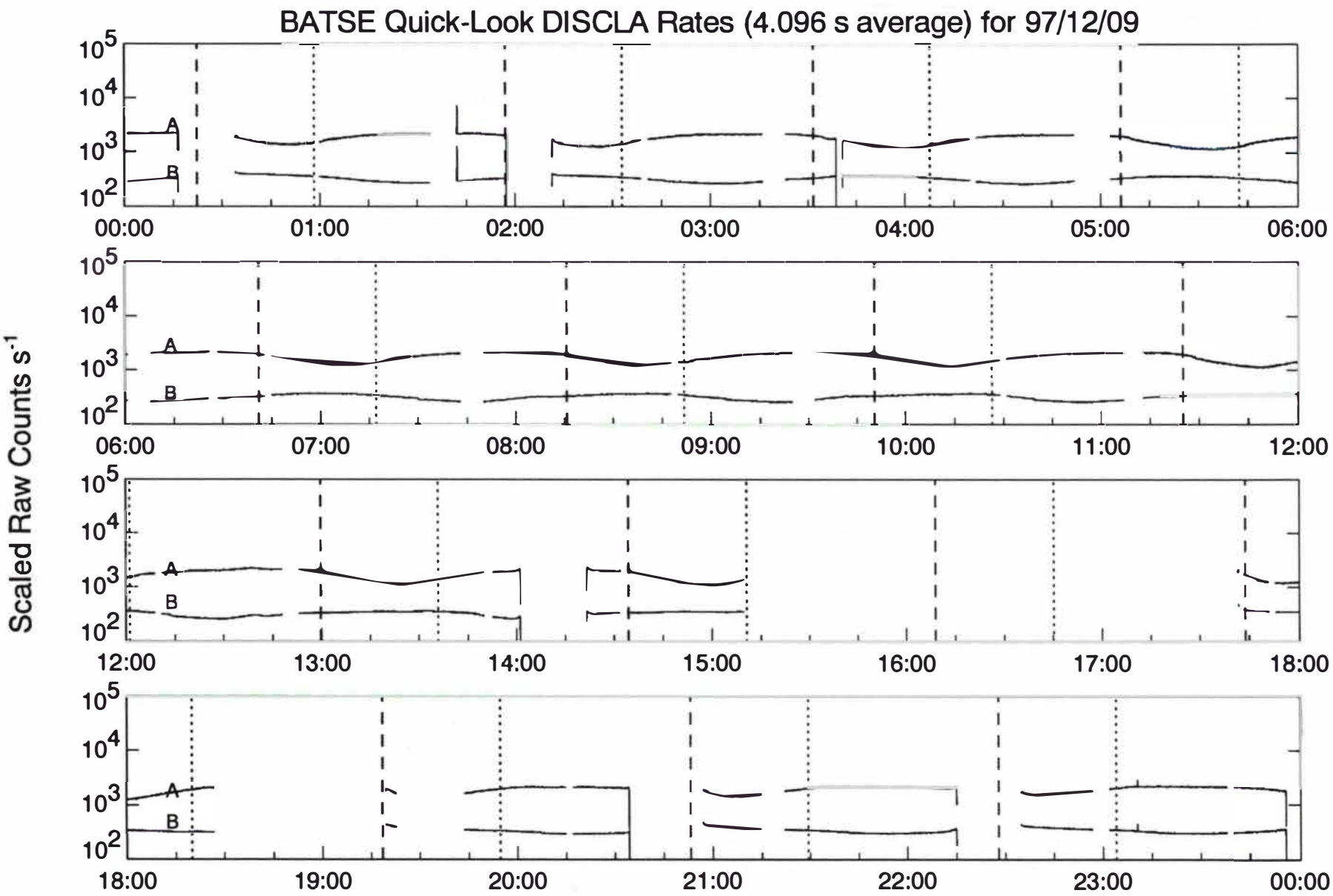
22- 149 keV

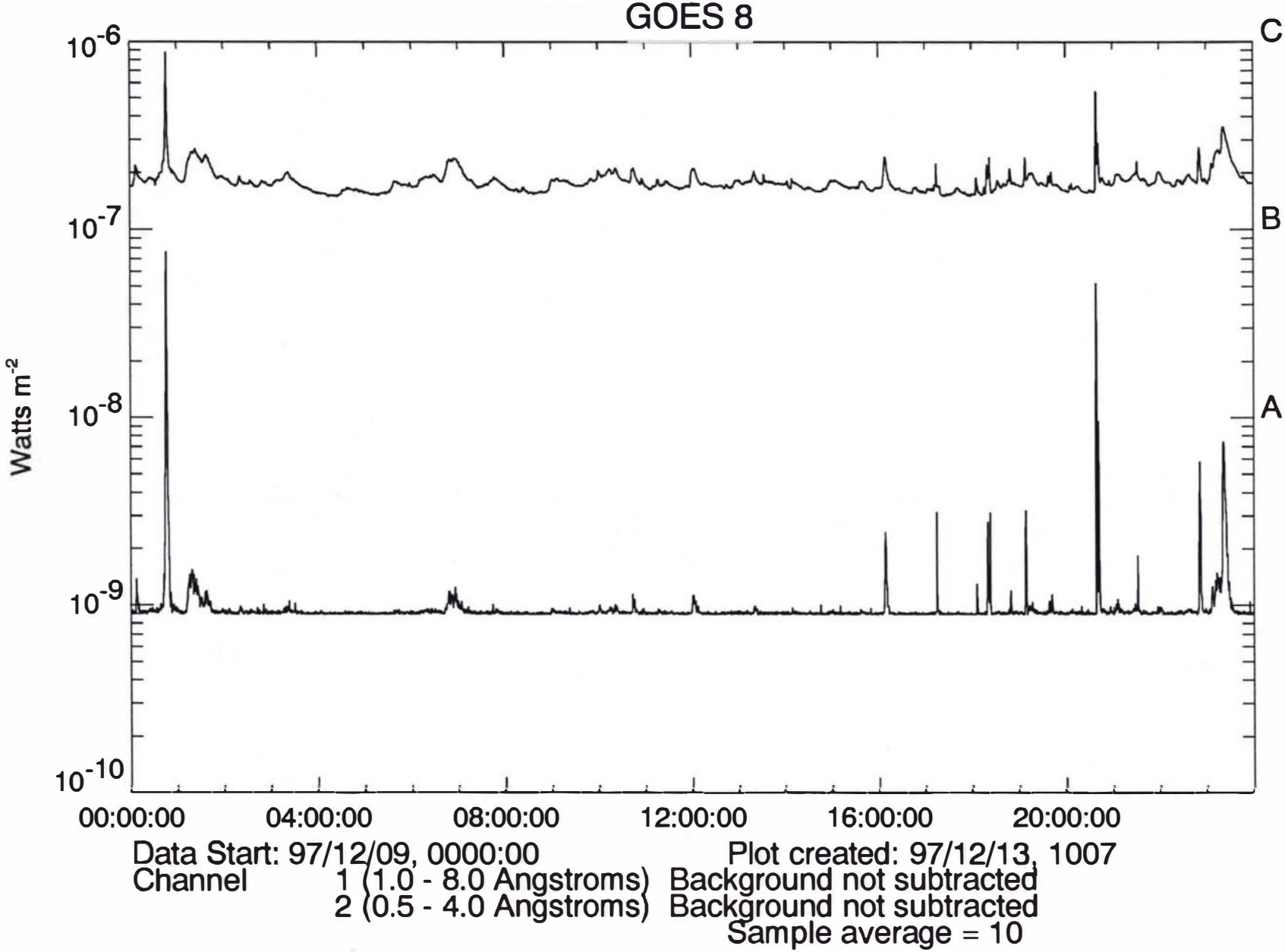


13/12/97

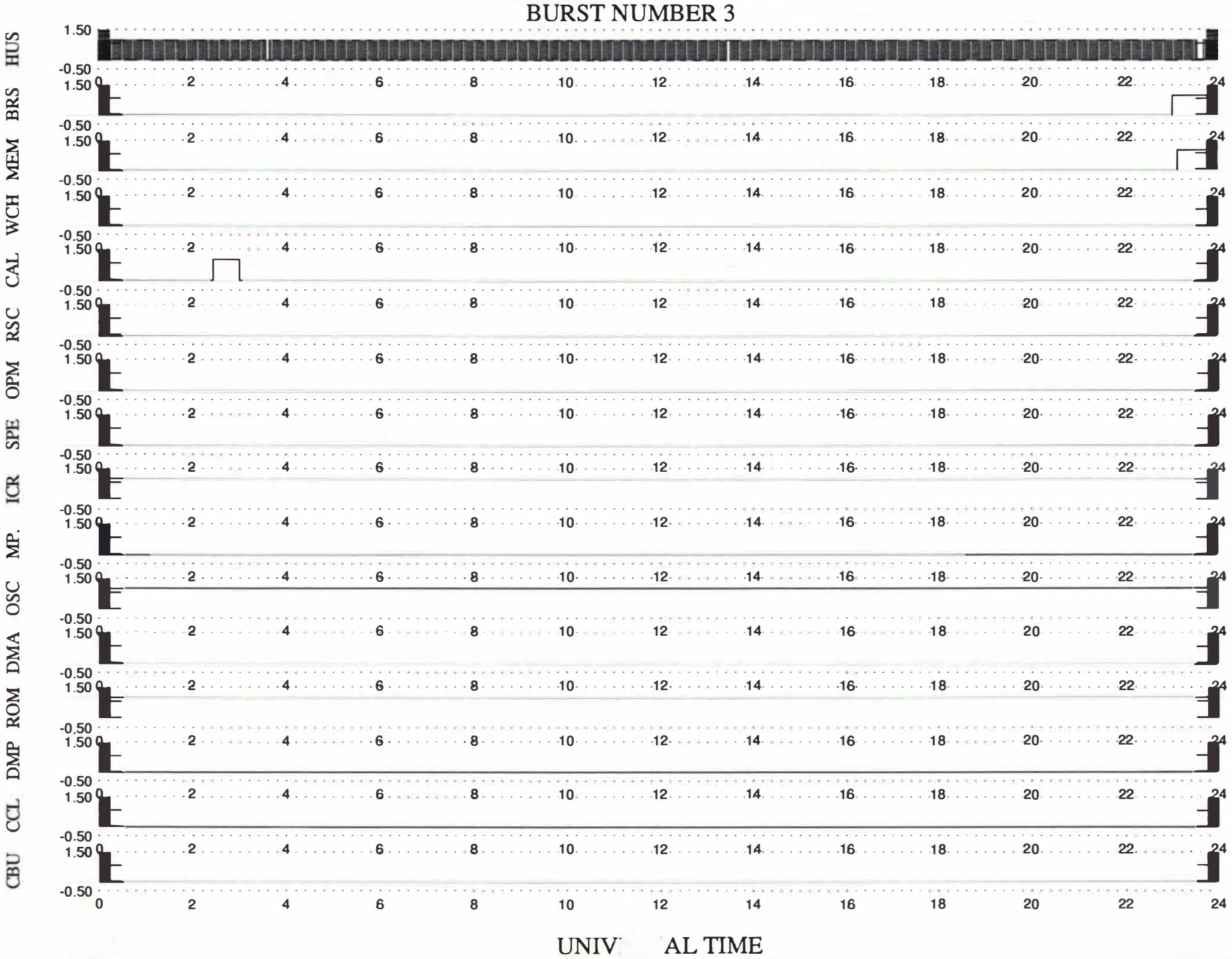

BATSE 09/12/97 83436.001
25- 100 keV
COUNTS/0.064 S
2300
1800
1300
800
300
-3
0
1
5
9
13


DISCSC Data for K. Hurley, No. 6527
RATE (counts/sec)
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
10001
8000
6000
4000
-5
0
5
10
15
20
25
30
35
40
45
50
SECONDS since trigger
12-DEC-1997 14:19:54
Created by MDPS BD
(Burst Display)
Version t2.25
Trigger # : 6527
Trigger Time:
10791 / 83436.881
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
Discriminators:
[ 1 , 2 ]
Quality Mask:
BDISP1


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/09
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/13, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

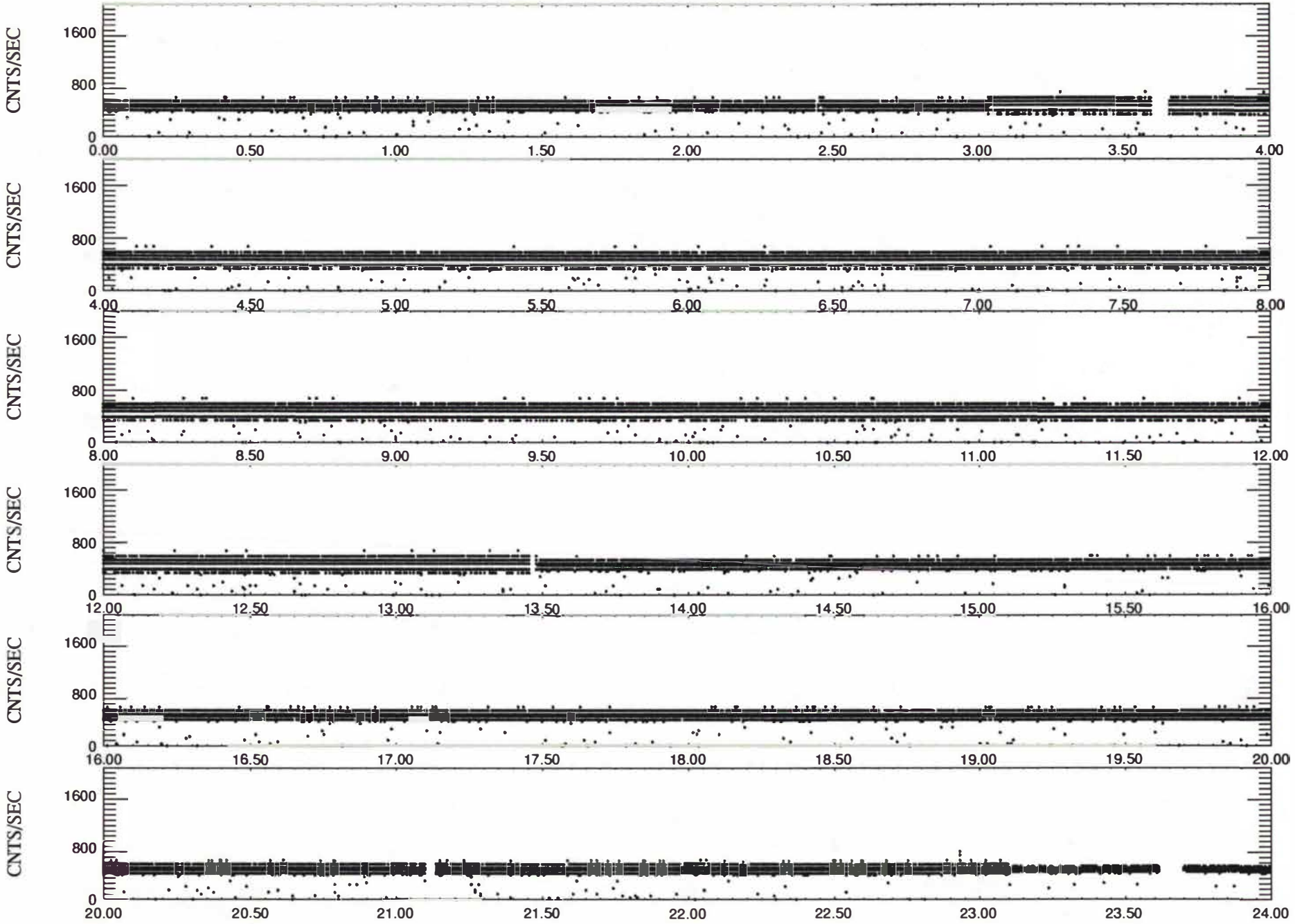

GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/09, 0000:00
Plot created: 97/12/13, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 343, year 1997 to day 343, year 1997 3/12/98



HUS 2A, MODE 1, NOT AVERAGED EDR day 343, year 1997 to day 343, year 1997 3/12/98

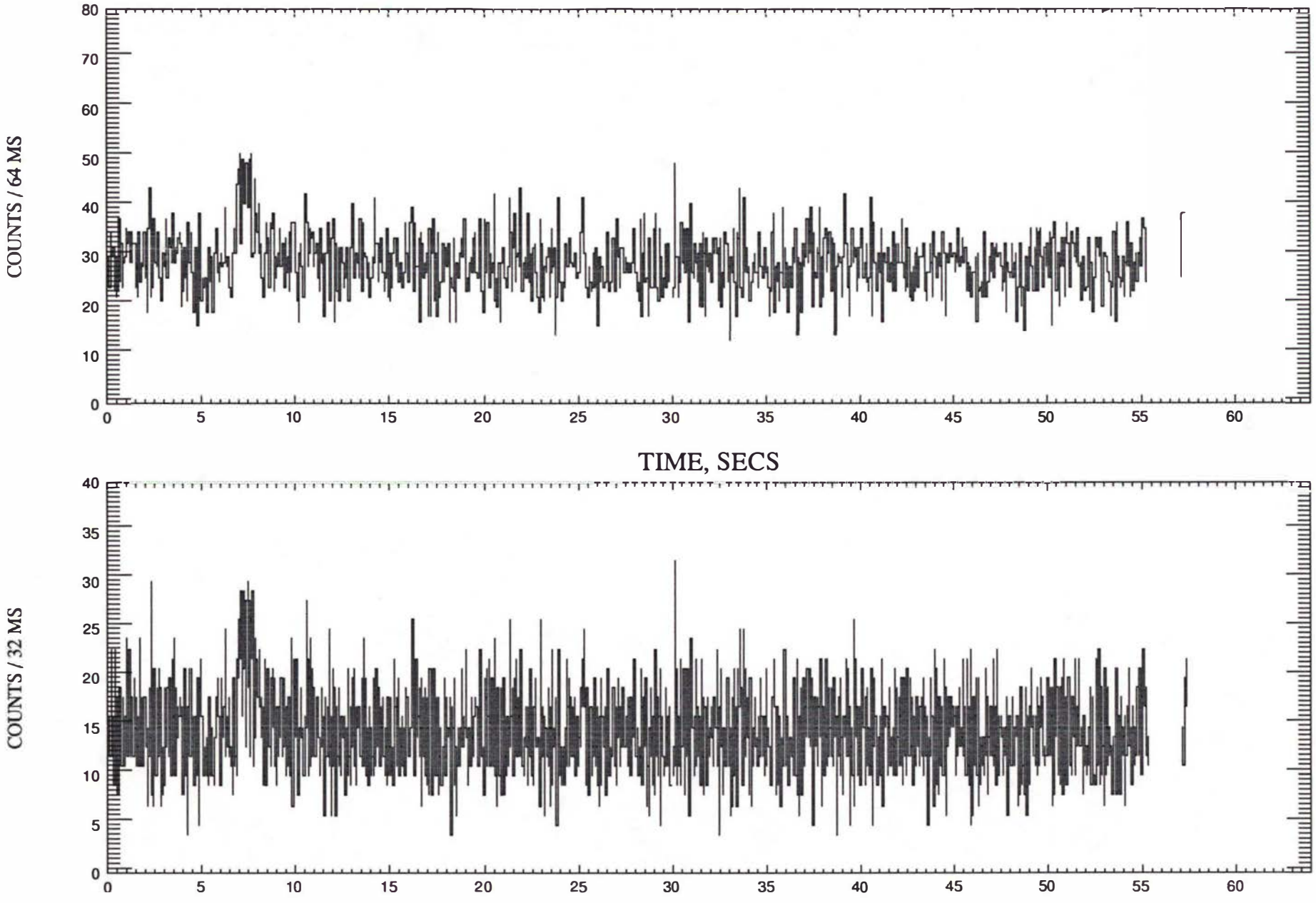
CALIBRATION DATA INCLUDED




UNIV `AL TIME

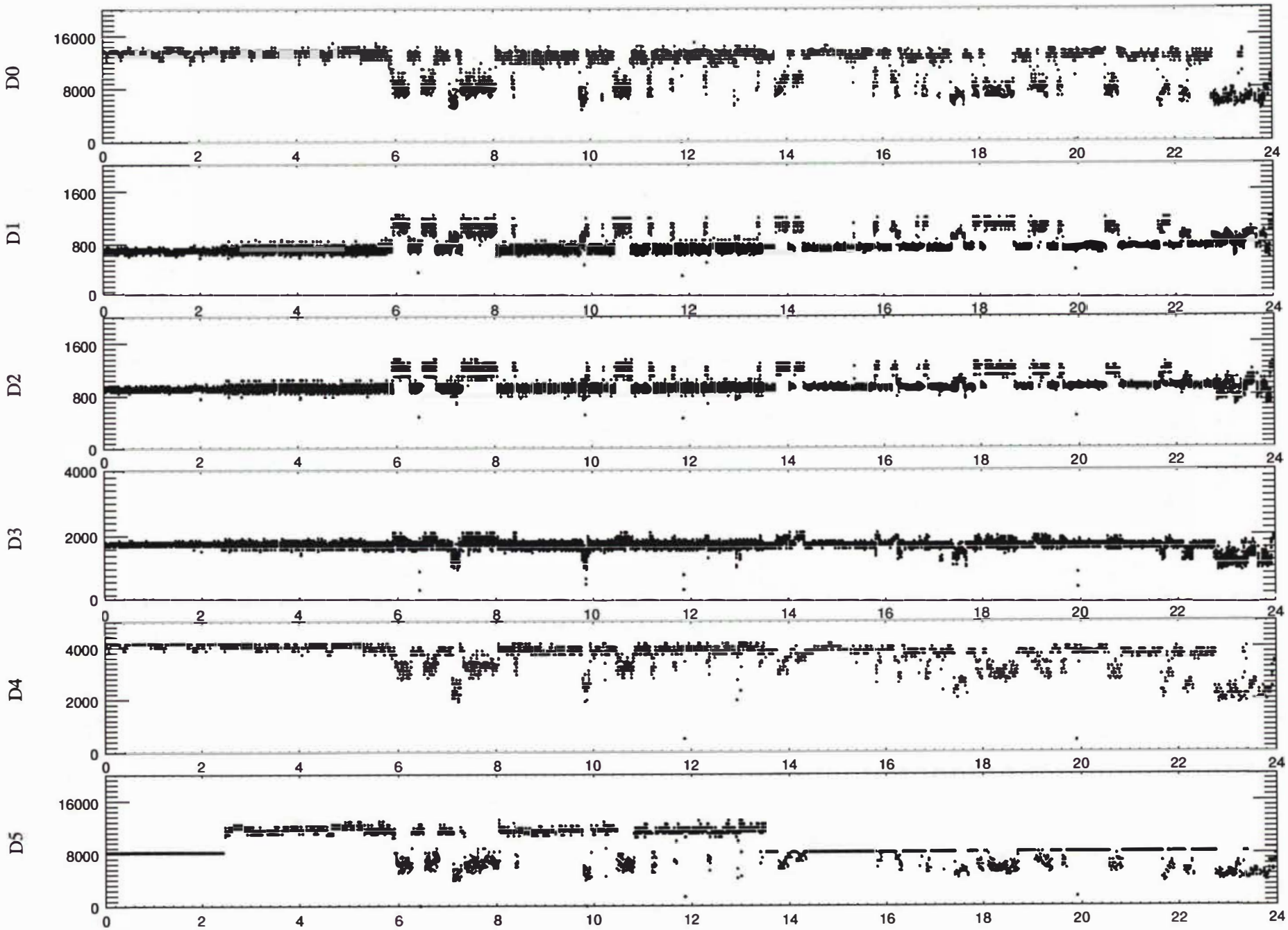
HUS 2A TRIGGERED DATA EDR day 343, year 1997 3/11/98

Burst Counter 3 at UT=22.931658092075 h=82553.969 s 22:55:53.969




B# 1

HUS 2B COUNTS / SEC EDR day 343, year 1997 to day 343, year 1997 3/12/98



From RICHARDSON@SSLMOR.msfc.nasa.gov Thu Dec 11 12:29:52 1997
Return-Path: <RICHARDSON@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA14575; Thu, 11 Dec 1997 12:29:51 -0800
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA12569; Thu, 11 Dec 1997 12:29:46 -0800
Date: Thu, 11 Dec 1997 14:26:58 -0600 (CST)
From: RICHARDSON@SSLMOR.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971211142658.21e13883@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6528
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6528
EVENT OF 1997 DEC 10 DAY OF YEAR=344
EVENT CROSSING TIME AT BATSE : 27813. S. OR 07:43:33.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 177.000 -52.000
BATSE PEAK COUNTING RATE: 14000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 10/12/ 97 IS:
RA= 170.741 DEC= 12.073 DIST= 5.235 AU
BATSE-ULYSSES DISTANCE = 783145676. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=115.70 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1132.77 SECS.
CROSSING TIME AT ULYSSES IS 26680. S. OR 07:24:40 +/- 441.47 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 10/12/ 97 IS:
RA= 295.646 DEC= -22.609 DIST= 2.064 AU
MARS-BATSE DISTANCE = 308728928. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 91.75 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -31.39 SECS.
CROSSING TIME AT MARS IS 27782. S. OR 07:43:01 +/- 178.23 SECONDS

BATSE BURST TRIGGER

NO.: 6528

TIME: TJD=0792 SECONDS=27813

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

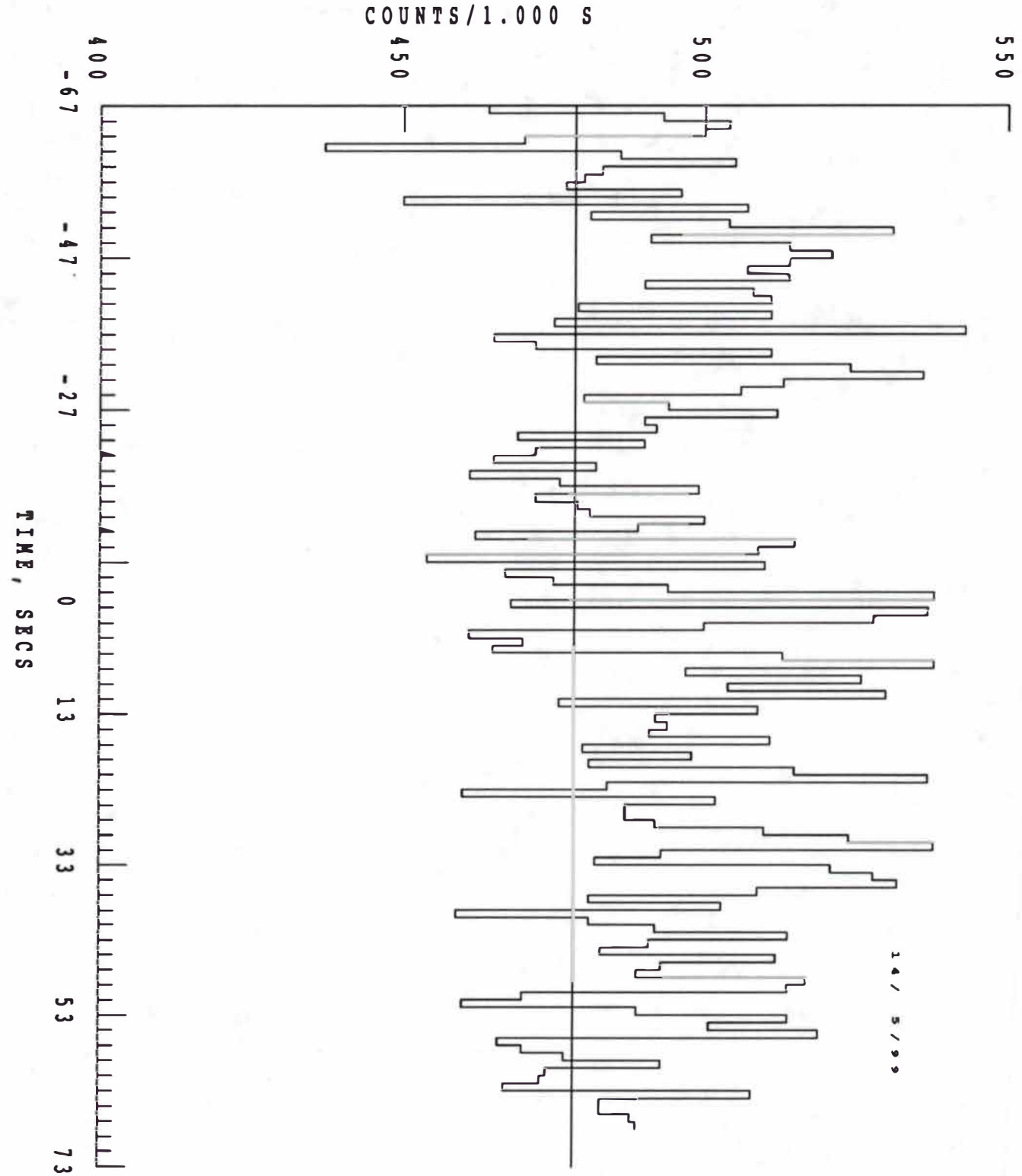
LOCATION: ZENITH=26.3 AZIMUTH=167.6 ERROR=1.1 DEGREES

COMMENTS:
GRB LOTS OF STRUCTURE. PRE-EMMISION AT APPROX. T-17 SEC WITH DURATION APPROX.
= 5 SEC. MAIN EVENT AT T WITH DURATION APPROX. = 20 SEC. TOTAL DURATION
APPROX. = 37 SEC. NOT VISIBLE ABOVE 300KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6528 | 971210 | 10792 | 27813 | 14000 | 177 | -52 | 37 |

NEAR 10/12/97 27842.860

100-1000 keV



Helio corr removed Feb 9 00

Date: May 5 '98

**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? N/A

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

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

2. BATSE Data

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

☑ BATSE ephemeris for $T_0$?

☑ Error circle position and radius from public catalog used?

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

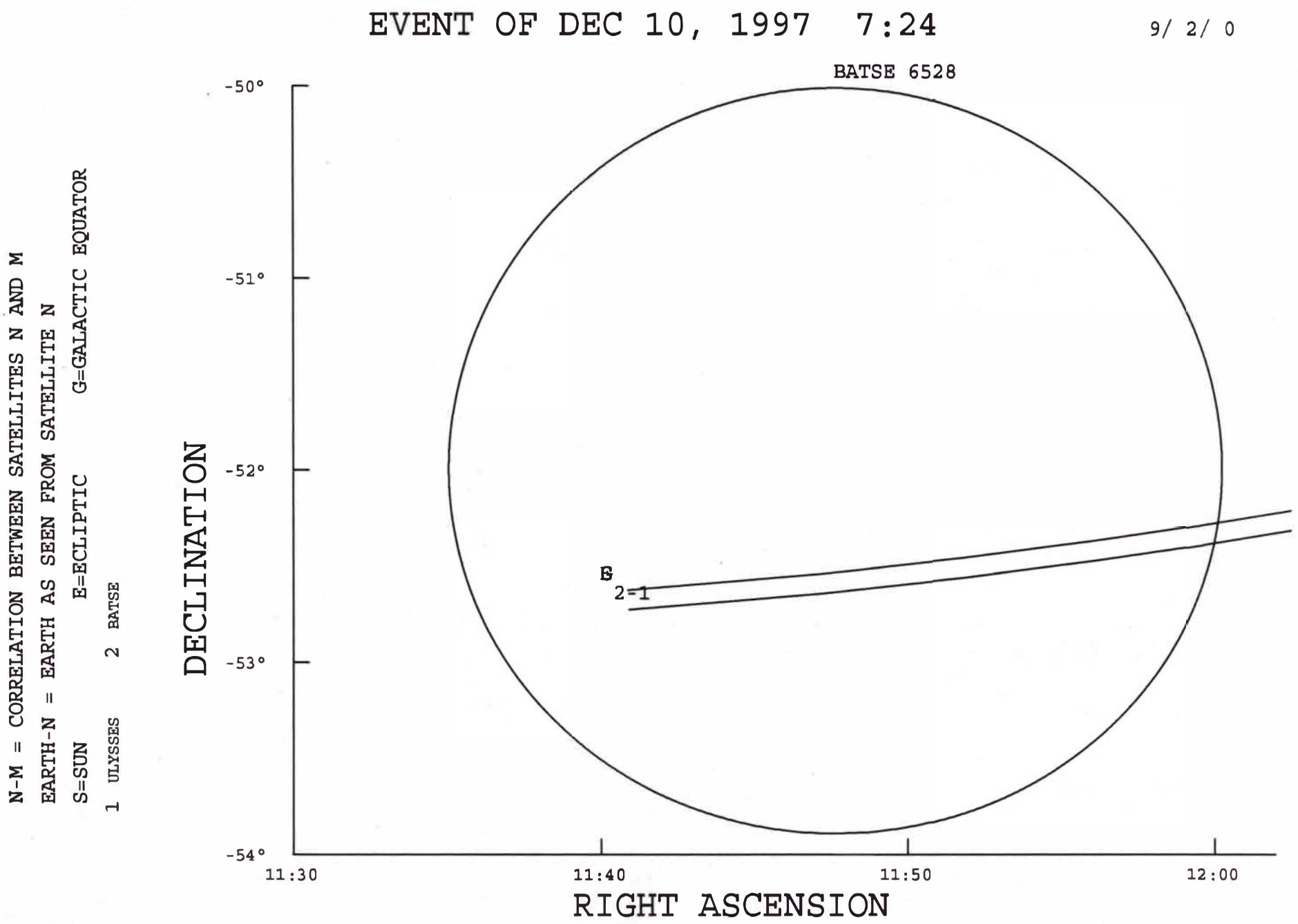
3. PVO Data

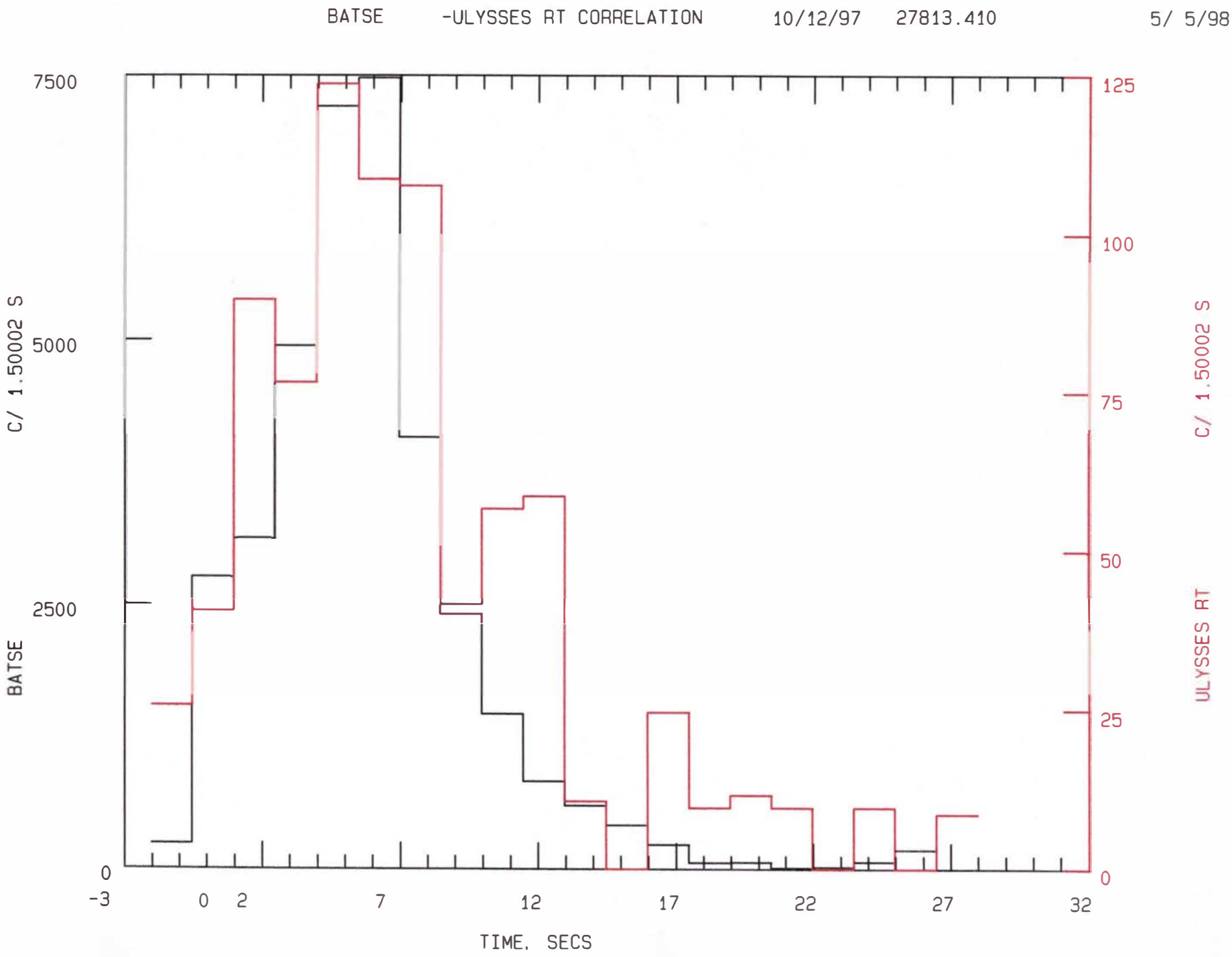
☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

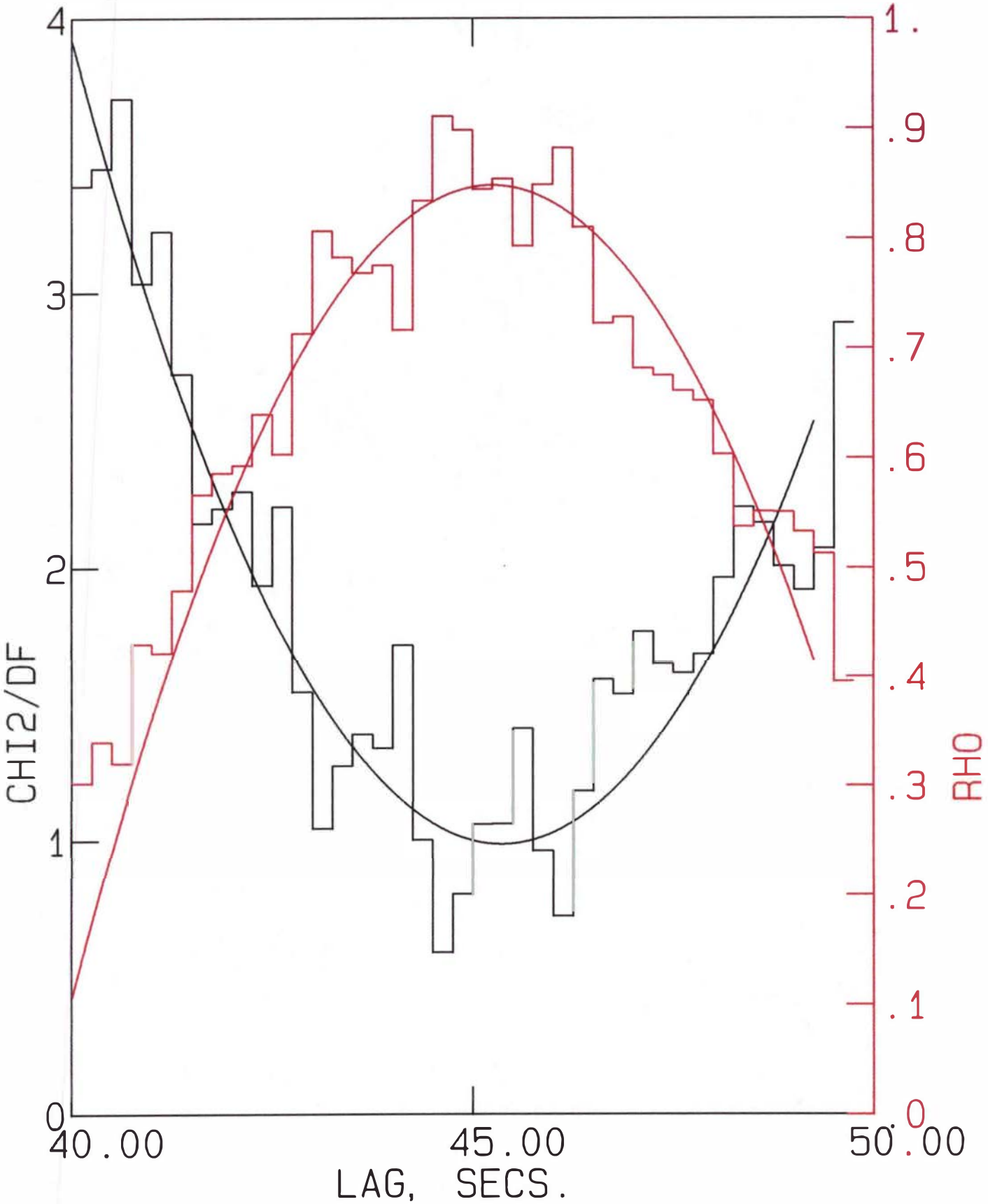
☐ Geocentric time used?

☑ ACCESS database updated?


EVENT OF DEC 10, 1997 7:24
9/ 2/ 0
BATSE 6528
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
DECLINATION
-50°
-51°
-52°
-53°
-54°
E
2=1
11:30
11:40
11:50
12:00
RIGHT ASCENSION


BATSE -ULYSSES RT CORRELATION 10/12/97 27813.410 5/ 5/98
7500
5000
2500
0
C/ 1.50002 S
BATSE
125
100
75
50
25
0
C/ 1.50002 S
ULYSSES RT
-3
0
2
7
12
17
22
27
32
TIME, SECS

BATSE -ULYSSES RT CORRELATION 10/12/97 27813.410

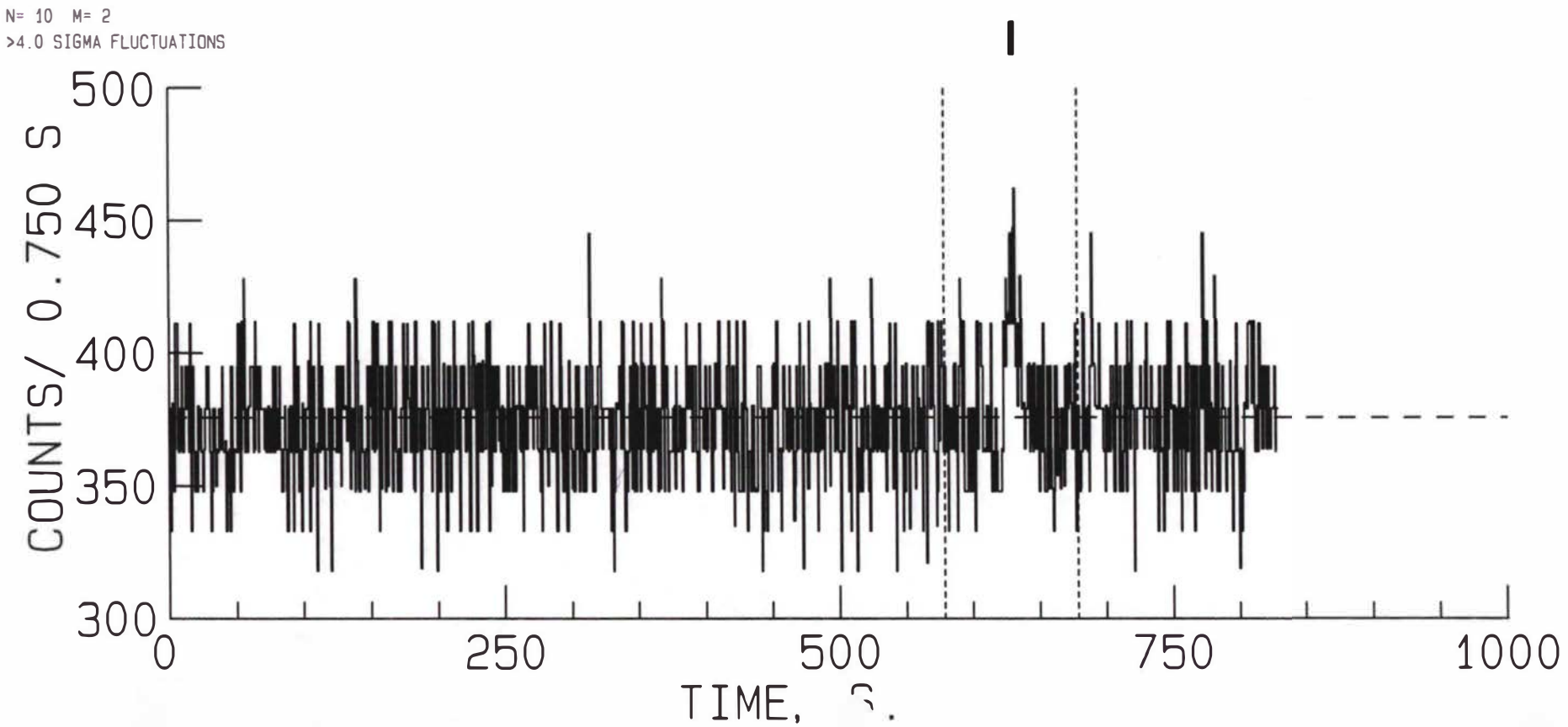


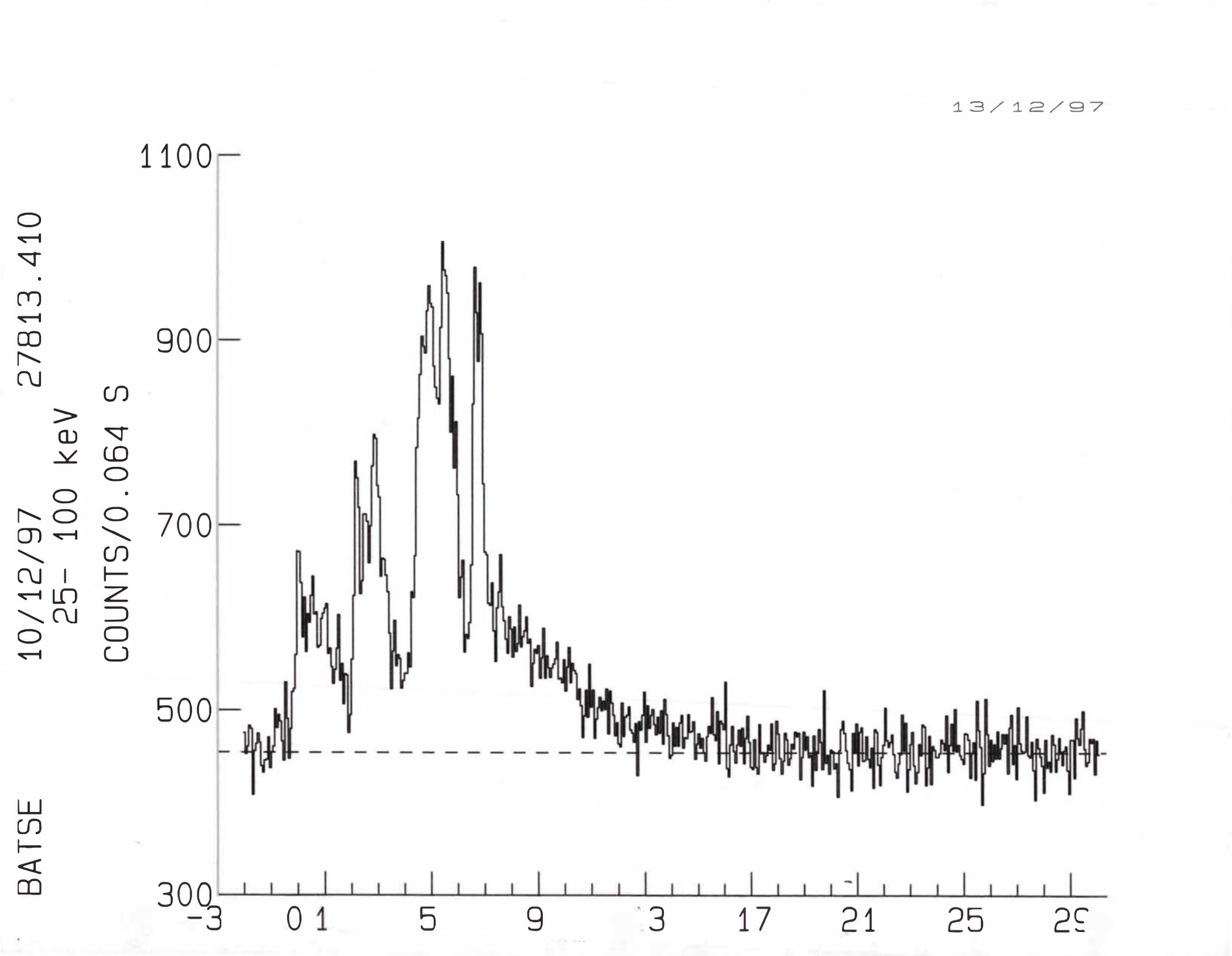
ULYSSES RT 5/ 5/98

10/12/97 26064.032 s

0.250 S INTERVALS REGROUPED BY 3

22- 149 keV




13/12/97
BATSE
10/12/97 27813.410
25- 100 keV
COUNTS/0.064 S
1100
900
700
500
300
-3
0 1
5
9
3
17
21
25
29

DISCSC Data for K. Hurley, No. 6528
RATE (counts/sec)
16000
15001
14000
13000
12000
11001
10000
9000
8000
7000
6000
5000
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
12-DEC-1997 14:21:00
Created by KORS 80
(Burst Display)
Version 12.25
Trigger # : 6528
Trigger Time:
18792 / 27813.489
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 seconds
Detectors [7..0]:
-0-0----
Discriminators:
1 1 . 2 1
Quality Mask:
B0150

KONUS

ULYSSES RT 07/02/00

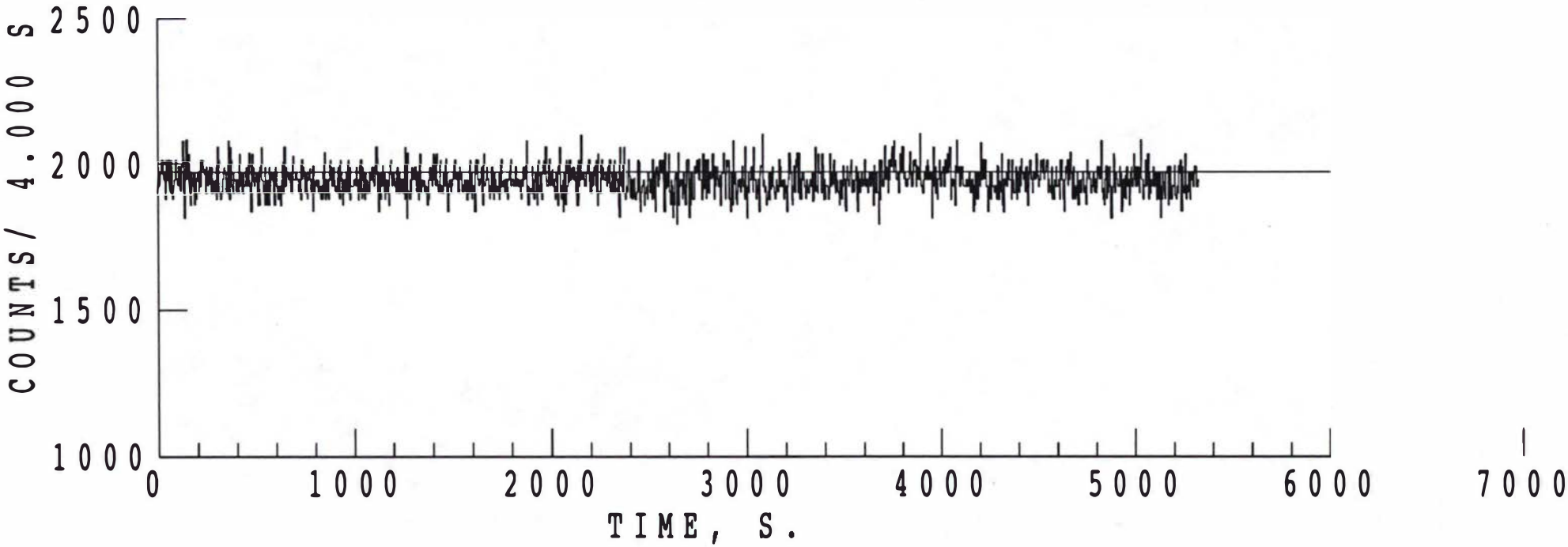
10/12/97 60624.168 s

0.500 S INTERVALS REGROUPED BY 8

0- 0 keV

N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From RICHARDSON@SSLMOR.msfc.nasa.gov Thu Dec 11 12:30:30 1997
Return-Path: <RICHARDSON@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
        id MAA14586; Thu, 11 Dec 1997 12:30:21 -0800
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
        id MAA12585; Thu, 11 Dec 1997 12:30:21 -0800
Date: Thu, 11 Dec 1997 14:28:31 -0600 (CST)
From: RICHARDSON@SSLMOR.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971211142831.21e13883@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6529
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6529
EVENT OF 1997 DEC 10 DAY OF YEAR=344
EVENT CROSSING TIME AT BATSE : 77005. S. OR 21:23:25.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 254.000 33.000
BATSE PEAK COUNTING RATE: 1100 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 10/12/ 97 IS:
RA= 170.735 DEC= 12.060 DIST= 5.226 AU
BATSE-ULYSSES DISTANCE = 781751508. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=102.12 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -547.55 SECS.
CROSSING TIME AT ULYSSES IS 76457. S. OR 21:14:17 +/- 484.32 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 10/12/ 97 IS:
RA= 295.646 DEC= -22.609 DIST= 2.064 AU
MARS-BATSE DISTANCE = 308728928. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=111.66 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -380.16 SECS.
CROSSING TIME AT MARS IS 76625. S. OR 21:17:04 +/- 160.39 SECONDS

BATSE BURST TRIGGER
NO.: 6529

TIME: TJD=0792 SECONDS=77005

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

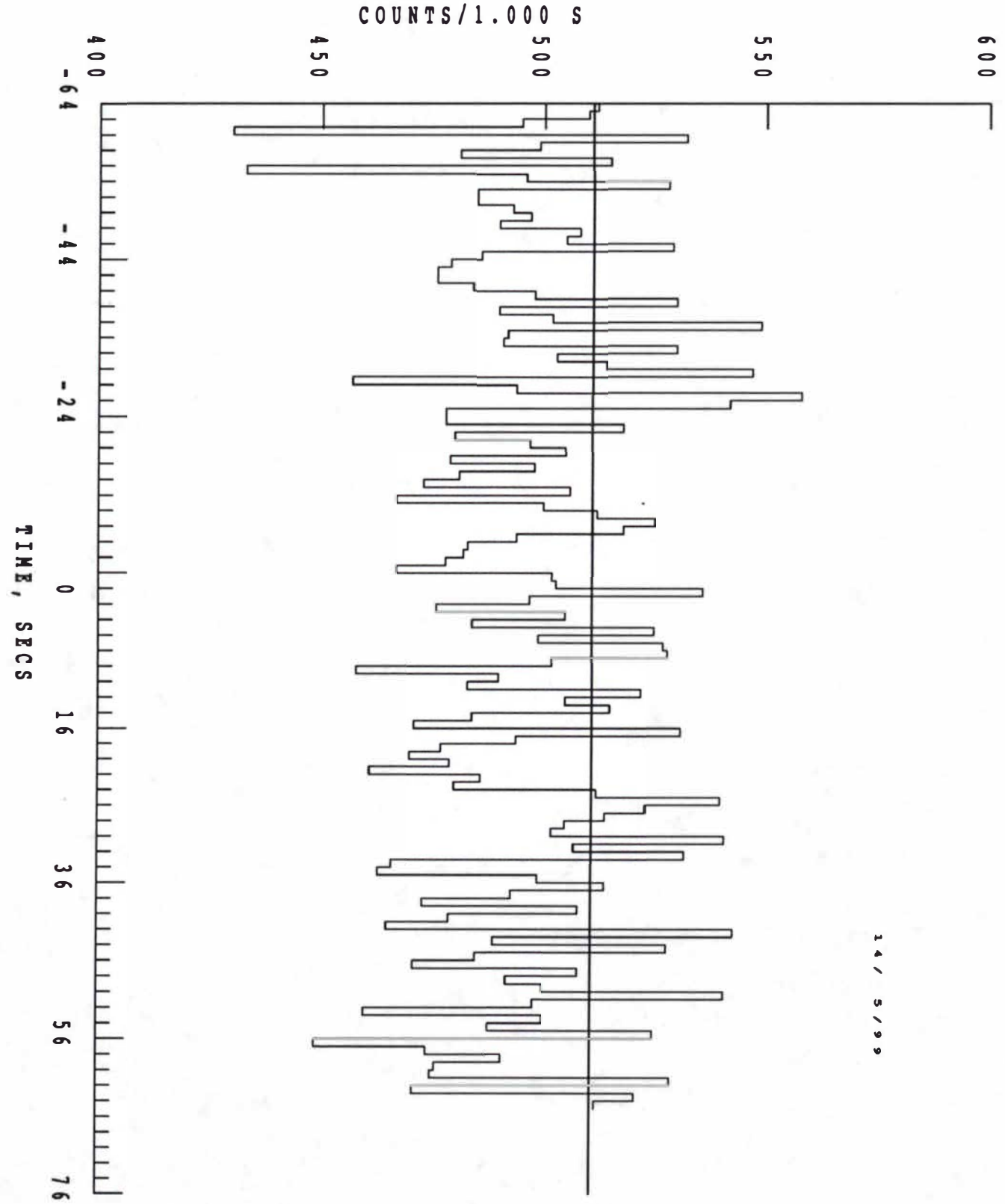
LOCATION: ZENITH=89.2 AZIMUTH=31.9 ERROR=5.6 DEGREES

COMMENTS:
GRP SINGLE PULSE. DURATION APPROX. = 15 SEC. NOT VISIBLE ABOVE 300KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6529 | 971210 | 10792 | 77005 | 1100 | 254 | +33 | 15 |

NEAR 10/12/97 77060.851

100-1000 keV



BATSE BURST# 6529

ULYSSES RT 11/12/97

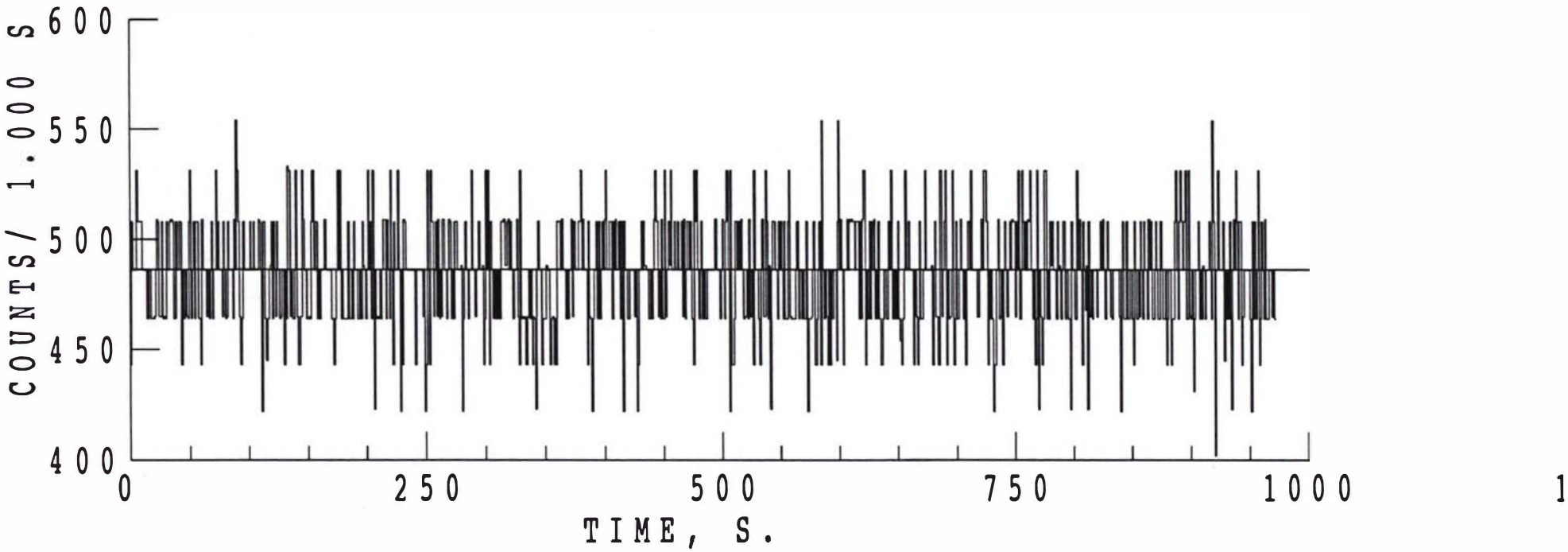
10/12/97 75960.375 s

0.500 S INTERVALS REGROUPED BY 2

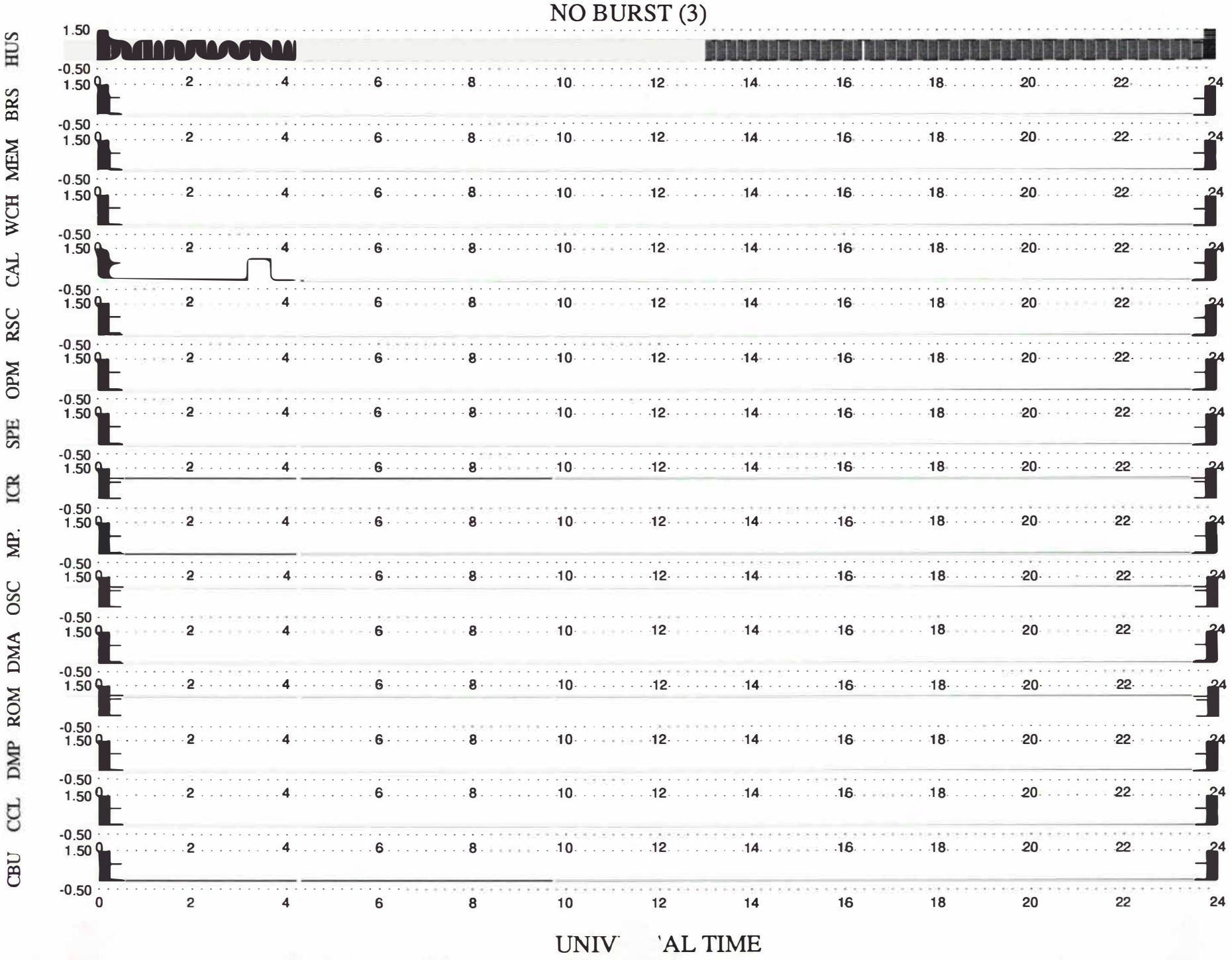
0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

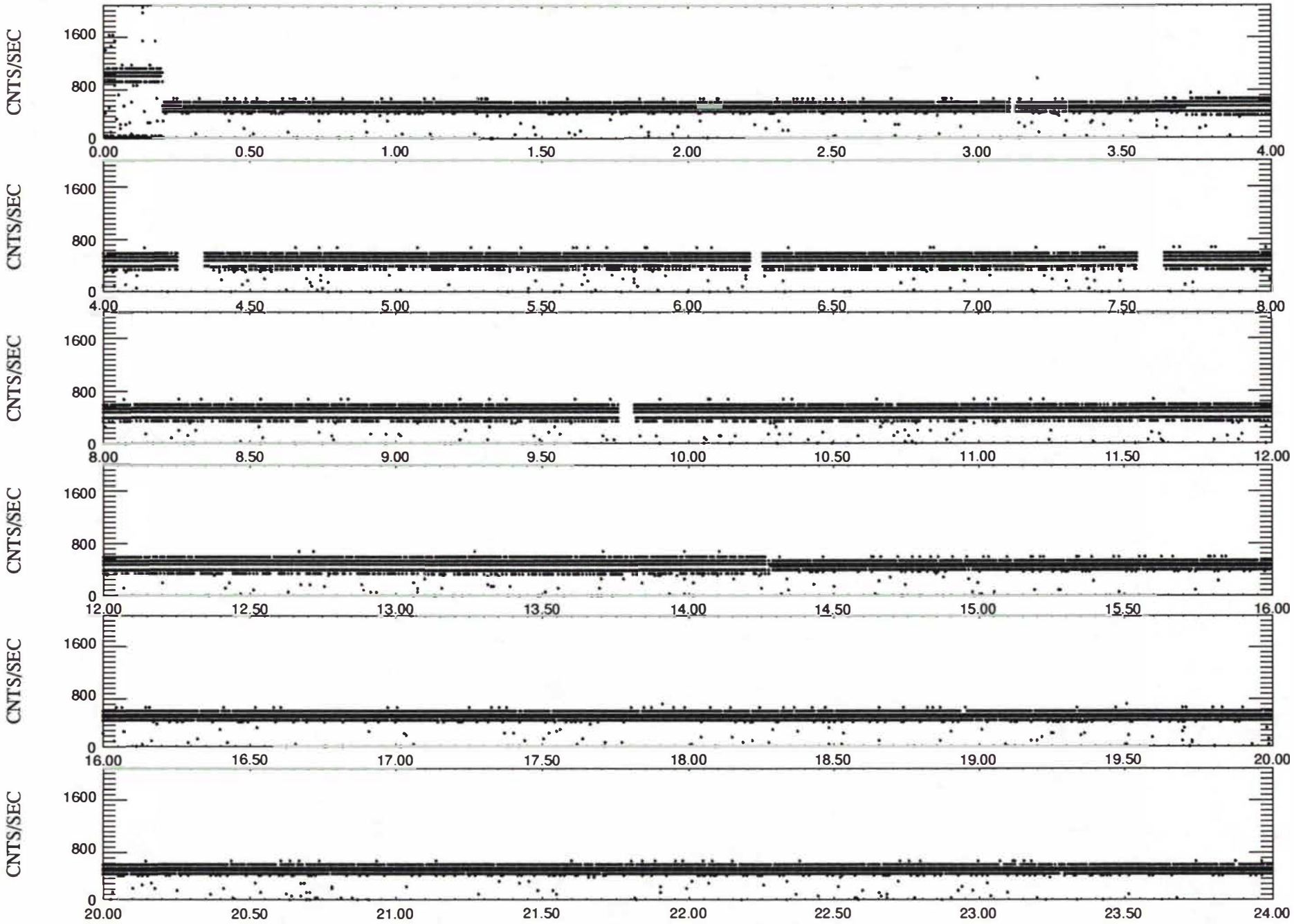


HUS MODES EDR day 344, year 1997 to day 344, year 1997 3/12/98



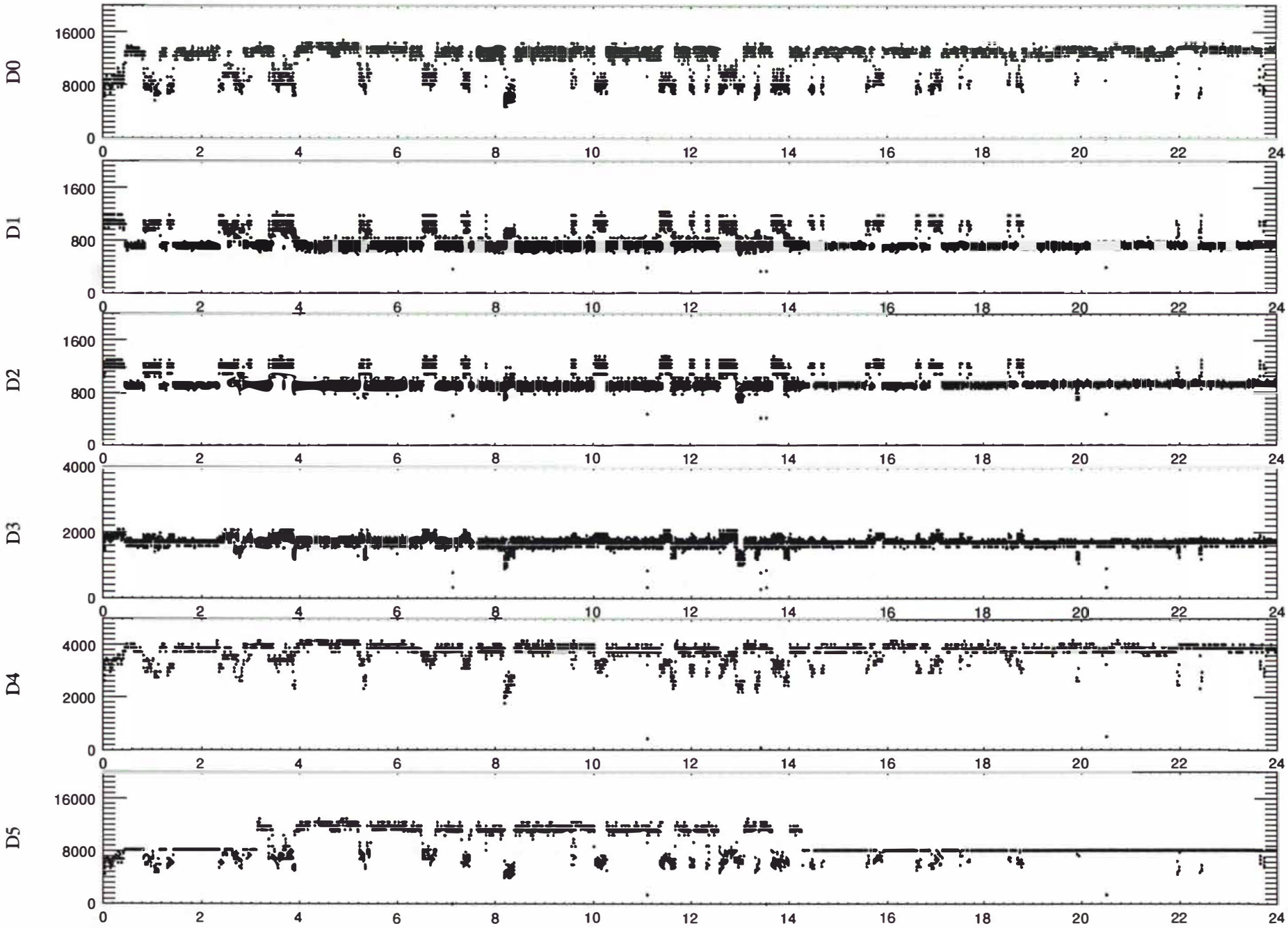
HUS 2A, MODE 1, NOT AVERAGED EDR day 344, year 1997 to day 344, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2B COUNTS / SEC EDR day 344, year 1997 to day 344, year 1997 3/12/98



---

.mber 17 1997 02:08  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.
---

November 18 1997 11:22  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.
---

November 29 1997 20:25  Ulysses time; weak burst, 100 ms long

This event was not detected by Konus.
---

December 7 1997 11:24  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.
---

December 11 1997 20:22  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.
---

December 14 1997 08:44  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.
---

December 19 1997 21:33  Ulysses time; moderate burst, 15 s long

Konus triggered at 22:12:54.241 in the North-facing detector.  The event consisted of a single broad soft peak lasting 10 seconds, with a 50-200 keV spike 4 seconds after the trigger and lasting 0.5 seconds.
---

ember 25 1997 17:23  Ulysses time; weak burst, 32 ms long

Konus waiting-mode data records a couple of events during the period of interest.  There was a weak to moderate North-facing detector soft event lasting 60 seconds, with a peak at 18:00:35.  A single 3-second timebin

From kraken@rosserv.gsfc.nasa.gov Wed Dec 17 14:05 PST 1997
X-Sender: kraken@kangaroo.gsfc.nasa.gov
Mime-Version: 1.0
Date: Wed, 17 Dec 1997 17:07:14 -0500
    khurley@sunspot.ssl.berkeley.edu (Kevin Hurley)
From: Peter Kurczynski <kraken@rosserv.gsfc.nasa.gov>
Subject: Ulysses bursts and TGRS
Cc: TEEGARDEN@tgrs2.gsfc.nasa.gov

Hi Kevin,

Here are the results of a search through TGRS data for recent Ulysses bursts. We cannot report the detection of any of the bursts listed below. Three bursts had interesting anomalies within a 6000 second window centered on the Ulysses trigger time. Such events are under investigation, but are probably not GRB's.

November 17 1997 02:08 Ulysses time; weak burst, 100 ms long
TGRS sees a single high data channel at 7100s between 100-300 keV

November 18 1997 11:22 " " ; weak burst, 64 ms long
November 29 1997 20:25 Ulysses time; weak burst, 100 ms long
December 7 1997 11:24 Ulysses time; weak burst, 64 ms long
December 11 1997 20:22 Ulysses time; weak burst, 32 ms long
TGRS sees a single high data channel at 75700s between 35-100 keV with what st?

December 14 1997 08:44 Ulysses time; weak burst, 32 ms long
TGRS sees a single high data channel at 35100s between 100-300 keV

Take care, and Happy Holidays.

Pete

From HENZE@fender.msfc.nasa.gov Fri Dec 12 09:17:05 1997
Date: Fri, 12 Dec 1997 11:16:24 -0600 (CST)
From: Bill Henze (205-544-7616) <HENZE@fender.msfc.nasa.gov>
To: burst@comptel.sr.unh.edu, grobad@estsa2.estec.esa.nl,
cline@lheavx.gsfc.nasa.gov, barthelmy@lheavx.gsfc.nasa.gov,
bacodine@lheawww.gsfc.nasa.gov, scott@circe.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, band@cass09.ucsd.edu,
gruber@cass09.ucsd.edu, matteson@cass09.ucsd.edu,
PACIESAS@fender.msfc.nasa.gov, HORACK@fender.msfc.nasa.gov,
khurley@sunspot.ssl.berkeley.edu, park@kabul.llnl.gov
Subject: Burst Trigger Message

BATSE BURST TRIGGER

NO.: 6530

TIME: TJD=0793 SECONDS=46501

TYPE: CYG X-1 SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

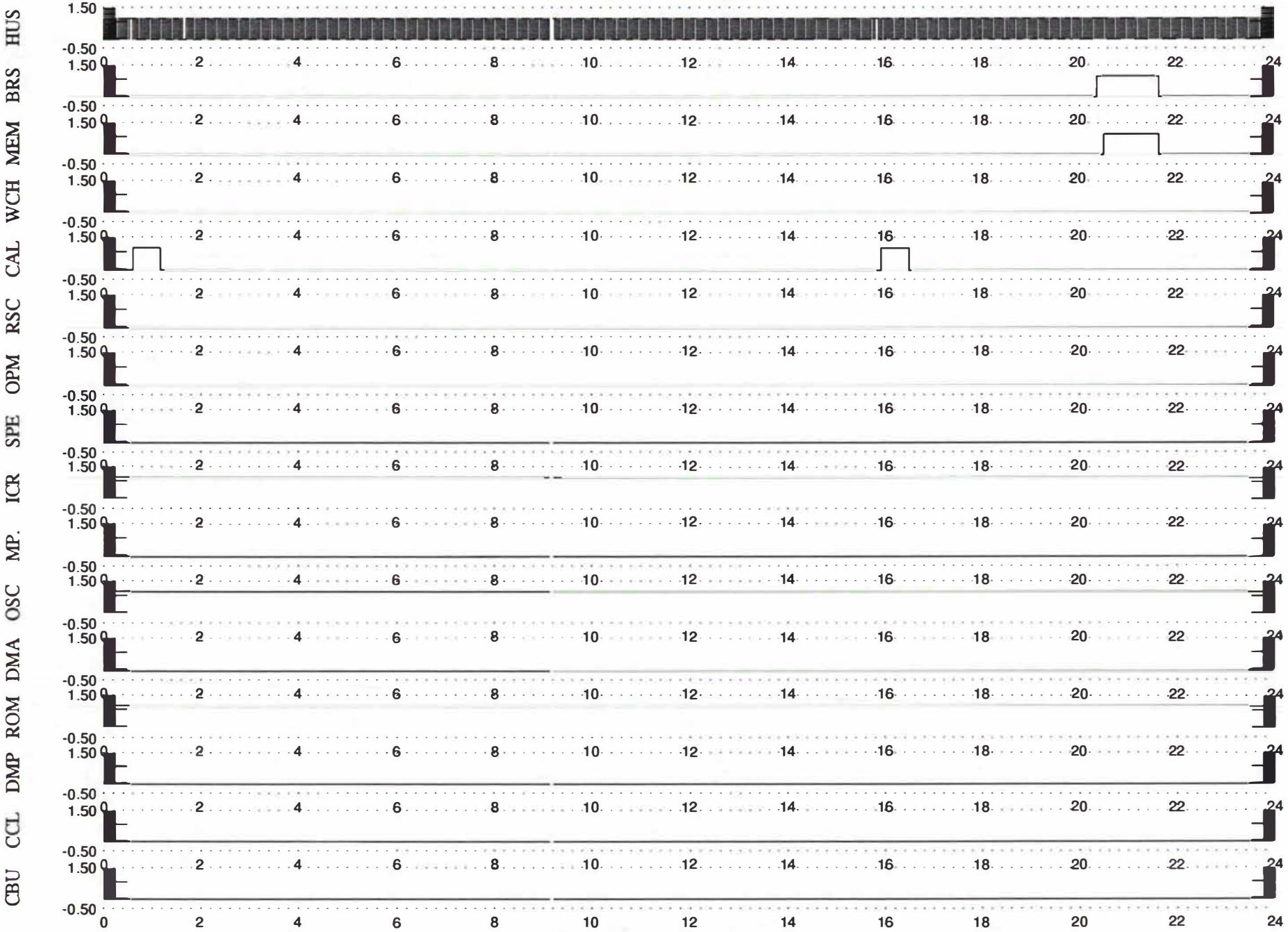
INTENSITY: COUNTS/CM2

LOCATION: ZENITH=110.1 AZIMUTH=355.0 ERROR= 5.8 DEGREES

COMMENTS:
FLUCTUATION FOLLOWING CYG X-1 OCCULTATION RISE.

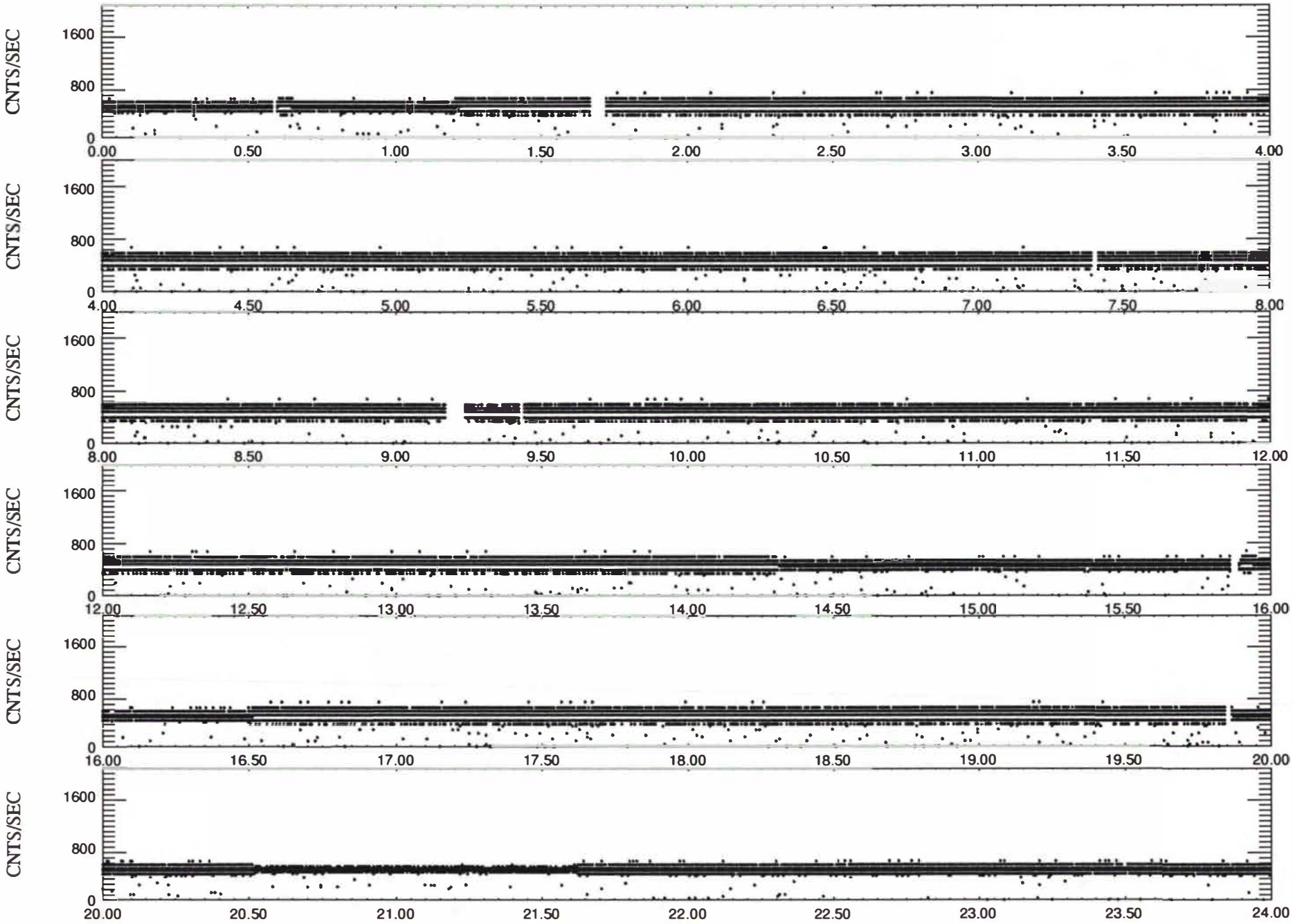
HUS MODES EDR day 345, year 1997 to day 345, year 1997 3/12/98

BURST NUMBER 4



HUS 2A, MODE 1, NOT AVERAGED EDR day 345, year 1997 to day 345, year 1997 3/12/98

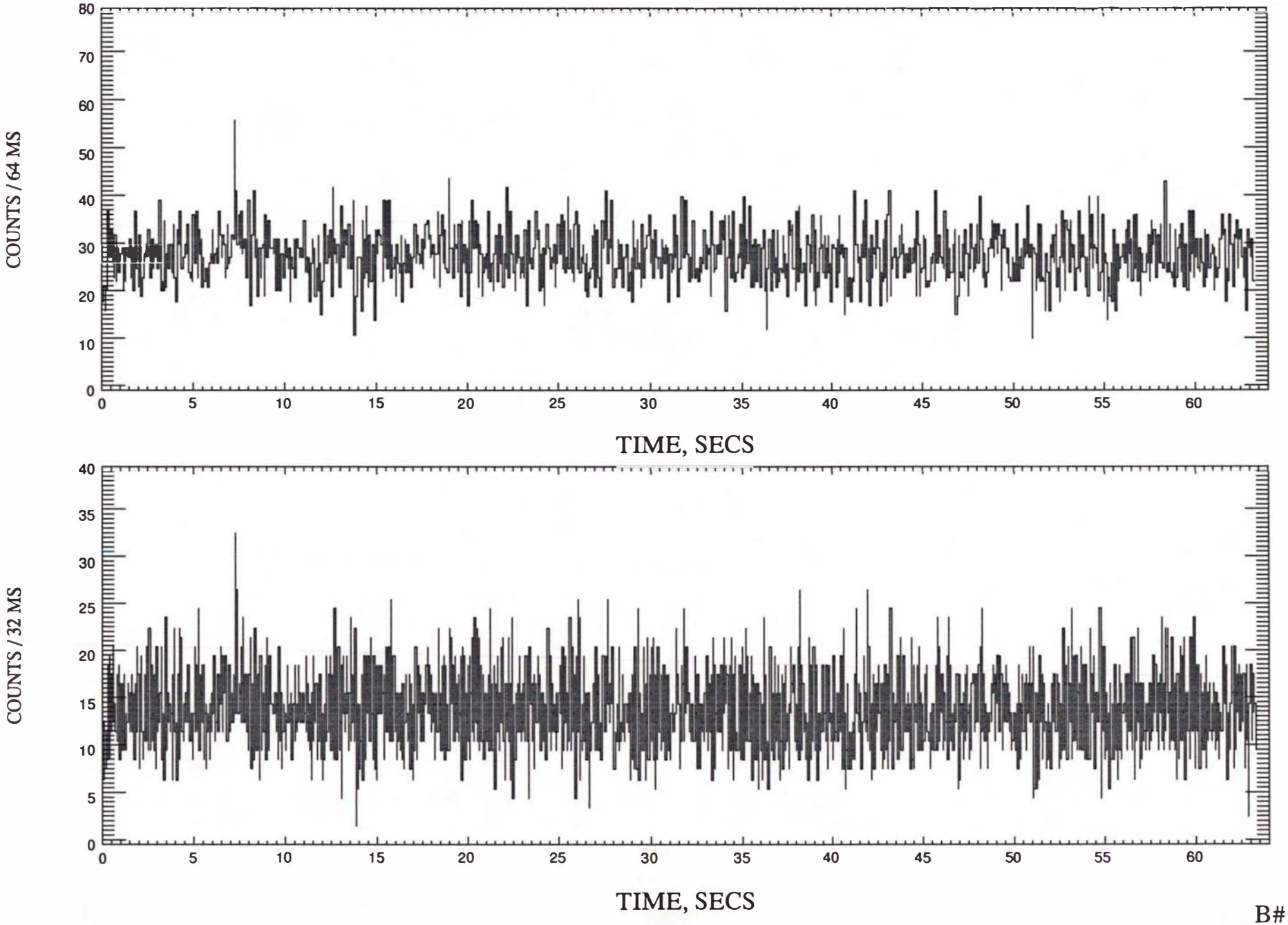
CALIBRATION DATA INCLUDED




UNIV' 'AL TIME

HUS 2A TRIGGERED DATA EDR day 345, year 1997 3/11/98

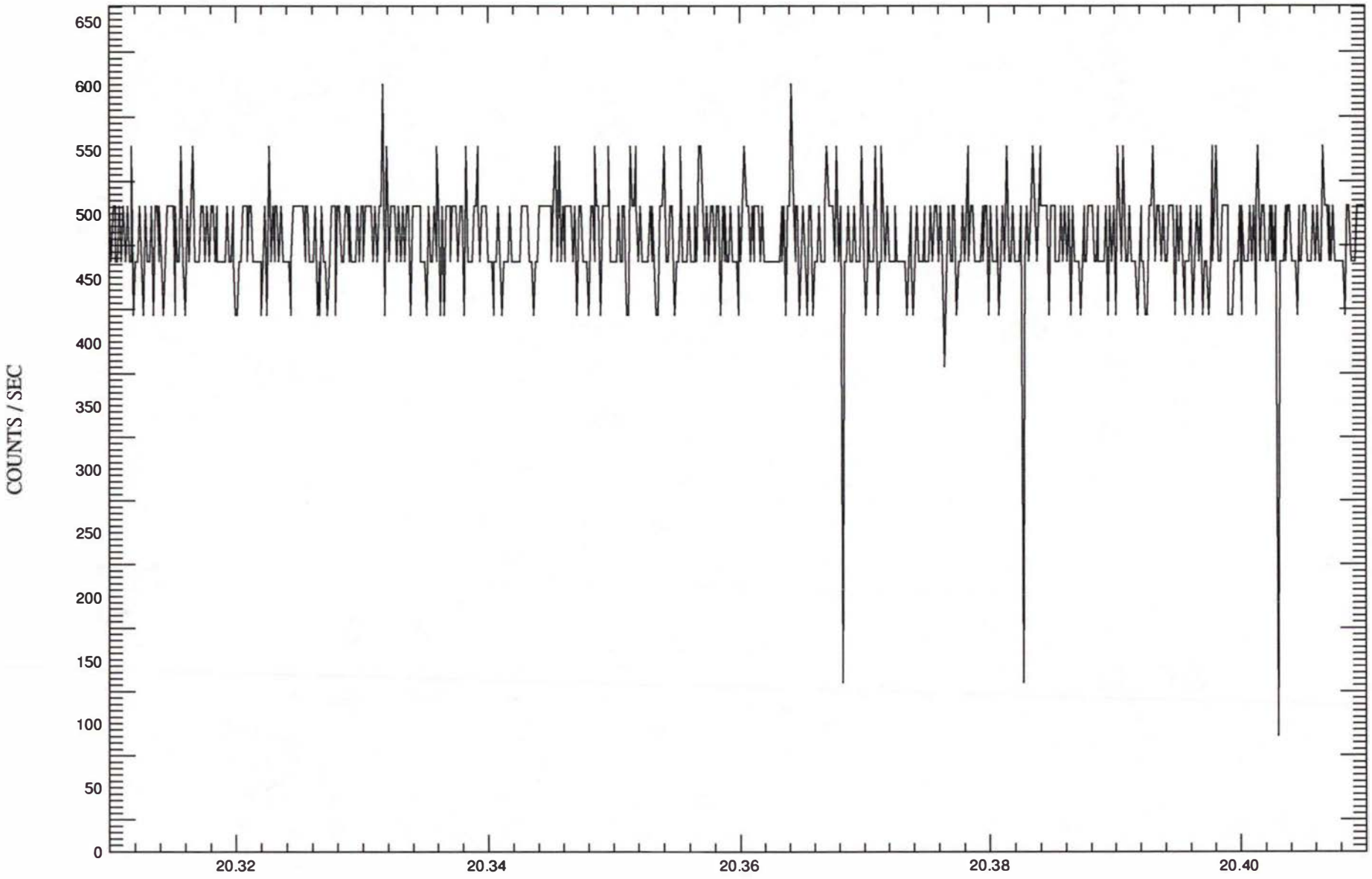
Burst Counter 4 at UT=20.364307568868 h=73311.507 s 20:21:51.507



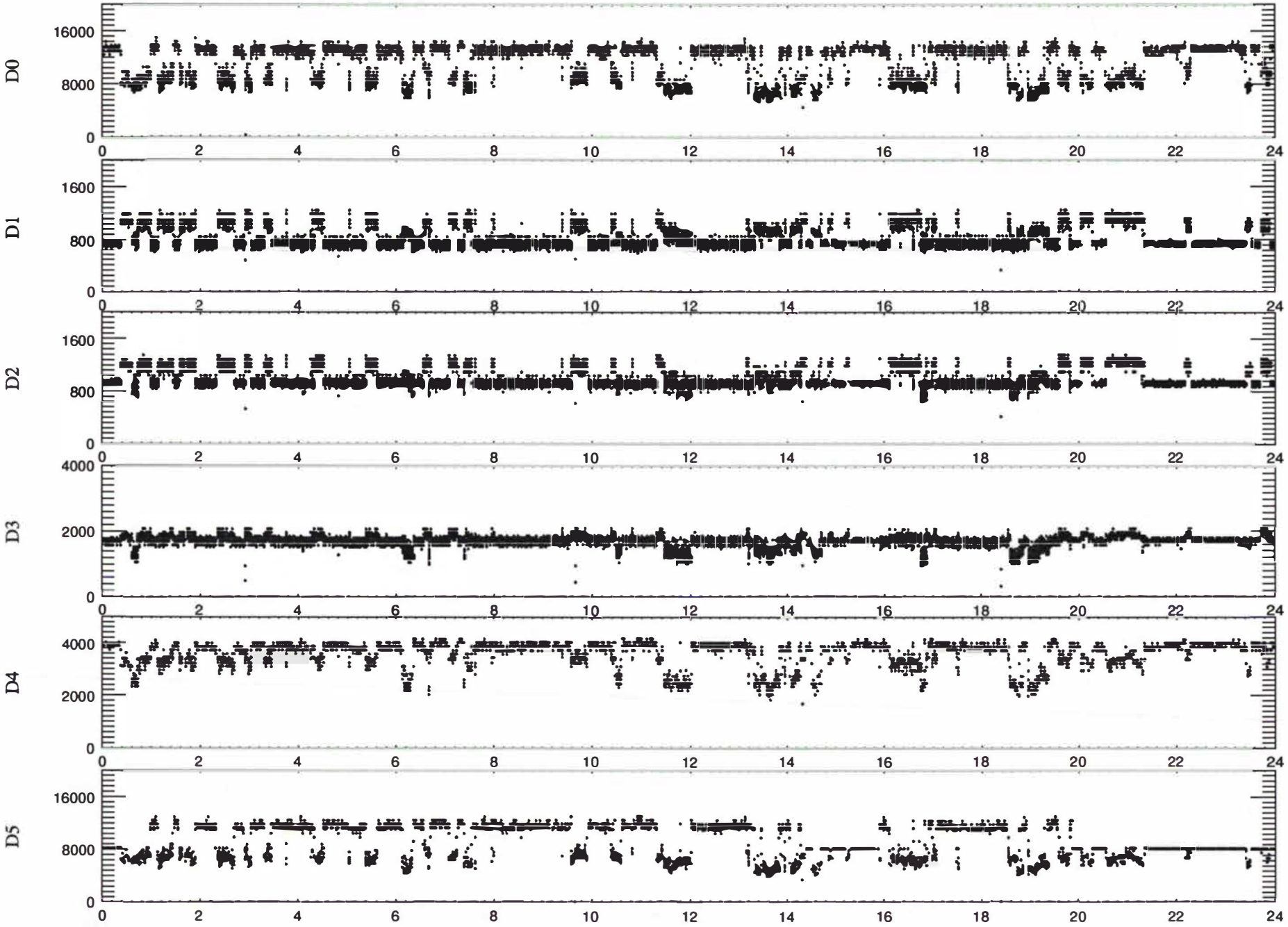

B# 1

HUS 2A, MODE 1, NOT AVERAGED EDR day 345, year 1997 to day 345, year 1997 3/11/98

CALIBRATION DATA INCLUDED



HUS 2B COUNTS / SEC EDR day 345, year 1997 to day 345, year 1997 3/12/98



From HENZE@SSLMOR.msfc.nasa.gov Mon Dec 15 15:18:48 1997
Return-Path: <HENZE@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id PAA16268; Mon, 15 Dec 1997 15:18:40 -0800
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id PAA19866; Mon, 15 Dec 1997 15:18:31 -0800
Date: Mon, 15 Dec 1997 17:16:18 -0600 (CST)
From: HENZE@SSLMOR.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971215171618.21e0d8ee@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6531
Content-Length: 1135
X-Lines: 26
Status: RO

No - too weak

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

BATSE BURST # 6531
EVENT OF 1997 DEC 12 DAY OF YEAR=346
EVENT CROSSING TIME AT BATSE : 80246. S. OR 22:17:26.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 306.000 -45.000
BATSE PEAK COUNTING RATE: 2500 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 12/12/ 97 IS:
RA= 170.701 DEC= 12.015 DIST= 5.192 AU
BATSE-ULYSSES DISTANCE = 776753219. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 50.30 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1655.09 SECS.
CROSSING TIME AT ULYSSES IS 81901. S. OR 22:45:01 +/- 421.23 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 12/12/ 97 IS:
RA= 297.301 DEC= -22.329 DIST= 2.070 AU
MARS-BATSE DISTANCE = 309740512. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=156.24 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -945.58 SECS.
CROSSING TIME AT MARS IS 79300. S. OR 22:01:40 +/- 57.92 SECONDS

BATSE BURST TRIGGER
NO.: 6531

TIME: TJD=0794 SECONDS=80246

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= 54.5 AZIMUTH=299.8 ERROR= 8.1 DEGREES

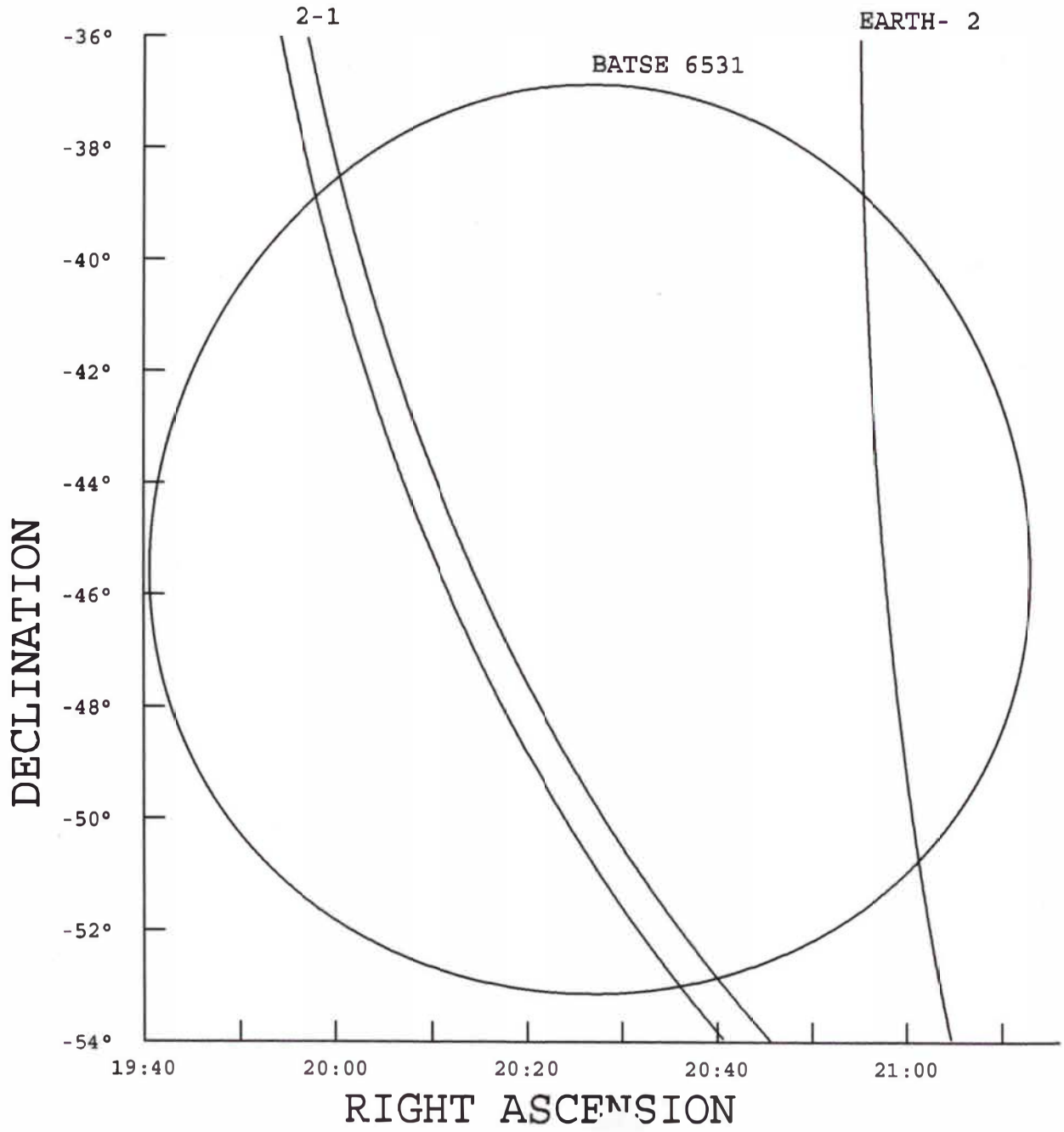
COMMENTS:
SINGLE PULSE, DUR. APPROX. 35 S. NOT VISIBLE ABOVE 300 KEV.
POSSIBLE PRECURSOR AT APPROX. T-55 S.

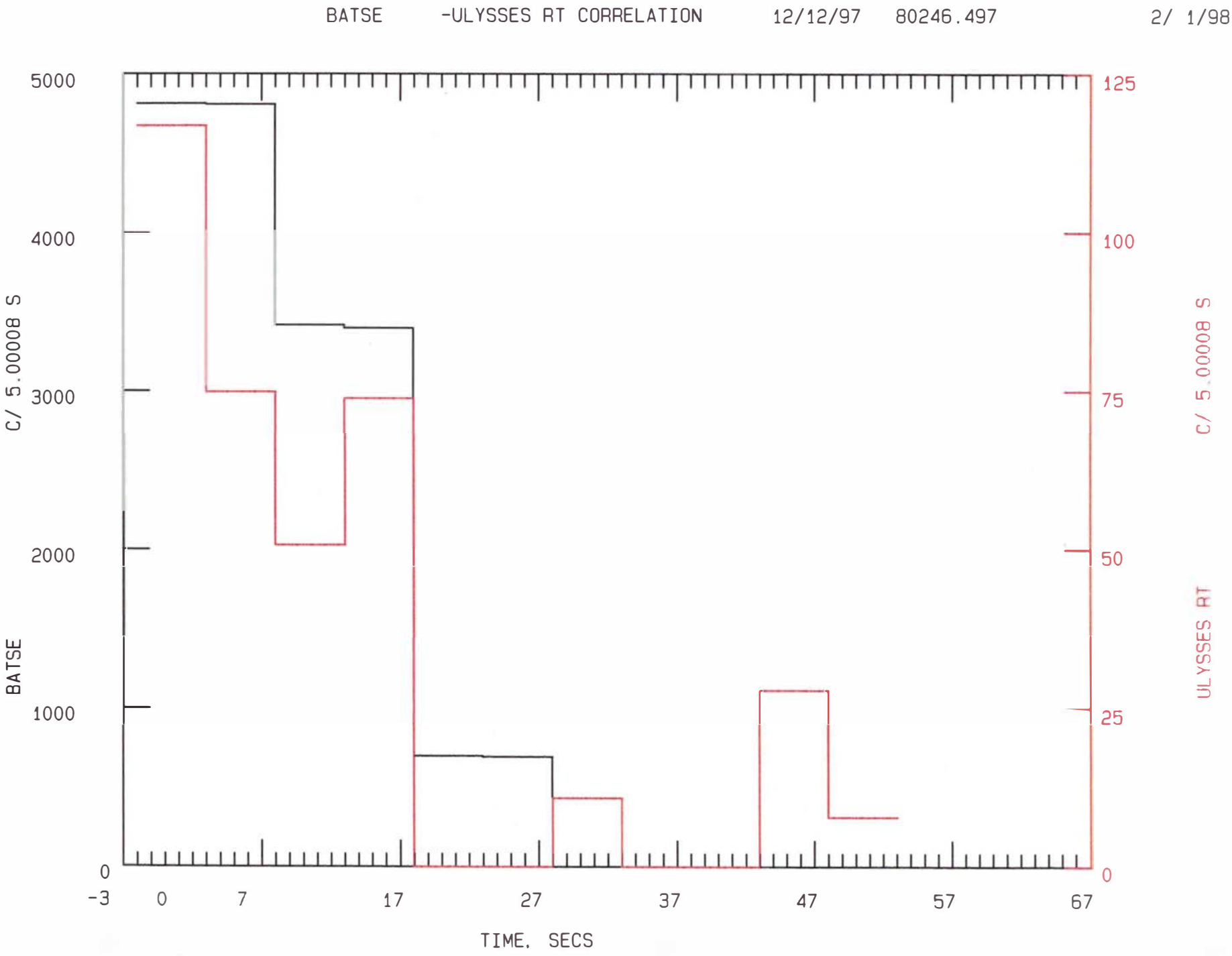
| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6531 | 971212 | 10794 | 80246 | 2500 | 306 | -45 | 35 |

# EVENT OF DEC 12, 1997 22:42

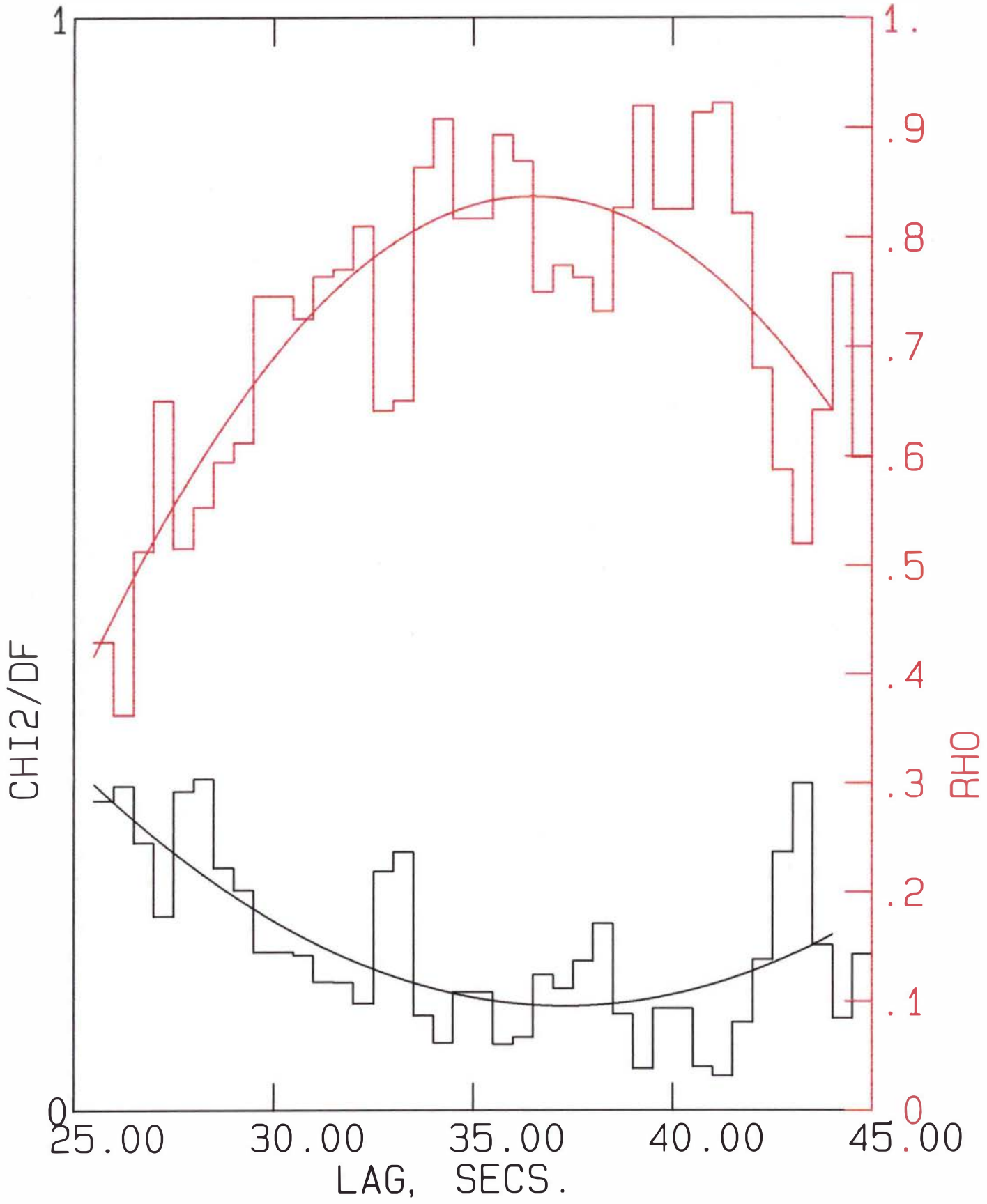


N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE




BATSE -ULYSSES RT CORRELATION 12/12/97 80246.497 2/ 1/98
5000
4000
3000
2000
1000
0
C/ 5.00008 S
BATSE
125
100
75
50
25
0
C/ 5.00008 S
ULYSSES RT
-3
0
7
17
27
37
47
57
67
TIME, SECS

BATSE -ULYSSES RT CORRELATION 12/12/97 80246.497

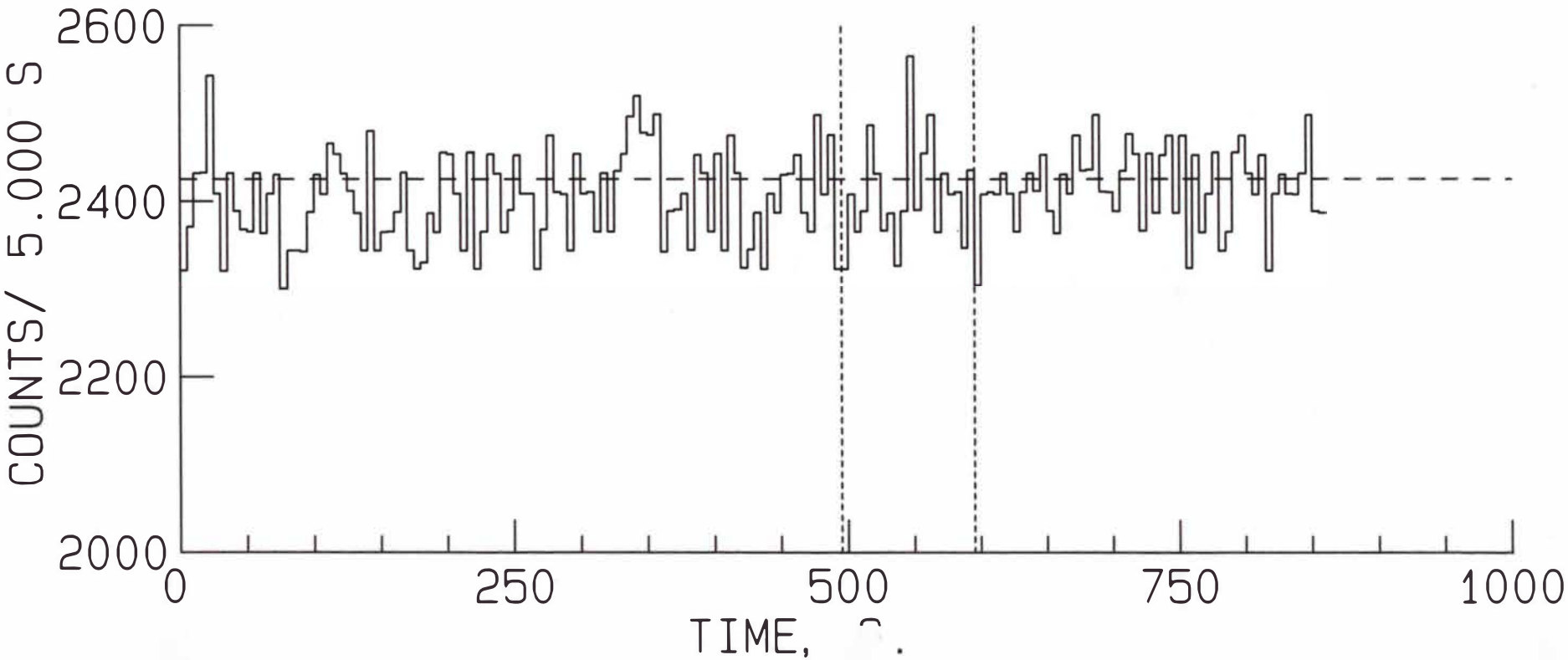


ULYSSES RT 2/ 1/98

12/12/97 81468.374 s

0.500 S INTERVALS REGROUPED BY 10

22- 147 keV



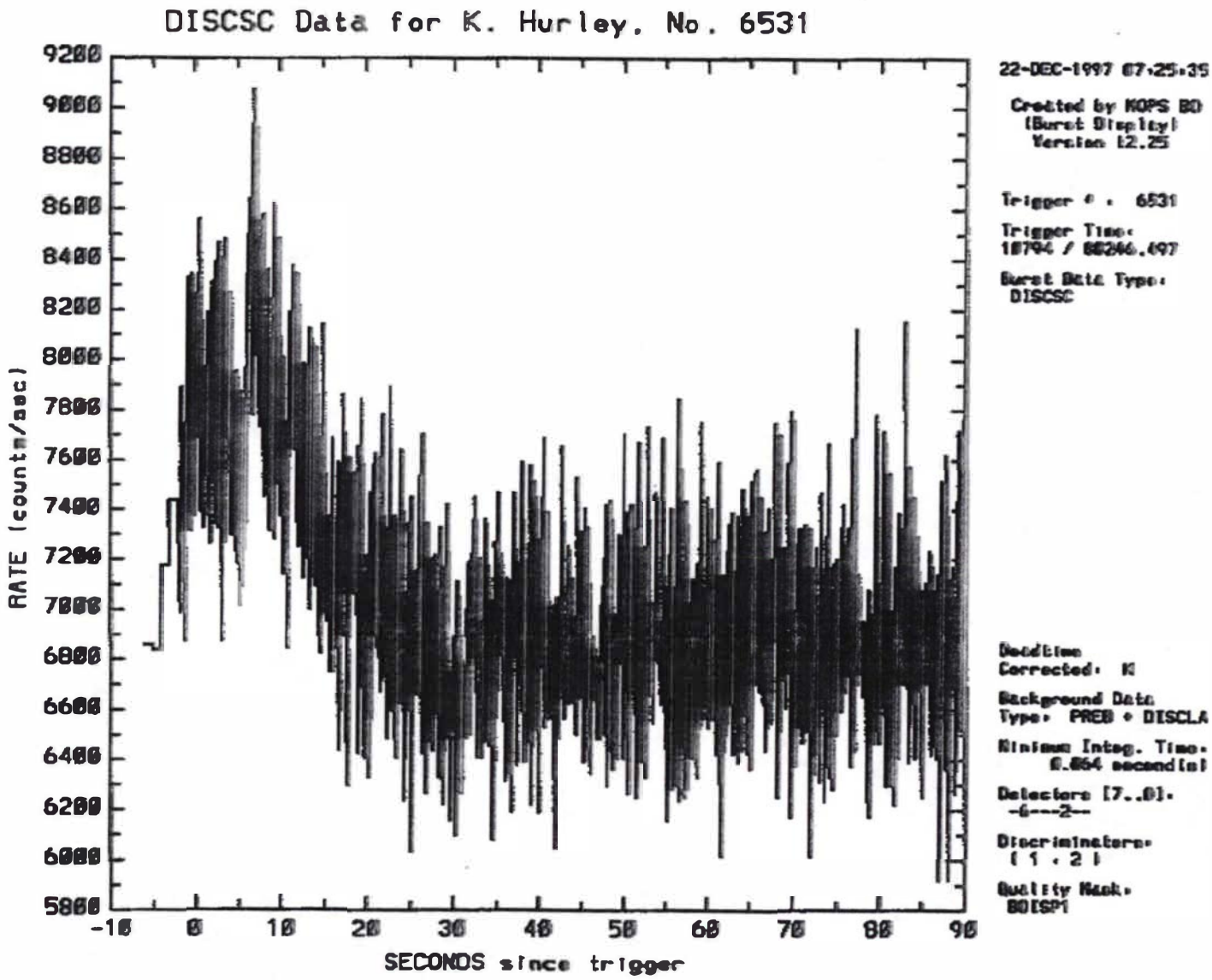
BATSE 12/12/97 80246.497

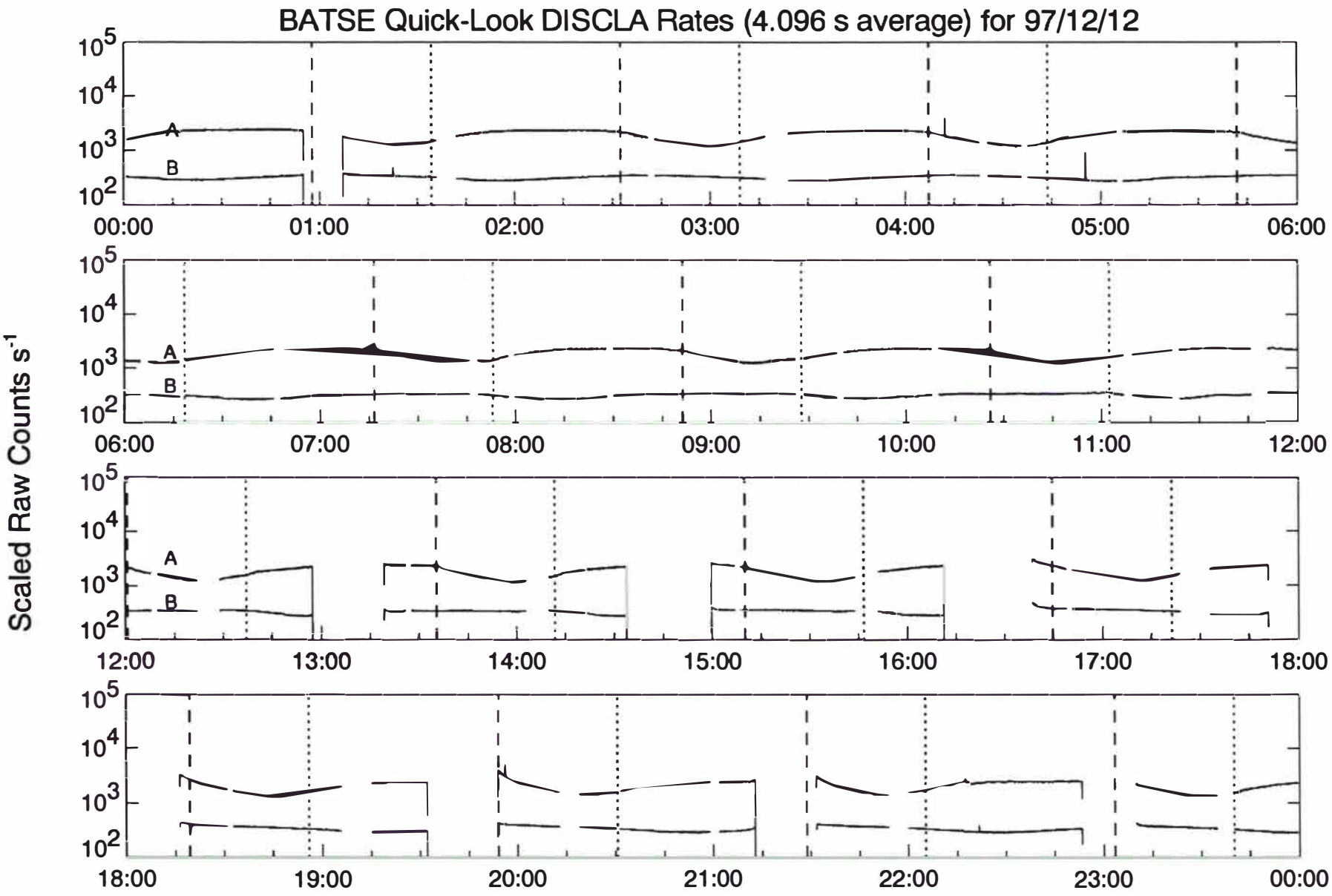
25- 100 keV

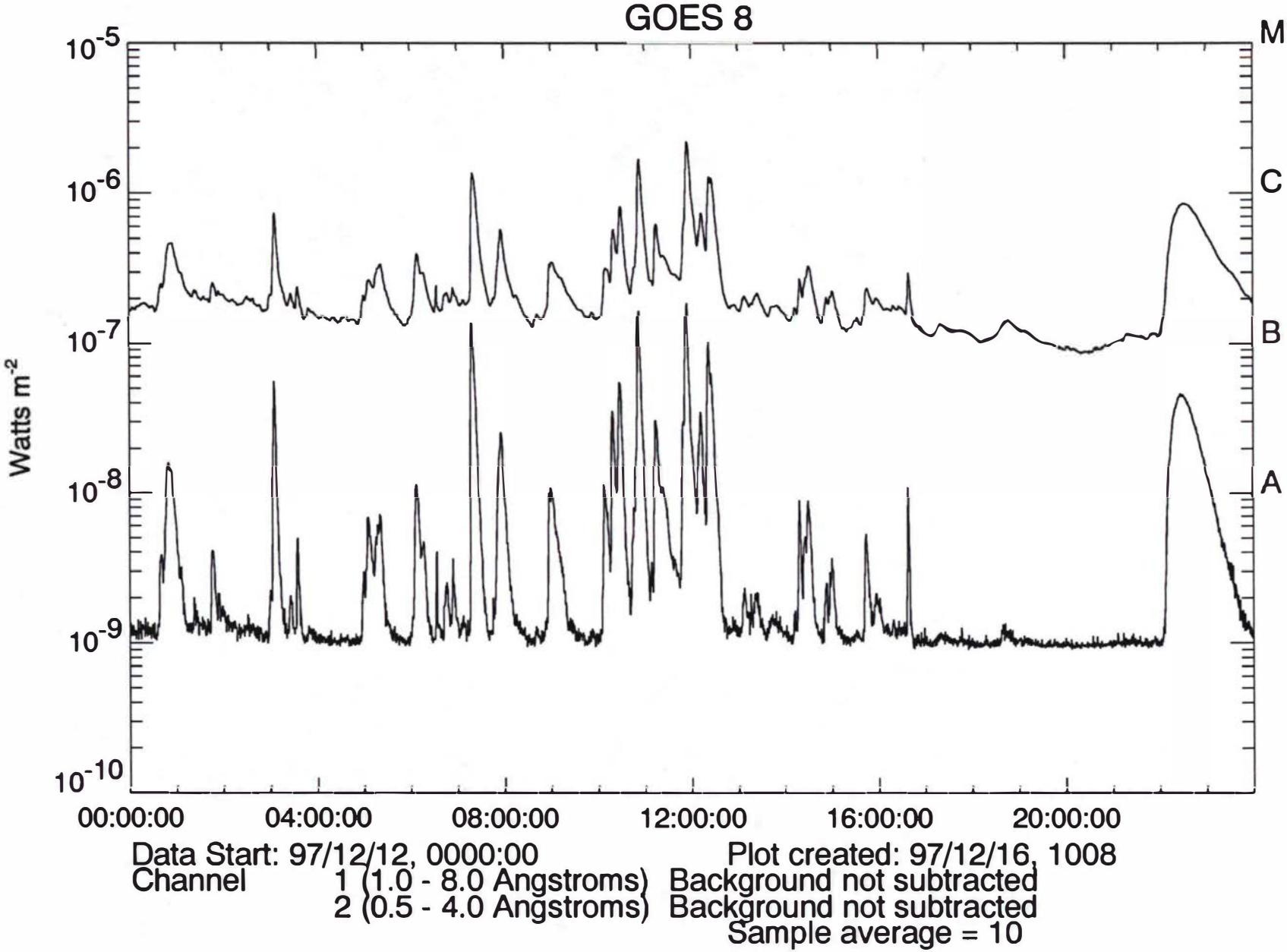
COUNTS/0.064 S



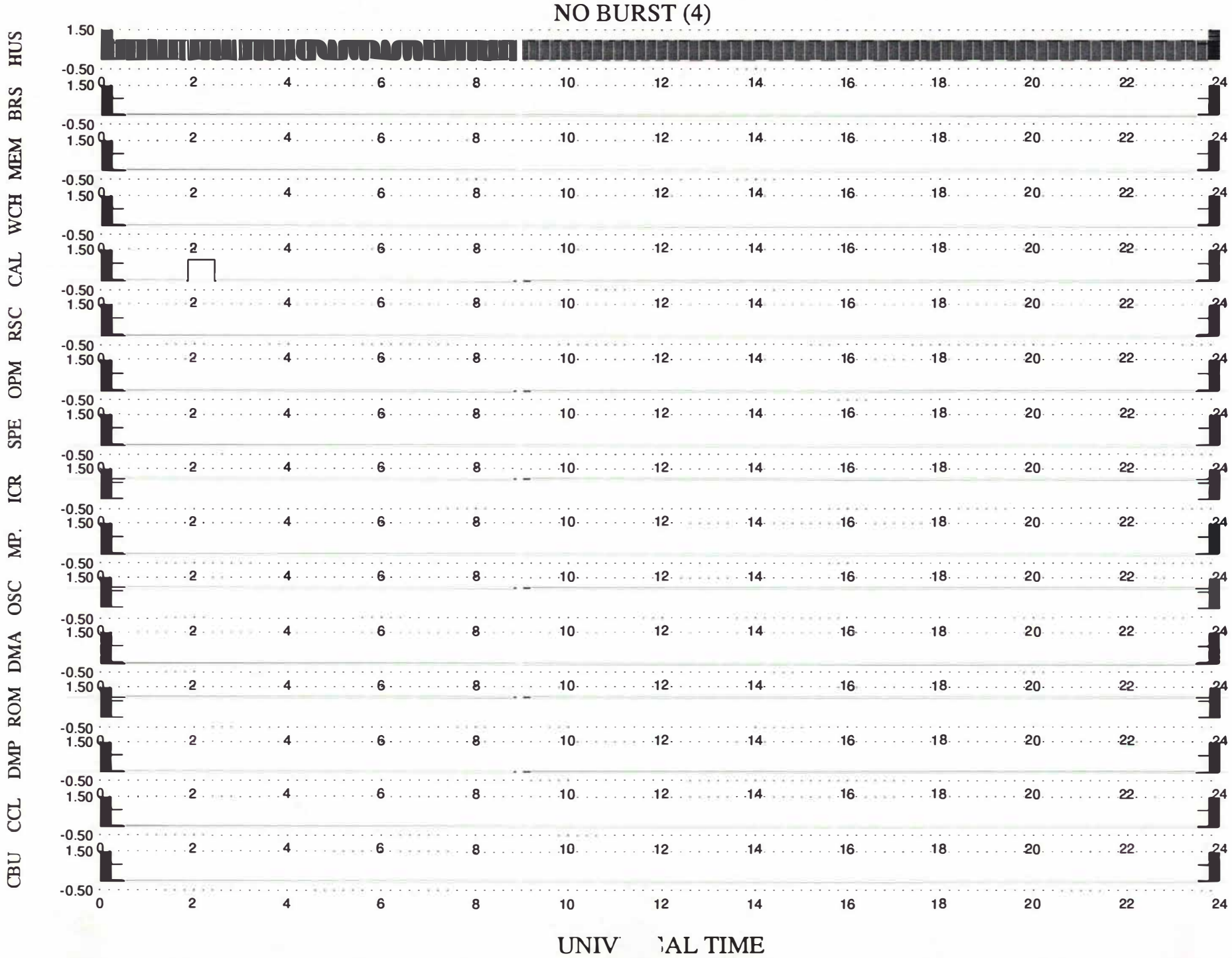

2/ 1/98


DISCSC Data for K. Hurley, No. 6531
RATE (counts/sec)
SECONDS since trigger
22-DEC-1997 07:25:35
Created by MOPS BD
(Burst Display)
Version 12.25
Trigger # : 6531
Trigger Time:
18794 / 86246.497
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 seconds
Detectors [7..0]:
-6---2--
Discriminators:
( 1 , 2 )
Quality Mask:
BDISP1


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/12
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/16, 1010 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

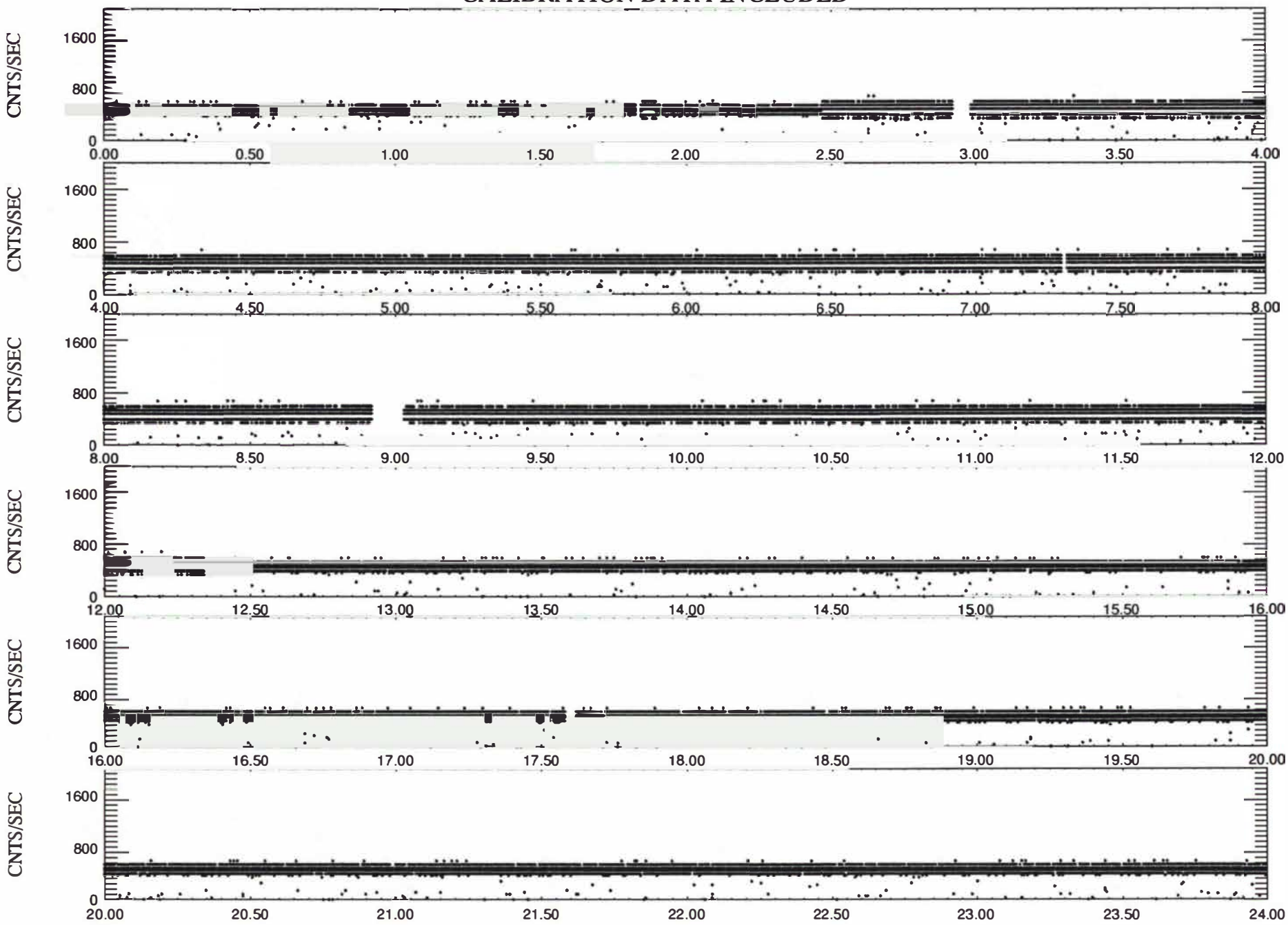

GOES 8
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/12, 0000:00
Plot created: 97/12/16, 1008
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 346, year 1997 to day 346, year 1997 3/12/98



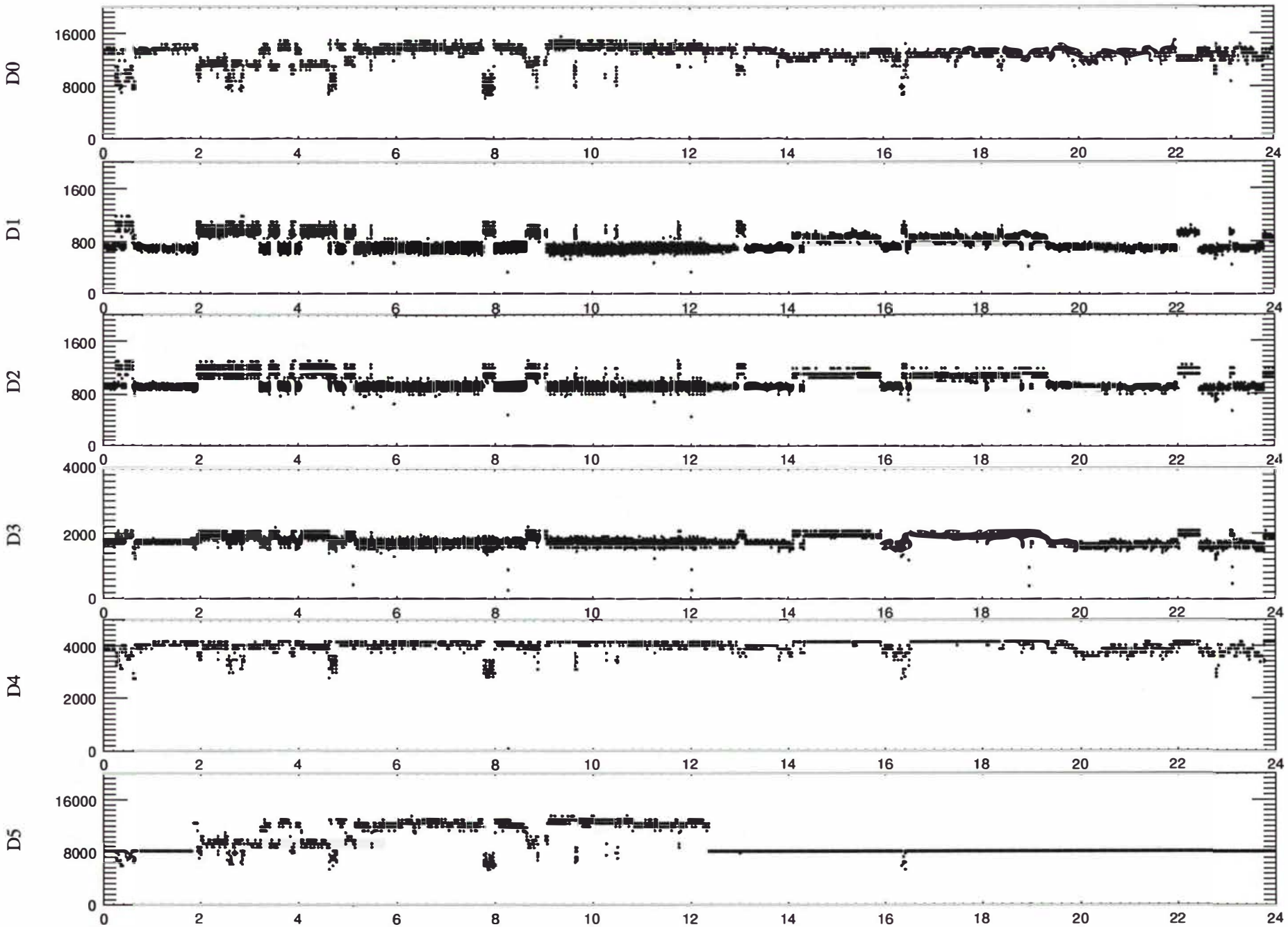
HUS 2A, MODE 1, NOT AVERAGED EDR day 346, year 1997 to day 346, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2B COUNTS / SEC EDR day 346, year 1997 to day 346, year 1997 3/12/98



From SURASAK@SSLLES.MSFC.NASA.GOV Mon Dec 15 12:19:23 1997
Return-Path: <SURASAK@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA14133; Mon, 15 Dec 1997 12:19:15 -0800
From: SURASAK@SSLLES.MSFC.NASA.GOV
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA18298; Mon, 15 Dec 1997 12:19:03 -0800
Date: Mon, 15 Dec 1997 14:18:09 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971215141809.23404694@SSLLES.MSFC.NASA.GOV>
Subject: Crossing Windows for BATSE Burst 6532
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6532
EVENT OF 1997 DEC 13 DAY OF YEAR=347
EVENT CROSSING TIME AT BATSE : 62653. S. OR 17:24:13.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 345.000 -7.000
BATSE PEAK COUNTING RATE: 2100 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 13/12/ 97 IS:
RA= 170.685 DEC= 11.999 DIST= 5.179 AU
BATSE-ULYSSES DISTANCE = 774803210. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 7.51 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2562.29 SECS.
CROSSING TIME AT ULYSSES IS 65215. S. OR 18:06:55 +/- 147.56 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 13/12/ 97 IS:
RA= 298.127 DEC= -22.183 DIST= 2.074 AU
MARS-BATSE DISTANCE = 310244544. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=132.40 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -697.82 SECS.
CROSSING TIME AT MARS IS 61955. S. OR 17:12:35 +/- 122.08 SECONDS

BATSE BURST TRIGGER

NO.: 6532

TIME: TJD=0795 SECONDS=62653

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

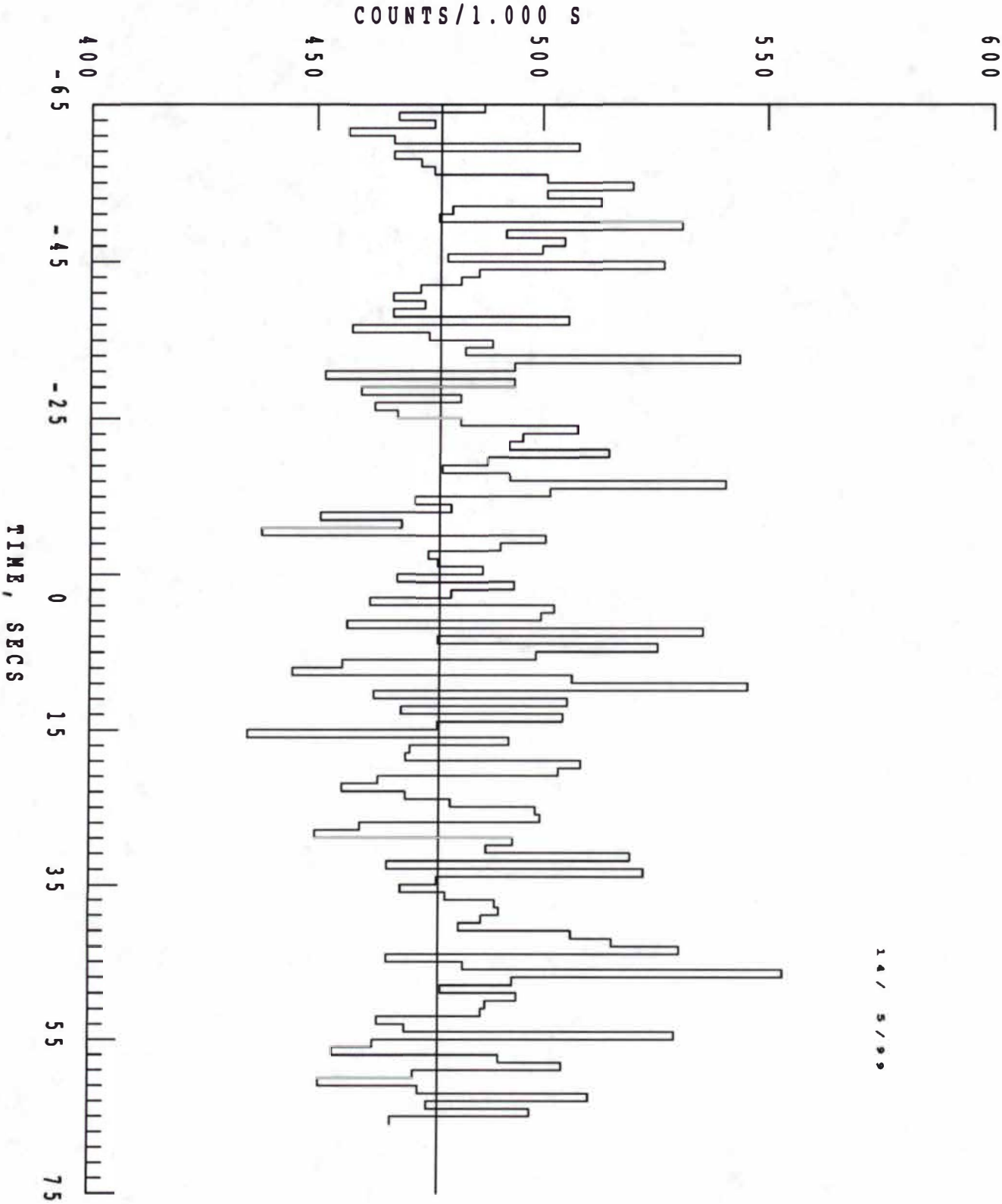
LOCATION: ZENITH=105.5 AZIMUTH=296.7 ERROR=2.973 DEGREES

COMMENTS:
GRB. DOUBLE PULSES. FIRST PULSE IS A SINGLE PULSE. SATRTS AT ABOUT T-5S.
DURATION ABOUT 45S. SECOND PULSE STARTS AT ABOUT T+120S. DURATION ABOUT 40S.
BOTH PULSES ARE NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6532 | 971213 | 10795 | 62653 | 2100 | 345 | -07 | 180 |

NEAR 13/12/97 62670.804

100-1000 keV



BATSE BURST# 6532

ULYSSES RT

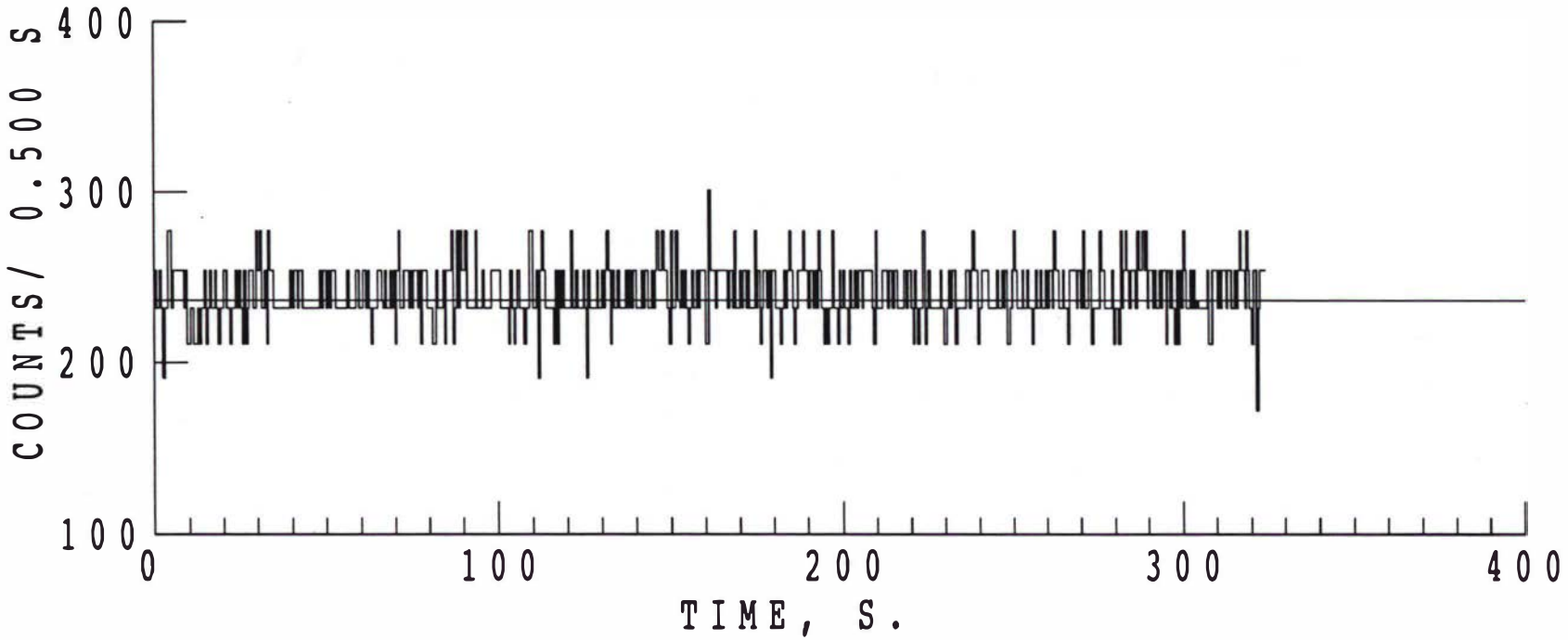
15/12/97

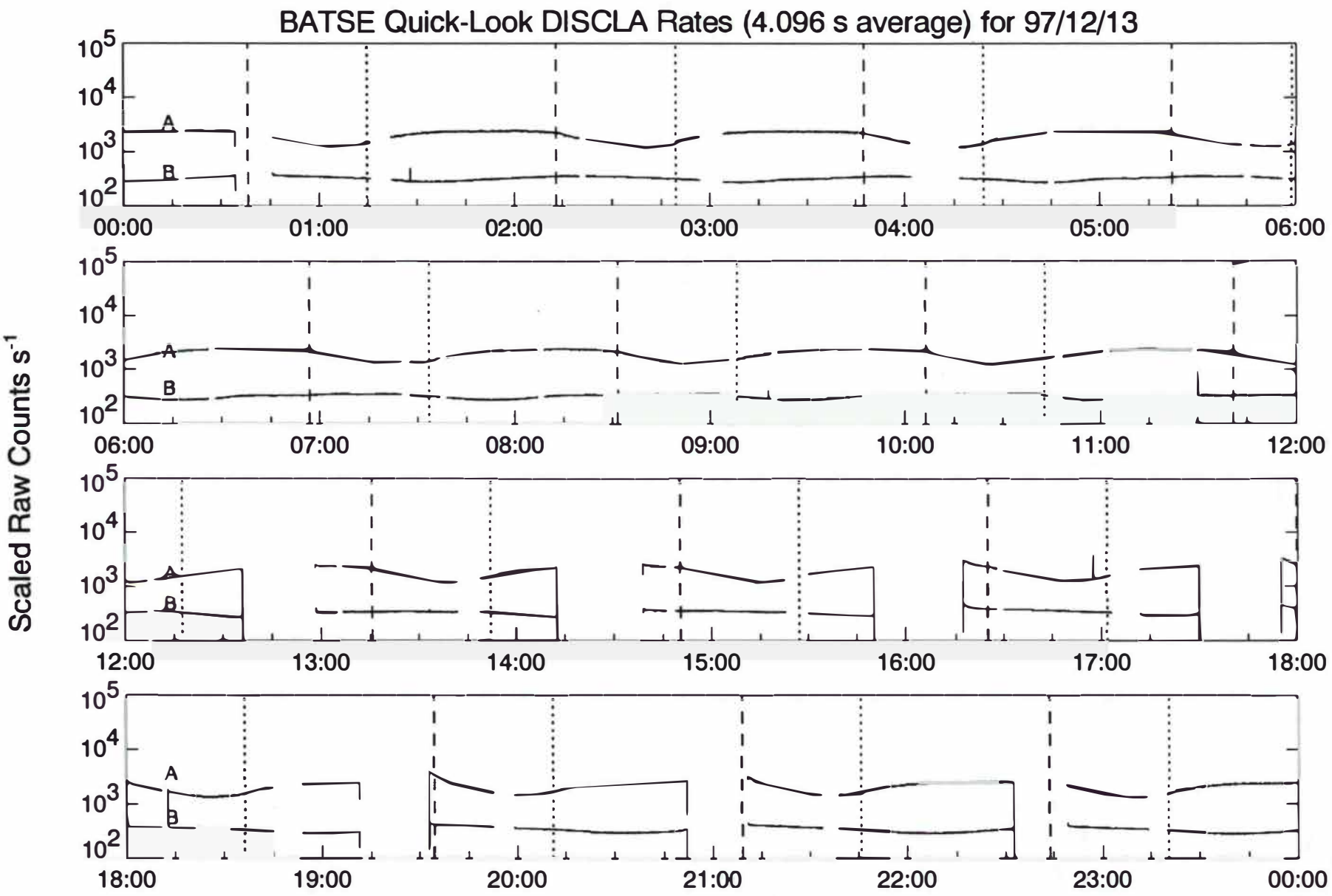
13/12/97 65052.156 s

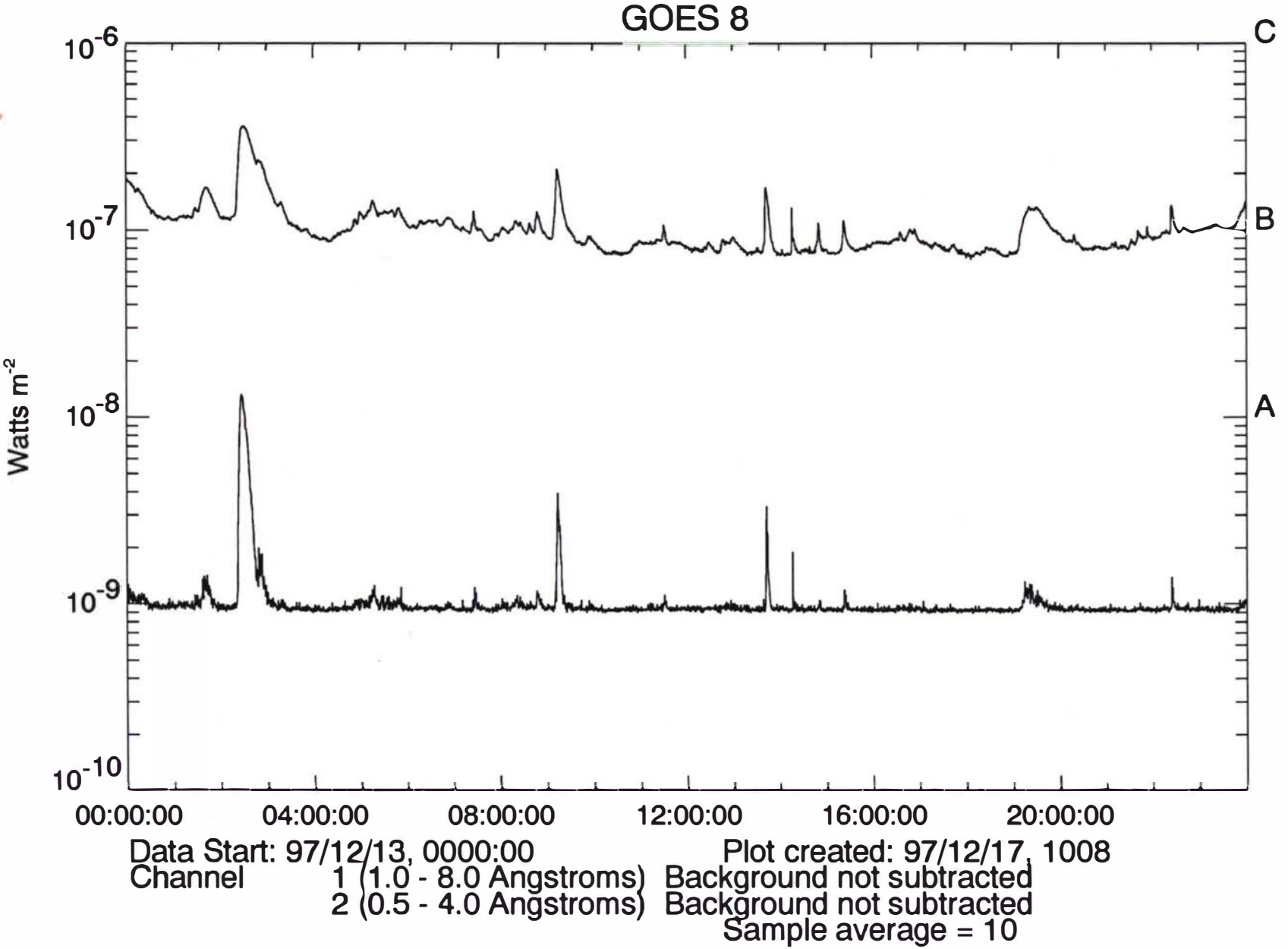
0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

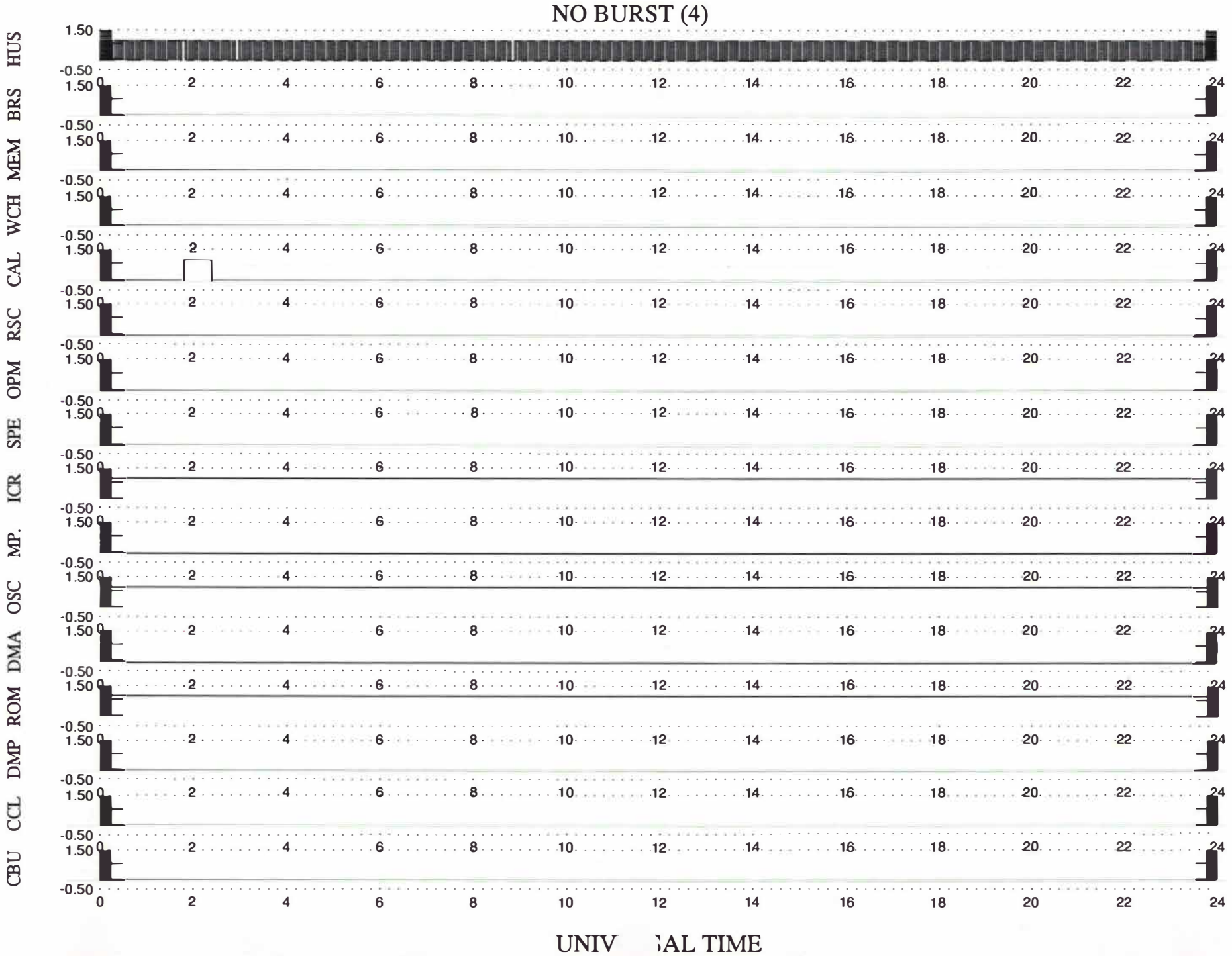
N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/13
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/17, 1009 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

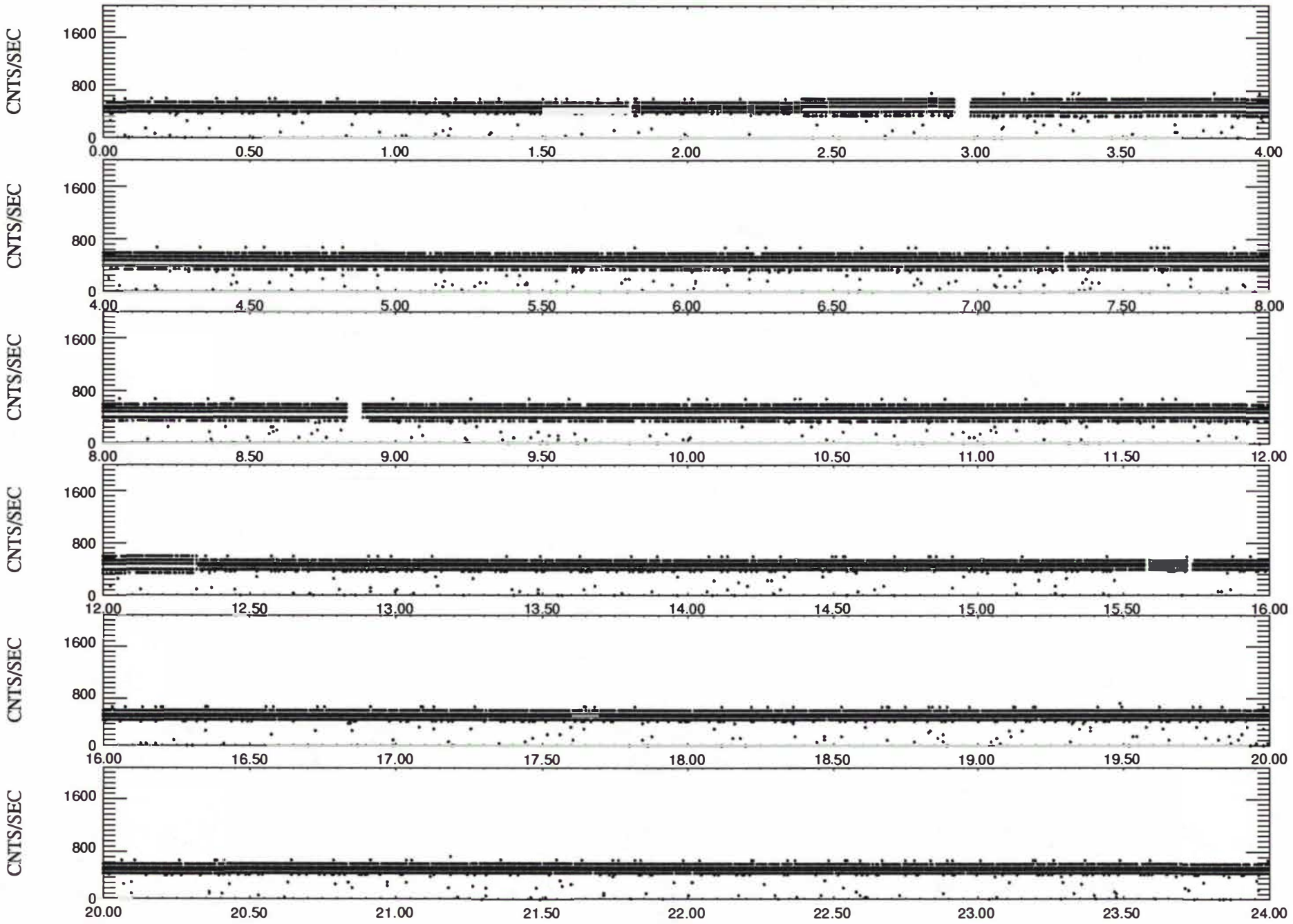

GOES 8
C
B
A
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/13, 0000:00
Plot created: 97/12/17, 1008
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 347, year 1997 to day 347, year 1997 3/12/98



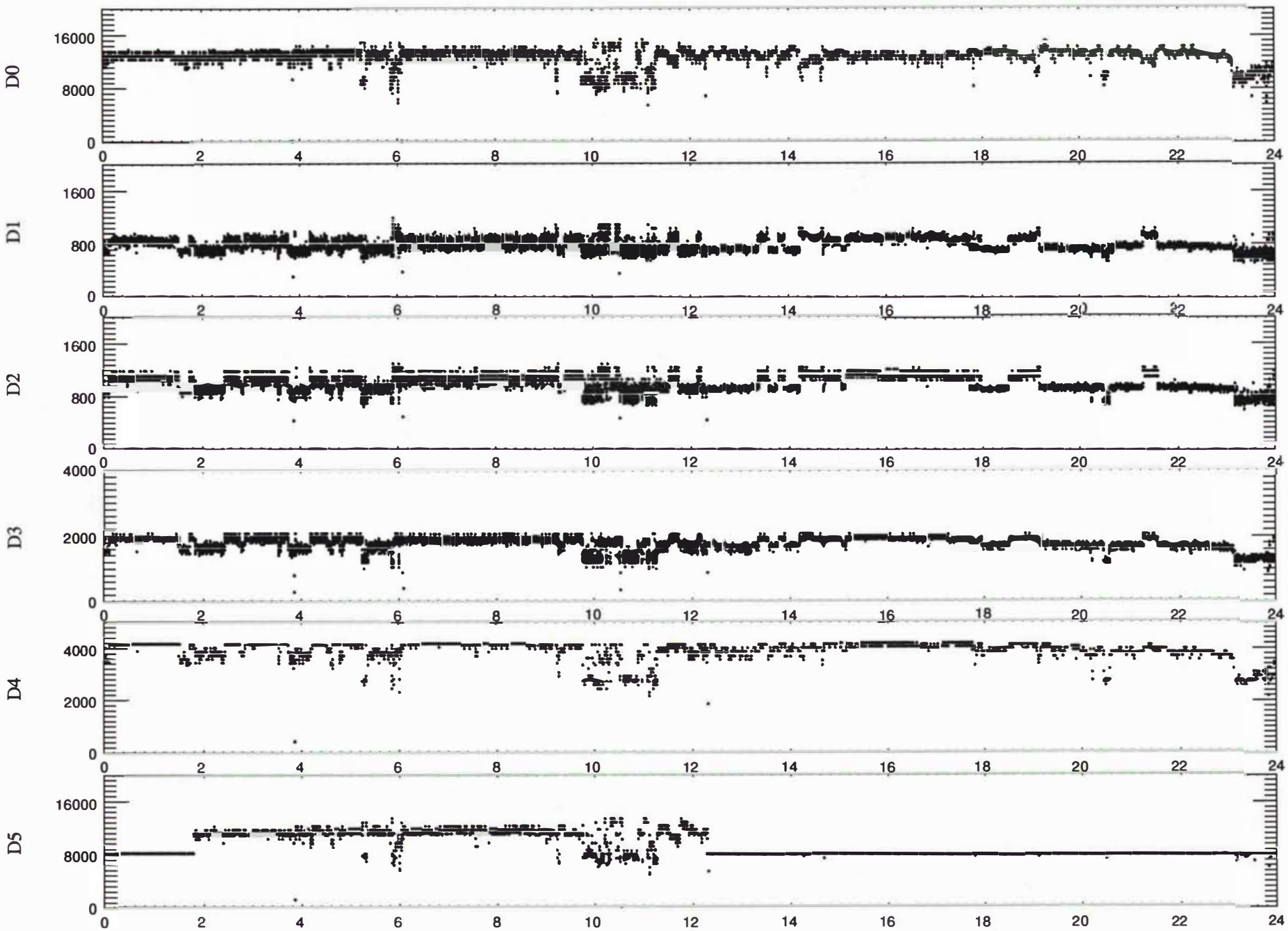
HUS 2A, MODE 1, NOT AVERAGED EDR day 347, year 1997 to day 347, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2B COUNTS / SEC EDR day 347, year 1997 to day 347, year 1997 3/12/98



GRBM 19971214 09510

ULYSSES RT 15/01/07

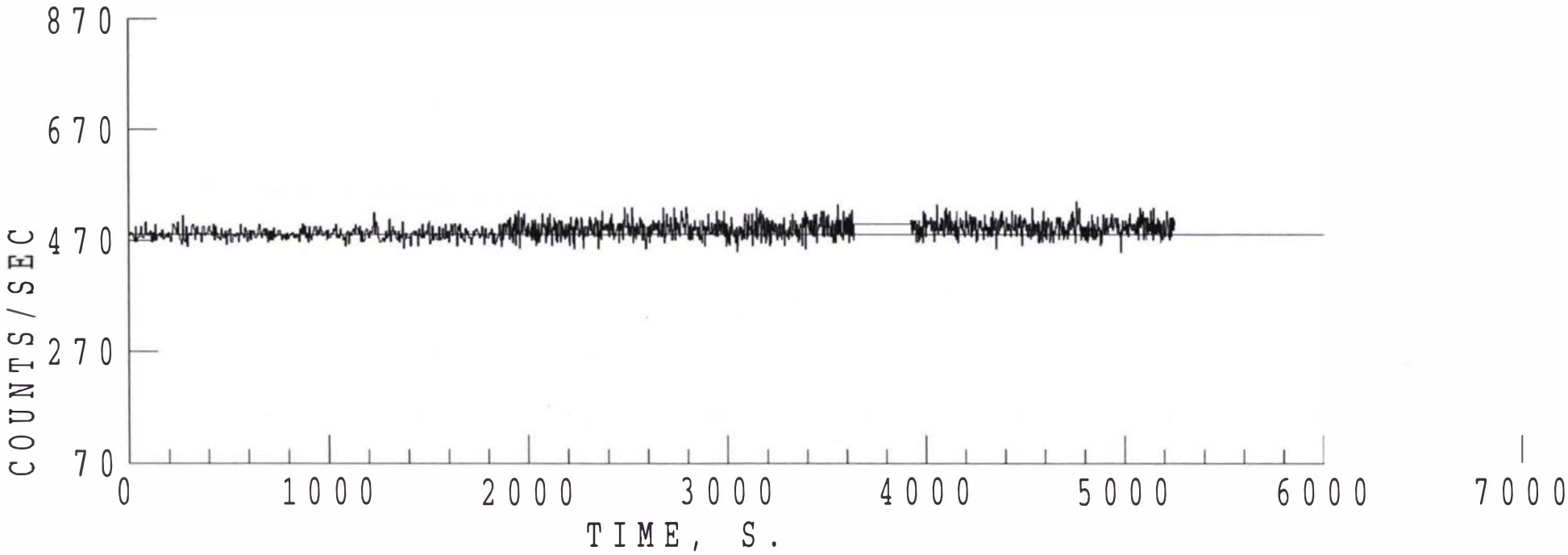
14/12/97 6876.418 s

INTERVALS REGROUPED BY 11

0- 0 keV

N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



---

ember 17 1997 02:08  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

November 18 1997 11:22  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

November 29 1997 20:25  Ulysses time; weak burst, 100 ms long

This event was not detected by Konus.

---

December 7 1997 11:24  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

December 11 1997 20:22  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.

---

December 14 1997 08:44  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.

---

December 19 1997 21:33  Ulysses time; moderate burst, 15 s long

Konus triggered at 22:12:54.241 in the North-facing detector.  The event consisted of a single broad soft peak lasting 10 seconds, with a 50-200 keV spike 4 seconds after the trigger and lasting 0.5 seconds.

---

ember 25 1997 17:23  Ulysses time; weak burst, 32 ms long

Konus waiting-mode data records a couple of events during the period of interest.  There was a weak to moderate North-facing detector soft event lasting 60 seconds, with a peak at 18:00:35.  A single 3-second timebin

From kraken@rosserv.gsfc.nasa.gov Wed Dec 17 14:05 PST 1997
X-Sender: kraken@kangaroo.gsfc.nasa.gov
Mime-Version: 1.0
Date: Wed, 17 Dec 1997 17:07:14 -0500
    khurley@sunspot.ssl.berkeley.edu (Kevin Hurley)
From: Peter Kurczynski <kraken@rosserv.gsfc.nasa.gov>
Subject: Ulysses bursts and TGRS
Cc: TEEGARDEN@tgrs2.gsfc.nasa.gov

Hi Kevin,

Here are the results of a search through TGRS data for recent Ulysses bursts. We cannot report the detection of any of the bursts listed below. Three bursts had interesting anomalies within a 6000 second window centered on the Ulysses trigger time. Such events are under investigation, but are probably not GRB's.

November 17 1997 02:08 Ulysses time; weak burst, 100 ms long
TGRS sees a single high data channel at 7100s between 100-300 keV

November 18 1997 11:22 " " ; weak burst, 64 ms long
November 29 1997 20:25 Ulysses time; weak burst, 100 ms long
December 7 1997 11:24 Ulysses time; weak burst, 64 ms long
December 11 1997 20:22 Ulysses time; weak burst, 32 ms long
TGRS sees a single high data channel at 75700s between 35-100 keV

December 14 1997 08:44 Ulysses time; weak burst, 32 ms long
TGRS sees a single high data channel at 35100s between 100-300 keV with what at ?

Take care, and Happy Holidays.

Pete

From SURASAK@SSLLES.MSFC.NASA.GOV Mon Dec 15 12:16:54 1997
Return-Path: <SURASAK@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA14103; Mon, 15 Dec 1997 12:16:53 -0800
From: SURASAK@SSLLES.MSFC.NASA.GOV
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA18263; Mon, 15 Dec 1997 12:16:43 -0800
Date: Mon, 15 Dec 1997 14:16:30 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971215141630.23404694@SSLLES.MSFC.NASA.GOV>
Subject: Crossing Windows for BATSE Burst 6533
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6533
EVENT OF 1997 DEC 14 DAY OF YEAR=348
EVENT CROSSING TIME AT BATSE : 84041. S. OR 23:20:41.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 181.000 66.000
BATSE PEAK COUNTING RATE: 8050 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 14/12/ 97 IS:
RA= 170.655 DEC= 11.976 DIST= 5.159 AU
BATSE-ULYSSES DISTANCE = 771757069. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=125.52 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1495.59 SECS.
CROSSING TIME AT ULYSSES IS 82545. S. OR 22:55:45 +/- 391.06 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 14/12/ 97 IS:
RA= 298.952 DEC= -22.033 DIST= 2.077 AU
MARS-BATSE DISTANCE = 310747488. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 58.71 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 538.41 SECS.
CROSSING TIME AT MARS IS 84579. S. OR 23:29:39 +/- 161.95 SECONDS

BATSE BURST TRIGGER
NO.: 6533

TIME: TJD=0796 SECONDS=84041

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=121.4 AZIMUTH=76.9 ERROR=0.965 DEGREES

COMMENTS:
GRB. SINGLE PULSE WITH SUBSTRUCTURE. DURATION ABOUT 50S. VISIBLE ABOVE
300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6533 | 971214 | 10796 | 84041 | 8050 | 181 | +66 | 50 |

Date: Feb 9 00

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☐ Jim Schmidling's stat file correction applied?

Helio corr removed from this triangulation, but still present in SAX one

☐ Final ephemeris used?

☐ Final, CDROM data used?

☐ 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

☐ 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 vwx@bocc1, or from Teresa Sheets, have the correct time; files on website have incorrect times)

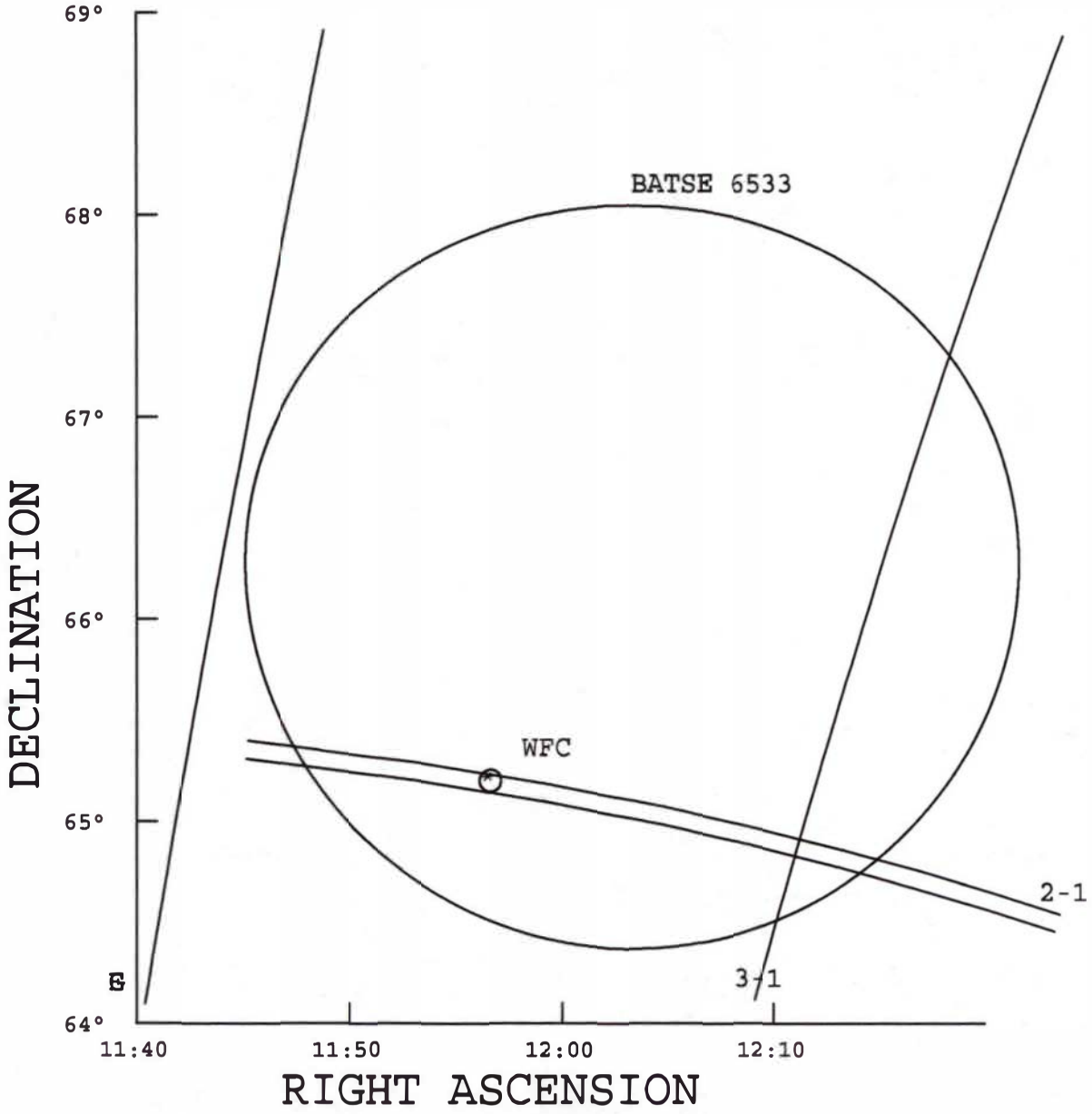
☑ BATSE >100 keV data used for NEAR correlation?

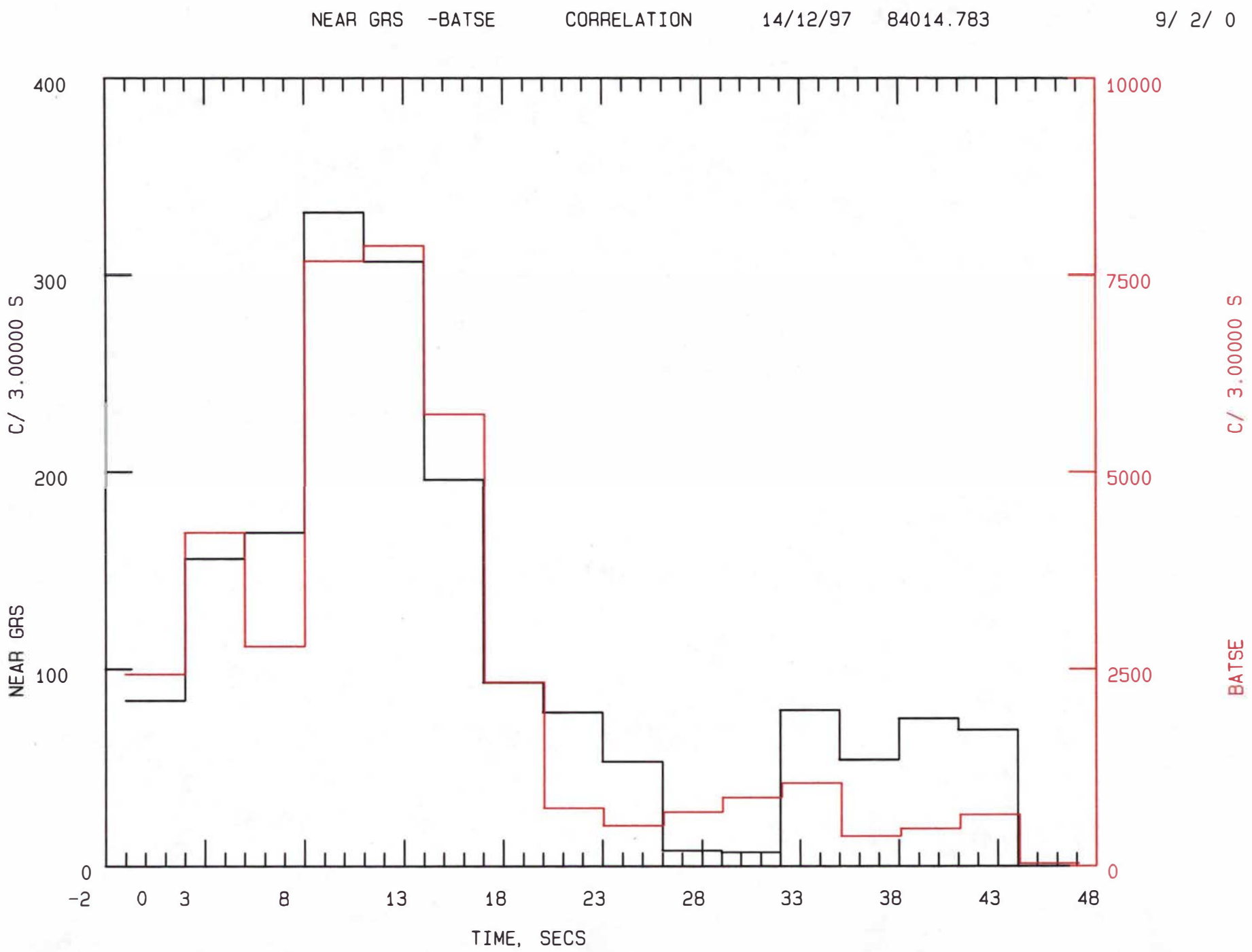
☑ ACCESS database updated?

# EVENT OF DEC 14, 1997 23:20

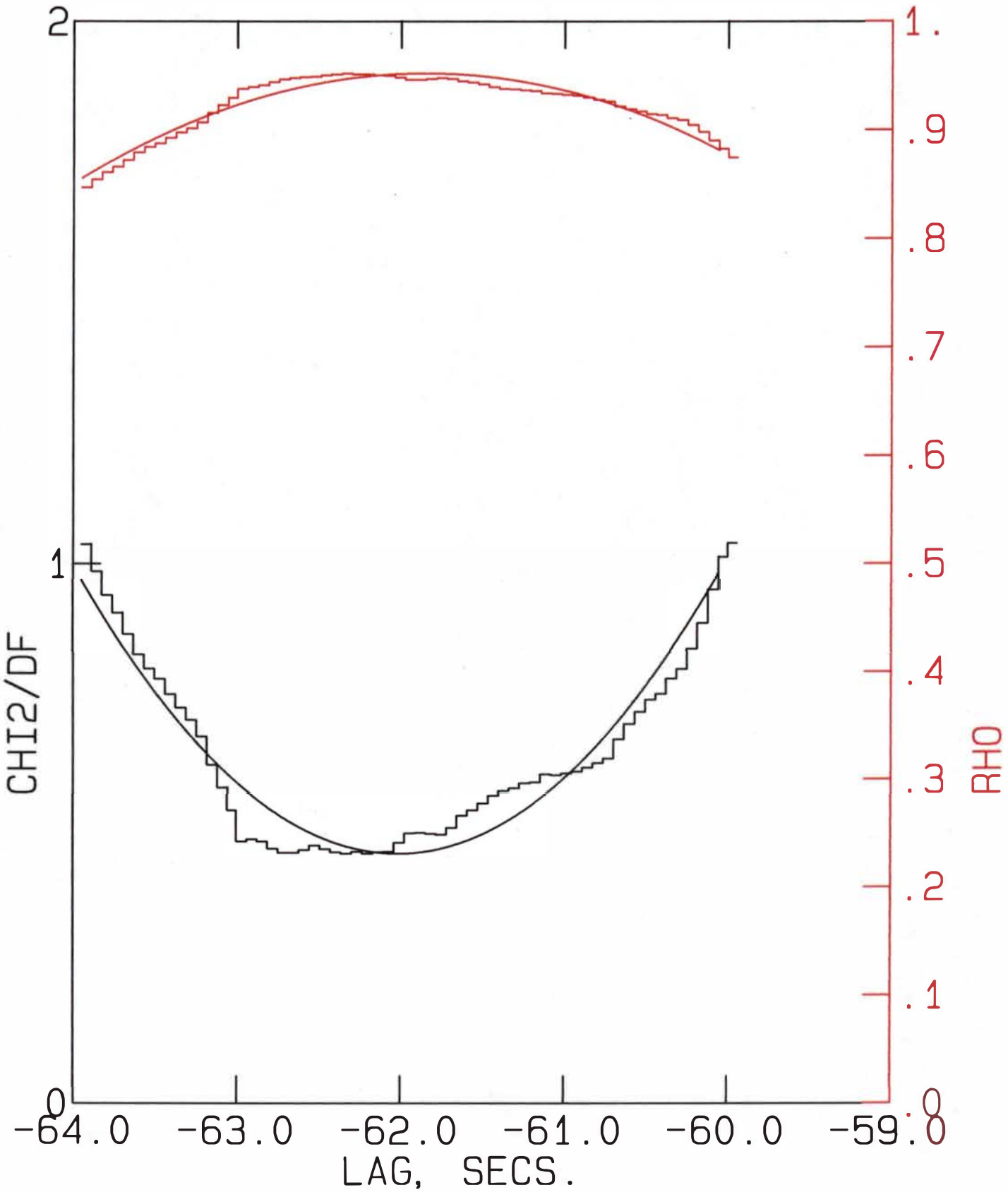


N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 BATSE 2 ULYSSES 3 NEAR



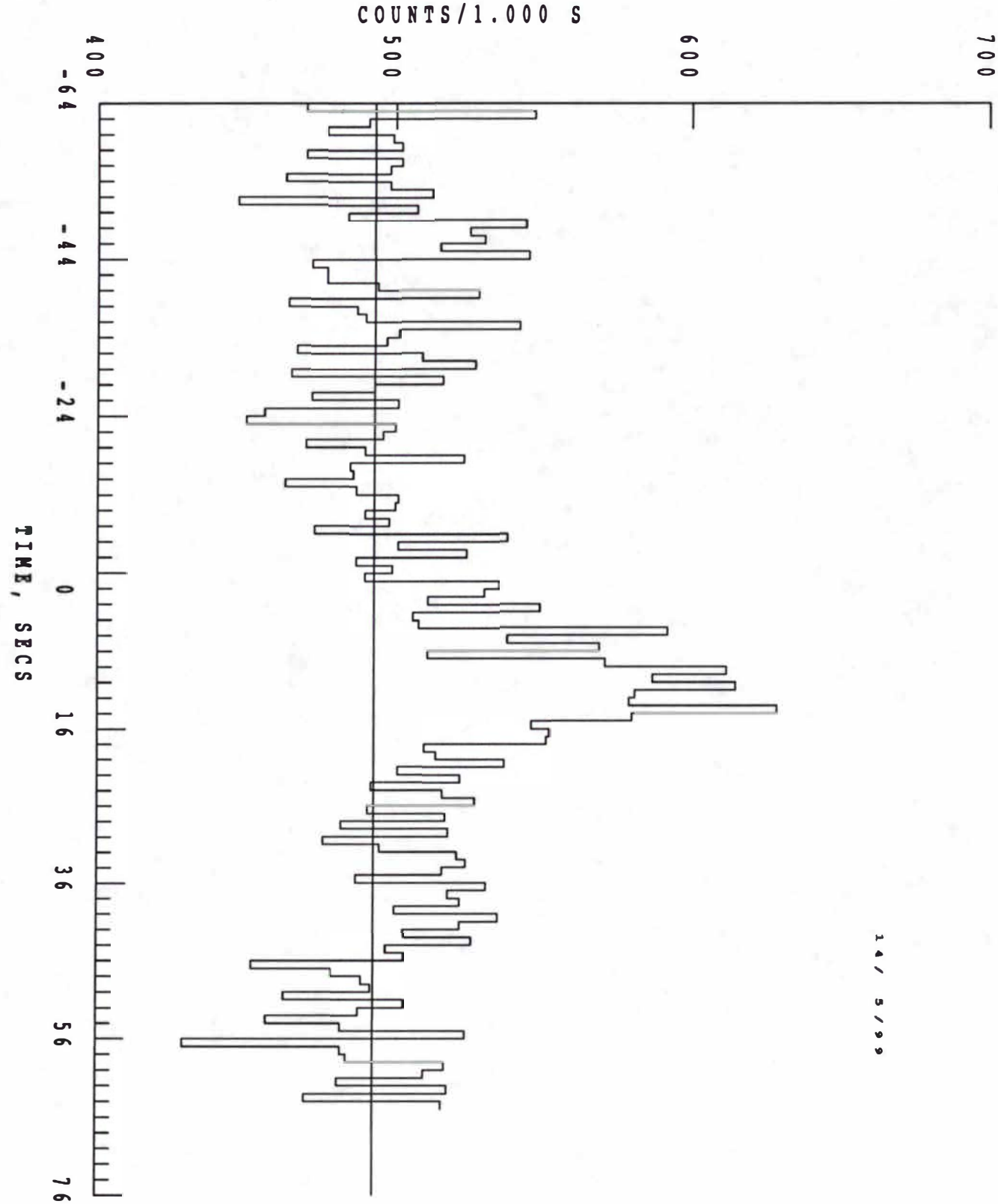

NEAR GRS -BATSE CORRELATION 14/12/97 84014.783 9/ 2/ 0
400
300
200
100
0
C/ 3.00000 S
NEAR GRS
10000
7500
5000
2500
0
C/ 3.00000 S
BATSE
-2
0
3
8
13
18
23
28
33
38
43
48
TIME, SECS

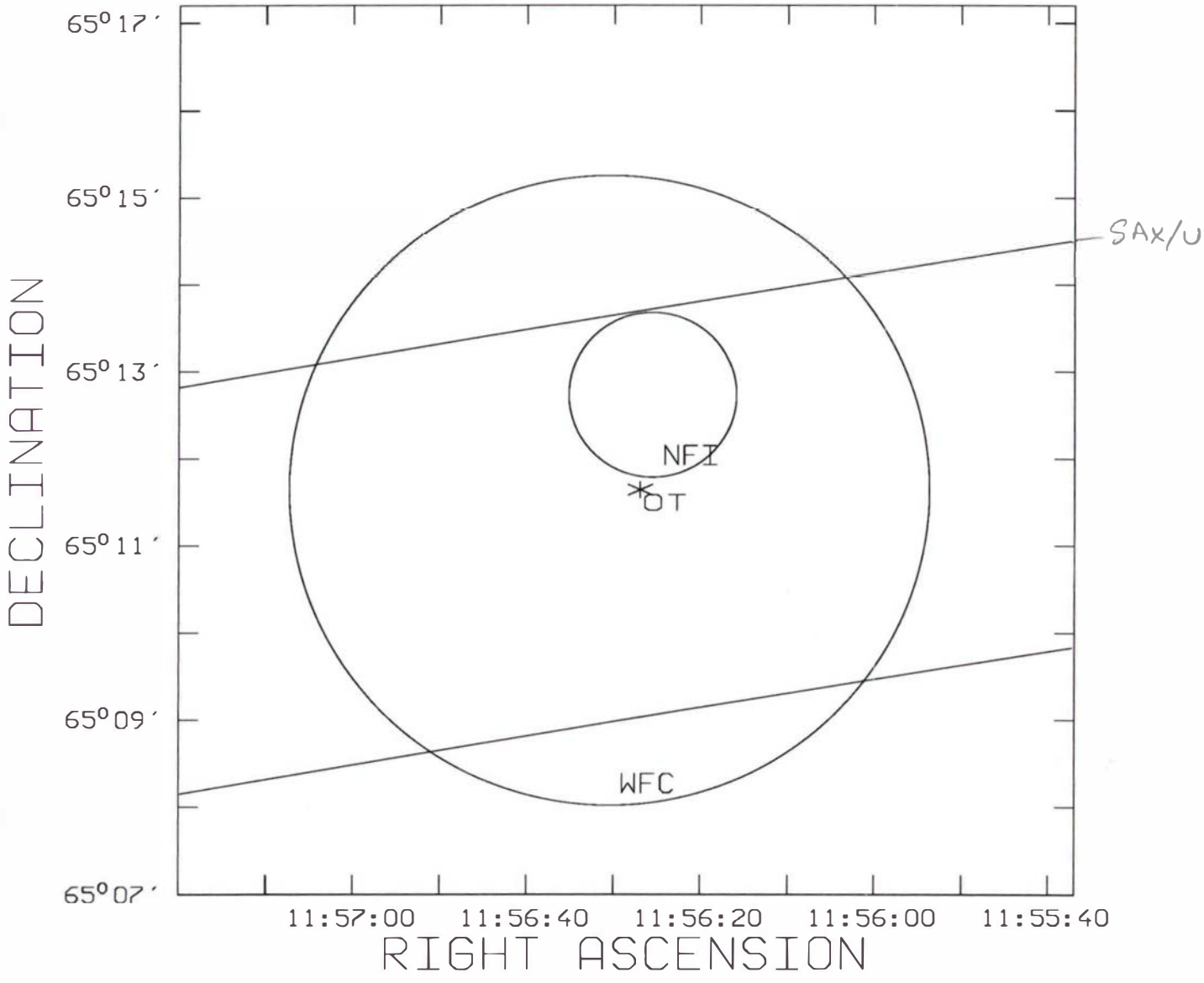
NEAR GRS -BATSE CORRELATION 14/12/97 84014.783

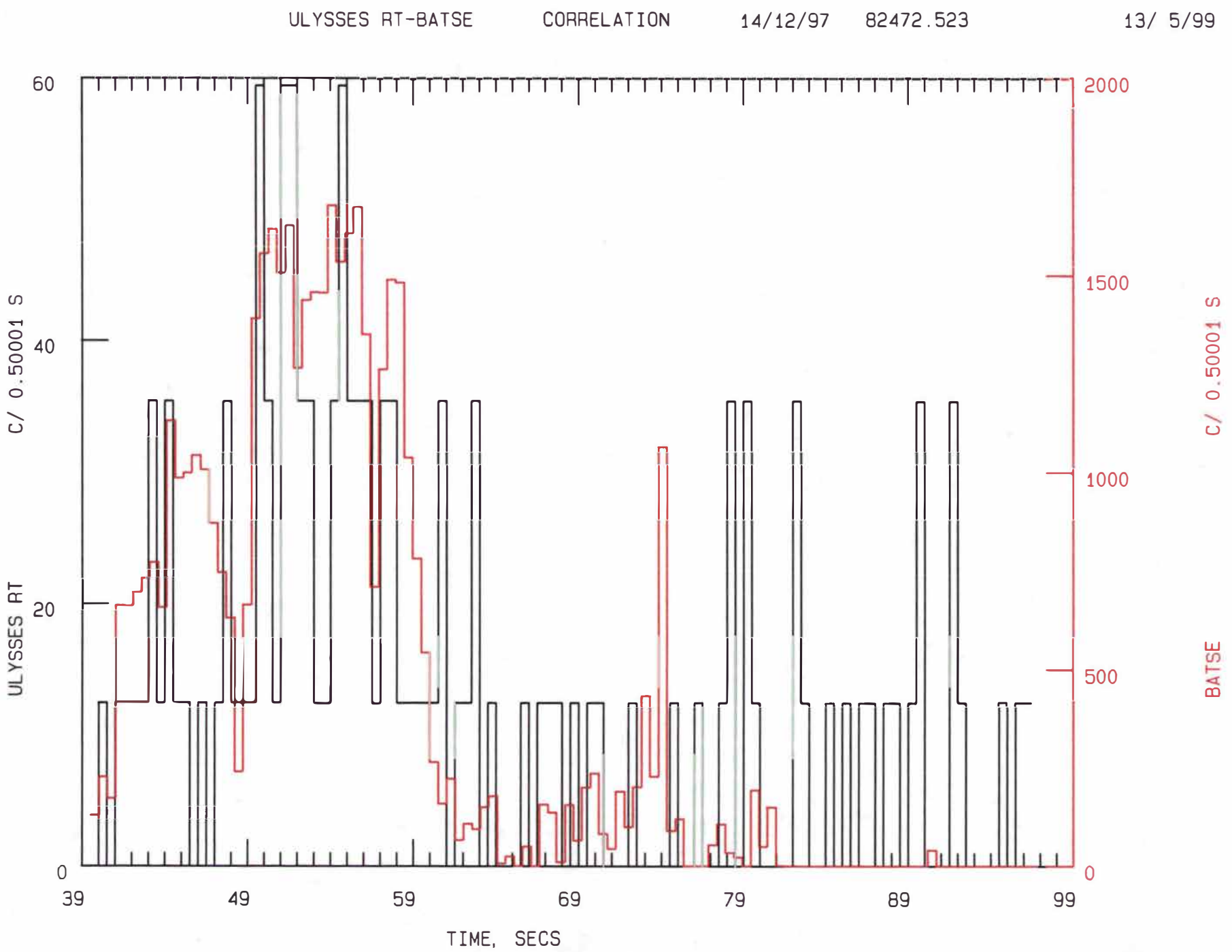


NEAR 14/12/97 84014.783

100-1000 keV

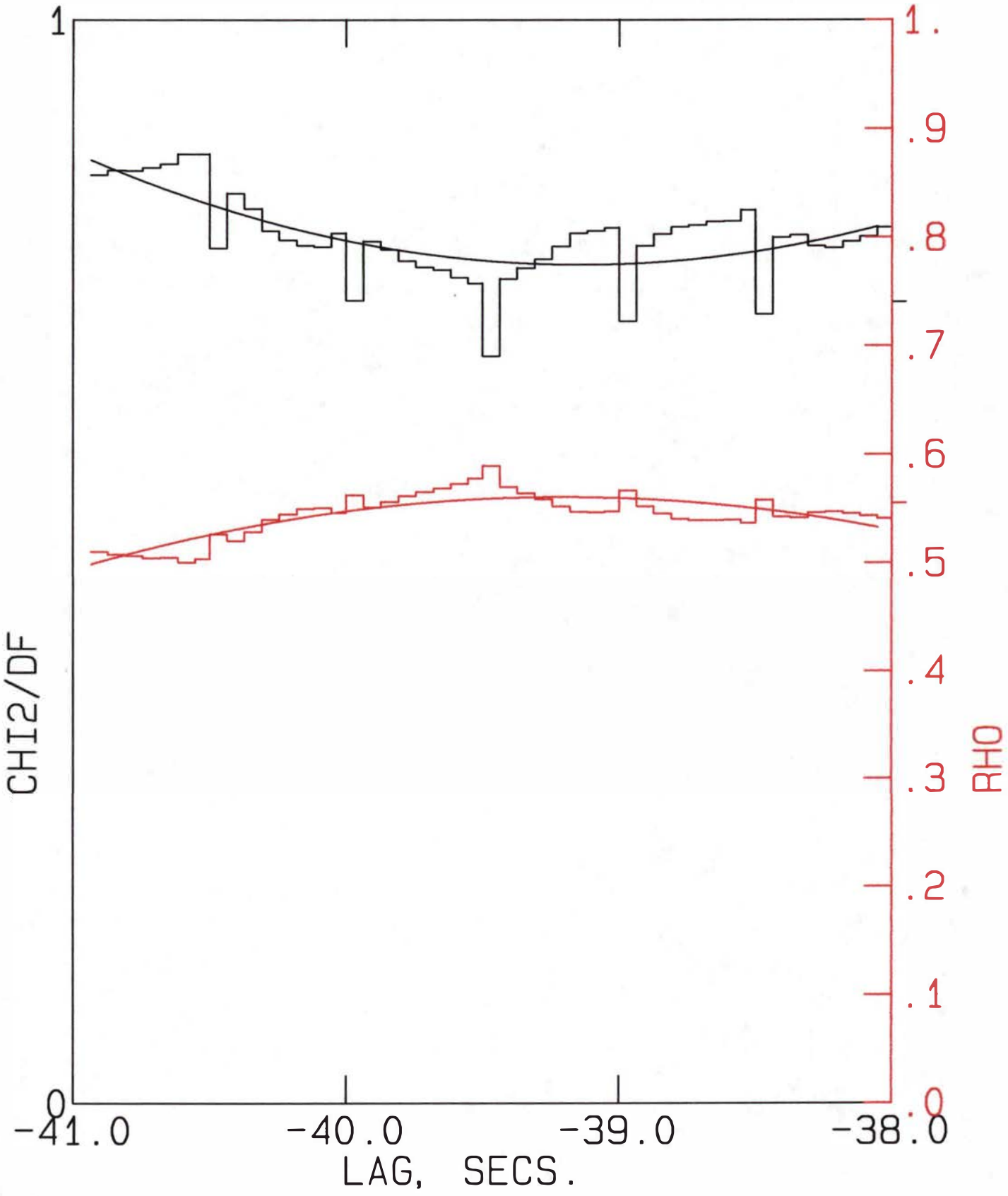



65°17′
65°15′
65°13′
65°11′
65°09′
65°07′
DECLINATION
SAX/U
NFI
OT
WFC
11:57:00
11:56:40
11:56:20
11:56:00
11:55:40
RIGHT ASCENSION


ULYSSES RT-BATSE CORRELATION 14/12/97 82472.523 13/ 5/99
60
40
20
0
2000
1500
1000
500
0
C/ 0.50001 S
ULYSSES RT
BATSE
39
49
59
69
79
89
99
TIME, SECS

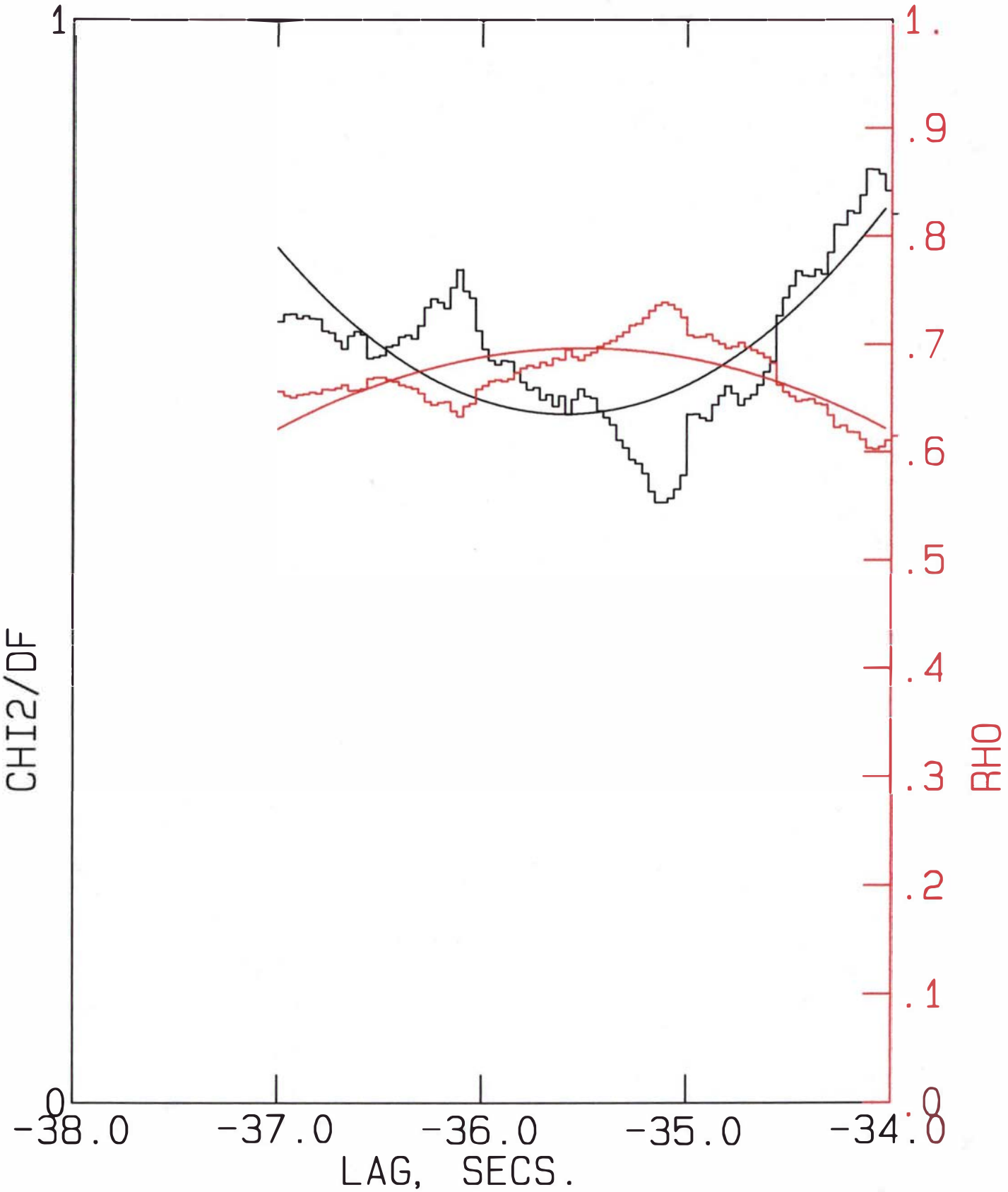
13/ 5/99

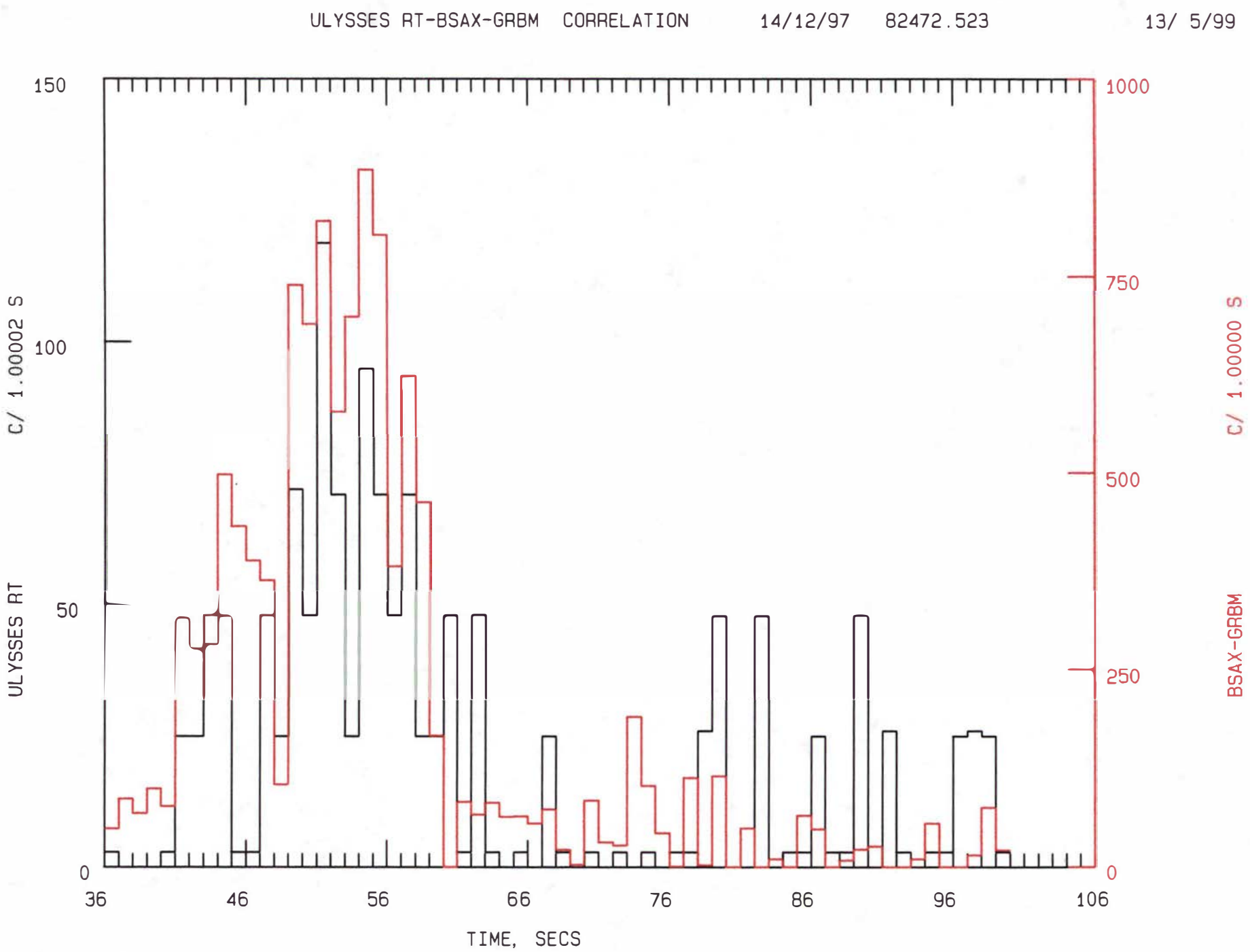
ULYSSES RT-BATSE CORRELATION 14/12/97 82472.523



13/ 5/99

ULYSSES RT-BSAX-GRBM CORRELATION 14/12/97 82472.523




ULYSSES RT-BSAX-GRBM CORRELATION 14/12/97 82472.523 13/ 5/99
150
100
50
0
ULYSSES RT
C/ 1.00002 S
1000
750
500
250
0
BSAX-GRBM
C/ 1.00000 S
36
46
56
66
76
86
96
106
TIME, SECS

From xrtpm@leptpm.gsfc.nasa.gov Thu Dec 18 07:11 PST 1997
Date: Thu, 18 Dec 1997 10:05:03 -0500 (EST)
From: Tim McClanahan <xrtpm@leptpm.gsfc.nasa.gov>
To: near-s-xgrs@jhuapl.edu, khurley@sunspot.ssl.berkeley.edu,
cline@apache.gsfc.nasa.gov, butterworth@pizza.gsfc.nasa.gov,
palmer@rosserv.gsfc.nasa.gov
Mime-Version: 1.0
Content-Transfer-Encoding: 7bit
Content-MD5: JYCu3pAUrgdvSbfKIr8mwg==

NEAR Gamma Ray Burst Info:

About 12 days of GRS data have been downloaded during the last week or so. The automated detection system has detected a single transient event at approximately:

1997:348: 23: 20.42

Another low magnitude event was not initially caught in the automated detection system due to rather broad transitions and lasted about 10 mins.

1997:342: 07: 48 (Approx)

Will have to make some modifications to post this to WWW.

WWW address: http://leptpm.gsfc.nasa.gov/near.html

** NOTE:
Clocking is still a problem and algorithms for an automated fix have been specified. I hope to have them put in during the next couple of weeks.

Happy Holidays,

Tim McClanahan
Laboratory for Astrochemistry
NASA/GSFC 691
Greenbelt, MD 20771
301-286-6748

Helio corr removed 2/3/99

Date: May 5 '98

# 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? N/A

☑ 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?

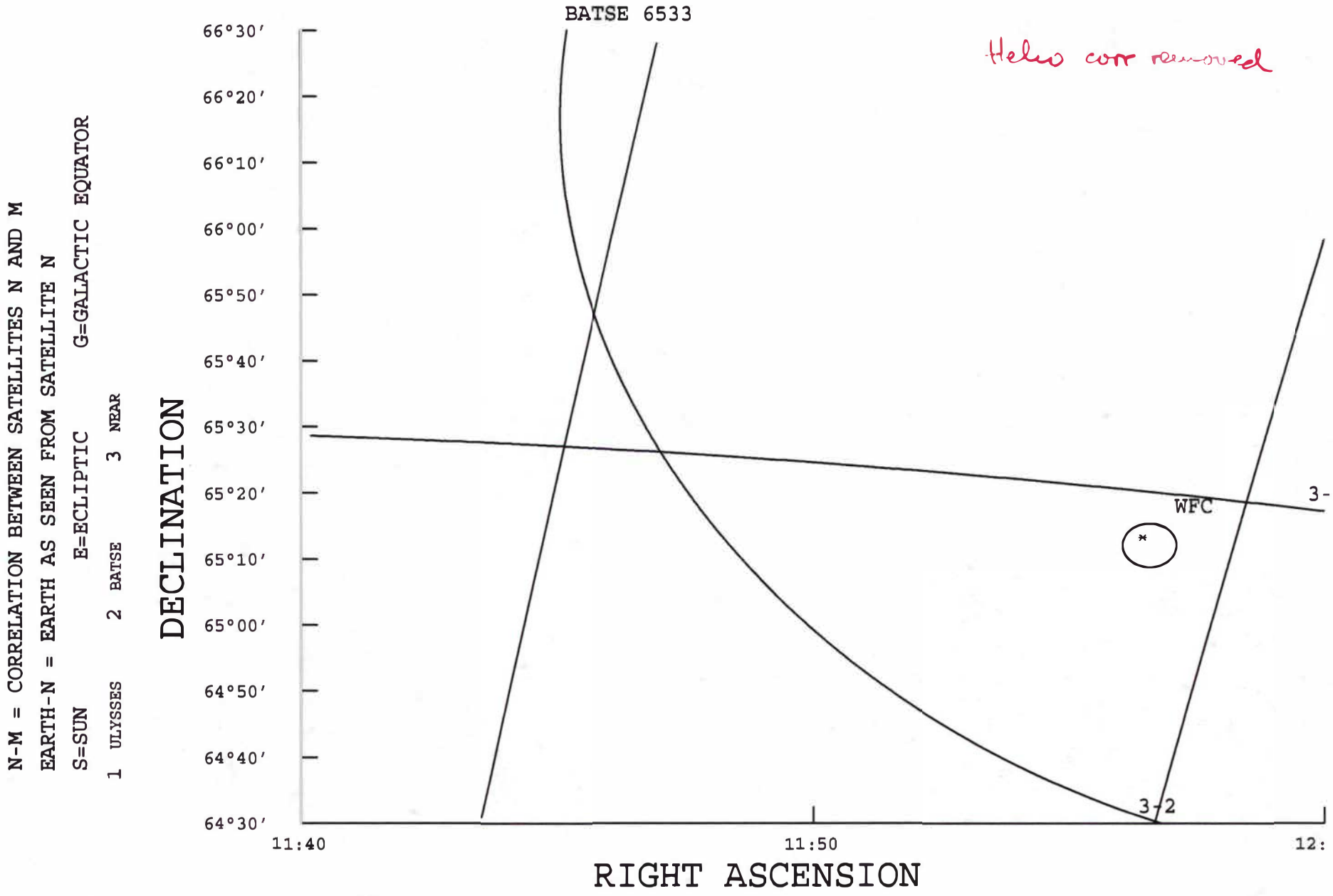
☐ Geocentric time used?

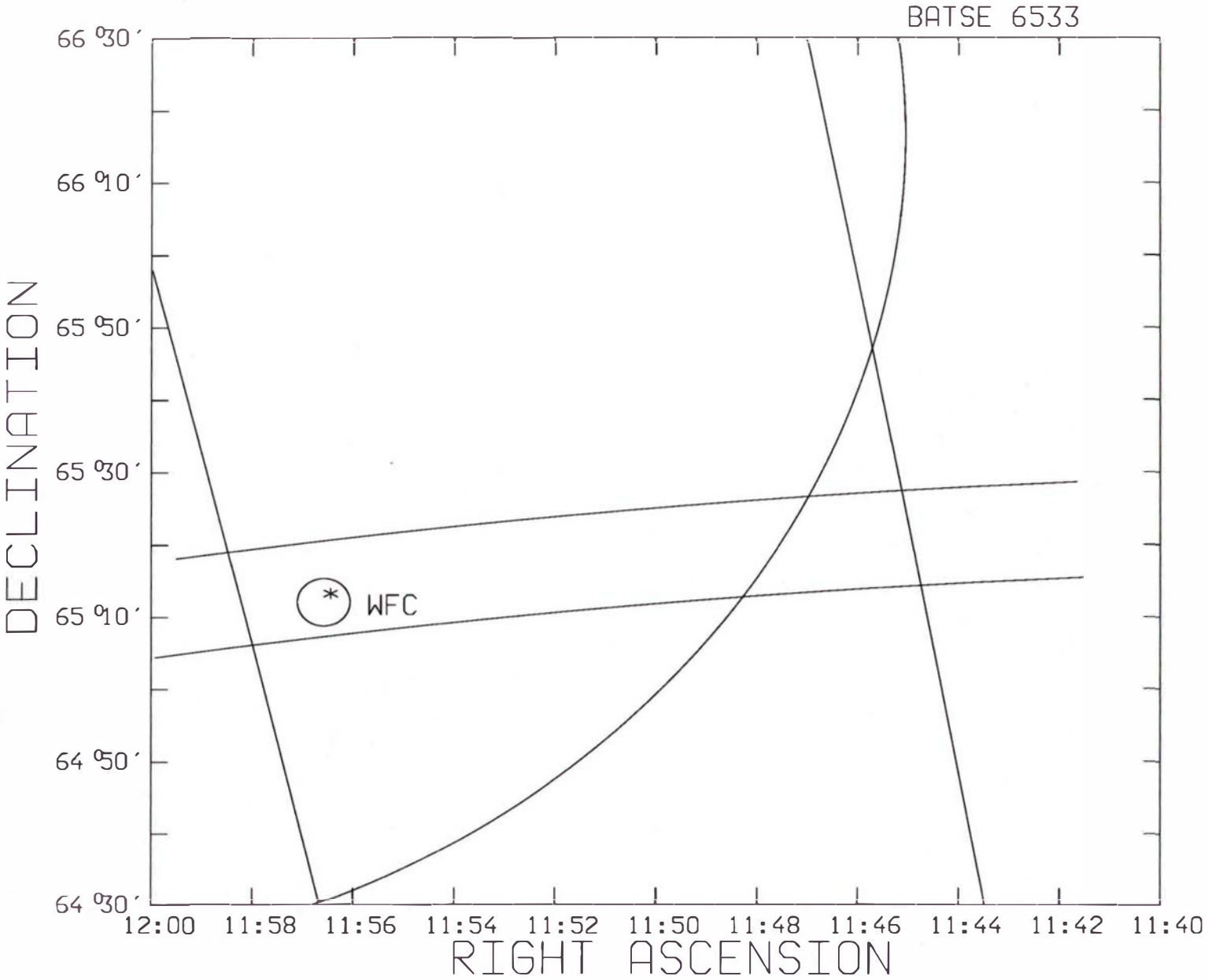
Re-do NEAR with BATSE 100 - 300 keV data

☑ ACCESS database updated?

# EVENT OF DEC 14, 1997 22:54

3/ 2/99



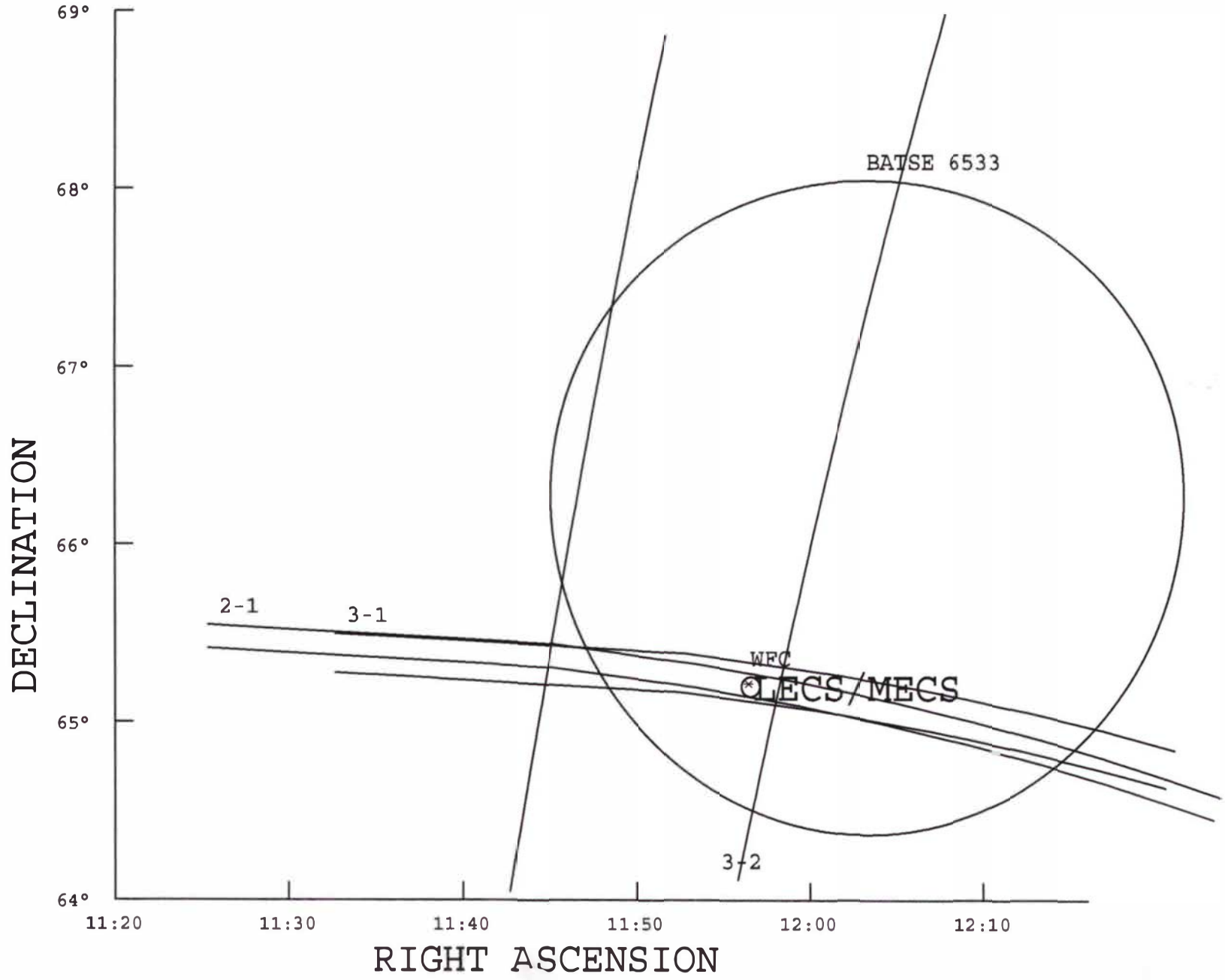

BATSE 6533
66 °30′
66 °10′
65 °50′
65 °30′
65 °10′
64 °50′
64 °30′
DECLINATION
WFC
12:00
11:58
11:56
11:54
11:52
11:50
11:48
11:46
11:44
11:42
11:40
RIGHT ASCENSION

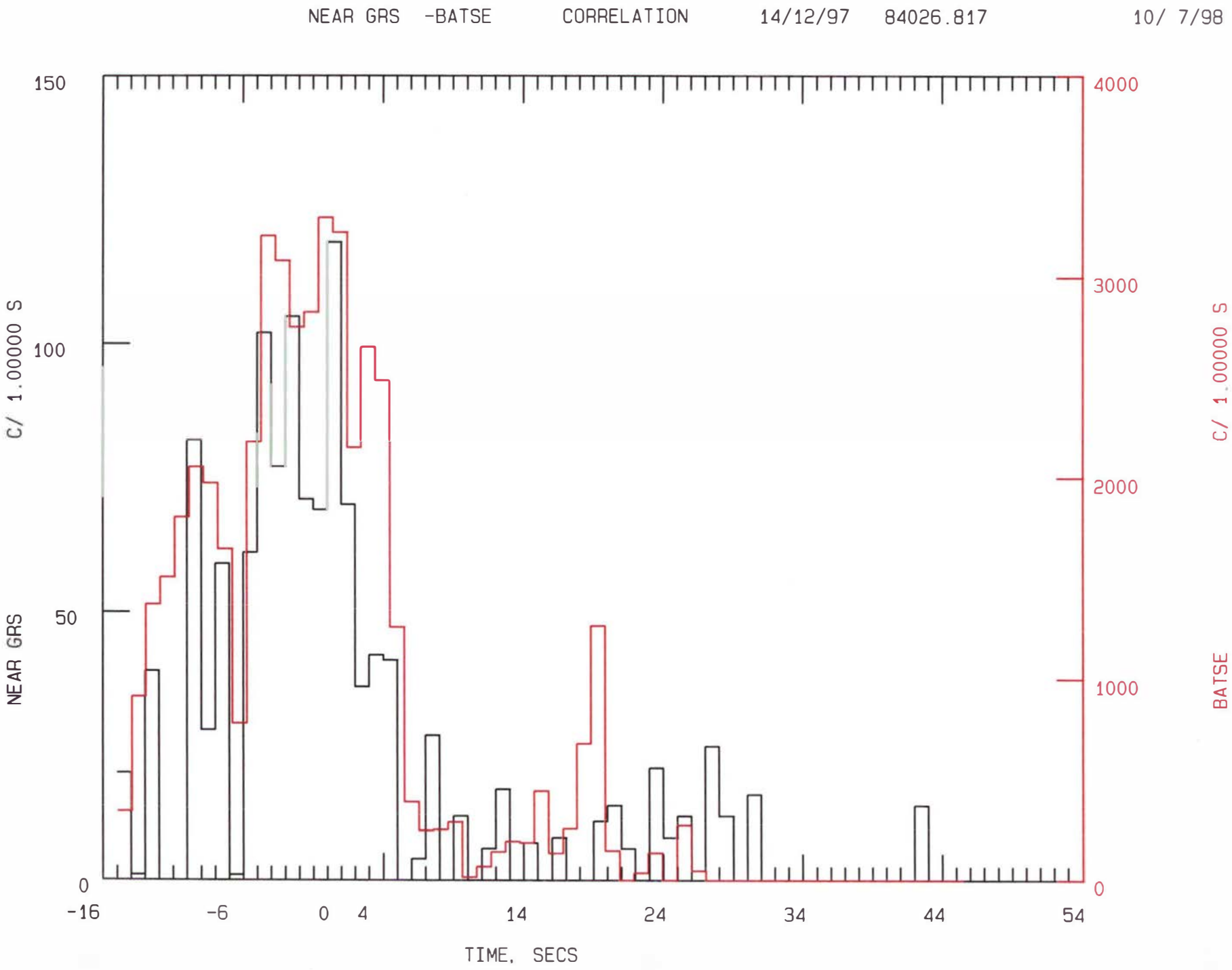
510 643 9443

# EVENT OF DEC 14, 1997 22:54

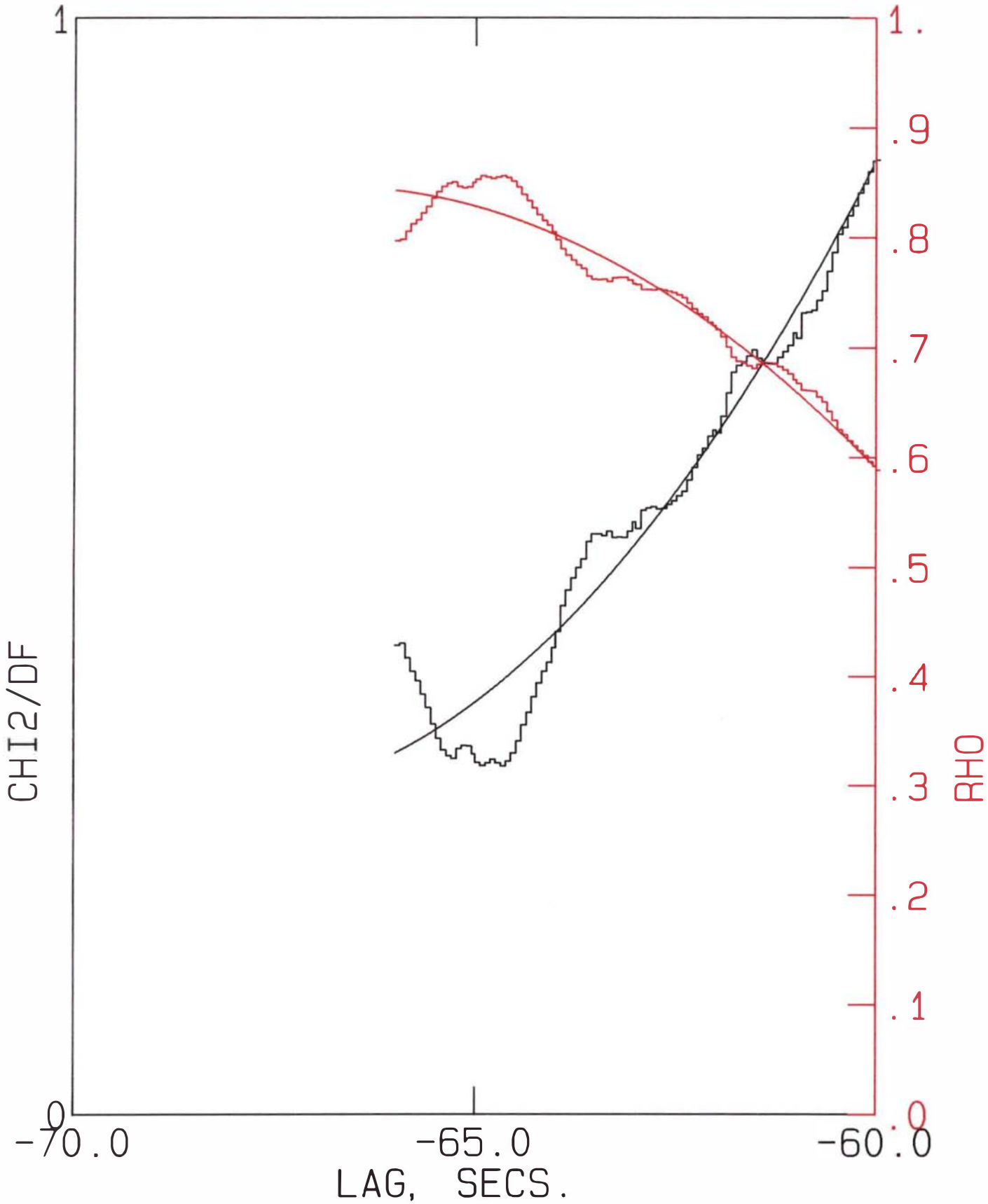
10/ 7/98

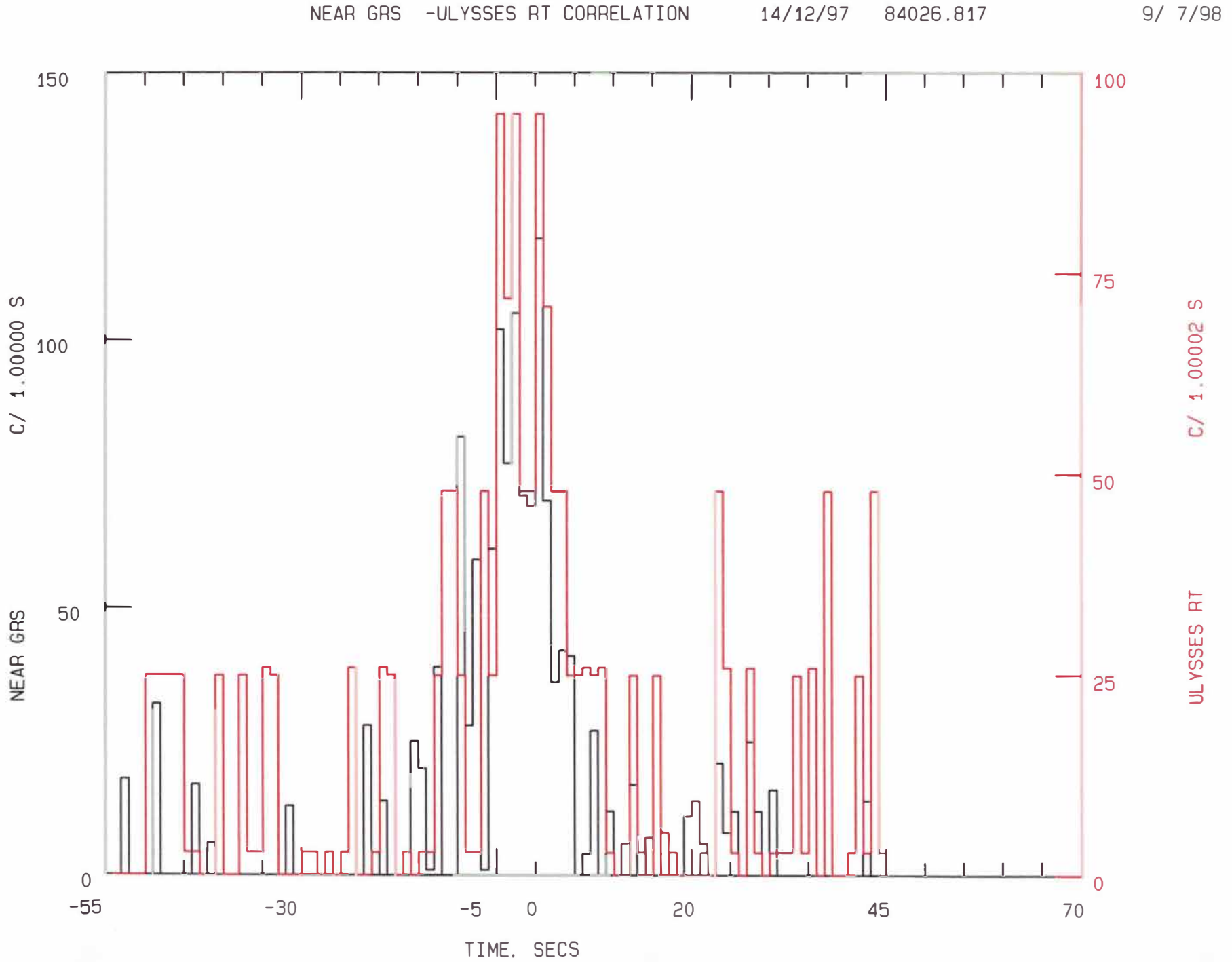
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE 3 NEAR



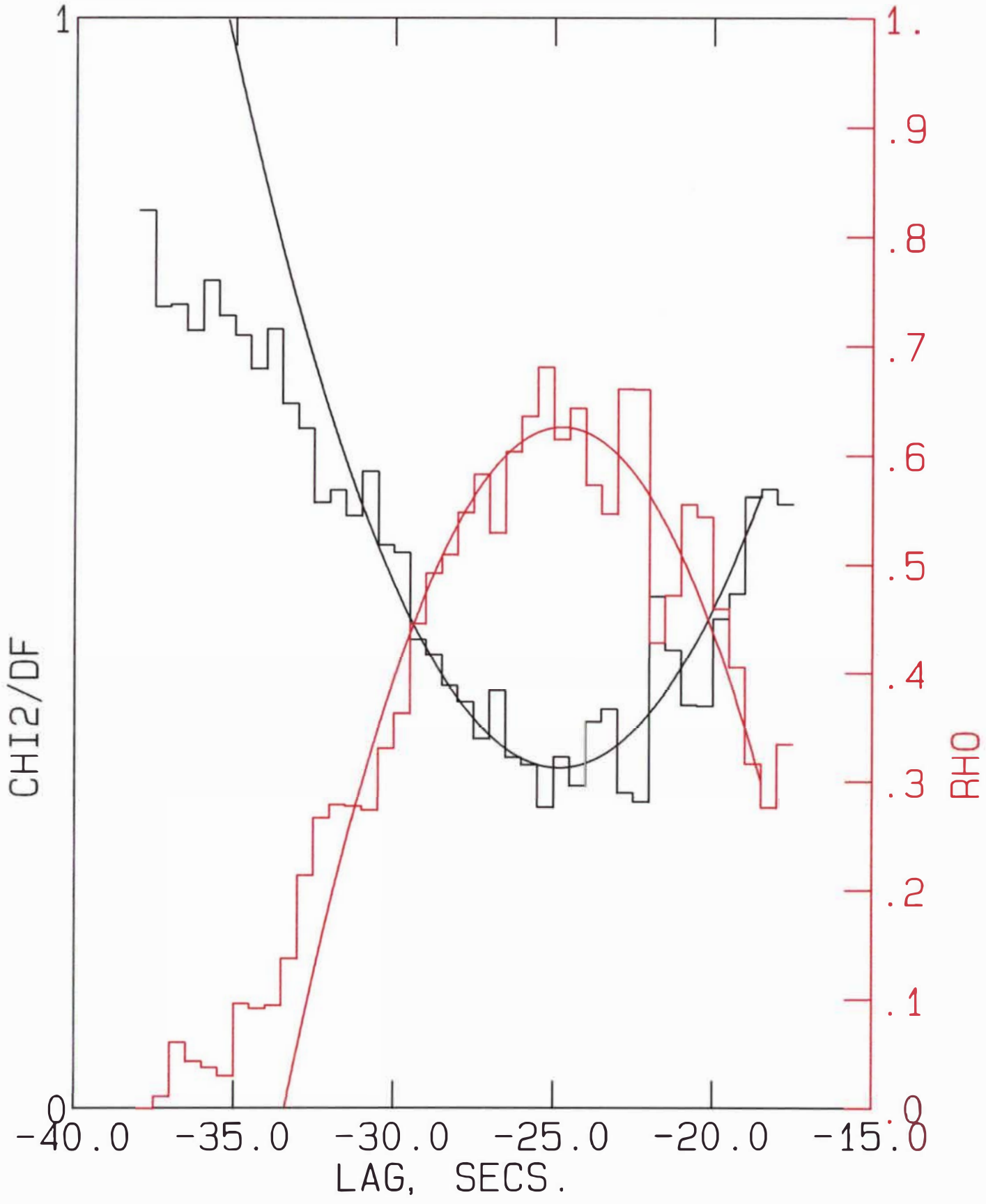

NEAR GRS -BATSE CORRELATION 14/12/97 84026.817 10/ 7/98
150
100
50
0
C/ 1.00000 S
NEAR GRS
4000
3000
2000
1000
0
C/ 1.00000 S
BATSE
-16
-6
0
4
14
24
34
44
54
TIME, SECS

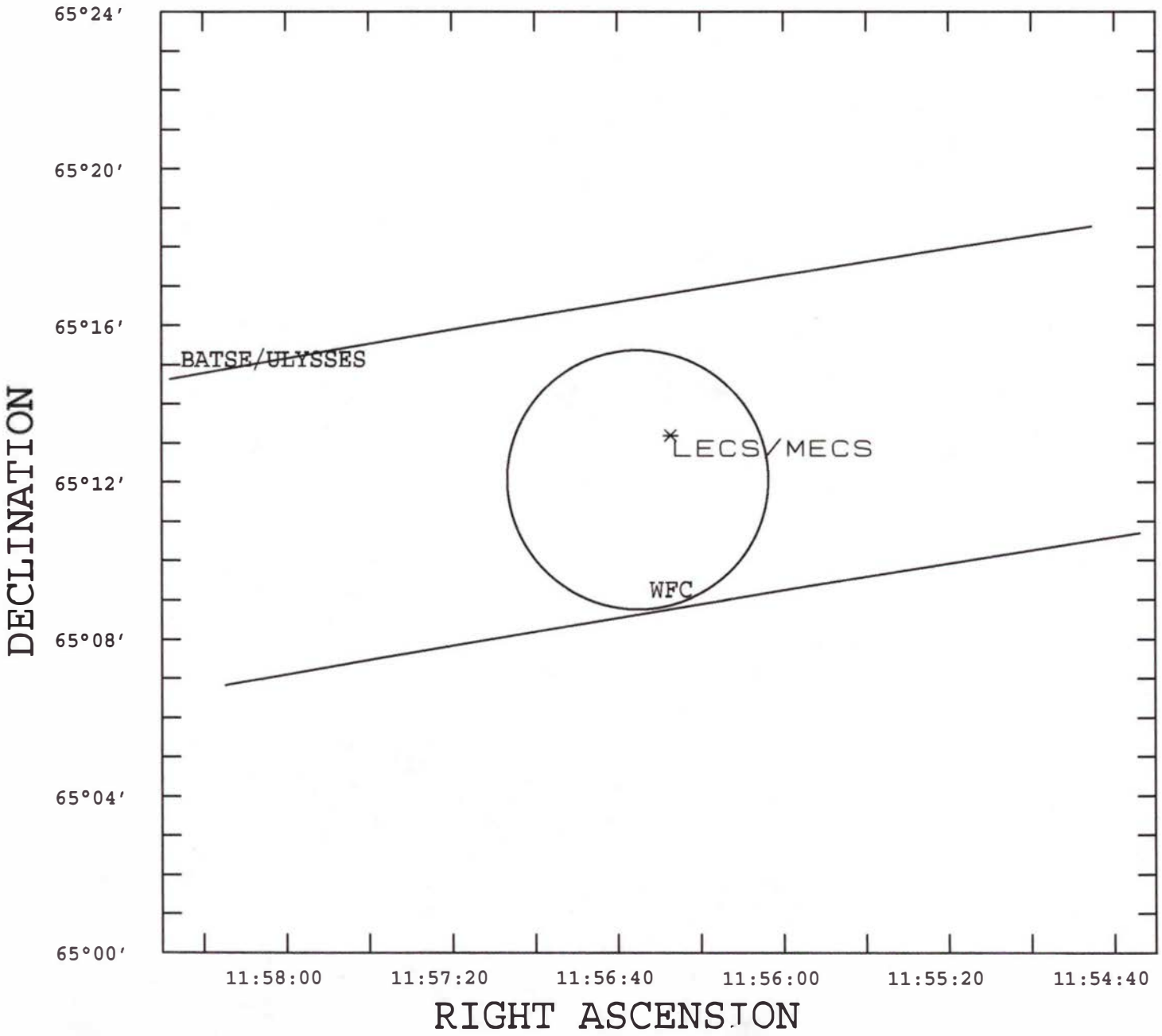
NEAR GRS -BATSE CORRELATION 14/12/97 84026.817

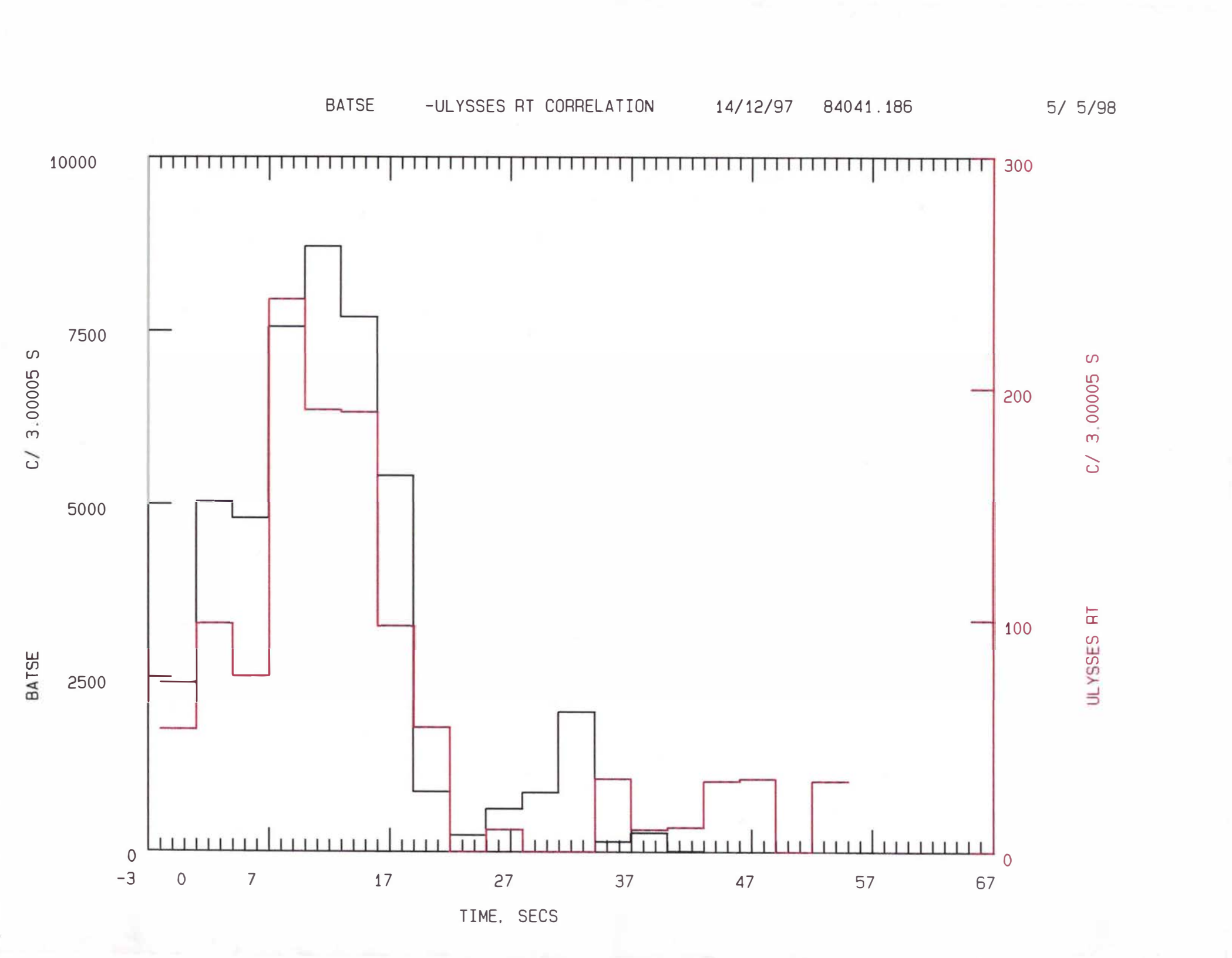



NEAR GRS -ULYSSES RT CORRELATION 14/12/97 84026.817 9/ 7/98
150
100
50
0
C/ 1.00000 S
NEAR GRS
100
75
50
25
0
C/ 1.00002 S
ULYSSES RT
-55
-30
-5
0
20
45
70
TIME, SECS

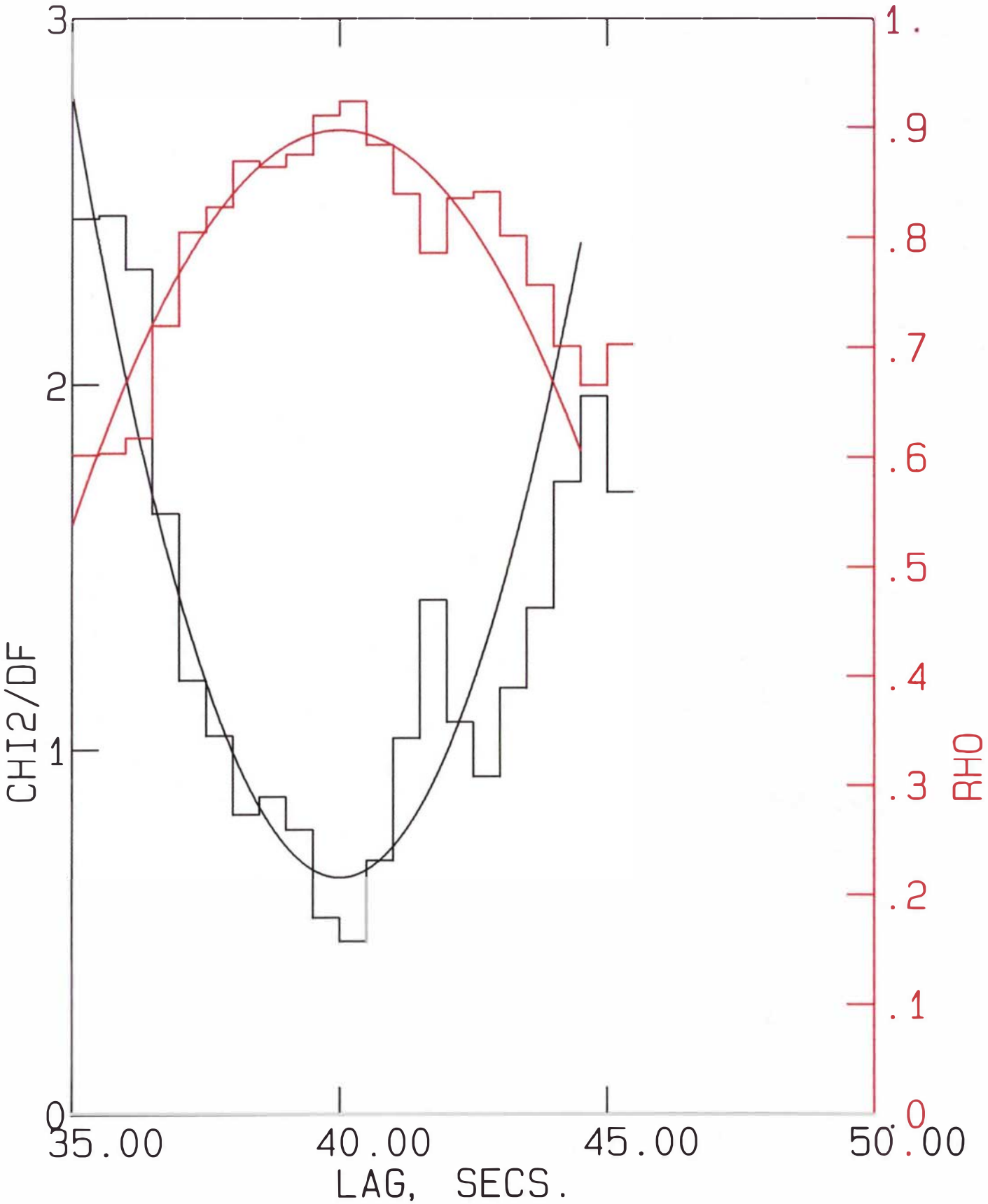
NEAR GRS -ULYSSES RT CORRELATION 14/12/97 84026.817




65°24′
65°20′
65°16′
65°12′
65°08′
65°04′
65°00′
DECLINATION
BATSE/ULYSSES
LECS/MECS
WFC
11:58:00
11:57:20
11:56:40
11:56:00
11:55:20
11:54:40
RIGHT ASCENSION


BATSE -ULYSSES RT CORRELATION 14/12/97 84041.186 5/ 5/98
10000
7500
5000
2500
0
C/ 3.00005 S
BATSE
300
200
100
0
C/ 3.00005 S
ULYSSES RT
-3
0
7
17
27
37
47
57
67
TIME, SECS

BATSE -ULYSSES RT CORRELATION 14/12/97 84041.186



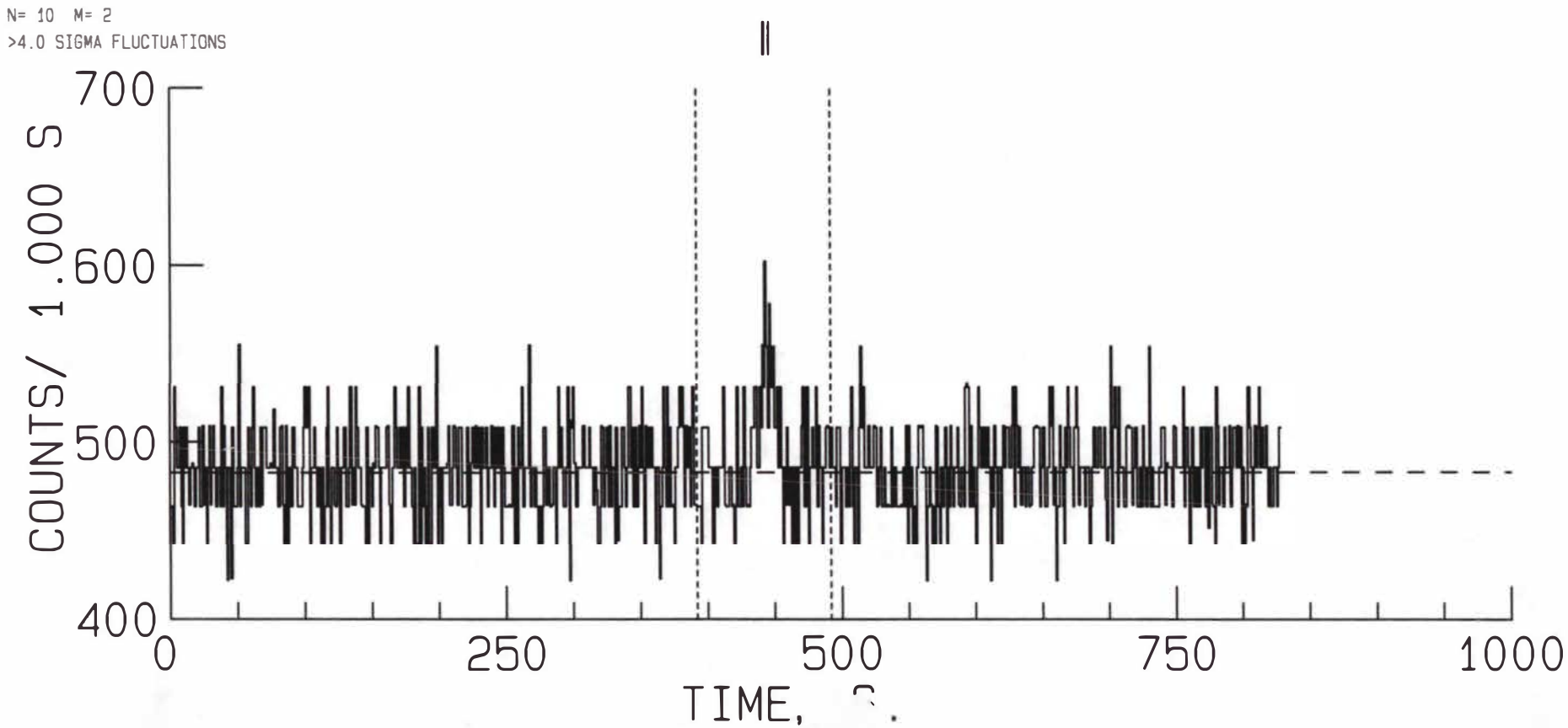
ULYSSES RT

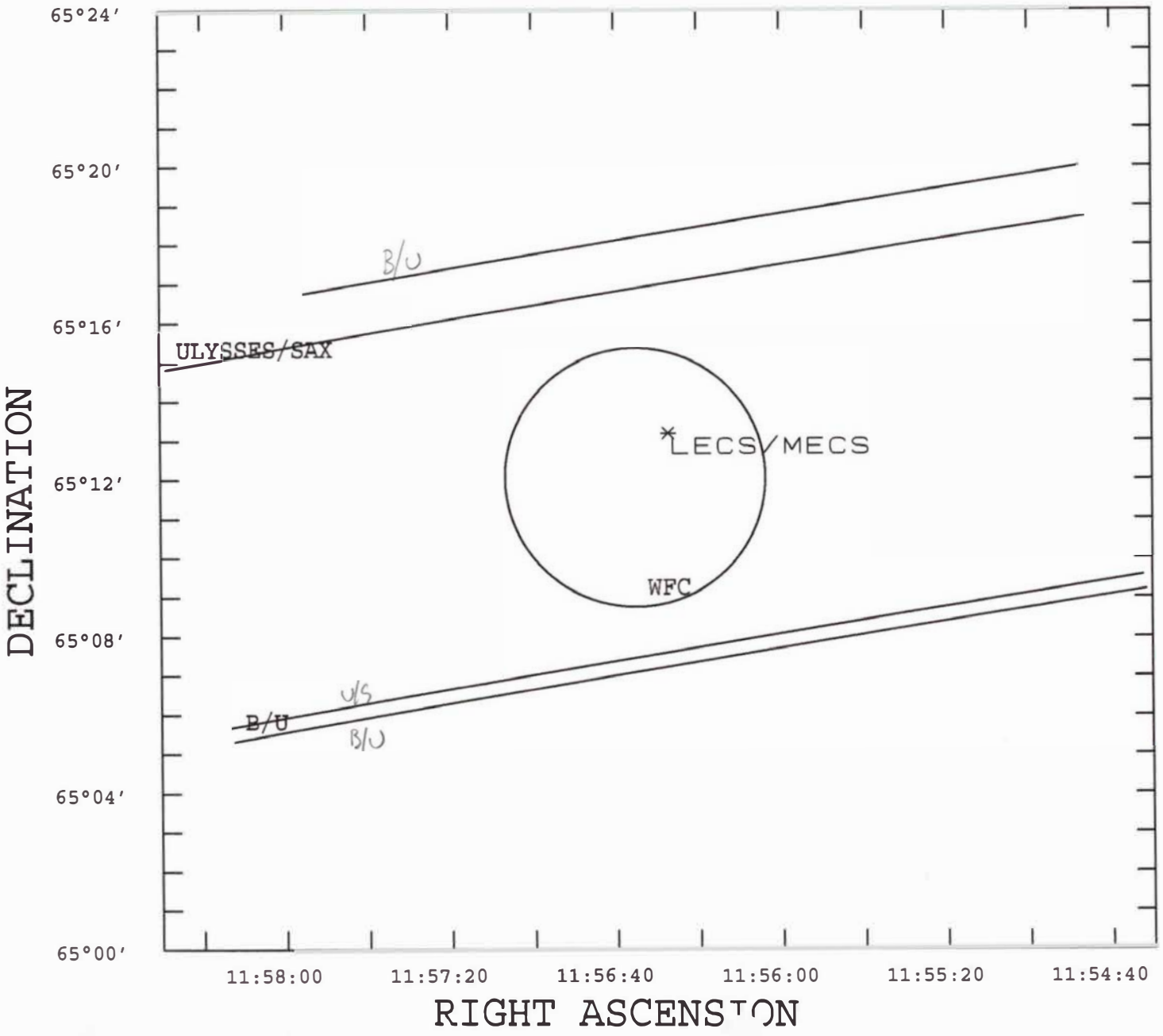
5/ 5/98

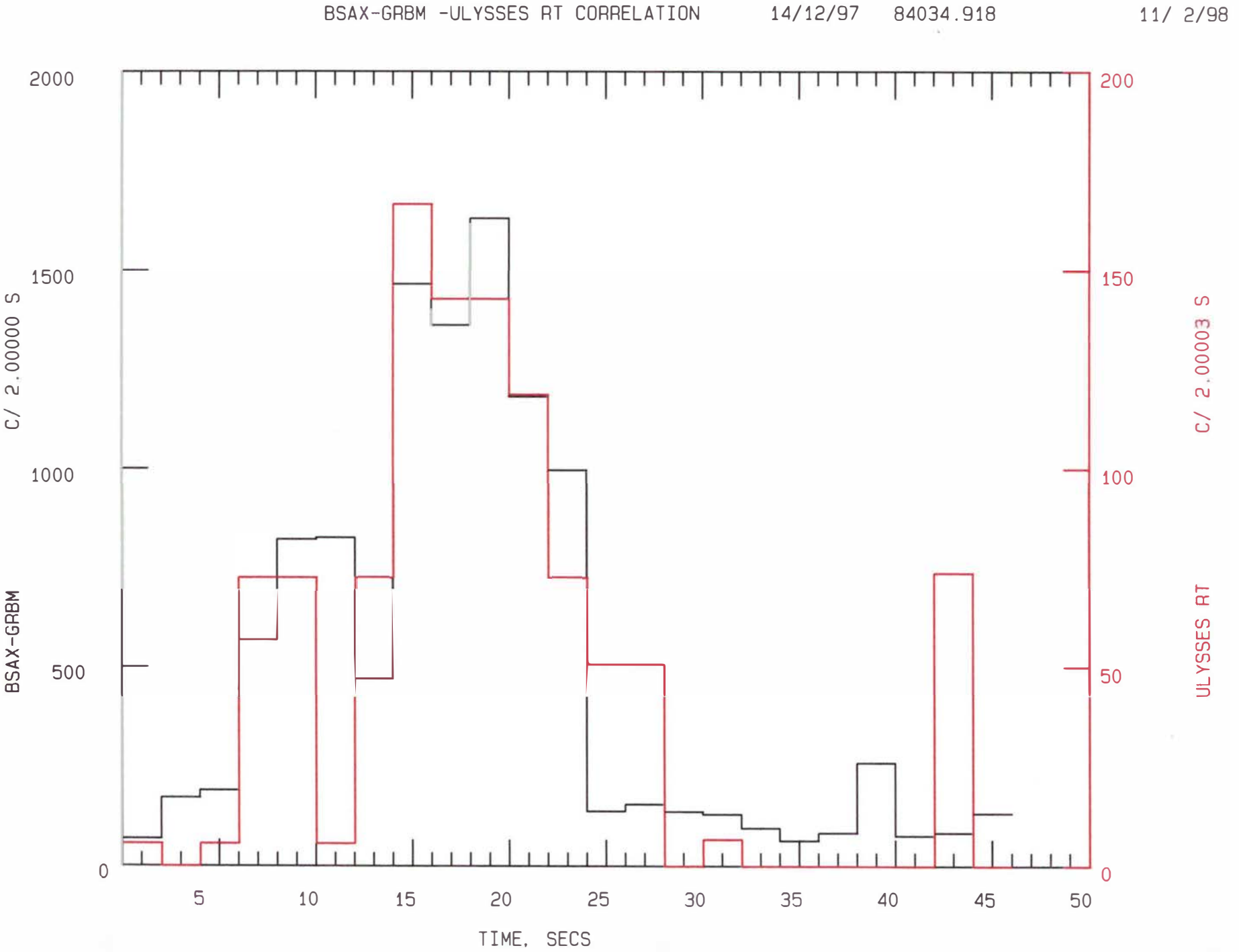
14/12/97 82080.258 s

0.500 S INTERVALS REGROUPED BY 2

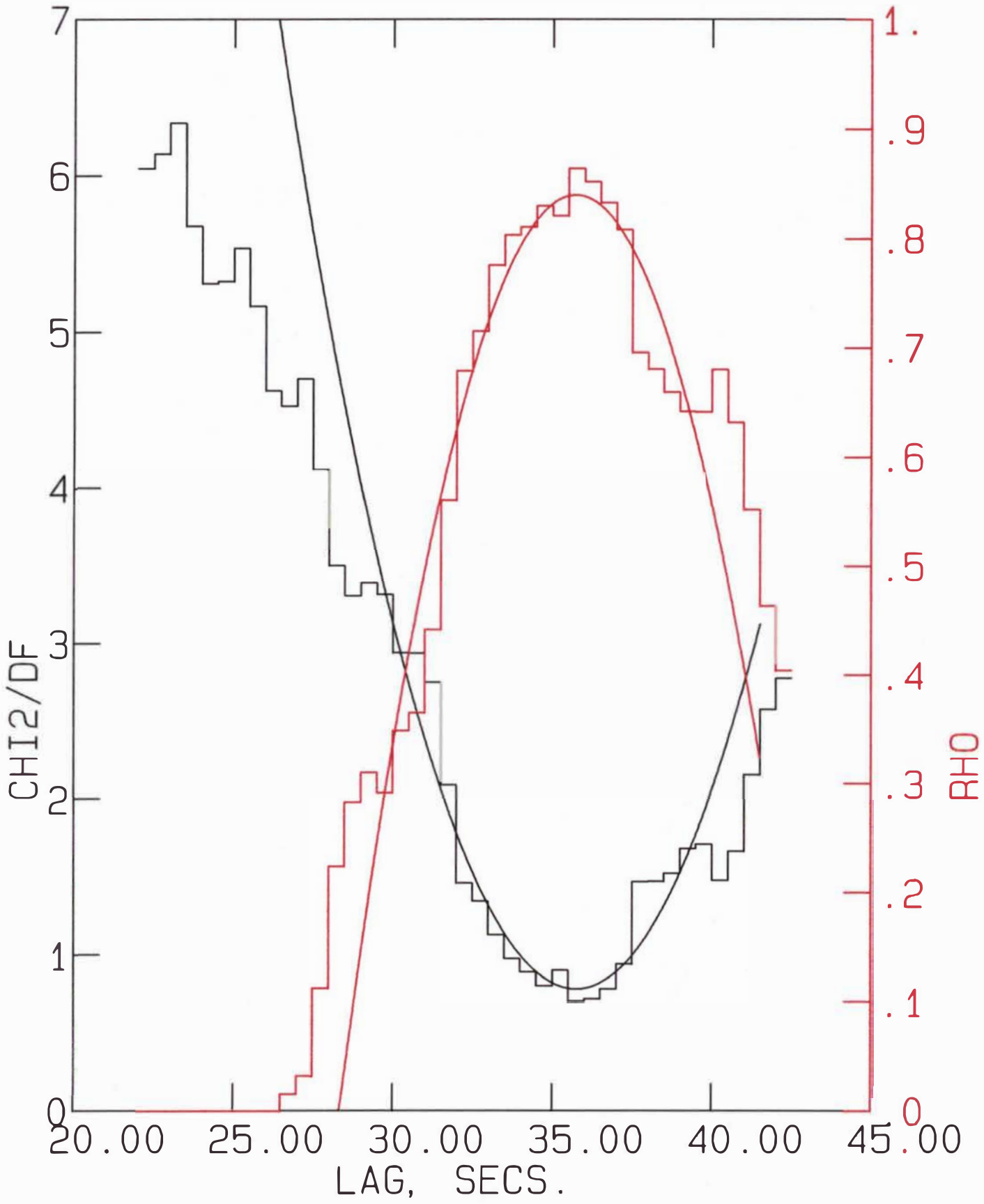
22- 148 keV

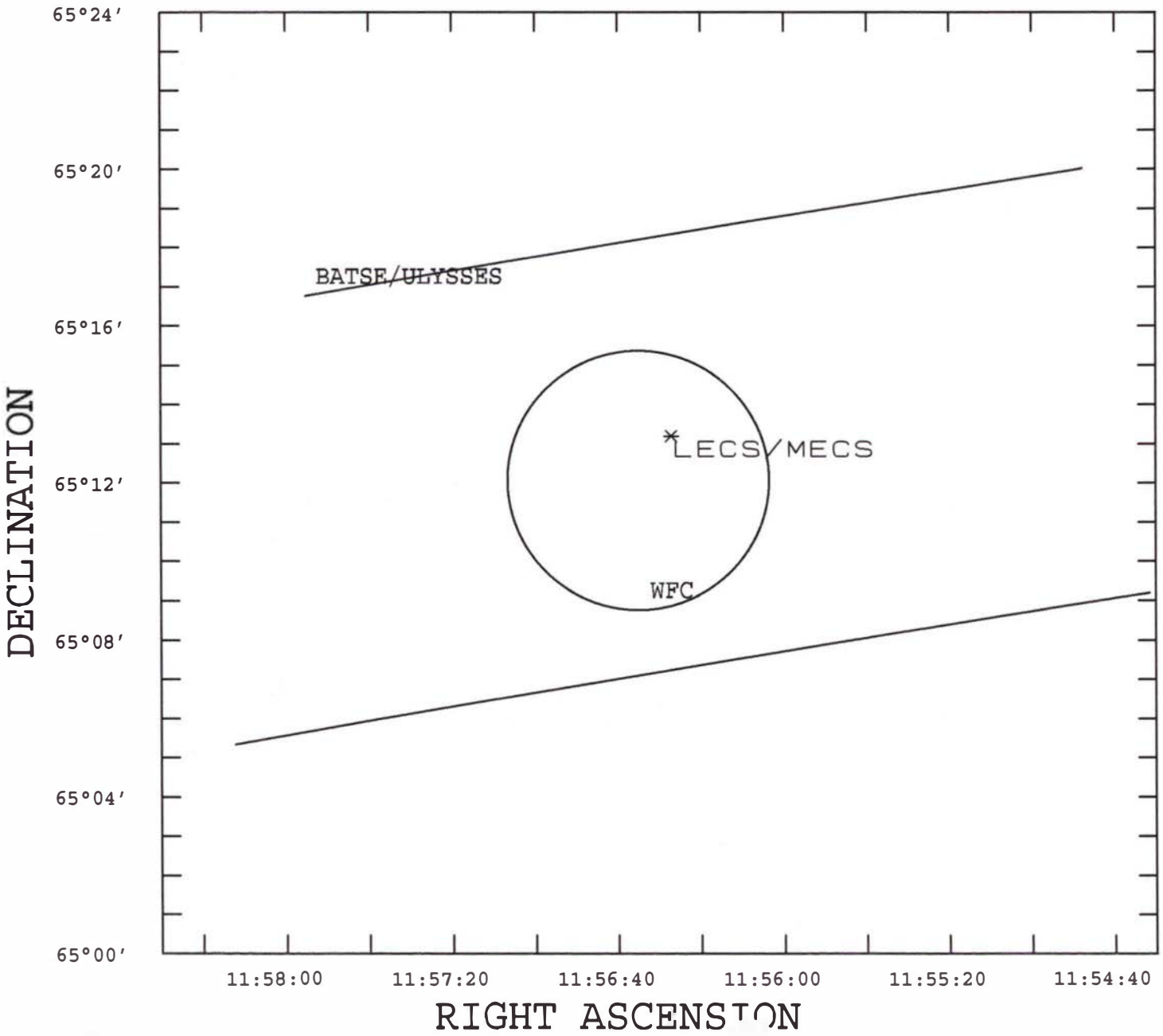



65°24′
65°20′
65°16′
65°12′
65°08′
65°04′
65°00′
DECLINATION
B/U
ULYSSES/SAX
LECS/MECS
WFC
U/S
B/U
B/U
11:58:00
11:57:20
11:56:40
11:56:00
11:55:20
11:54:40
RIGHT ASCENSION

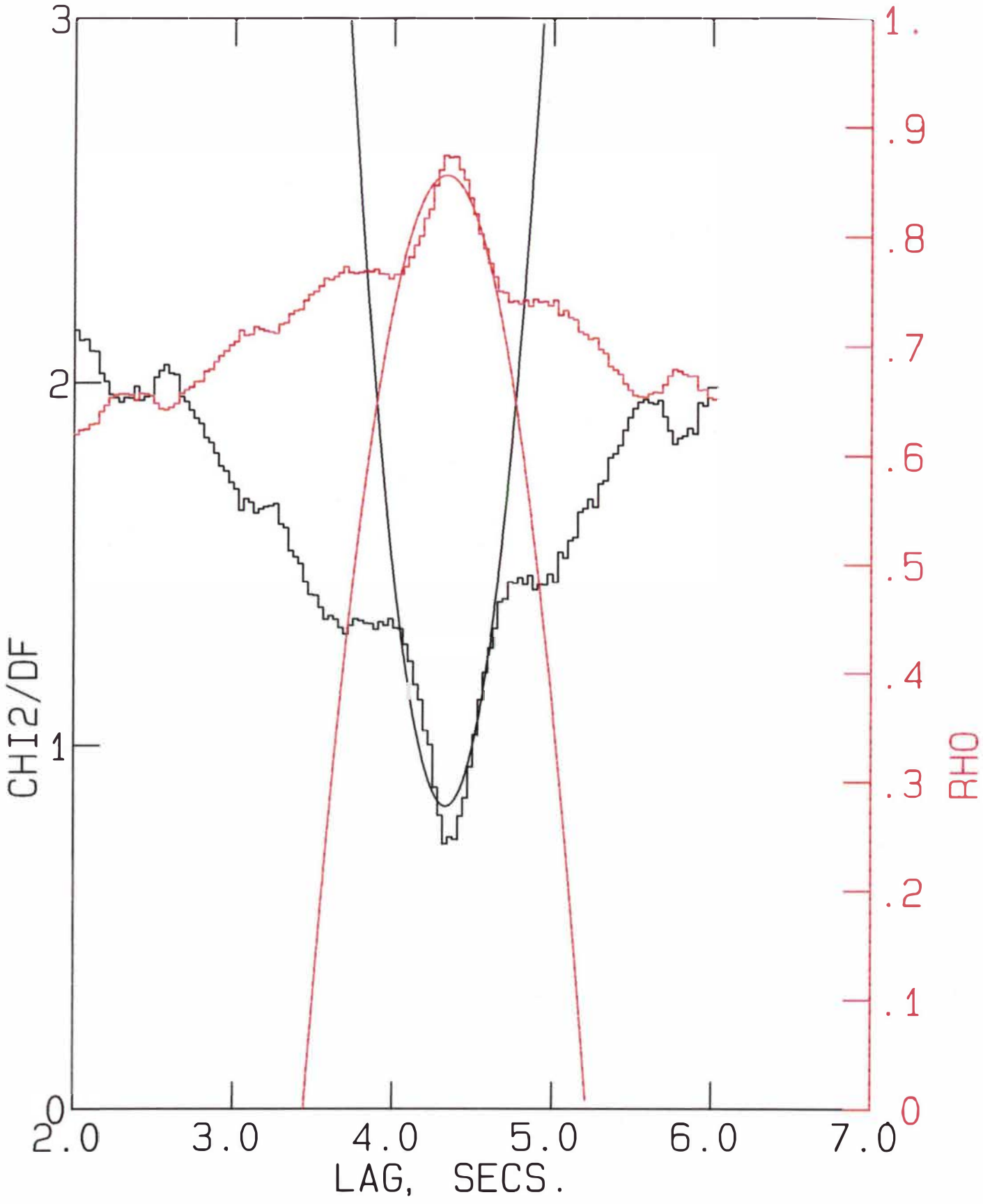

BSAX-GRBM -ULYSSES RT CORRELATION 14/12/97 84034.918 11/ 2/98
2000
1500
1000
500
0
200
150
100
50
0
C/ 2.00000 S
BSAX-GRBM
C/ 2.00003 S
ULYSSES RT
5
10
15
20
25
30
35
40
45
50
TIME, SECS

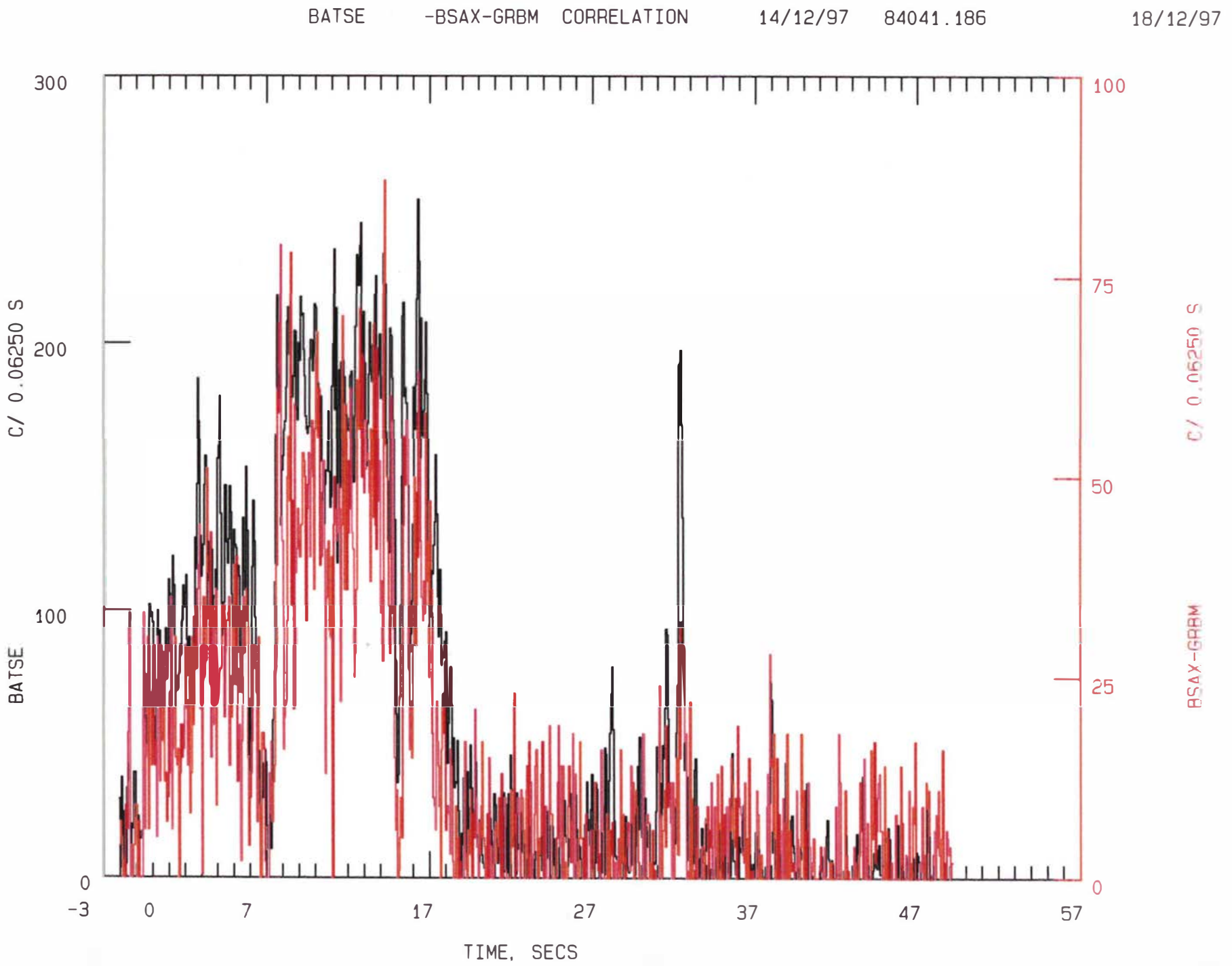
BSAX-GRBM -ULYSSES RT CORRELATION 14/12/97 84034.918

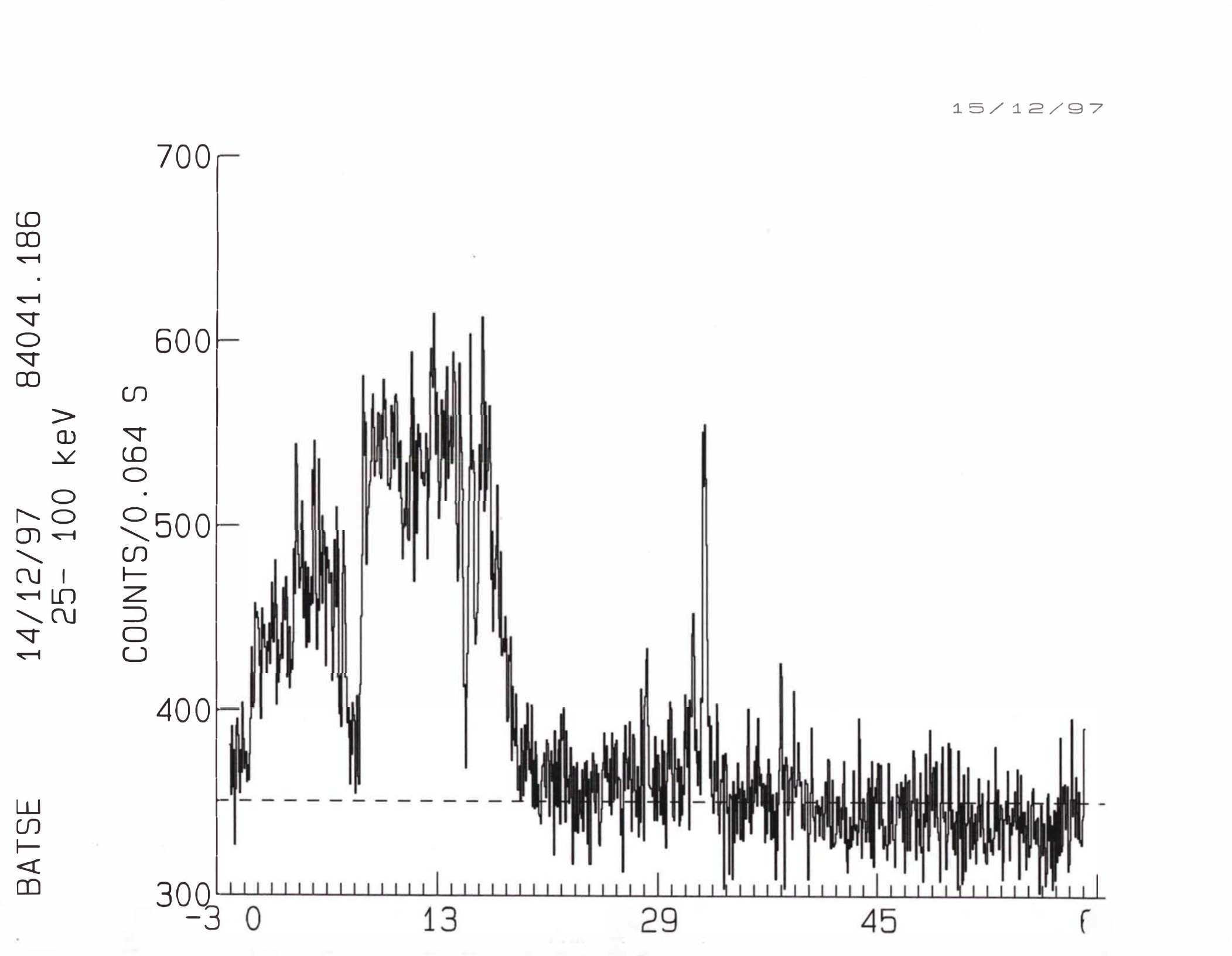


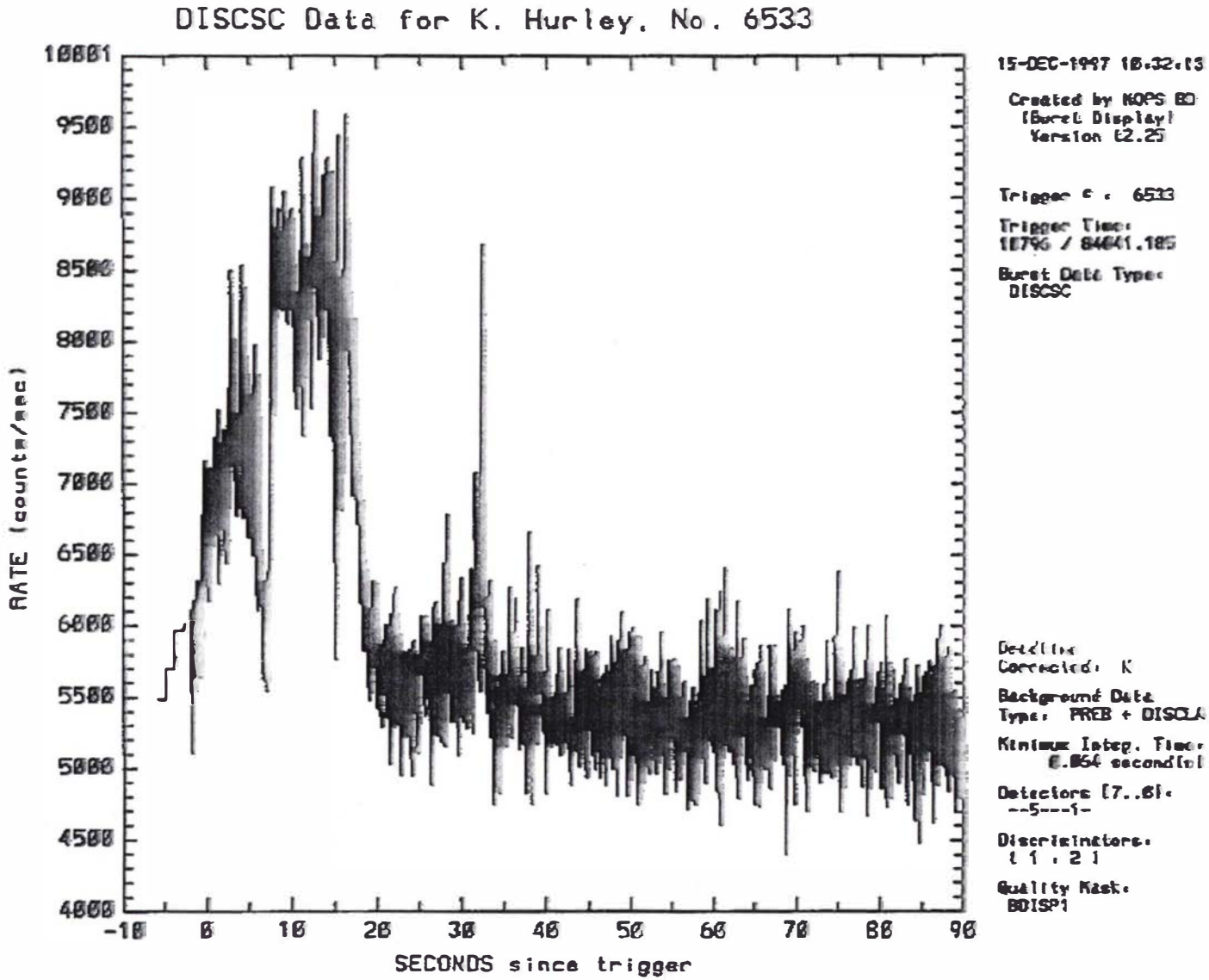

65°24′
65°20′
65°16′
65°12′
65°08′
65°04′
65°00′
DECLINATION
BATSE/ULYSSES
LECS/MECS
WFC
11:58:00
11:57:20
11:56:40
11:56:00
11:55:20
11:54:40
RIGHT ASCENSION

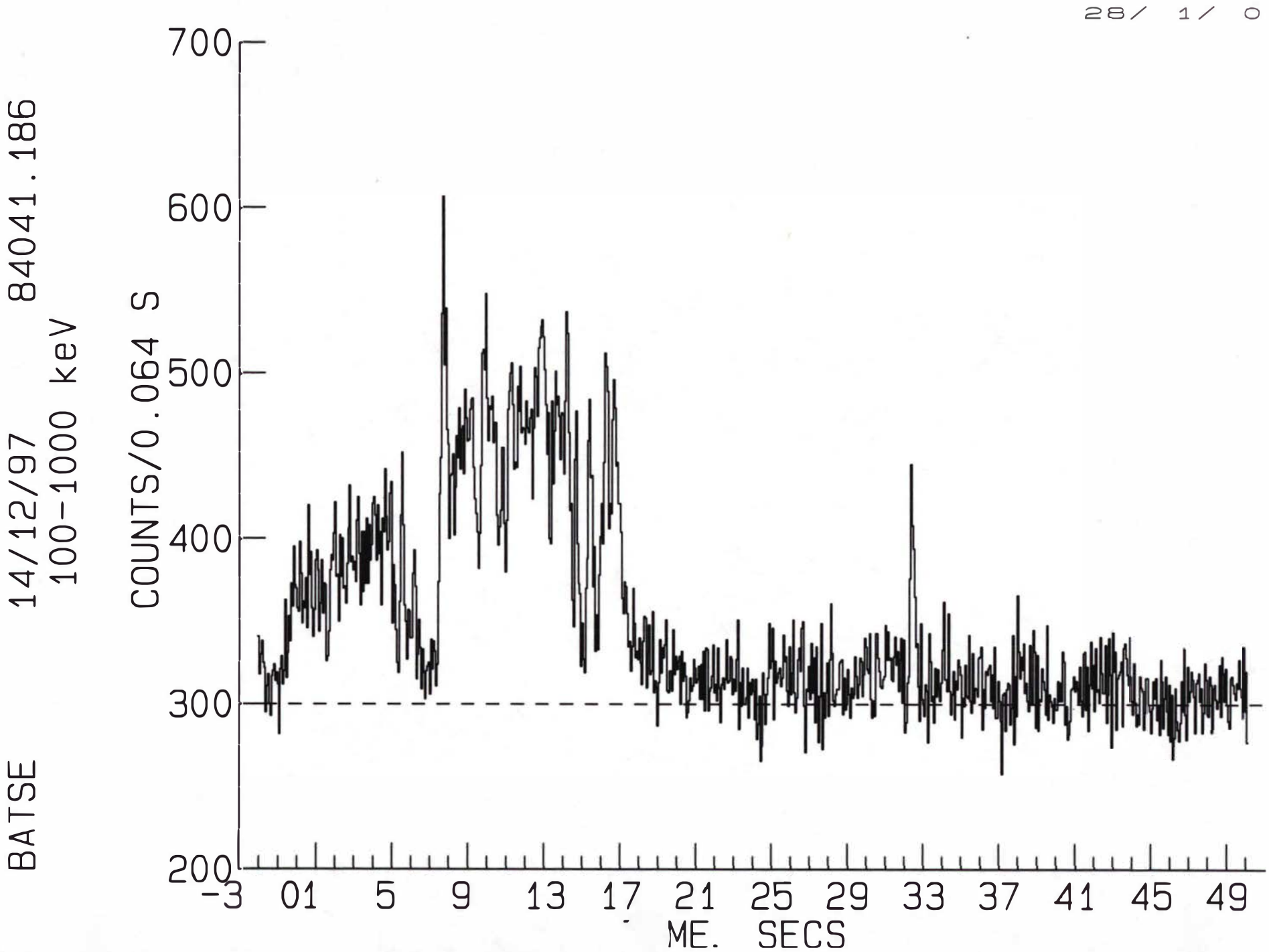
BATSE -BSAX-GRBM CORRELATION 14/12/97 84041.186

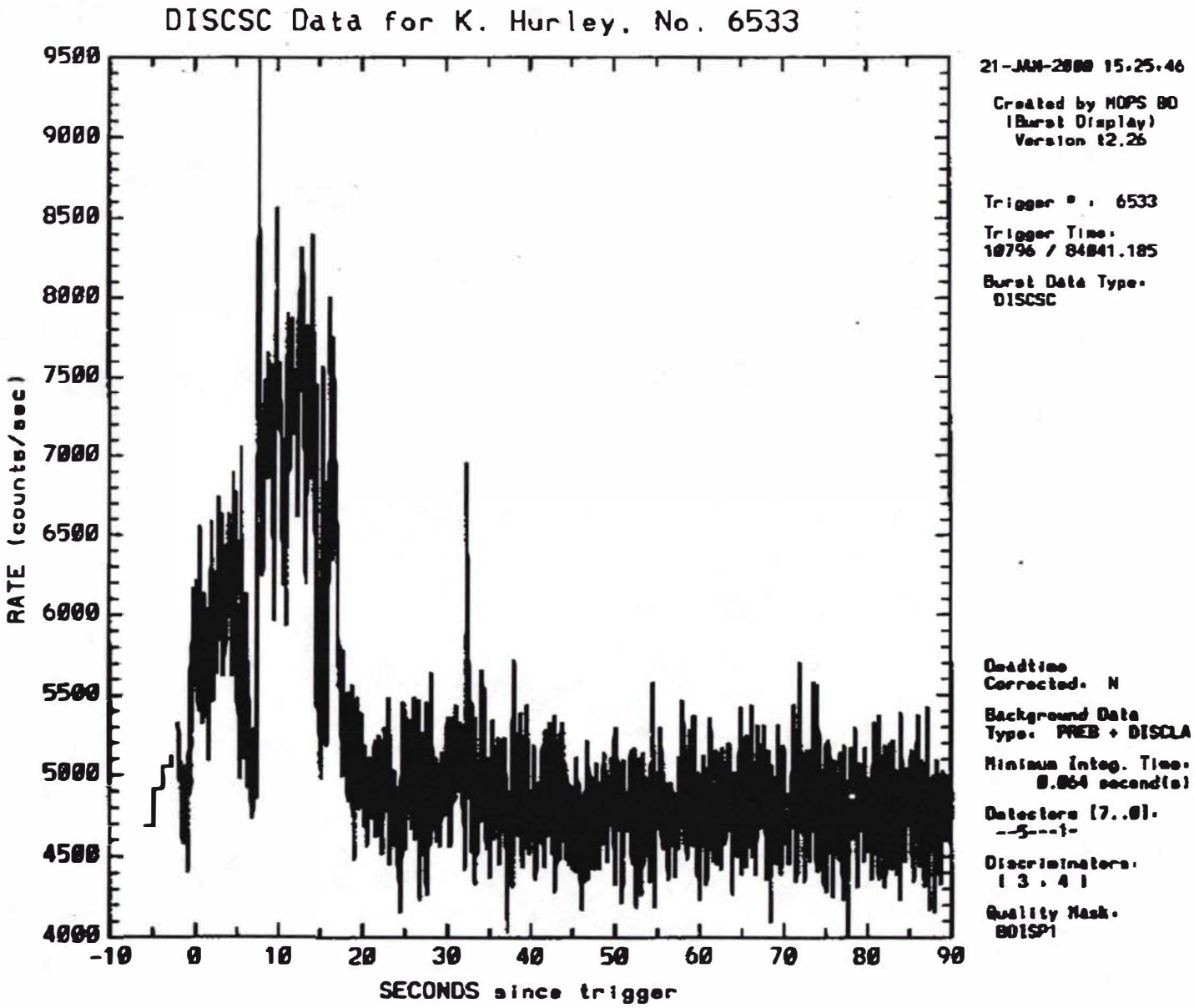



BATSE -BSAX-GRBM CORRELATION 14/12/97 84041.186 18/12/97
300
200
100
0
-3
0
7
17
27
37
47
57
C/ 0.06250 S
BATSE
100
75
50
25
0
C/ 0.06250 S
BSAX-GRBM
TIME, SECS


15/12/97
BATSE 14/12/97 84041.186
25- 100 keV
COUNTS/0.064 S
700
600
500
400
300
-3
0
13
29
45


DISCSC Data for K. Hurley, No. 6533
RATE (counts/sec)
10001
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
15-DEC-1997 10:32:13
Created by MOPS BD
(Burst Display)
Version 02.25
Trigger # : 6533
Trigger Time:
18796 / 84041.185
Burst Data Type:
DISCSC
Deadtime
Corrected: K
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
--5---1-
Discriminators:
[ 1 , 2 ]
Quality Mask:
BDISP1


28/ 1/ 0
BATSE 14/12/97 84041.186
100-1000 keV
COUNTS/0.064 S
700
600
500
400
300
200
-3 01 5 9 13 17 21 25 29 33 37 41 45 49
ME. SECS


DISCSC Data for K. Hurley, No. 6533
RATE (counts/sec)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
21-JAN-2000 15:25:46
Created by MOPS BD
(Burst Display)
Version t2.26
Trigger # : 6533
Trigger Time:
10796 / 84841.185
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
--5---1-
Discriminators:
[ 3 , 4 ]
Quality Mask:
BDISP1

CNN interactive
custom news
WORLD
U.S.
LOCAL
WEATHER
SPORTS
BUSINESS
SCI-TECH
computing
space
POLITICS
TRAVEL
STYLE
SHOWBIZ
BOOKS
HEALTH
EARTH
SPECIALS
CNNSI
allpolitics
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audio

COMMUNITY
Message Boards
Chat
Feedback

SITE SOURCES
Contents
Help!
Search CNN
Networks

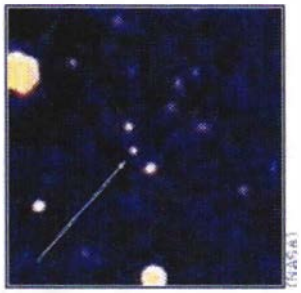
SPECIALS



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# Astronomers astounded by enormous explosion in deep space

**In this story:**



- As bright as the entire universe
- 'Brightest documented explosion in history'
- Power released is almost unimaginable
- Theoretical models can't explain it
- Related sites and stories

May 6, 1998
Web posted at: 8:37 p.m. EDT (0037 GMT)

WASHINGTON (CNN) -- Astronomers are mystified by the most powerful explosion ever witnessed, an enormous burst of gamma ray energy 12 billion light years from Earth that in one second released almost as much energy as all the stars of the universe.

The explosion was too far away to affect the Earth or the sun, but the astronomers say they

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are astounded by the might of the blast and baffled about what might have caused it.

"The energy released by this burst in its first few seconds staggers the imagination," said Shrinivas Kulkarni, a professor of astronomy at California Institute of Technology and leader of a team that helped calculate the explosion size.

**NASA animation of a gamma ray burst**

836K/8 sec./320x240
235K/8 sec./160x120
QuickTime movie

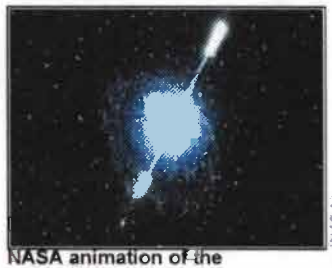
Kulkarni is co-author of a study being published Thursday in the journal Nature. He and others appeared at a Washington news conference Wednesday.

"For about one or two seconds, this burst was as luminous as all the rest of the entire universe," said Caltech professor George Djorgovski, another member of the team. "In a region about a hundred miles across, the burst created conditions like those in the early universe, about one millisecond after the Big Bang."

"I was astounded when I heard these results," said Stan Woosley, a professor of astronomy at the University of California, Santa Cruz, and an expert on astronomical explosions. "At first I could hardly believe them, but now I'm convinced they're true, and it makes the universe bigger and more exciting than I ever thought before."

## 'Brightest documented explosion in history'

The gamma ray explosion came from a faint galaxy known as GRB 971214 and was first seen December 14. It is about 12 billion light years from Earth. A light year is the distance light travels in a year at 189,000 miles a second, or about 5.9 trillion miles.



NASA animation of the explosion

Gamma ray bursts are common, occurring once or twice a day, but the rays are invisible and can be detected only by satellites orbiting above the Earth's atmosphere.

Since a burst lasts only seconds, astronomers rarely are able to focus telescopes on the source and measure the light necessary to calculate the size of the explosion or pin down its location.

But on the night of December 14, an Italian team detected the gamma ray burst with the BeppoSAX orbiting observatory and quickly alerted David J. Helfand, a Columbia University astronomer. Helfand relayed the information to astronomers operating telescopes at Kitt Peak near Tucson, Arizona, who were able to photograph the burst.

Later, the Hubble Space Telescope and others photographed the explosion's afterglow. Kulkarni and others analyzed the energy and light released from the object and concluded it was a very faint and distant galaxy about 12 billion light years away.

That it occurred so far away, Kulkarni said,

indicated that the explosion was immensely powerful.

"This was the brightest documented explosion in history," said Woosley.



The arrow shows the galaxy where the explosion occurred

## Power released is almost unimaginable

Woosley said the energy released was equal to about 5 billion supernovae, the explosion of dying stars that, until this explosion, had provided the most powerful documented sudden releases of energy.

In visible light alone, Woosley said, the gamma ray burst energy was equal to about 1,000 supernovae.

By some calculations, the gamma ray burst release equaled as much energy in one second as all of the 10 billion trillion stars in the universe combined.

Woosley said it is difficult to relate the power in common terms.

For instance, he said, if all of the nuclear weapons ever made were exploded at once, the energy released would equal about 1/100,000 of a second of the energy from Earth's sun. Yet over its 10 billion-year history, Woosley said, the sun will produce only about 1 percent of the energy of the explosion.

Gamma ray bursts were unknown until the launch of U.S. military satellites designed to

detect radiation from the explosion of atomic bombs. Later, scientific satellites were launched to study the bursts, but astronomers were still at a loss to explain them.

"We had no idea where they came from or what was responsible for them," said Alan Bunner, a science program director at NASA.

## Theoretical models can't explain it

More than 2,000 gamma ray bursts have been recorded, but astronomers were unable until recently to pinpoint their location or measure their distance from Earth. Only three have been pinpointed so far.

Kulkarni said that all of the bursts have been located in dusty regions where stars form, suggesting that the massive explosions may play a role in the birth of new stars.


NASA animation showing an exploding star

Woosley and others speculate that such an explosion may occur when a black hole swallows a neutron star. A black hole is a collapsed object that is so dense that its gravity permits not even light to escape; a neutron star is a massive collapsed star.

Astronomers believe the immense explosion sent matter, such as neutrons and electrons, streaking outward at near the speed of light. About a day later, the matter smashed into gas and dust particles, and the violence and heat of the collisions created gamma rays, X-rays, and then visible light.

It was these energy sources that were detected by the orbiting instruments and later by the telescopes.

"Most of the theoretical models proposed to explain these bursts cannot explain this much energy," Kulkarni said, adding that it might have come from a rotating black hole.

"On the other hand, this is such an extreme phenomenon that it is possible that we are dealing with something completely unanticipated and even more exotic."

*Correspondent Ann Kellan, The Associated Press and Reuters contributed to this report.*

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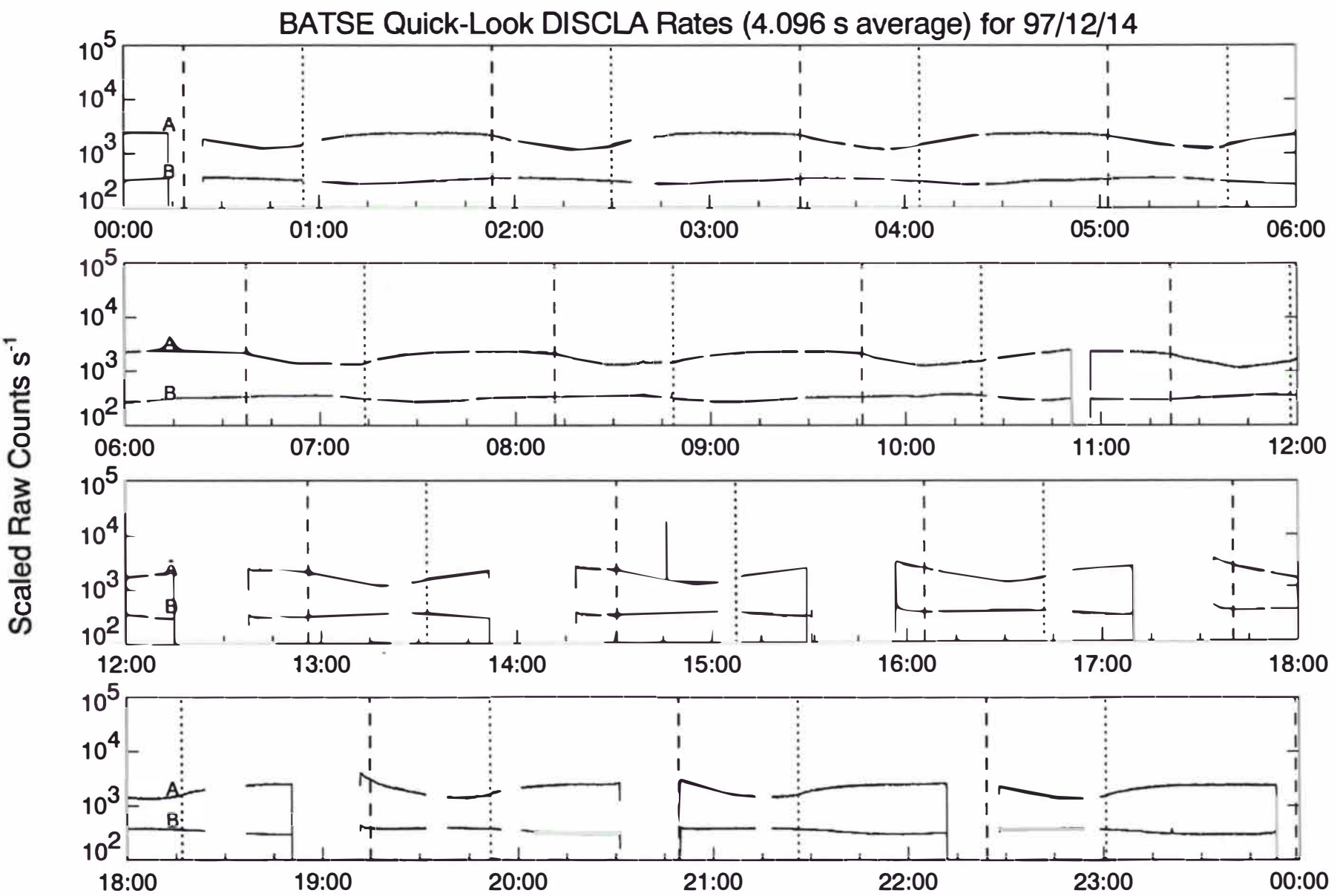
**Related stories:**

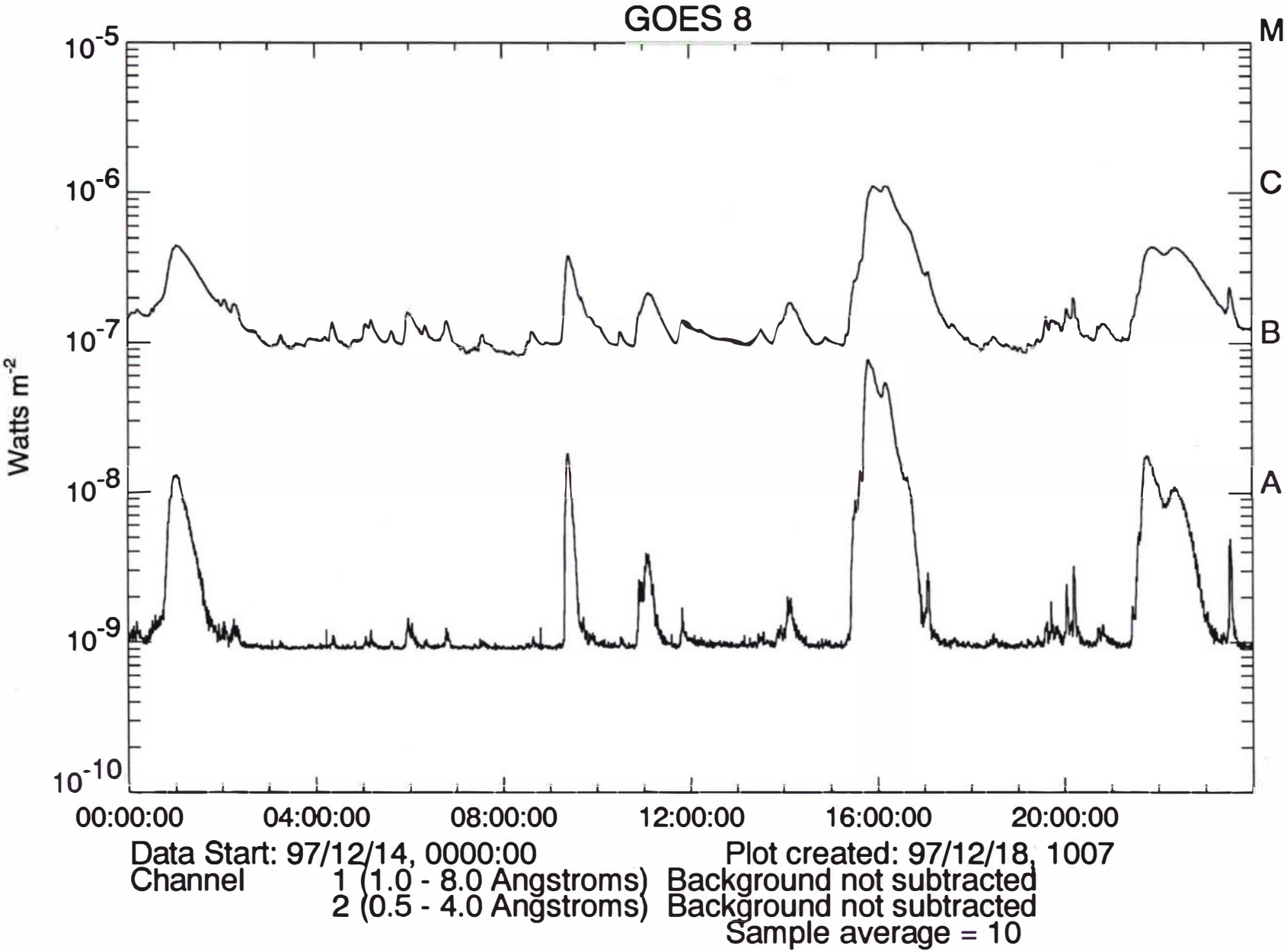
- Astronomers see most distant object ever - May 1, 1998
- Spacecraft finds solar tornadoes as wide as the Earth - April 28, 1998
- Pictures support theory of water on Europa - March 2, 1998

**Related sites:**

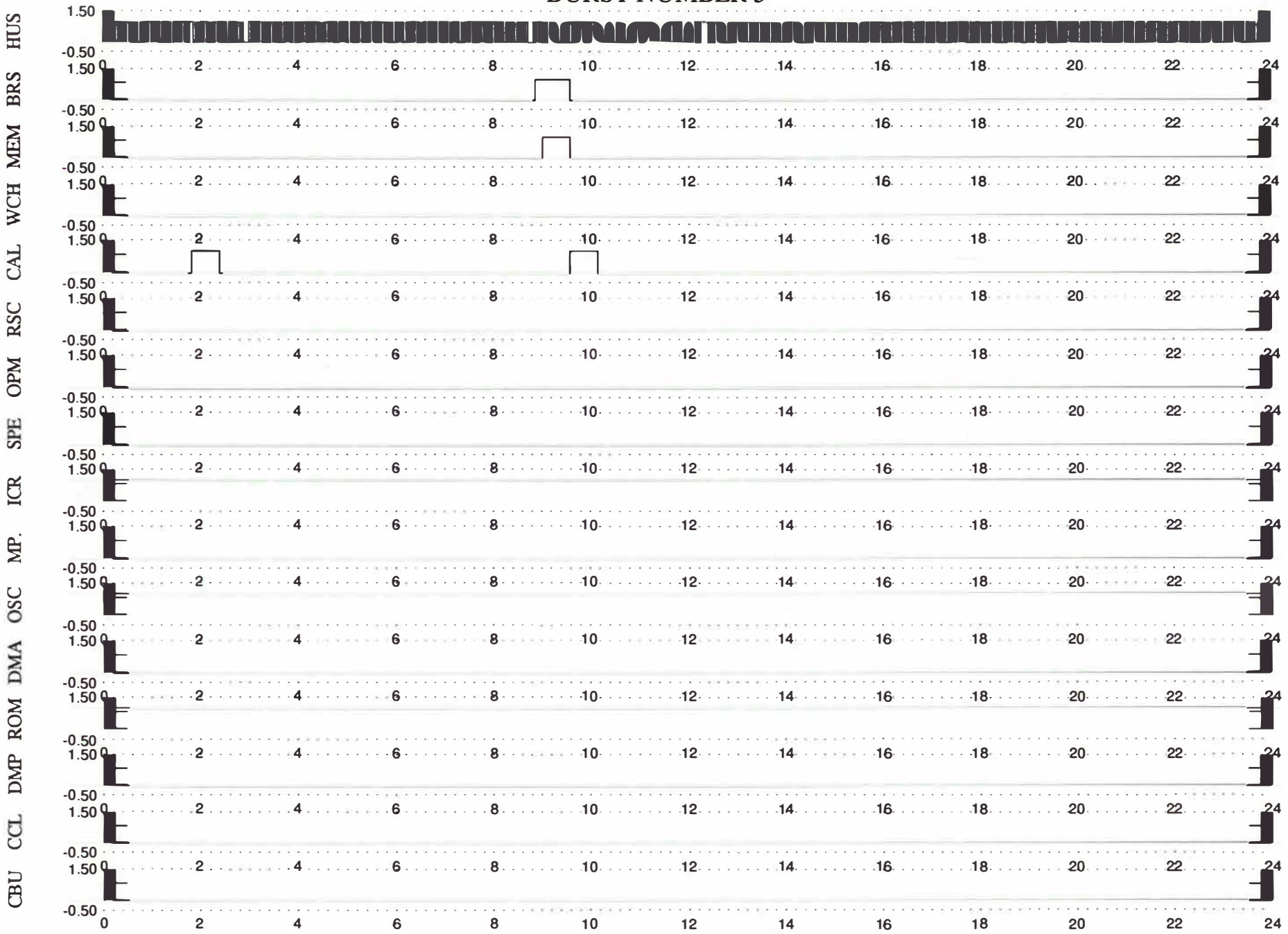
*Note: Pages will open in a new browser window*

- NASA Homepage
  - Most Powerful Explosion Since the Big Bang Challenges Gamma Ray Burst Theories - May 6, 1998
- BeppoSAX MISSION HOME PAGE
- Compton Gamma-Ray Observatory


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/14
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/18, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

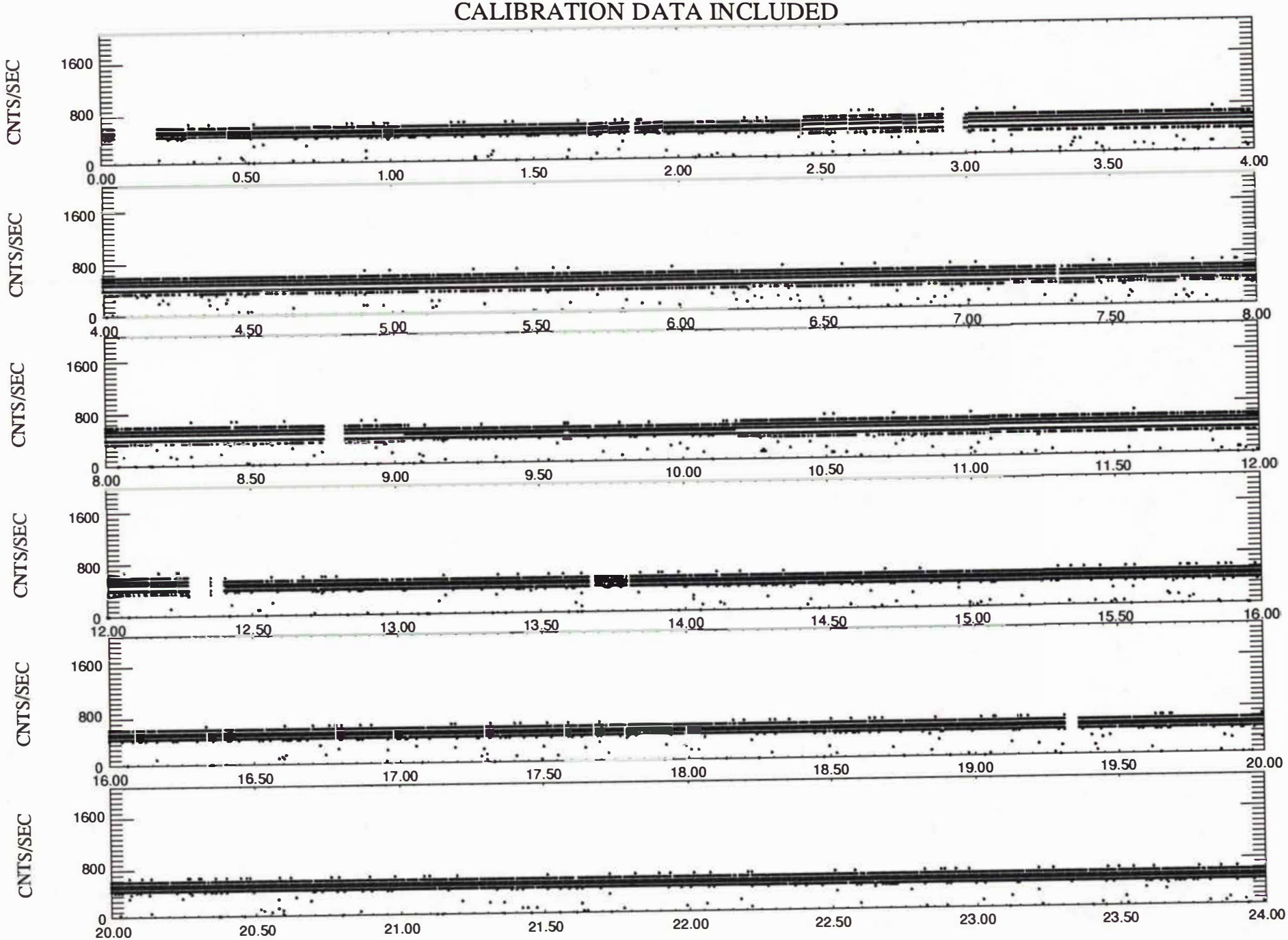

GOES 8
M
C
B
A
$10^{-5}$
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/14, 0000:00
Plot created: 97/12/18, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

BURST NUMBER 5



HUS 2A, MODE 1, NOT AVERAGED EDR day 348, year 1997 to day 348, year 1997 3/12/98

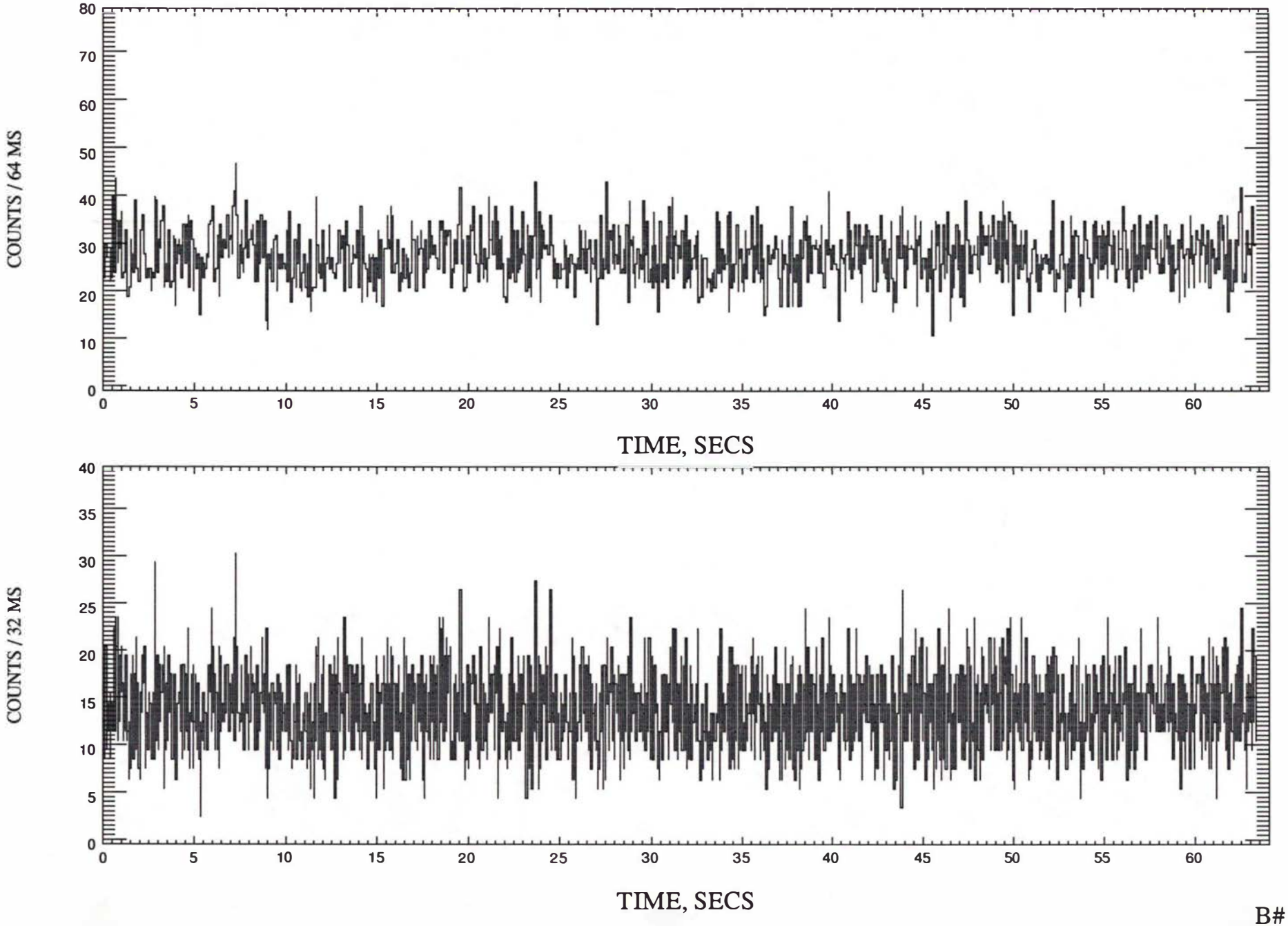
CALIBRATION DATA INCLUDED




UNIV 'AL TIME

HUS 2A TRIGGERED DATA EDR day 348, year 1997 3/11/98

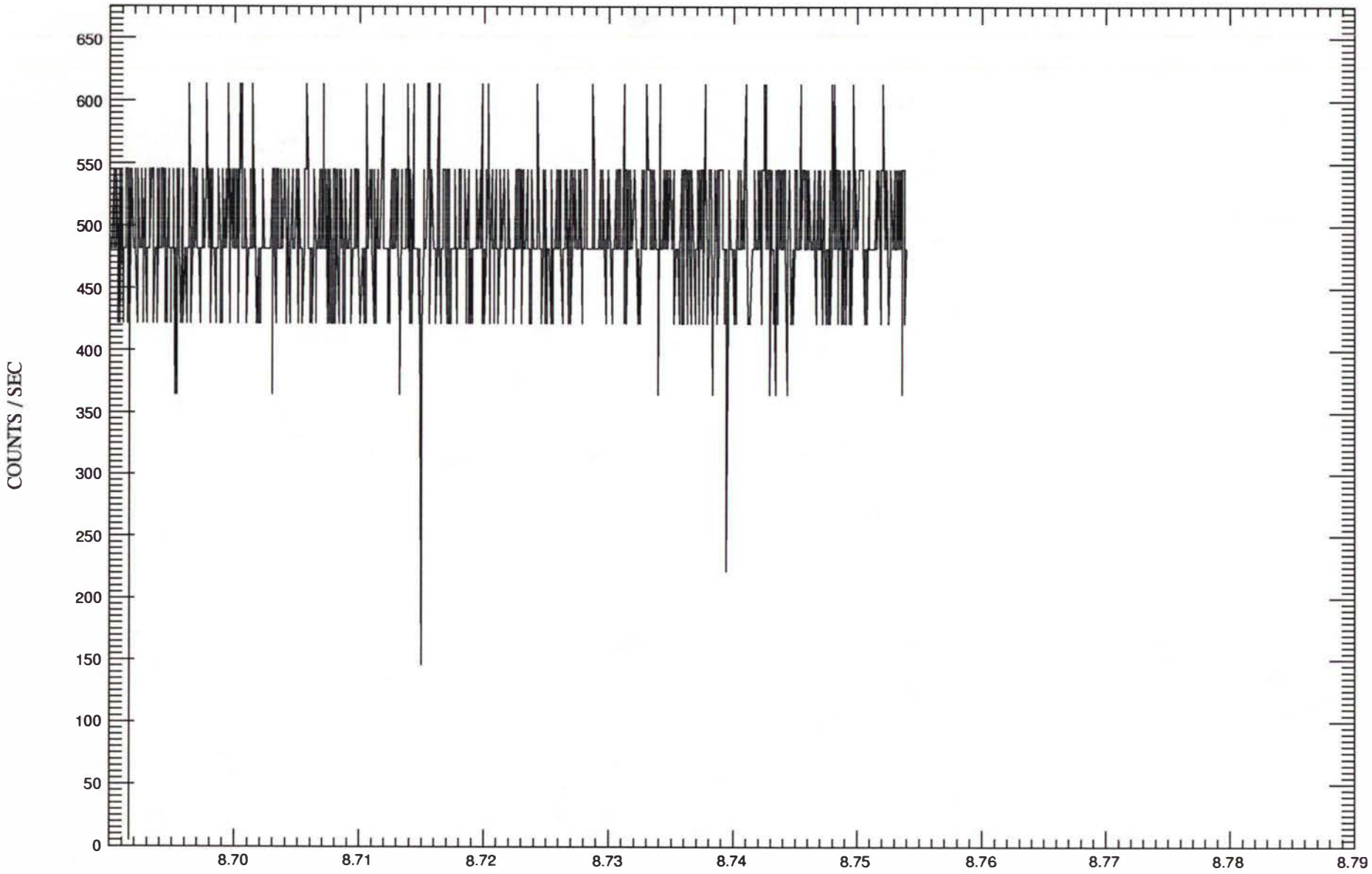
Burst Counter 5 at UT= 8.741474965413 h=31469.310 s 08:44:29.310



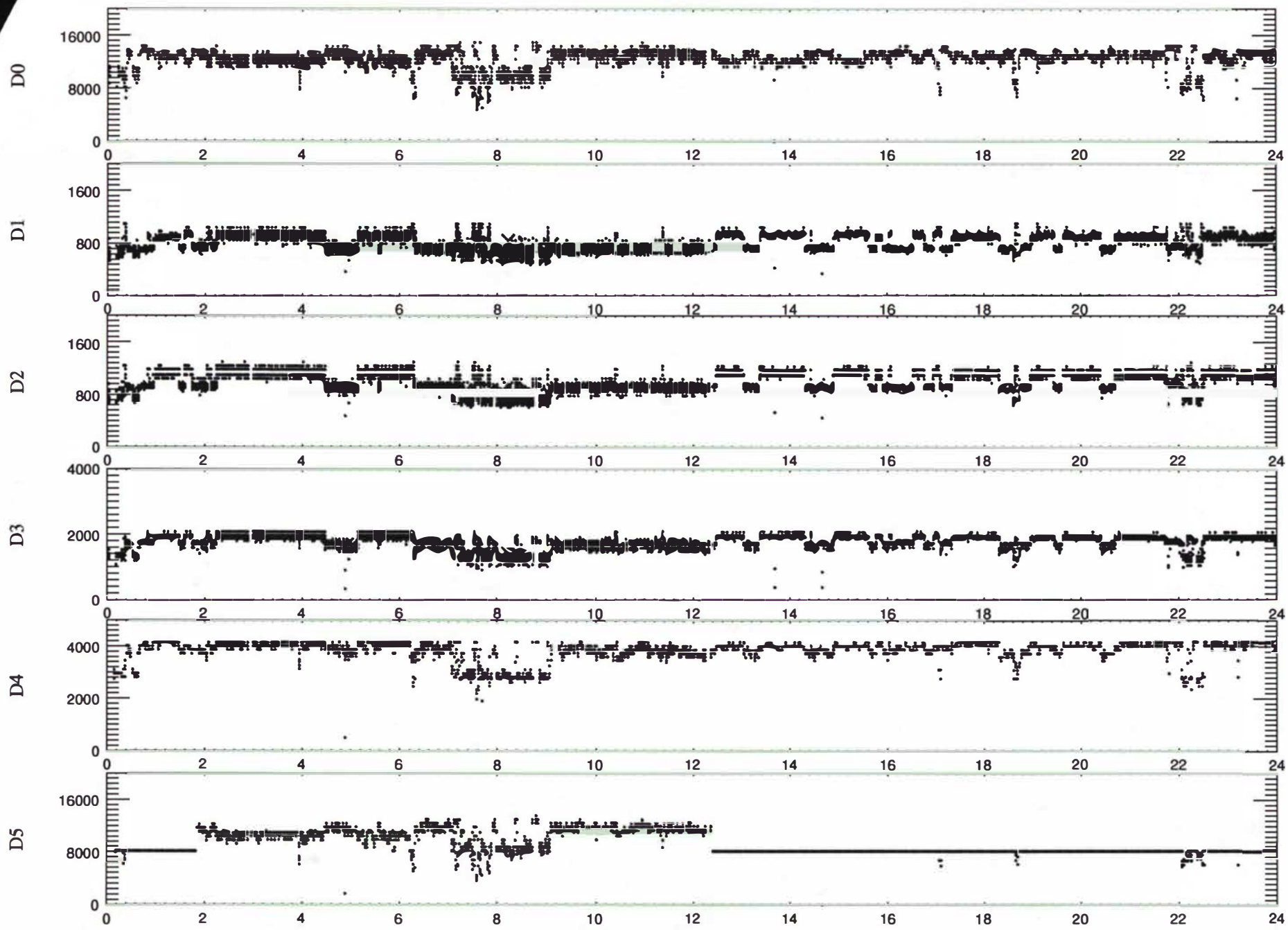

B# 1

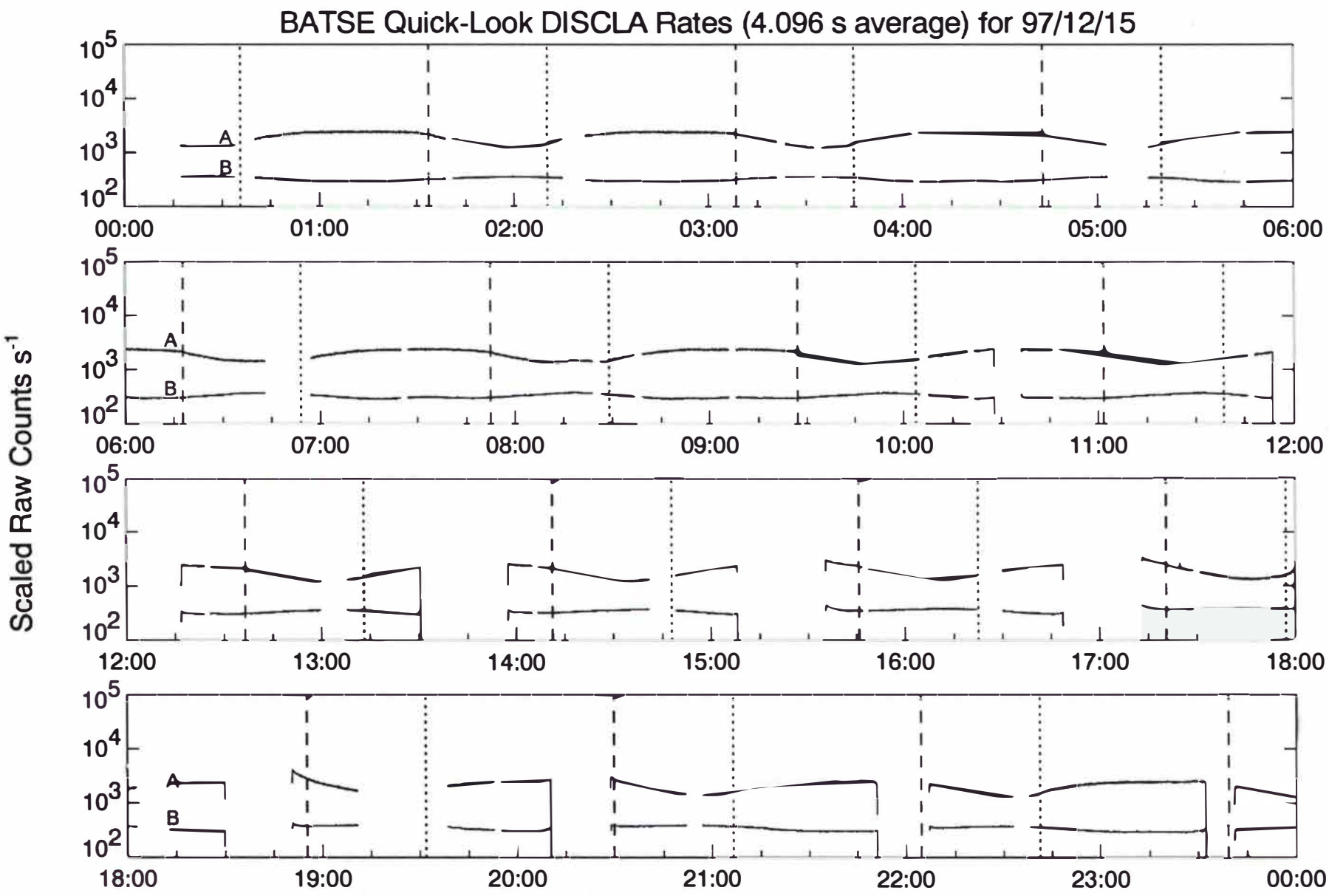
HUS 2A, MODE 1, NOT AVERAGED EDR day 348, year 1997 to day 348, year 1997 3/11/98

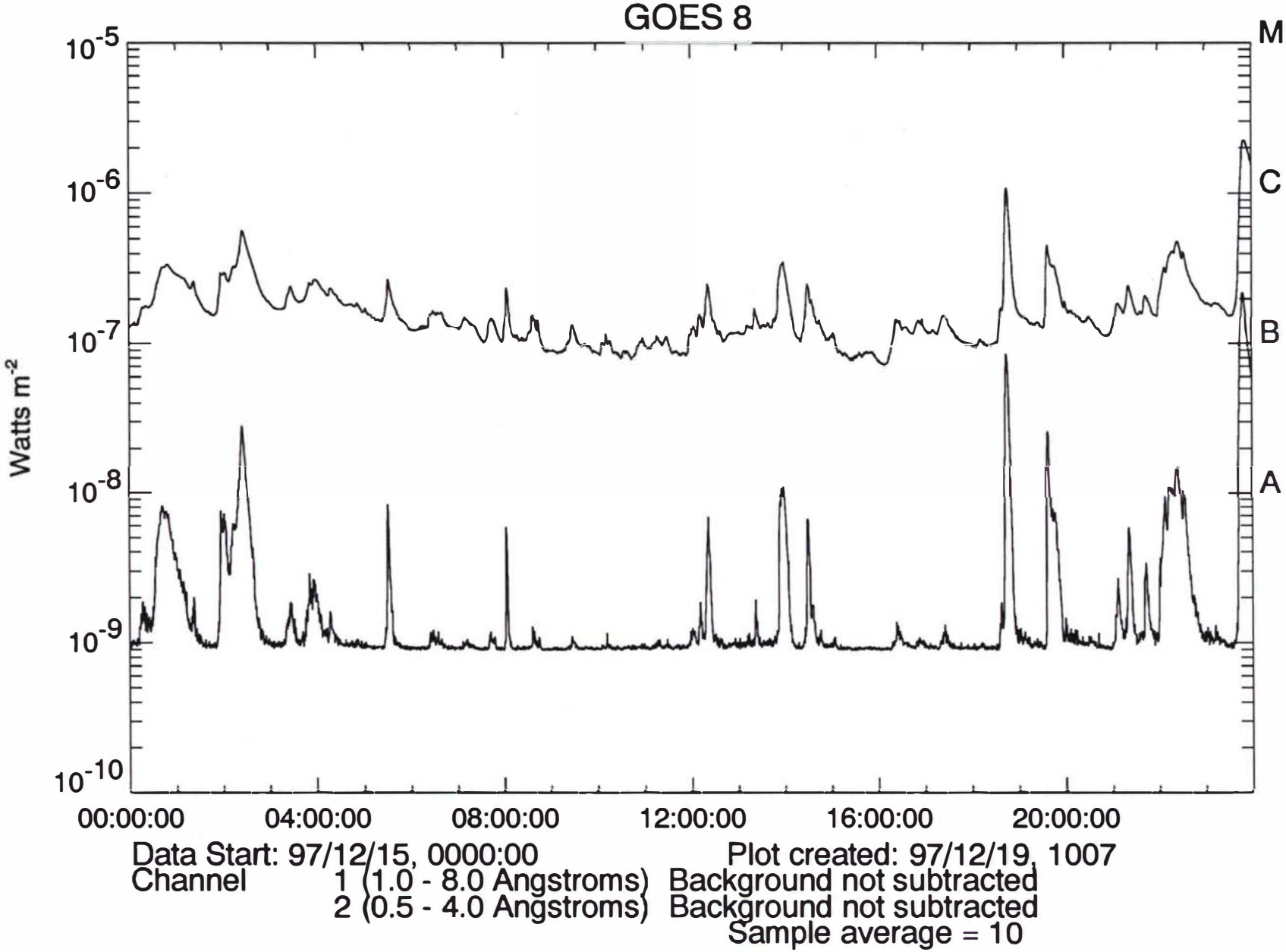
CALIBRATION DATA INCLUDED



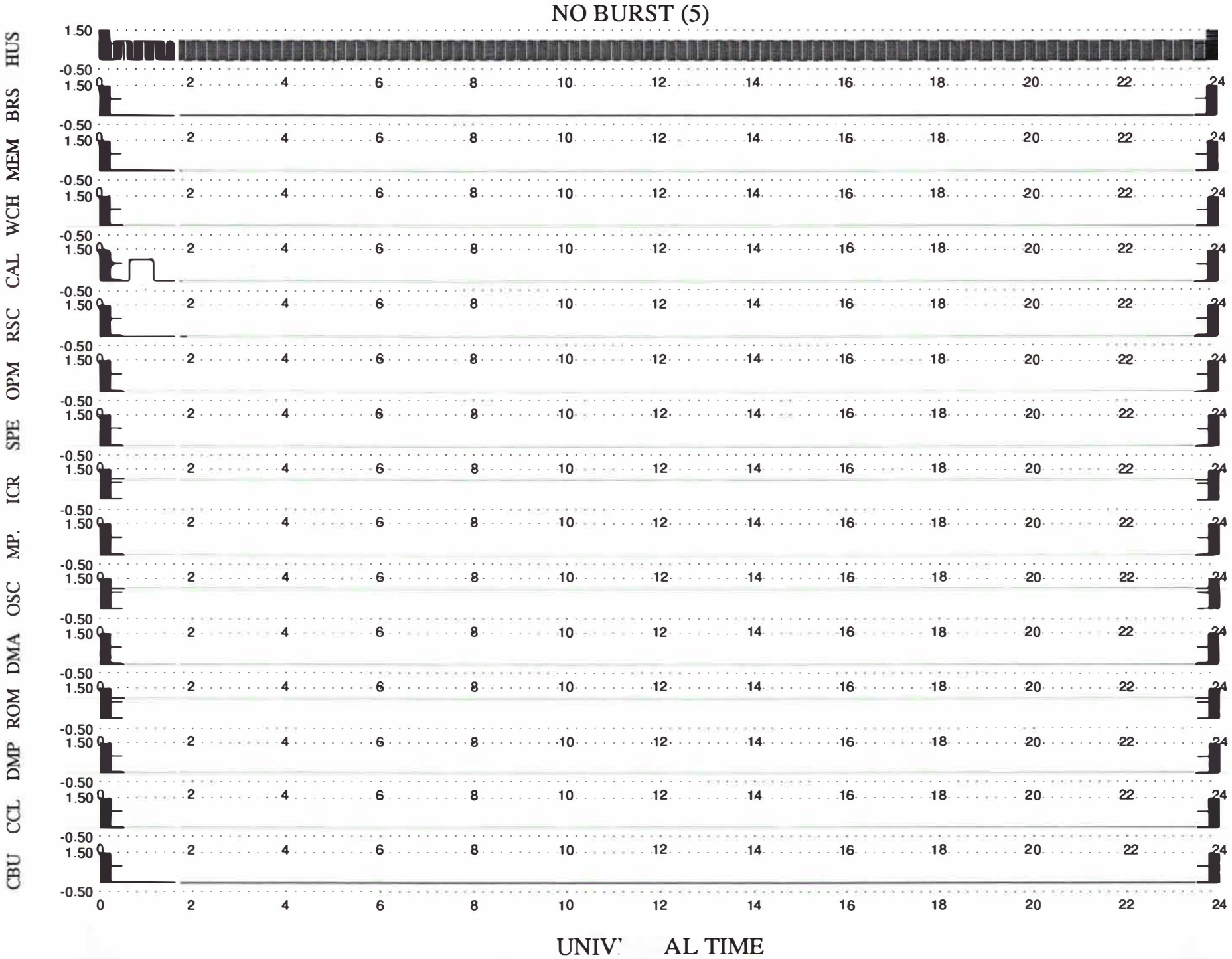
HUS 2B COUNTS / SEC EDR day 348, year 1997 to day 348, year 1997 3/12/98




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/15
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/19, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

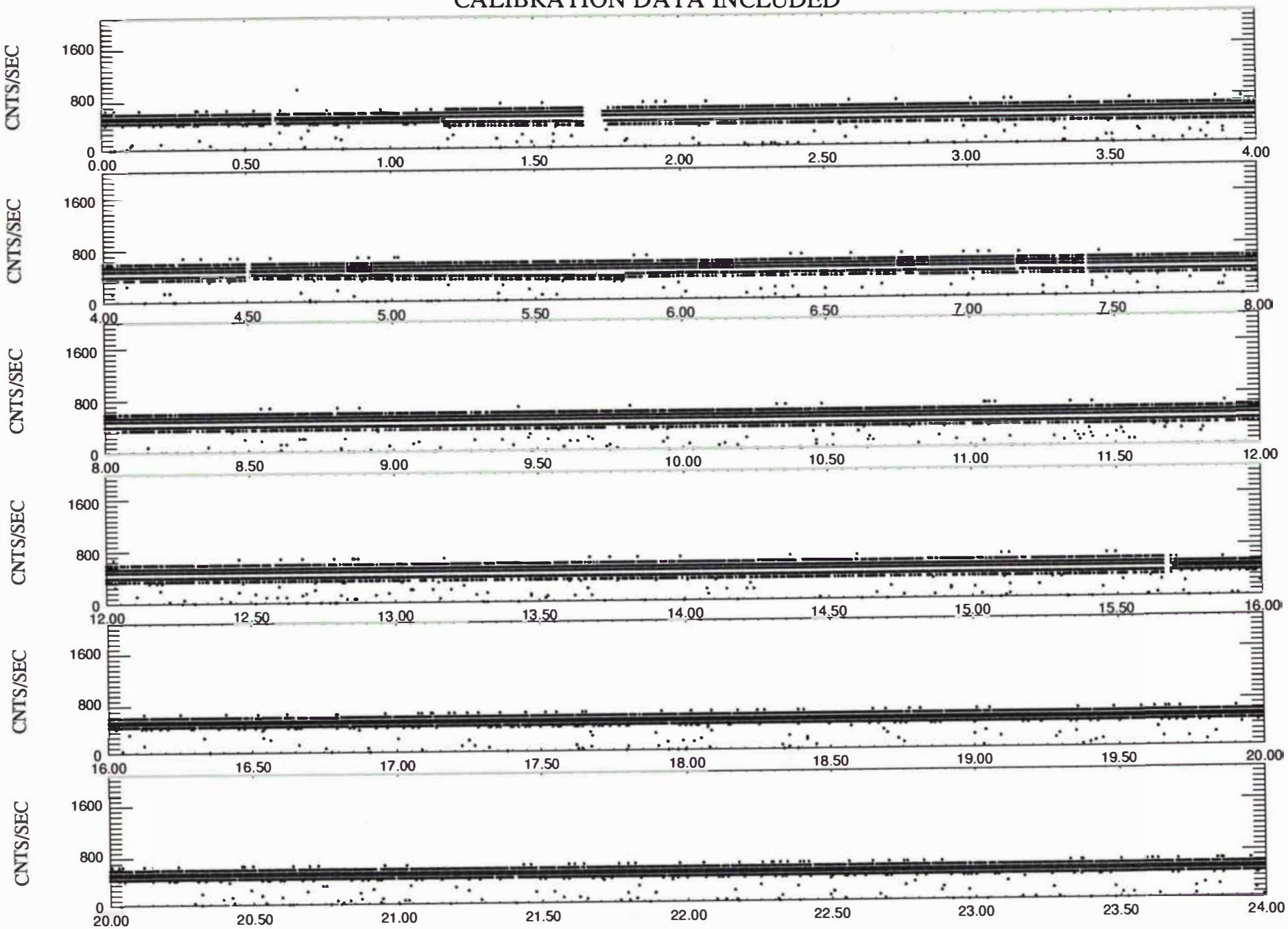

GOES 8
M
C
B
A
$10^{-5}$
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/15, 0000:00
Plot created: 97/12/19, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 349, year 1997 to day 349, year 1997 3/12/98



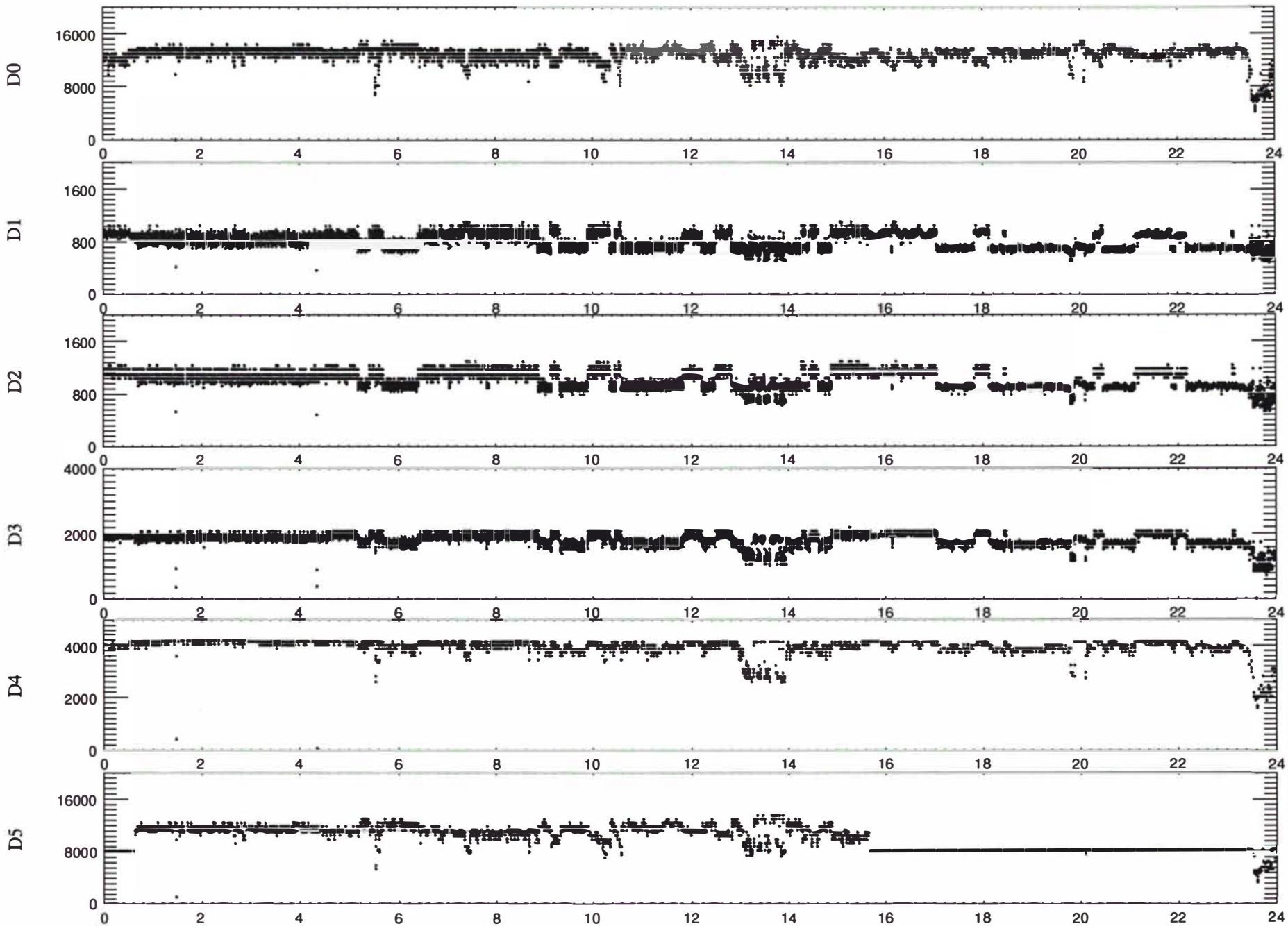
HUS 2A, MODE 1, NOT AVERAGED EDR day 349, year 1997 to day 349, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV AL TIME

HUS 2B COUNTS / SEC EDR day 349, year 1997 to day 349, year 1997 3/12/98



From RICHARDSON@SSLMOR.msfc.nasa.gov Thu Dec 18 09:14:53 1997
Return-Path: <RICHARDSON@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA19128; Thu, 18 Dec 1997 09:14:47 -0800
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA09632; Thu, 18 Dec 1997 09:14:42 -0800
Date: Thu, 18 Dec 1997 11:13:27 -0600 (CST)
From: RICHARDSON@SSLMOR.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971218111327.21e1121d@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6534
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6534
EVENT OF 1997 DEC 16 DAY OF YEAR=350
EVENT CROSSING TIME AT BATSE : 27902. S. OR 07:45:02.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 357.000 -23.000
BATSE PEAK COUNTING RATE: 4800 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 16/12/ 97 IS:
RA= 170.616 DEC= 11.952 DIST= 5.137 AU
BATSE-ULYSSES DISTANCE = 768460686. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 12.61 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 2501.49 SECS.
CROSSING TIME AT ULYSSES IS 30403. S. OR 08:26:43 +/- 185.14 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 16/12/ 97 IS:
RA= 300.598 DEC= -21.719 DIST= 2.084 AU
MARS-BATSE DISTANCE = 311750272. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=128.16 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -642.44 SECS.
CROSSING TIME AT MARS IS 27260. S. OR 07:34:19 +/- 132.21 SECONDS

BATSE BURST TRIGGER
NO.: 6534

TIME: TJD=0798 SECONDS=27902

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

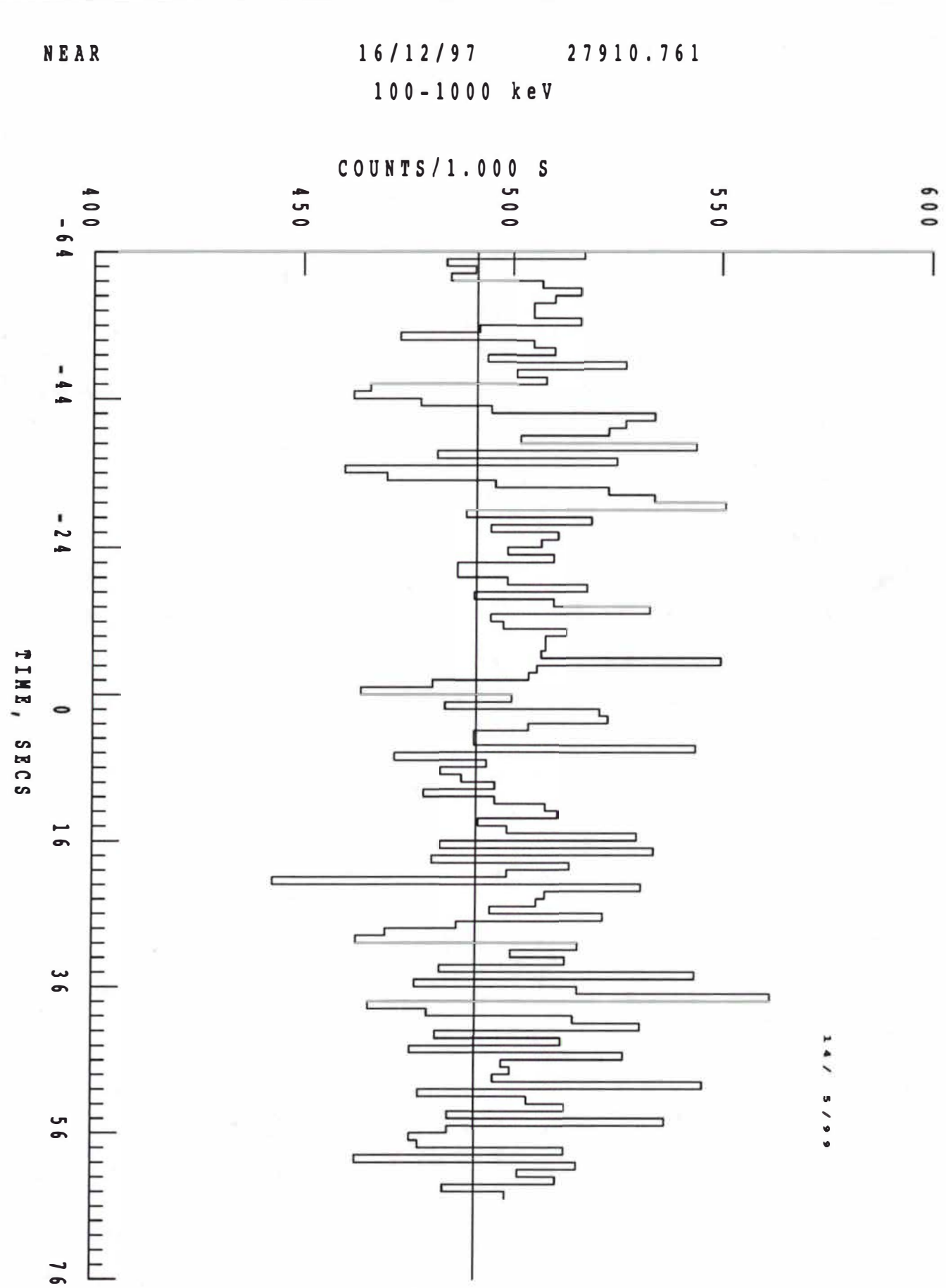
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=96.1 AZIMUTH=278.5 ERROR=3.5 DEGREES

COMMENTS:
GRB SINGLE PULSE WITH STRUCTURE. DUR. ~ 2 SEC. NOT VISIBLE ABOVE 300KEV

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6534 | 971216 | 10798 | 27902 | 4800 | 357 | -23 | 2 |


NEAR
16/12/97
27910.761
100-1000 keV
COUNTS/1.000 S
400
450
500
550
600
-64
-44
-24
0
16
36
56
76
TIME, SECS
14/ 5/99

BATSE BURST# 6534

ULYSSES RT 18/12/97

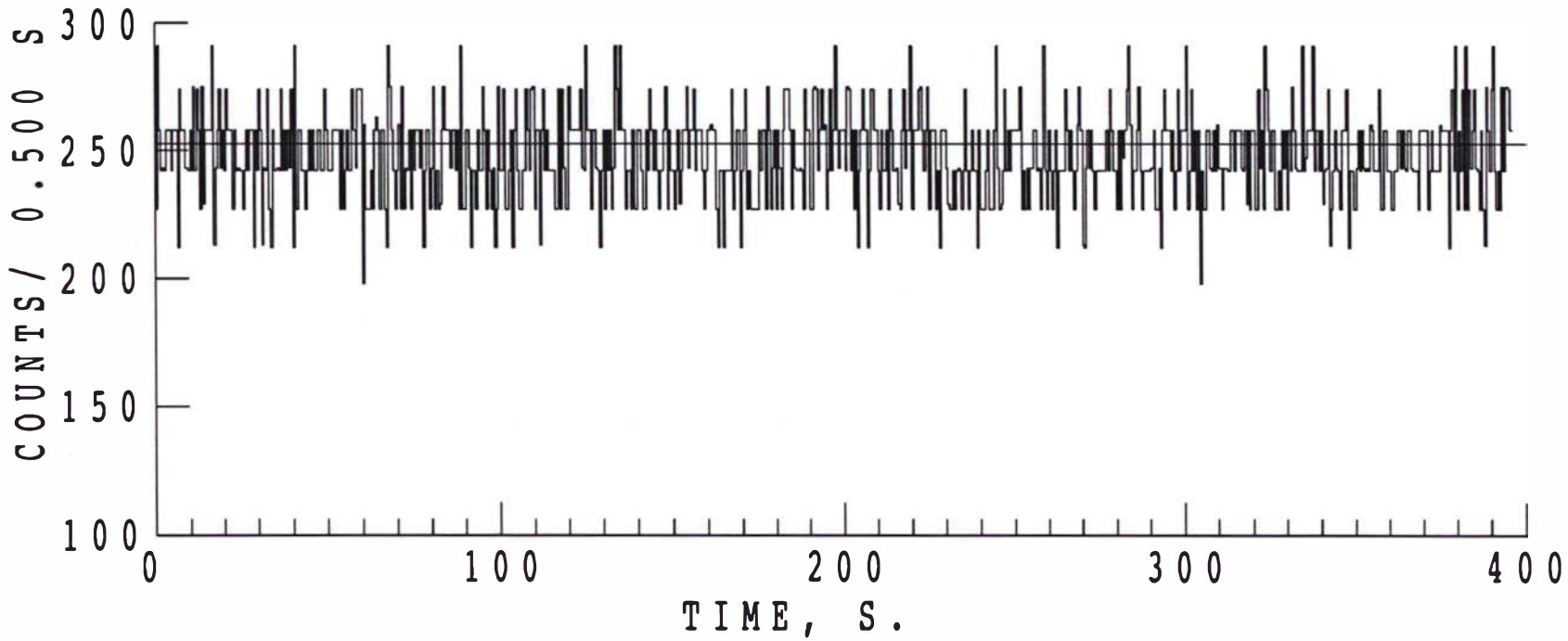
16/12/97 30204.164 s

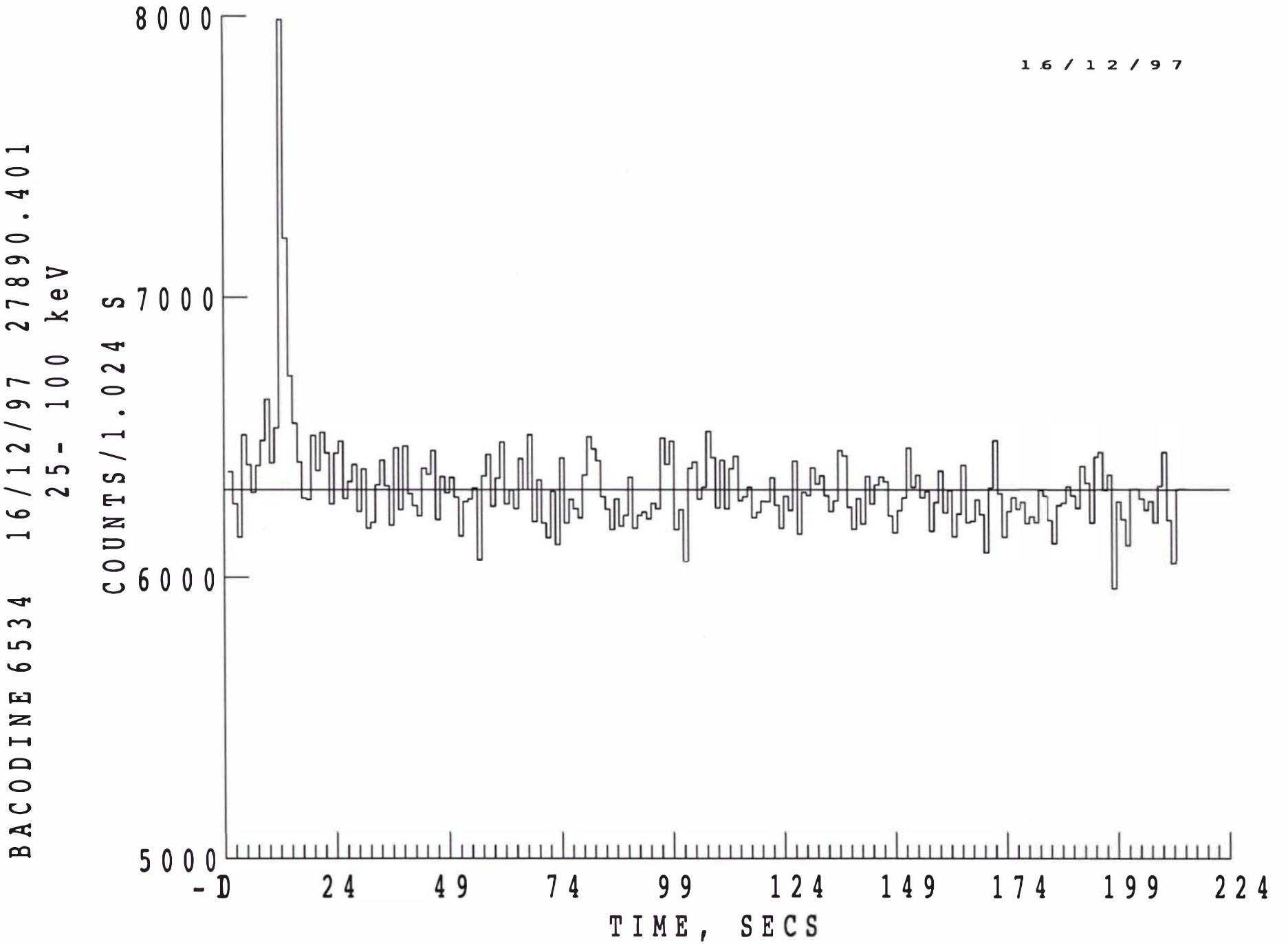
0.250 S INTERVALS REGROUPED BY 2

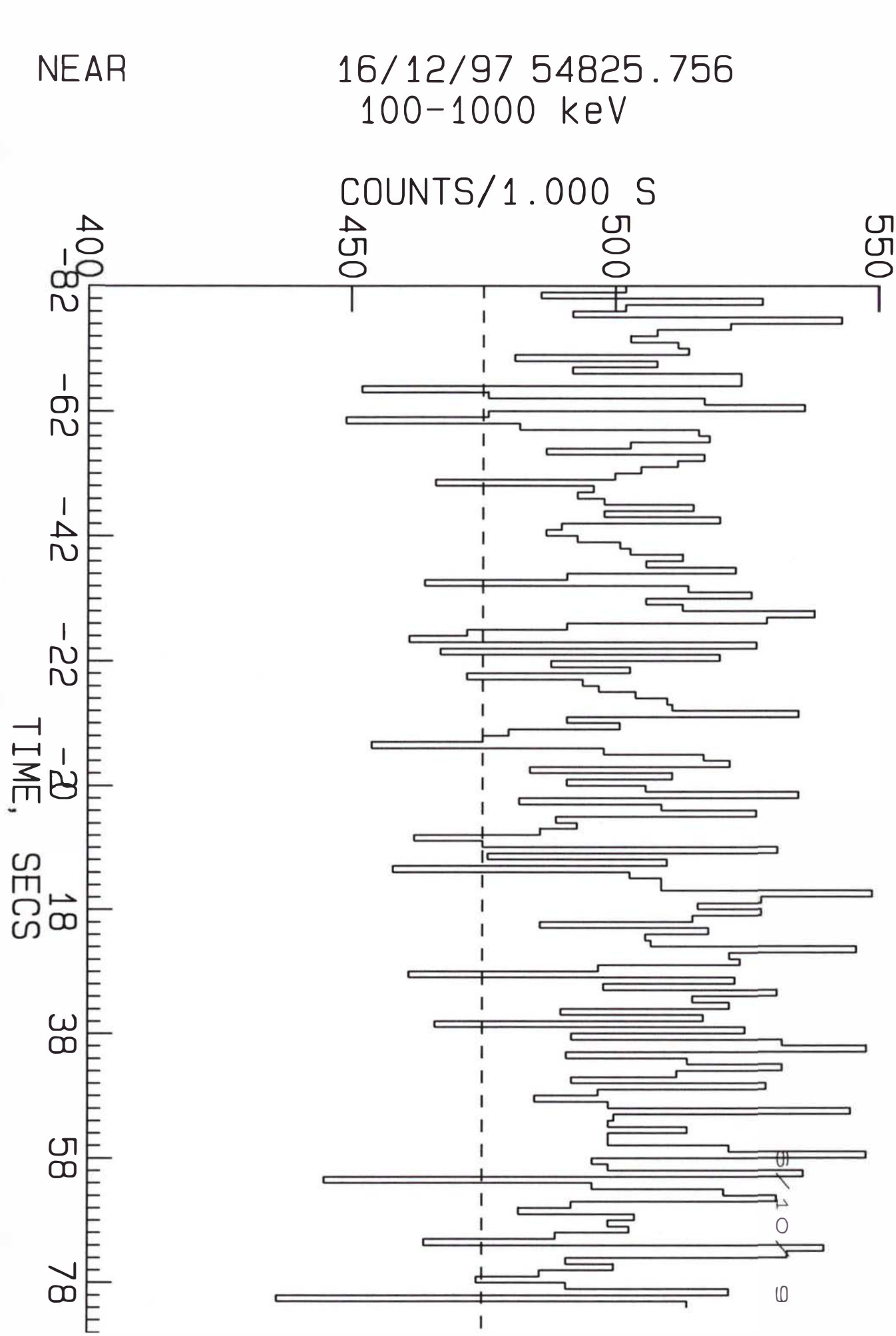
0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS




BACODINE 6534 16/12/97 27890.401
25- 100 keV
COUNTS/1.024 S
8000
7000
6000
5000
16/12/97
-D
24
49
74
99
124
149
174
199
224
TIME, SECS


NEAR
16/12/97 54825.756
100-1000 keV
COUNTS/1.000 S
400
450
500
550
-82
-62
-42
-22
-2
18
38
58
78
TIME, SECS

Date: 07 Oct '02

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☐ Final, CDROM data used?

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

## 2. For Konus events

☑ Konus ecliptic latitude used with latest calibration?

## 2. For Odyssey events

☐ Was CHECKMO run to eliminate data gaps?

☐ Did the Odyssey ephemeris correspond to the event time? (When there is data in the database, the ephemeris is for the start of record, usually ~1320 s prior to the request time; when there is no data in the database, the ephemeris is for the request time in the e-mail, so the request time in mosearch should be equal to the GRB time. Note that the time in the return e-mail will be ~1320 s prior to the time requested, in the line "no HEND data…")

☐ Was Mars-blocking used?

☐ For cruise phase data (April – October 2001), was the updated data used? (Old data has timing errors)

☐ GRS database searched for triggered data? Database data between August 2005 and January 2006 should be re-extracted, due to timing errors. (E-mailed data should be OK).

☐ GRS and HEND data cross-correlated to check timing?

## 2. For 3 or More Spacecraft events

☐ Σ 3Δt's calculated, and/or BMAPSUM executed?

## 3. For INTEGRAL events

☐ INTEGRAL SPI-ACS website checked for bursts that weren't transmitted automatically?

☐ 125 ms added to INTEGRAL SPI-ACS time for bursts prior to April 2 2004 11:00 UT?

☐ Updated ephemeris used for bursts prior to September 30, 2003?

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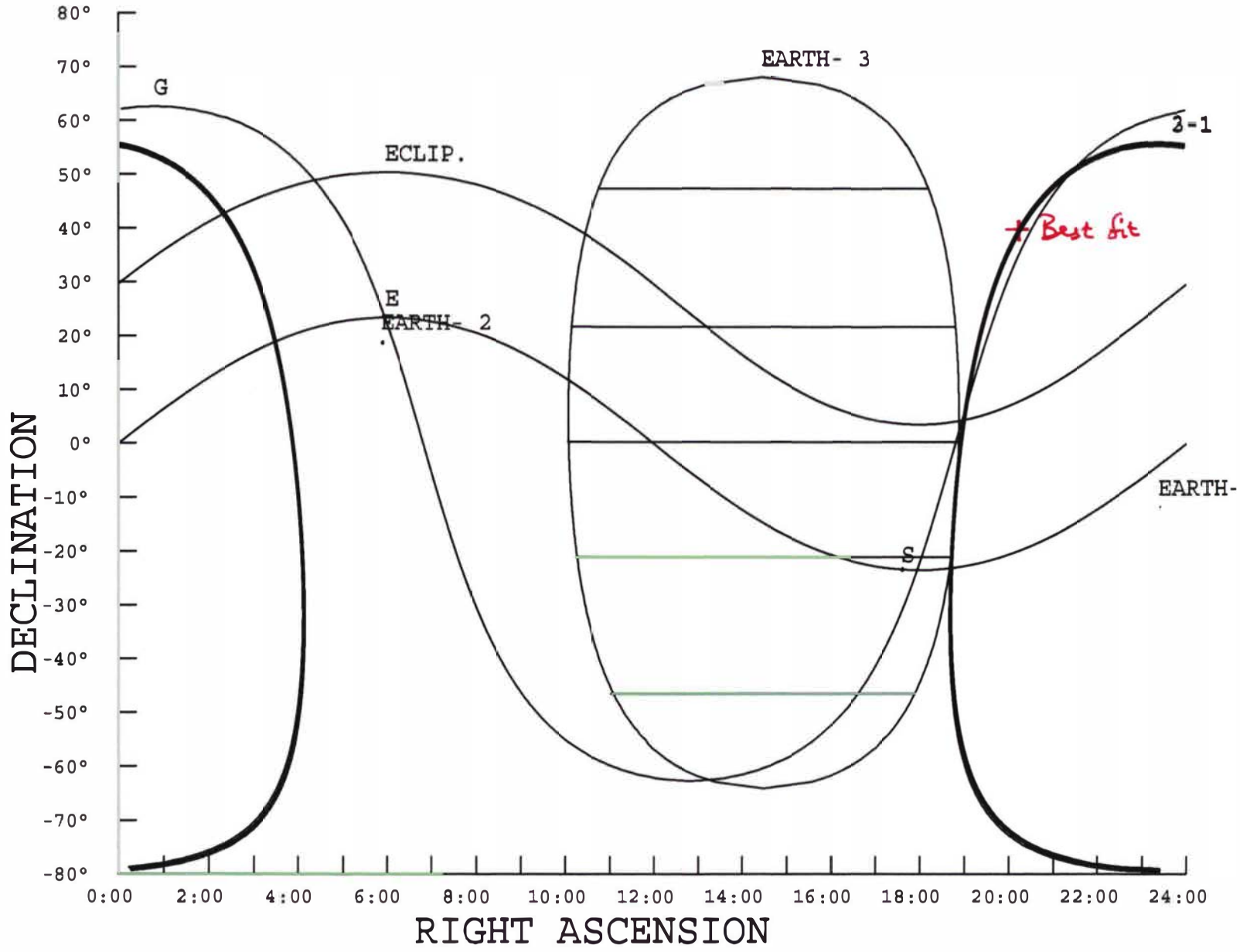
☑ ACCESS and MBL4 databases updated?

SAX added Jan 7 '10

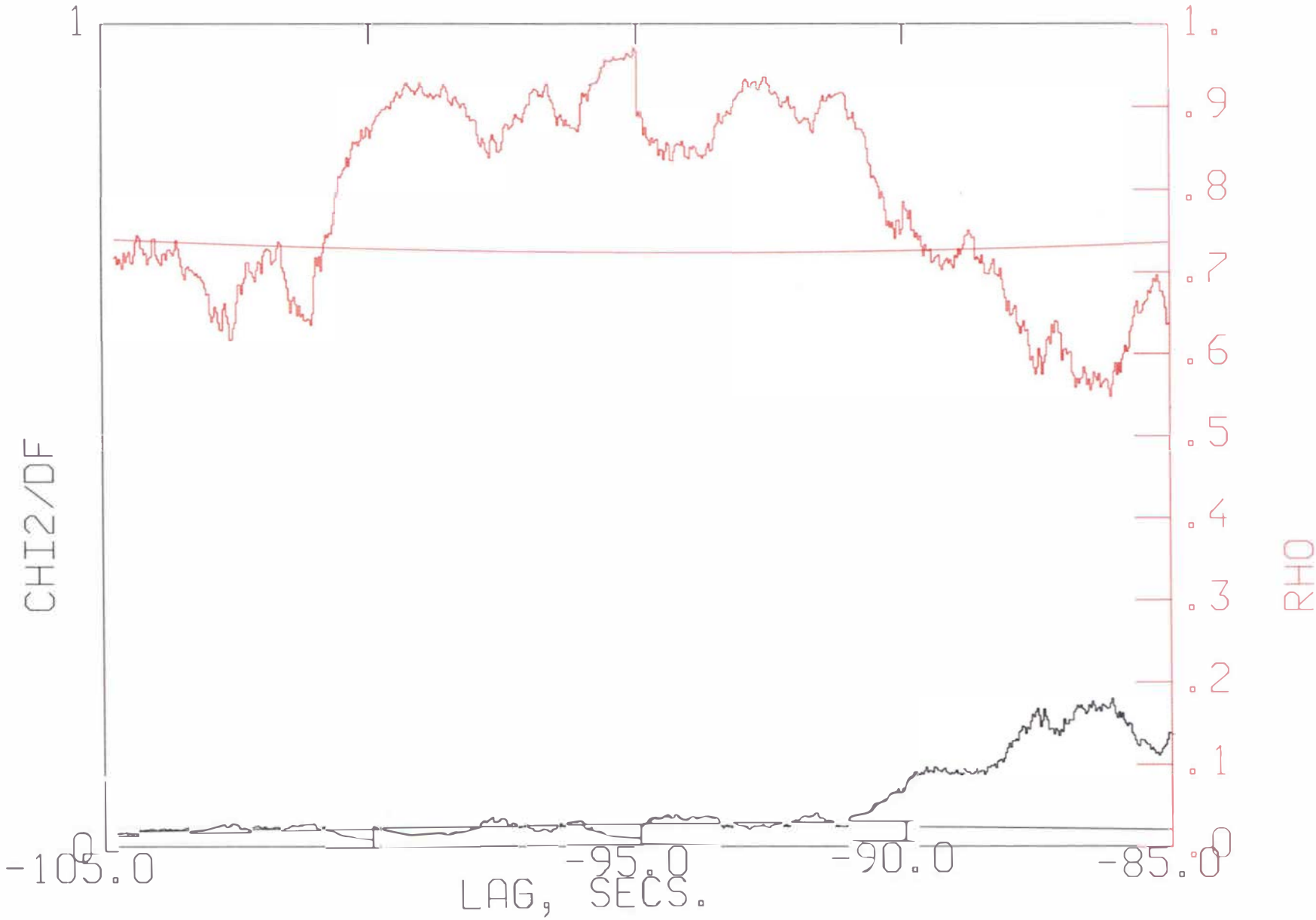
# EVENT OF DEC 16, 1997 15:28

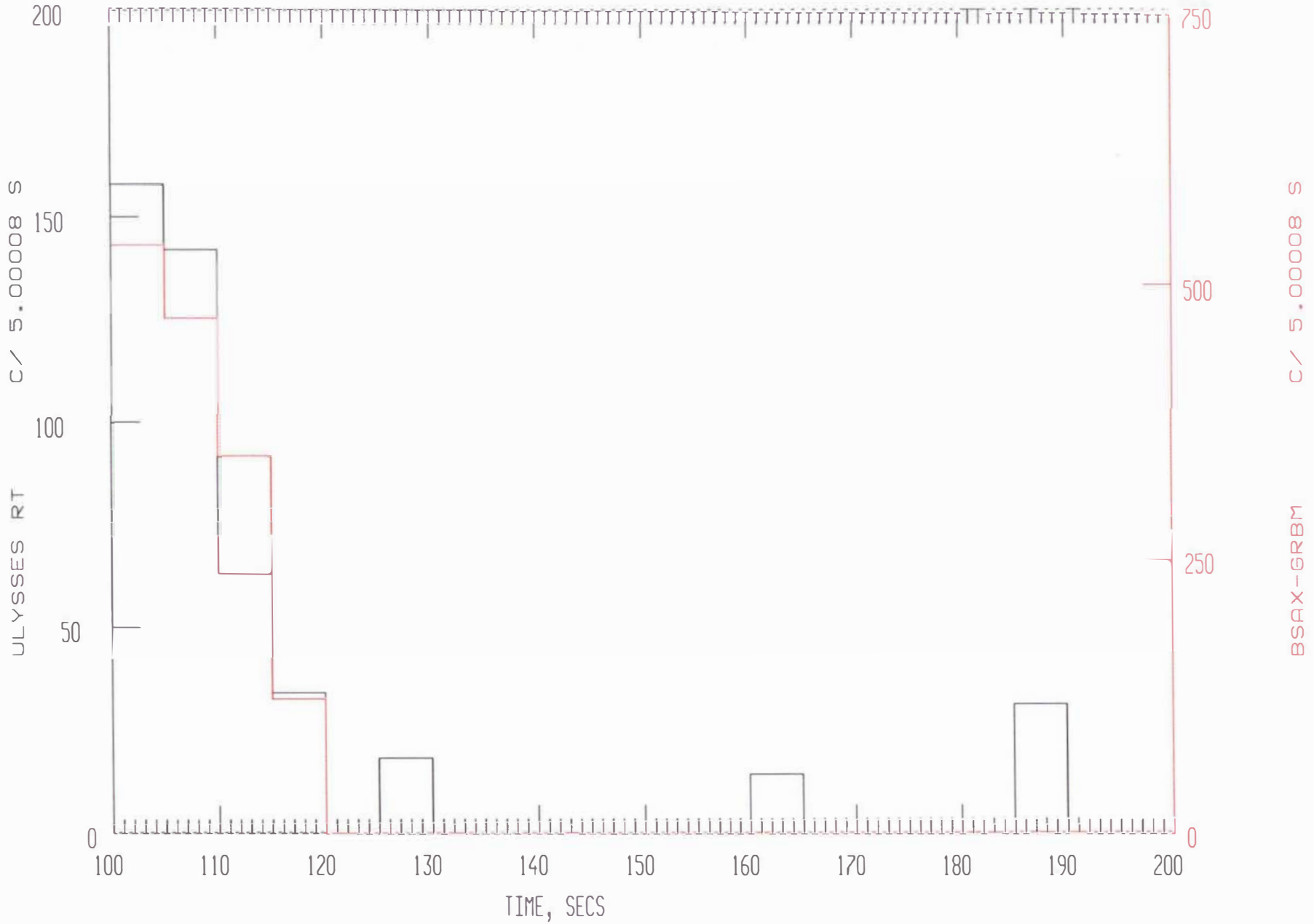
7/ 1/10

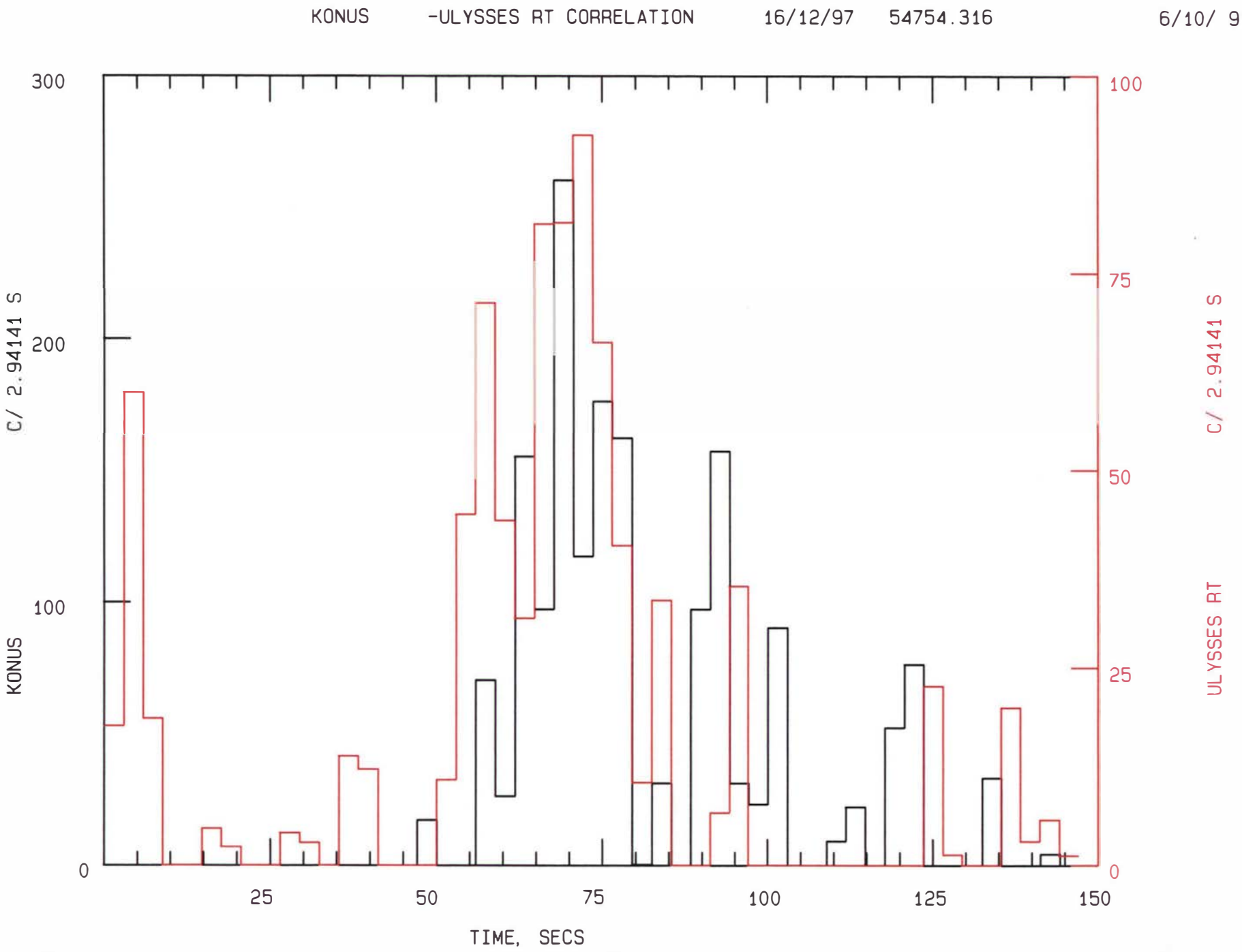
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 KONUS 3 SAX



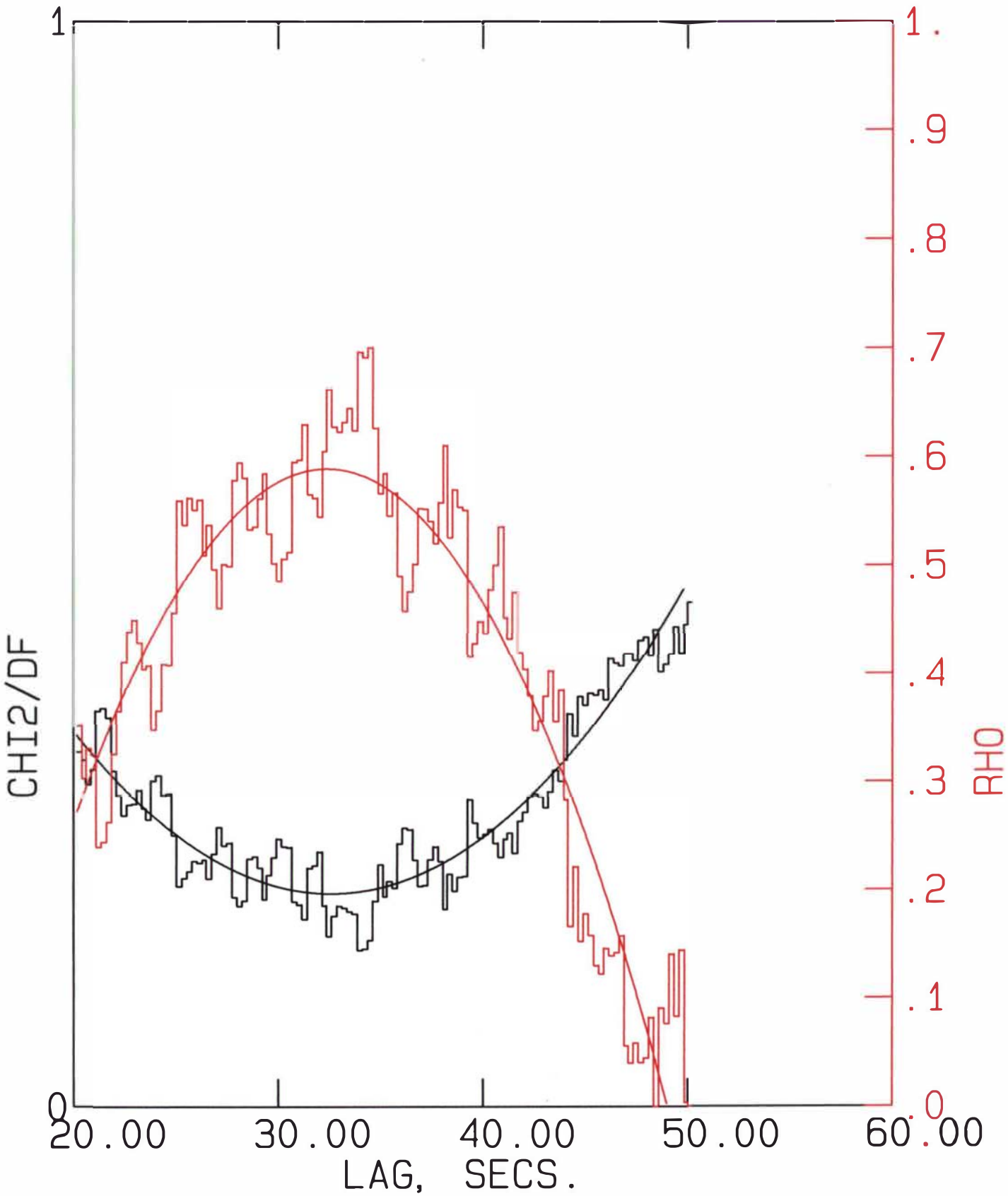
ULYSSES RT-BSAX-GRBM CORRELATION 16/12/97 55700.148




200
150
100
50
0
ULYSSES RT
C/ 5.00008 S
750
500
250
0
BSAX-GRBM
C/ 5.00008 S
100
110
120
130
140
150
160
170
180
190
200
TIME, SECS


KONUS -ULYSSES RT CORRELATION 16/12/97 54754.316 6/10/ 9
300
200
100
0
C/ 2.94141 S
KONUS
100
75
50
25
0
C/ 2.94141 S
ULYSSES RT
25
50
75
100
125
150
TIME, SECS

KONUS -ULYSSES RT CORRELATION 16/12/97 54754.316



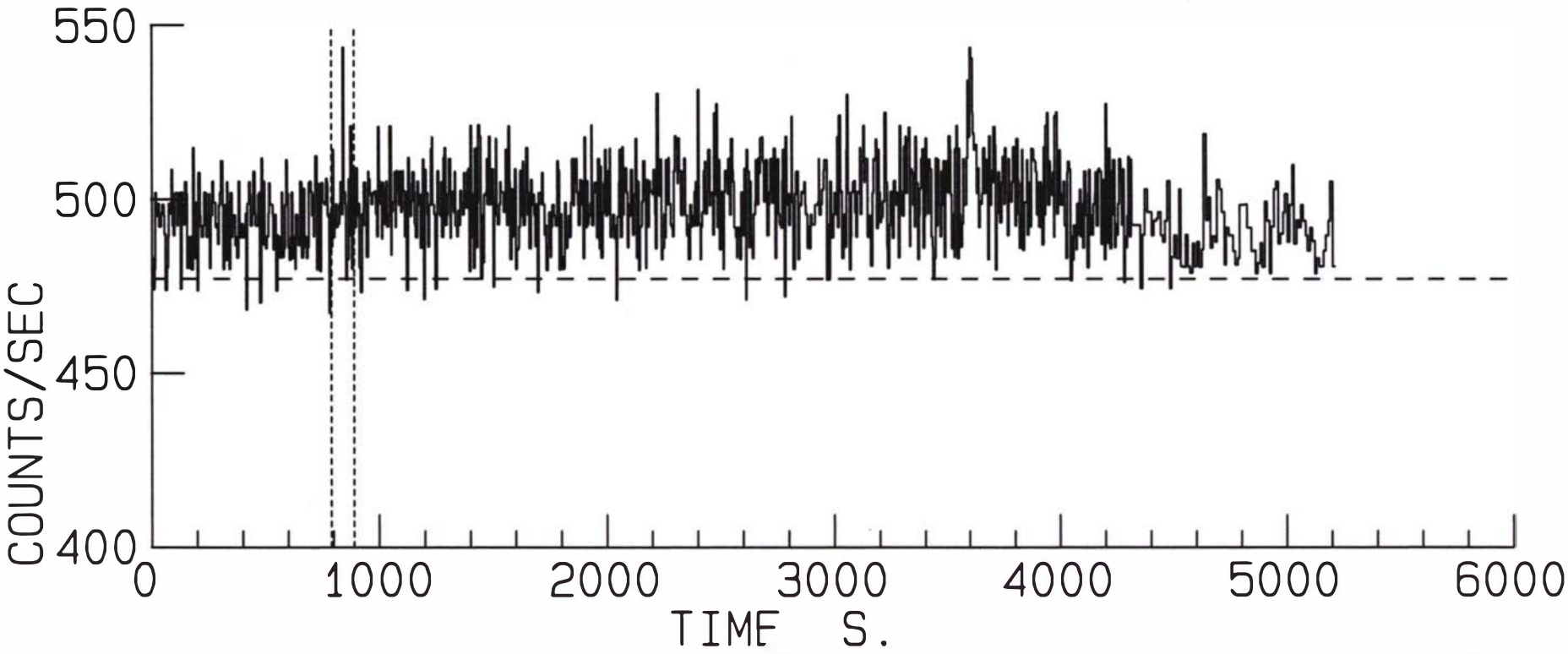
ULYSSES RT

6/10/ 9

16/12/97  52200.098 s

INTERVALS REGROUPED BY 20

22- 148 keV



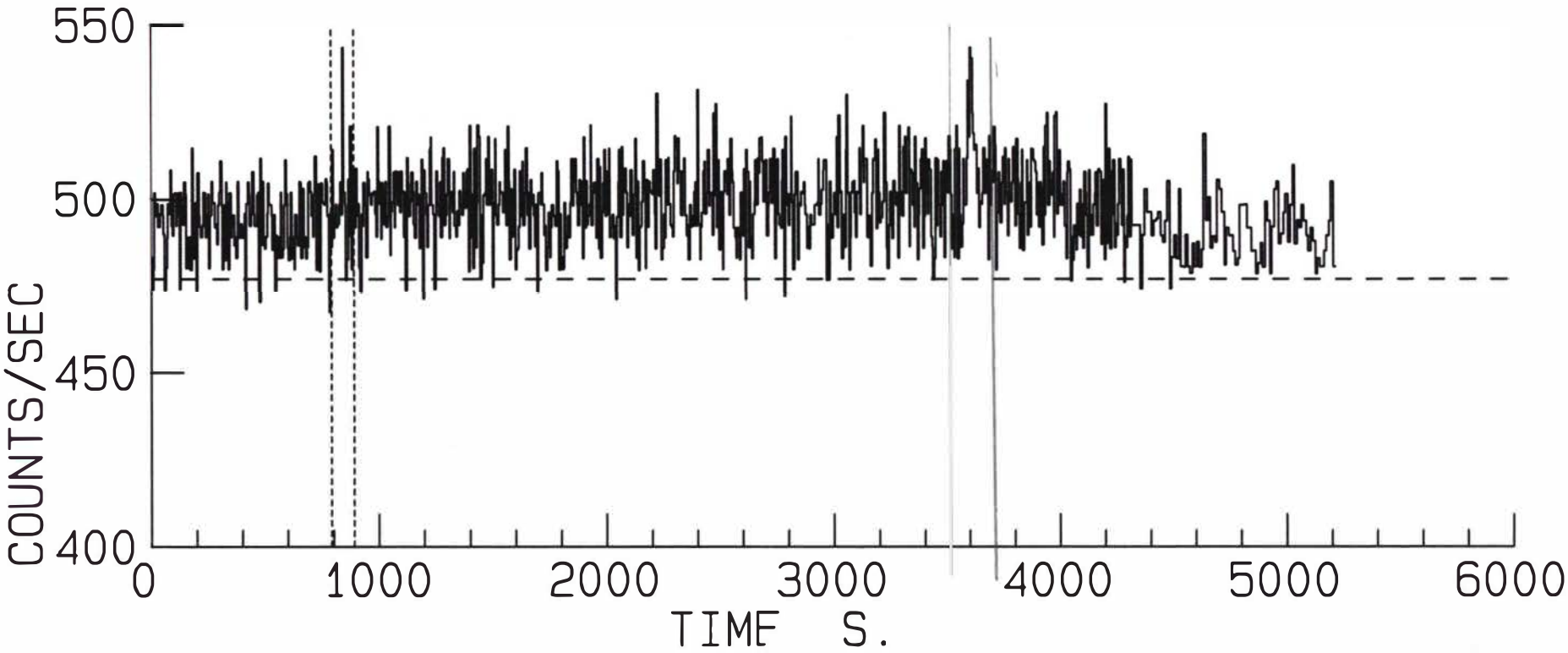
ULYSSES RT

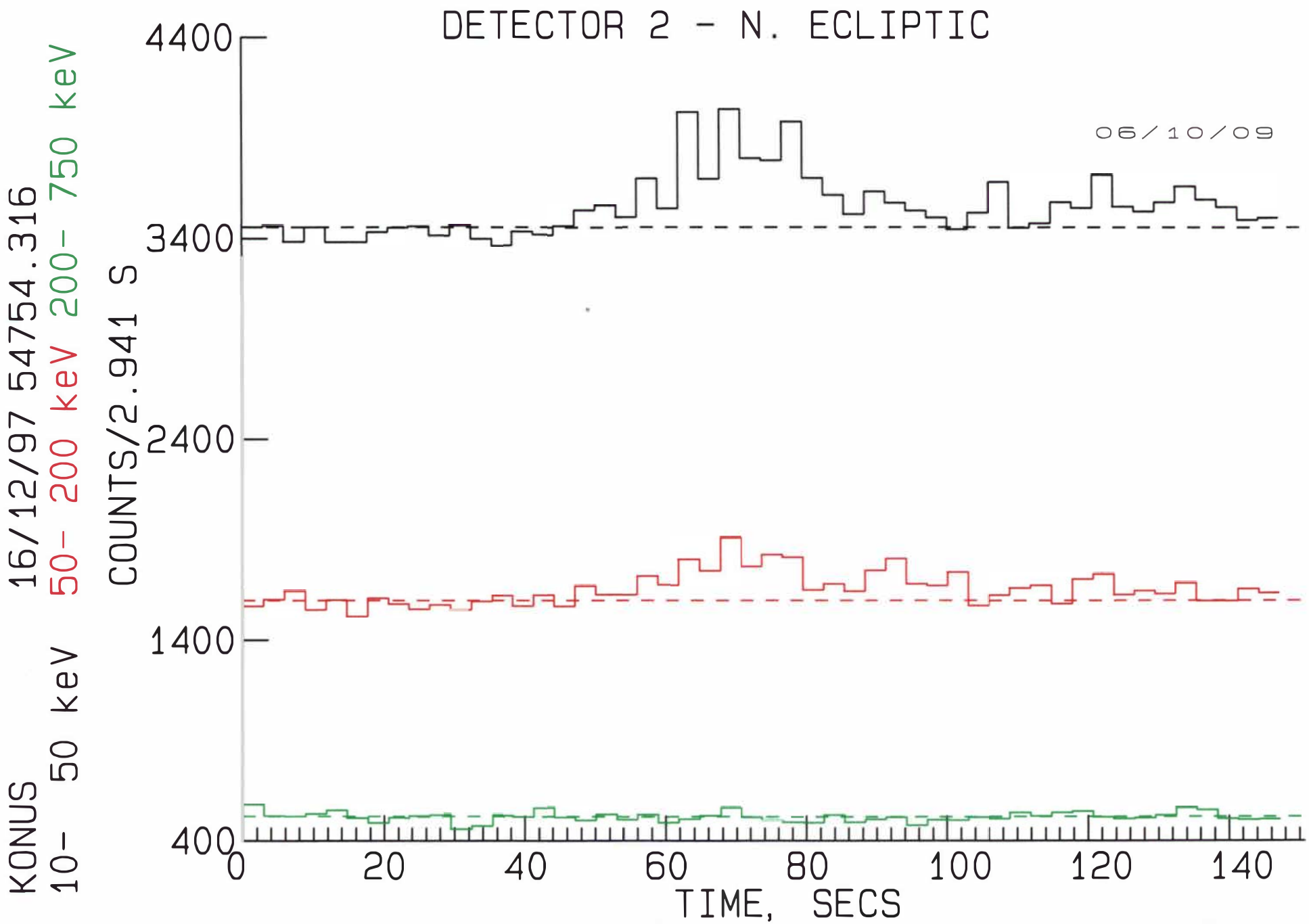
6/10/ 9

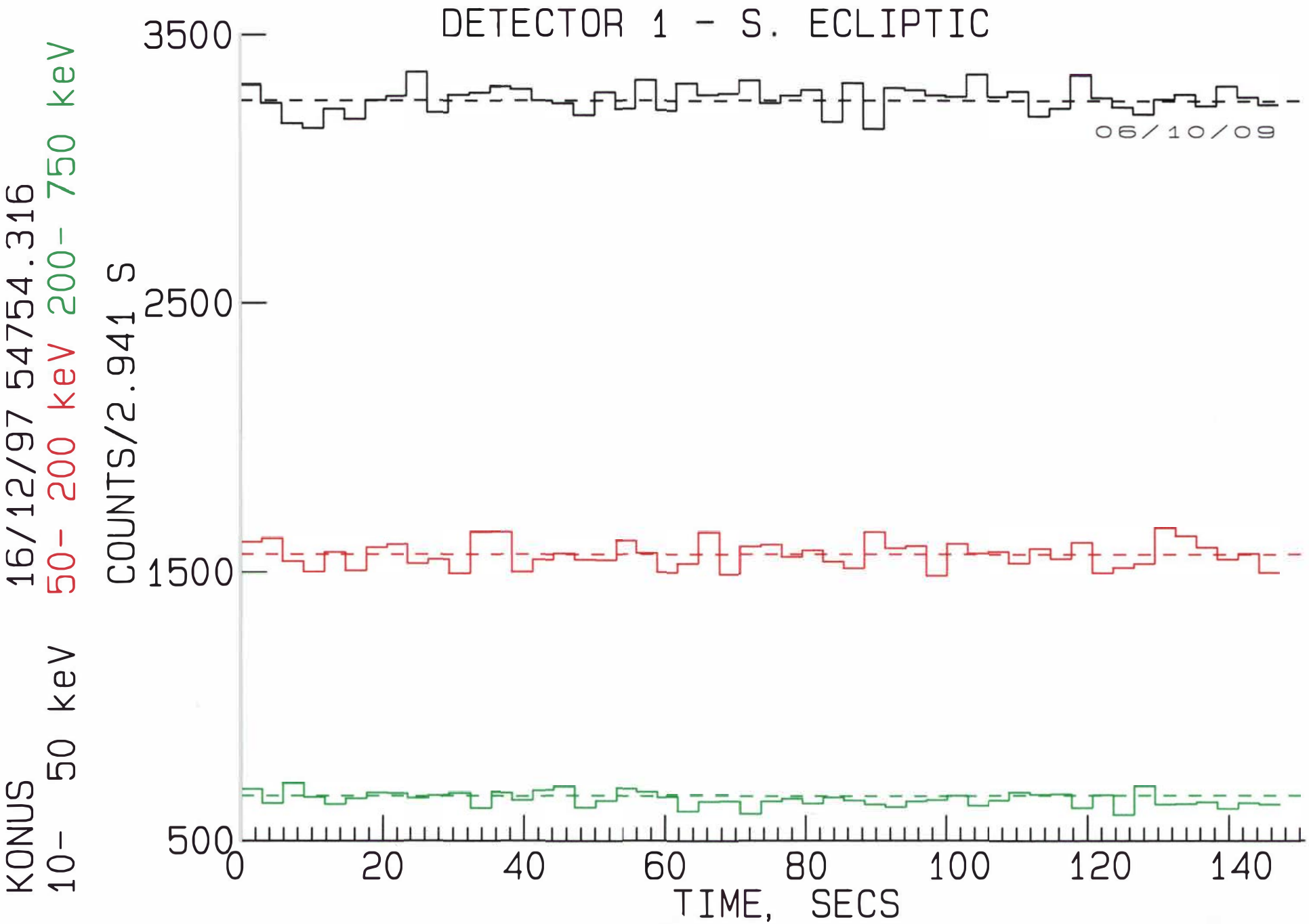
16/12/97  52200.098 s

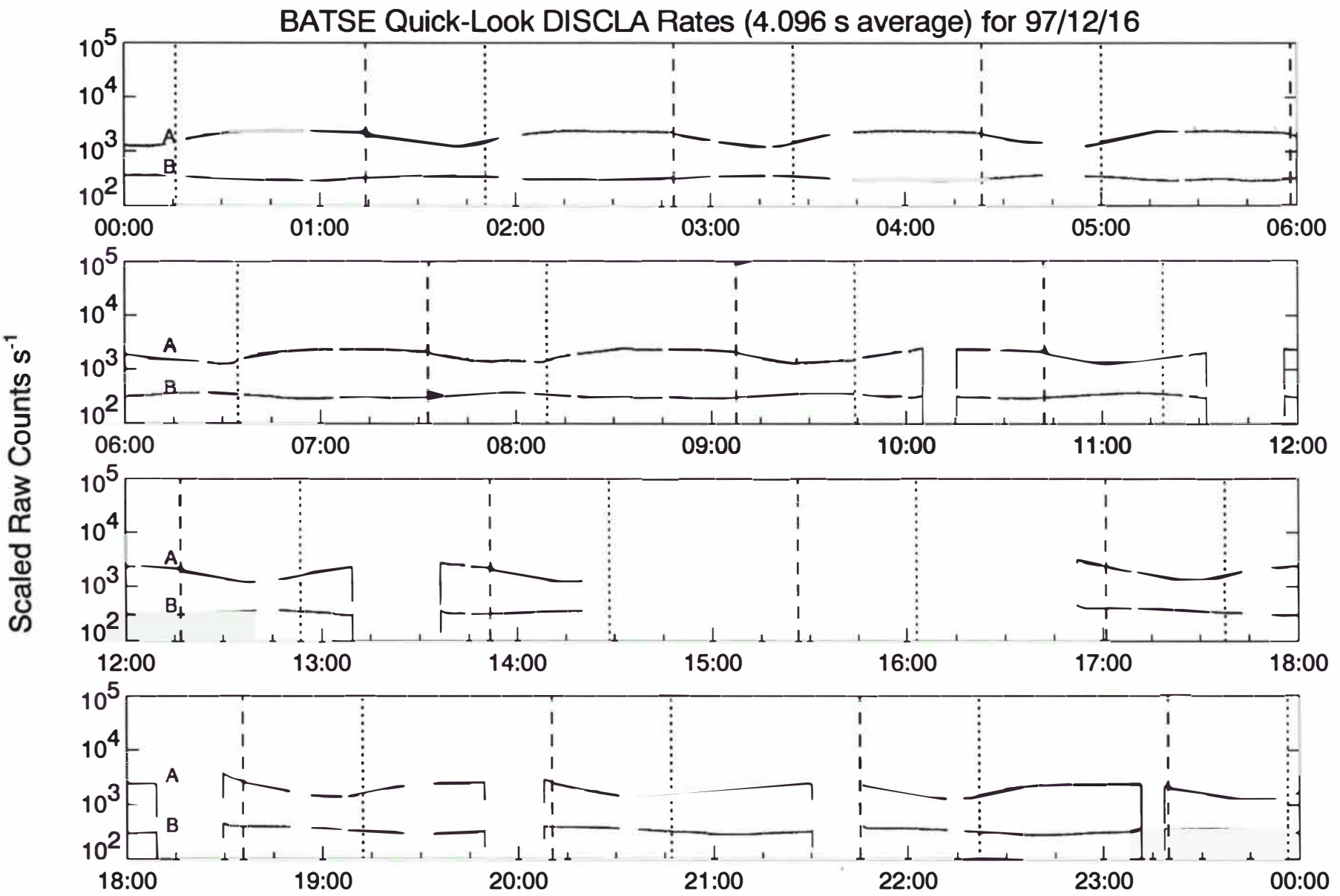
INTERVALS REGROUPED BY 20

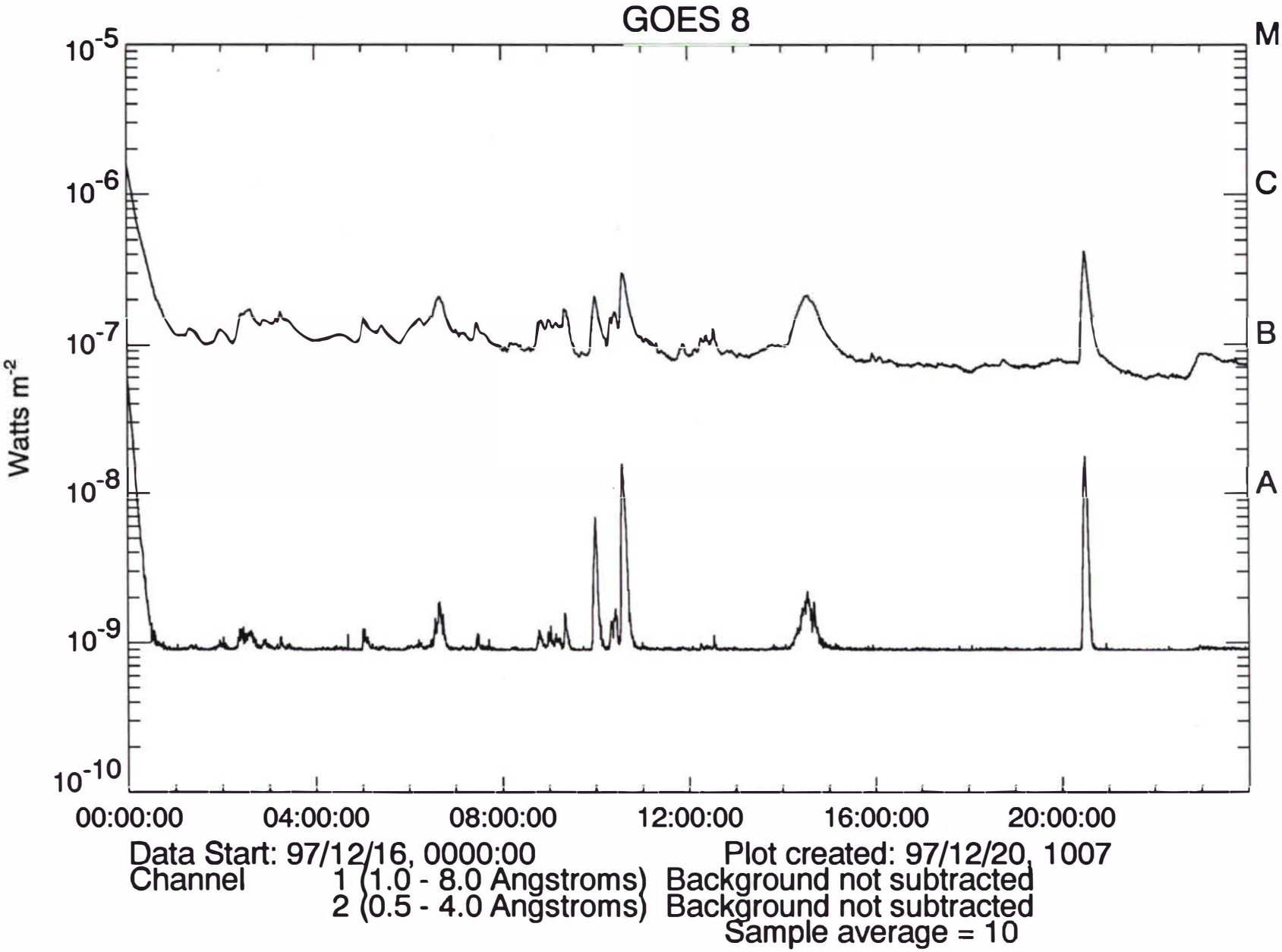
22- 148 keV



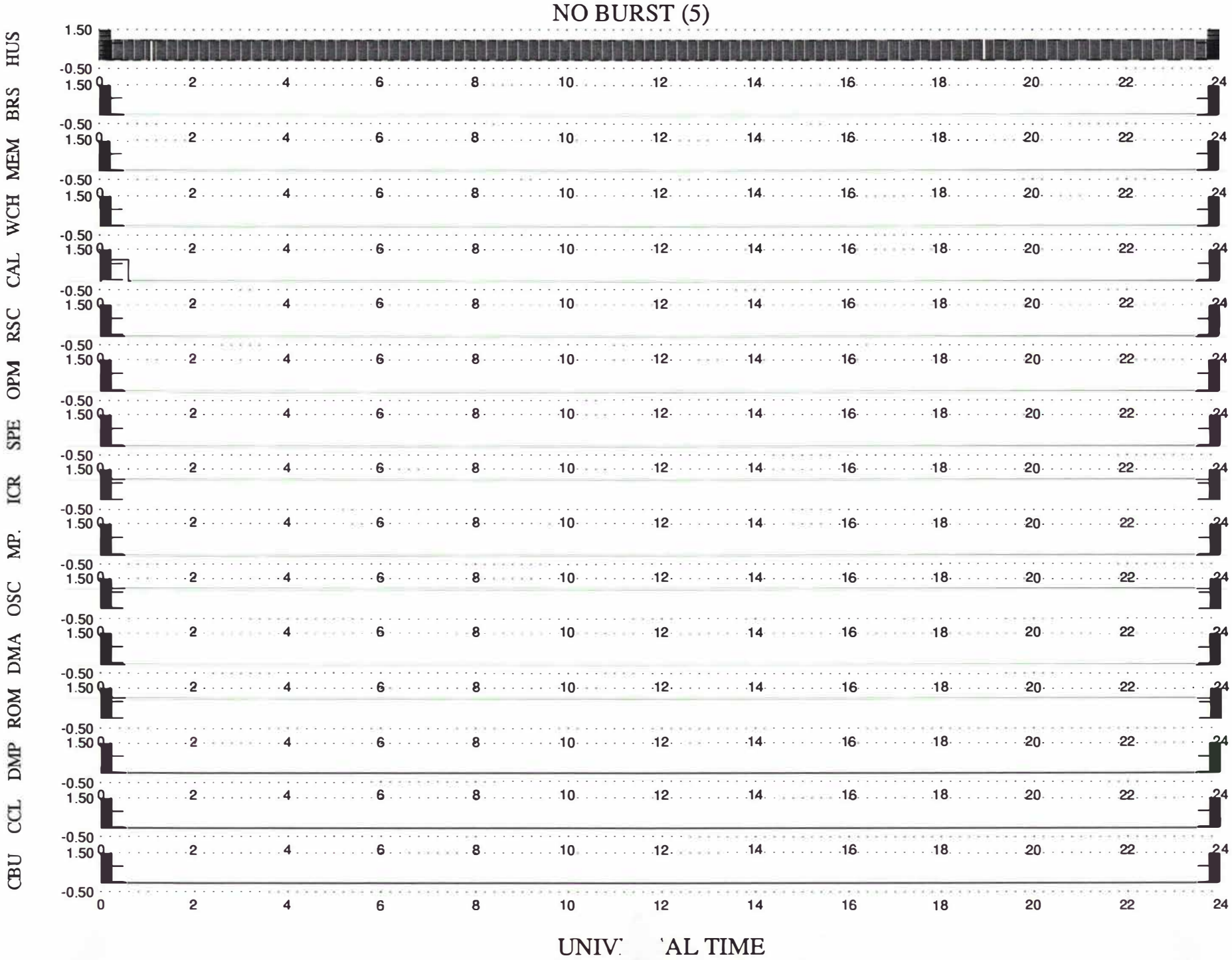

DETECTOR 2 - N. ECLIPTIC
06/10/09
KONUS
10- 50 keV 50- 200 keV 200- 750 keV
16/12/97 54754.316
COUNTS/2.941 S
4400
3400
2400
1400
400
0
20
40
60
80
100
120
140
TIME, SECS


DETECTOR 1 - S. ECLIPTIC
06/10/09
3500
2500
1500
500
0
20
40
60
80
100
120
140
TIME, SECS
COUNTS/2.941 S
KONUS
10- 50 keV
50- 200 keV
200- 750 keV
16/12/97 54754.316


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/16
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/20, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

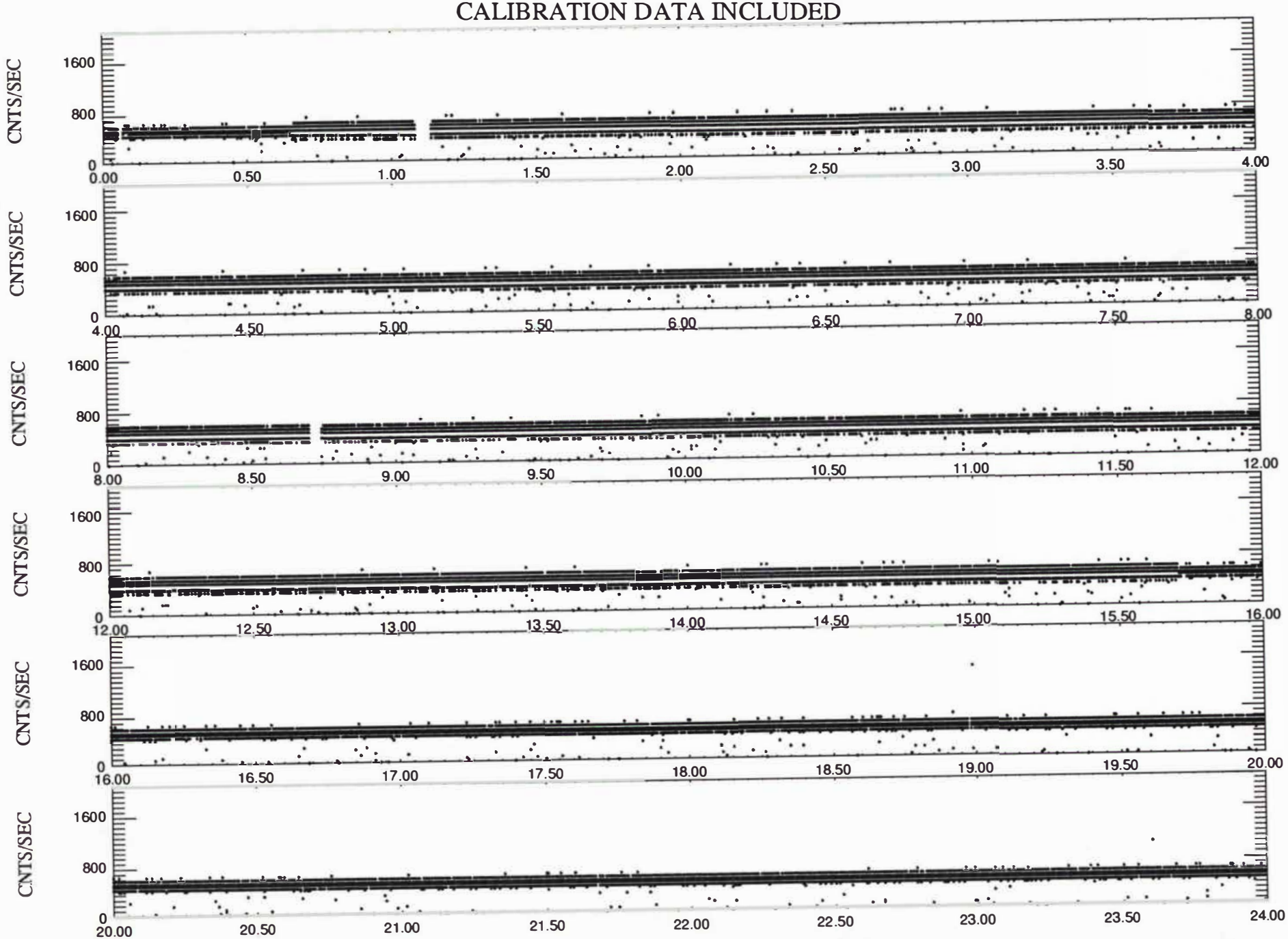

GOES 8
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/16, 0000:00
Plot created: 97/12/20, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 350, year 1997 to day 350, year 1997 3/12/98



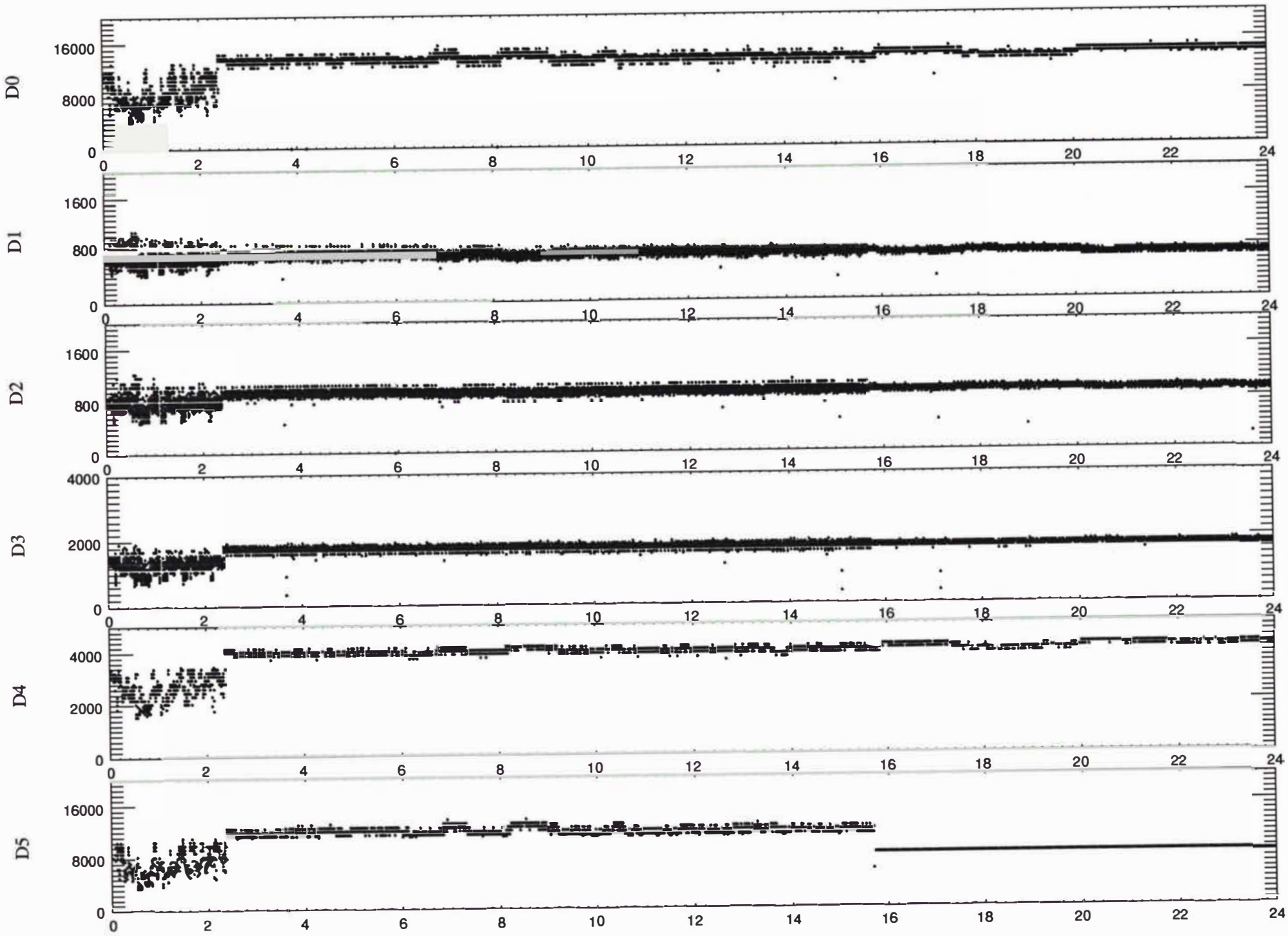
HUS 2A, MODE 1, NOT AVERAGED EDR day 350, year 1997 to day 350, year 1997 3/12/98

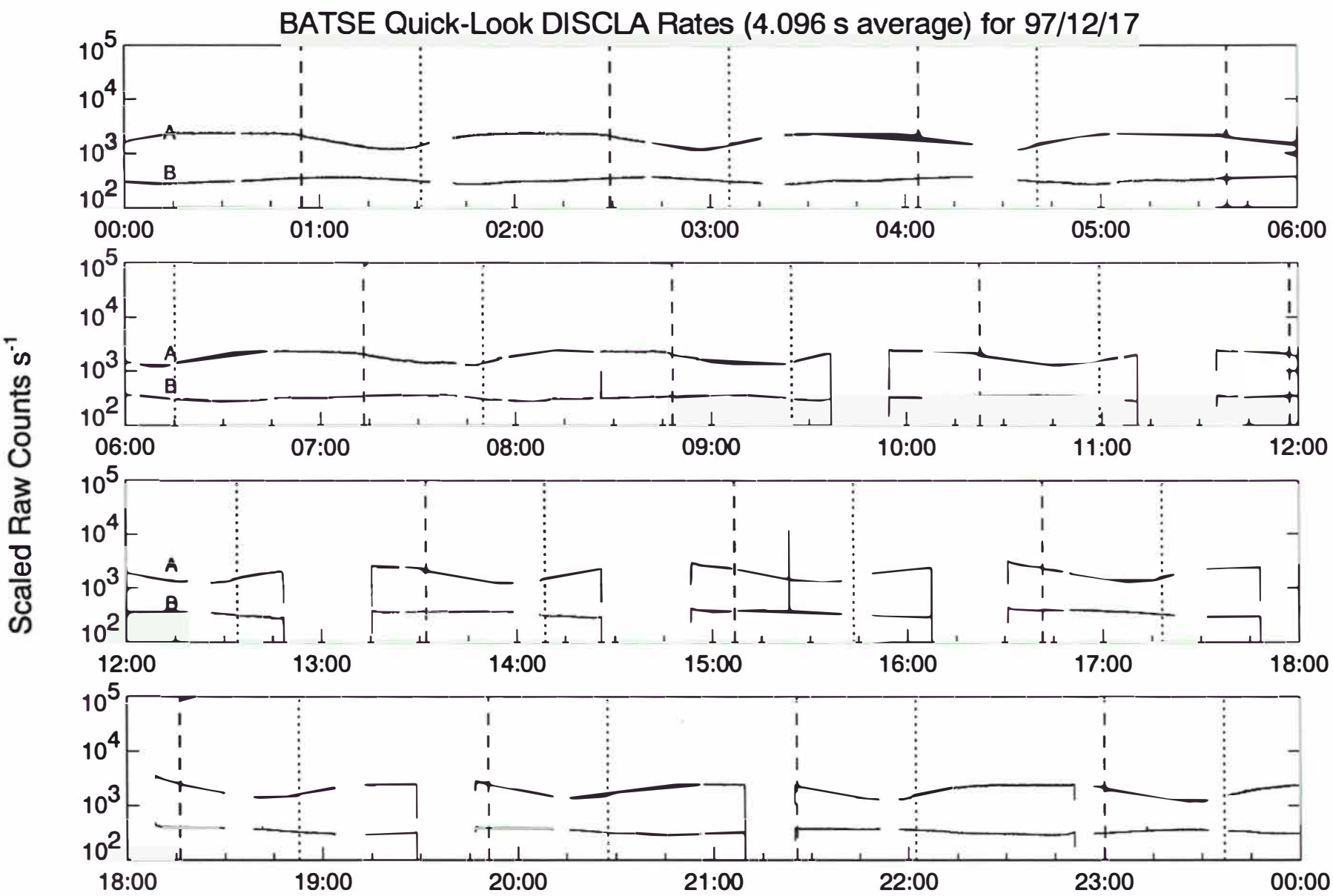
CALIBRATION DATA INCLUDED

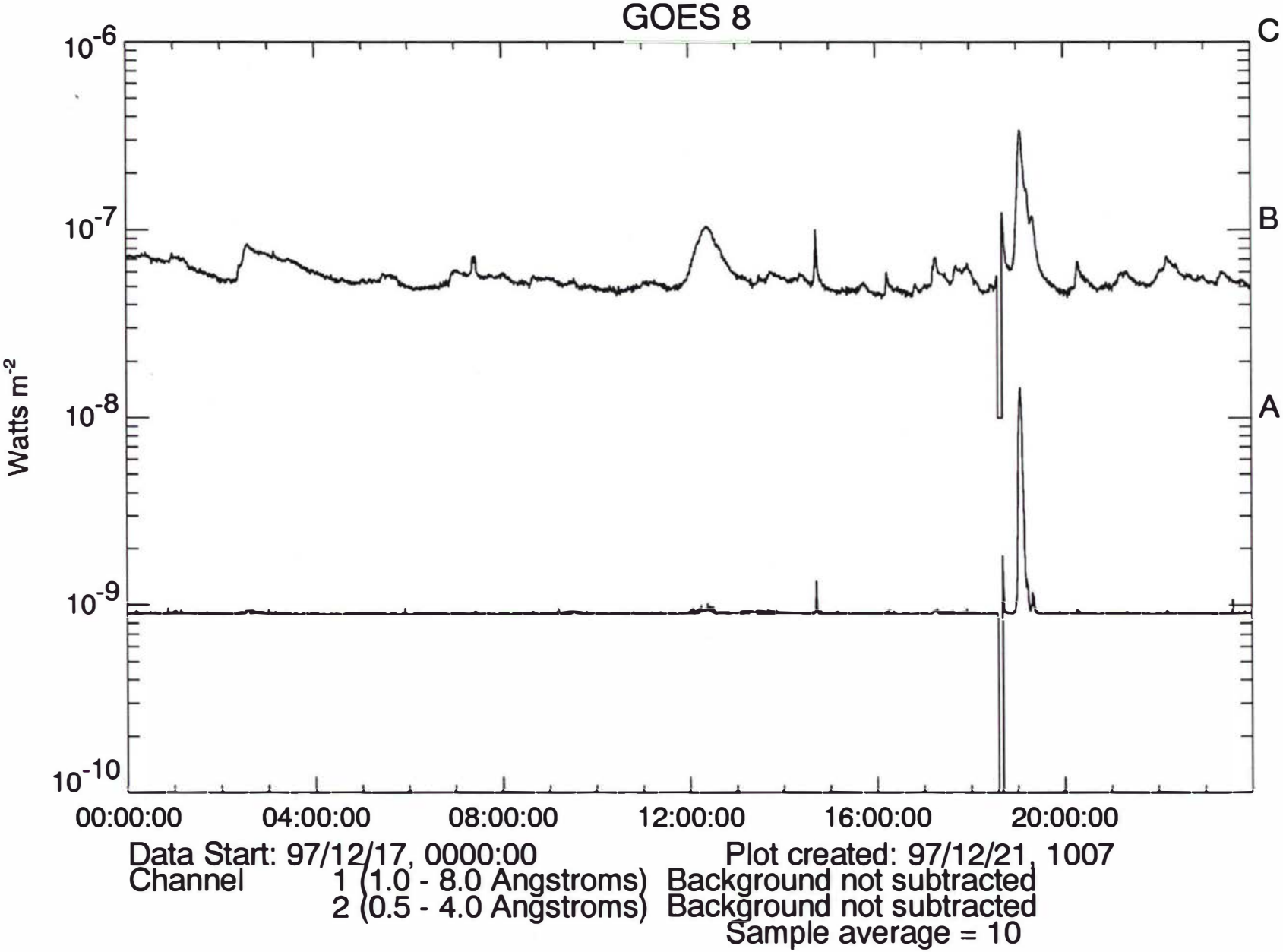



UNIV `AL TIME

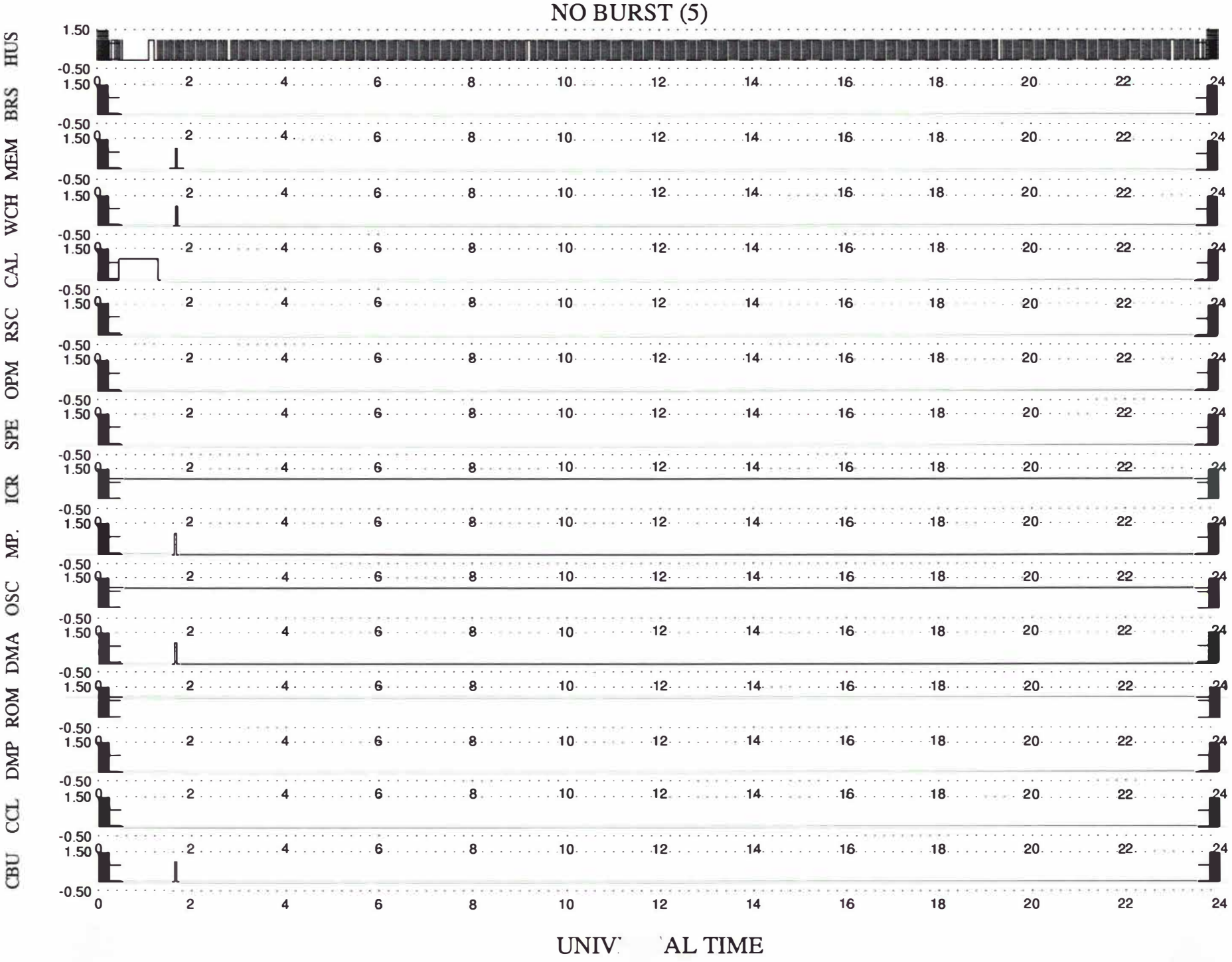
HUS 2B COUNTS / SEC EDR day 350, year 1997 to day 350, year 1997 3/12/98




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/17
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/21, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

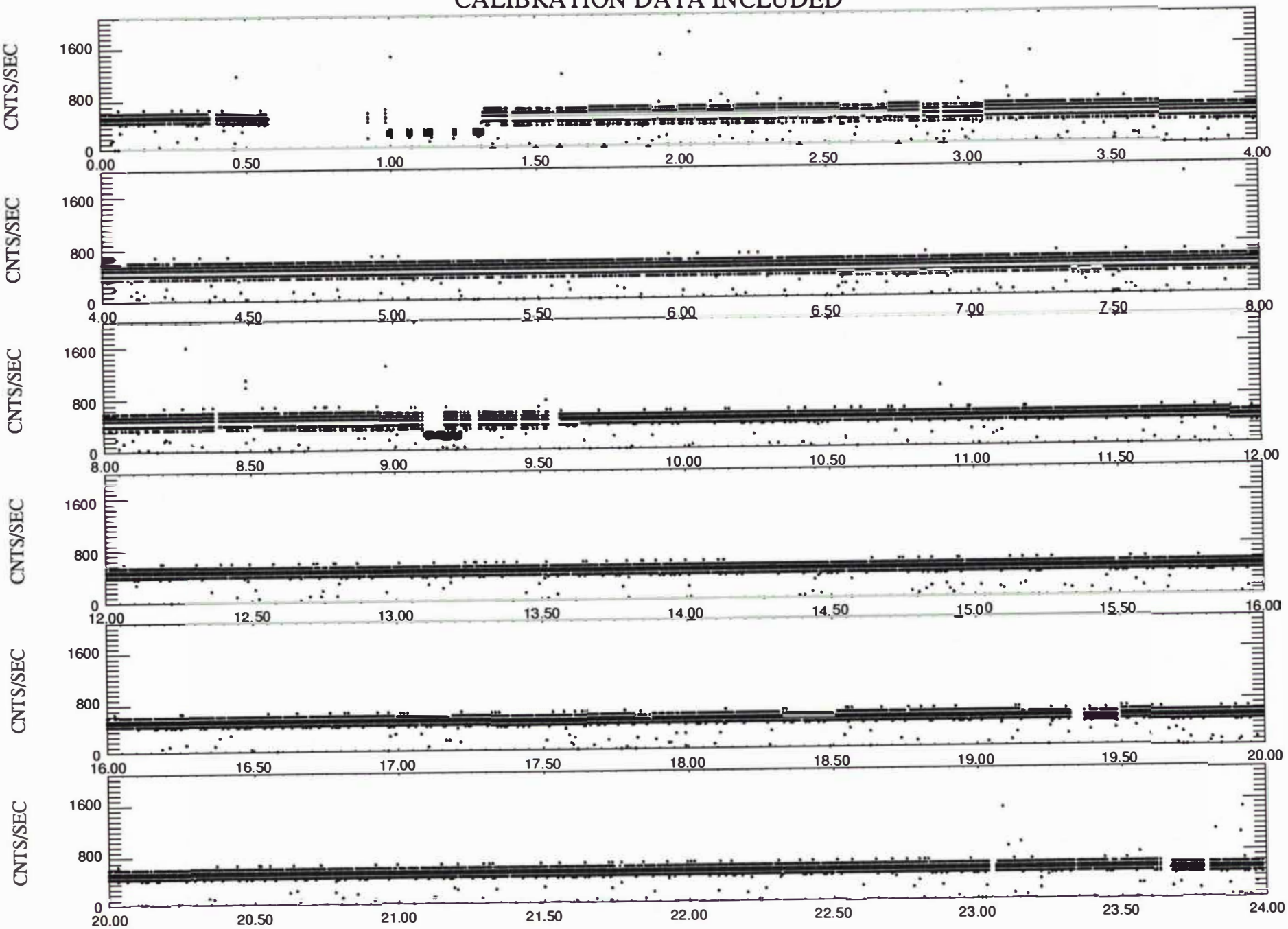

GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/17, 0000:00
Plot created: 97/12/21, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 351, year 1997 to day 351, year 1997 3/12/98



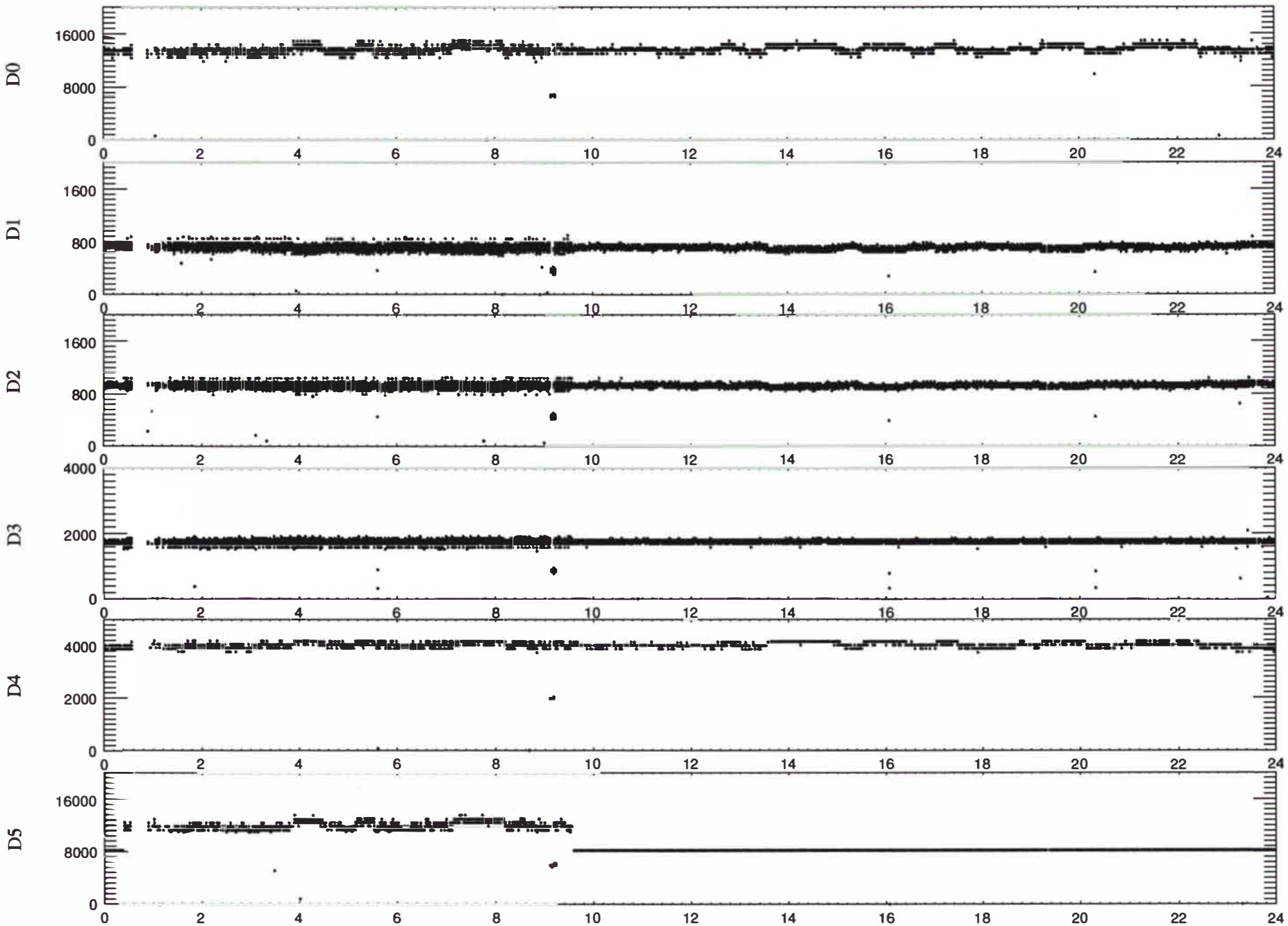
HUS 2A, MODE 1, NOT AVERAGED EDR day 351, year 1997 to day 351, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV' 'AL TIME

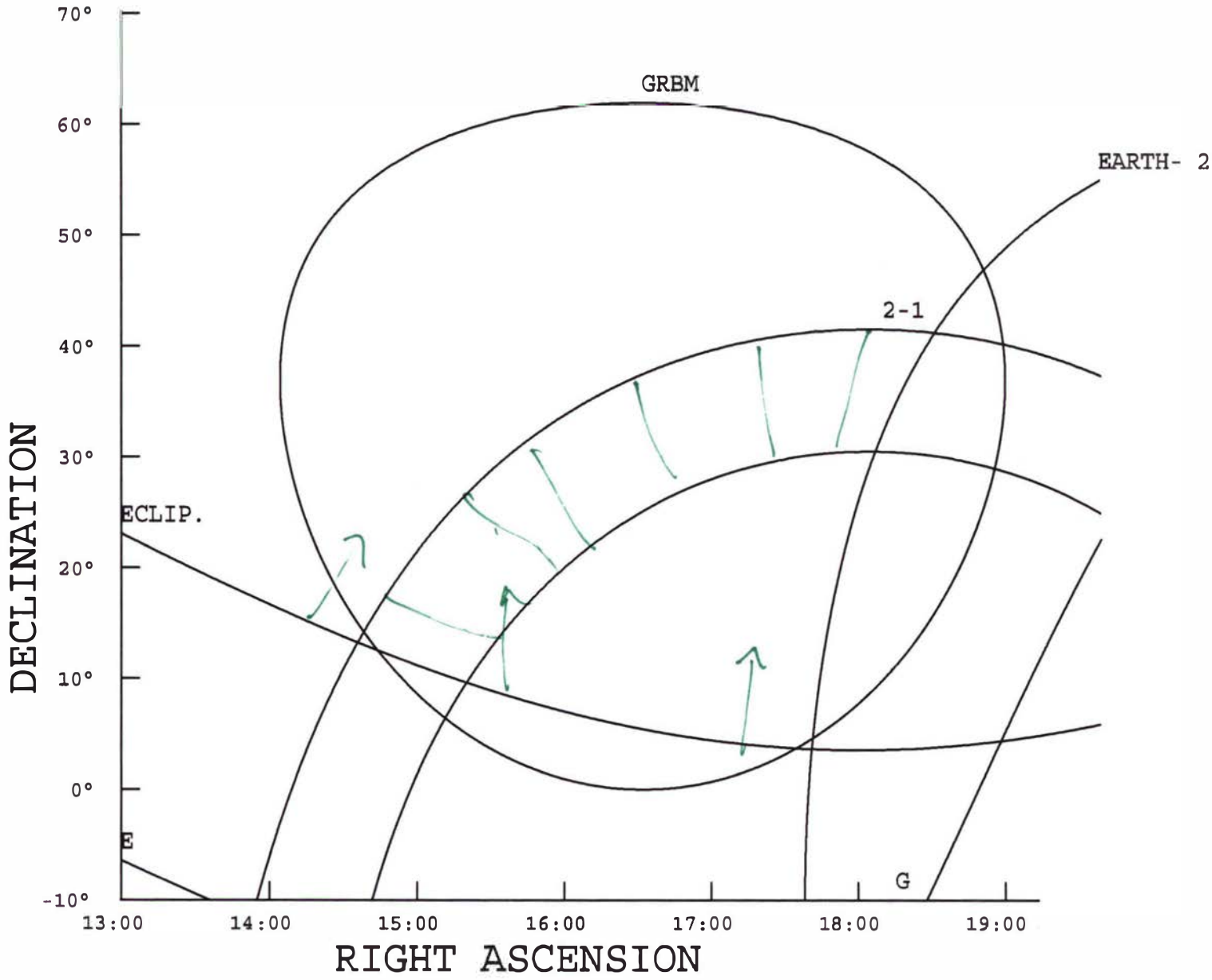
HUS 2B COUNTS / SEC EDR day 351, year 1997 to day 351, year 1997 3/12/98

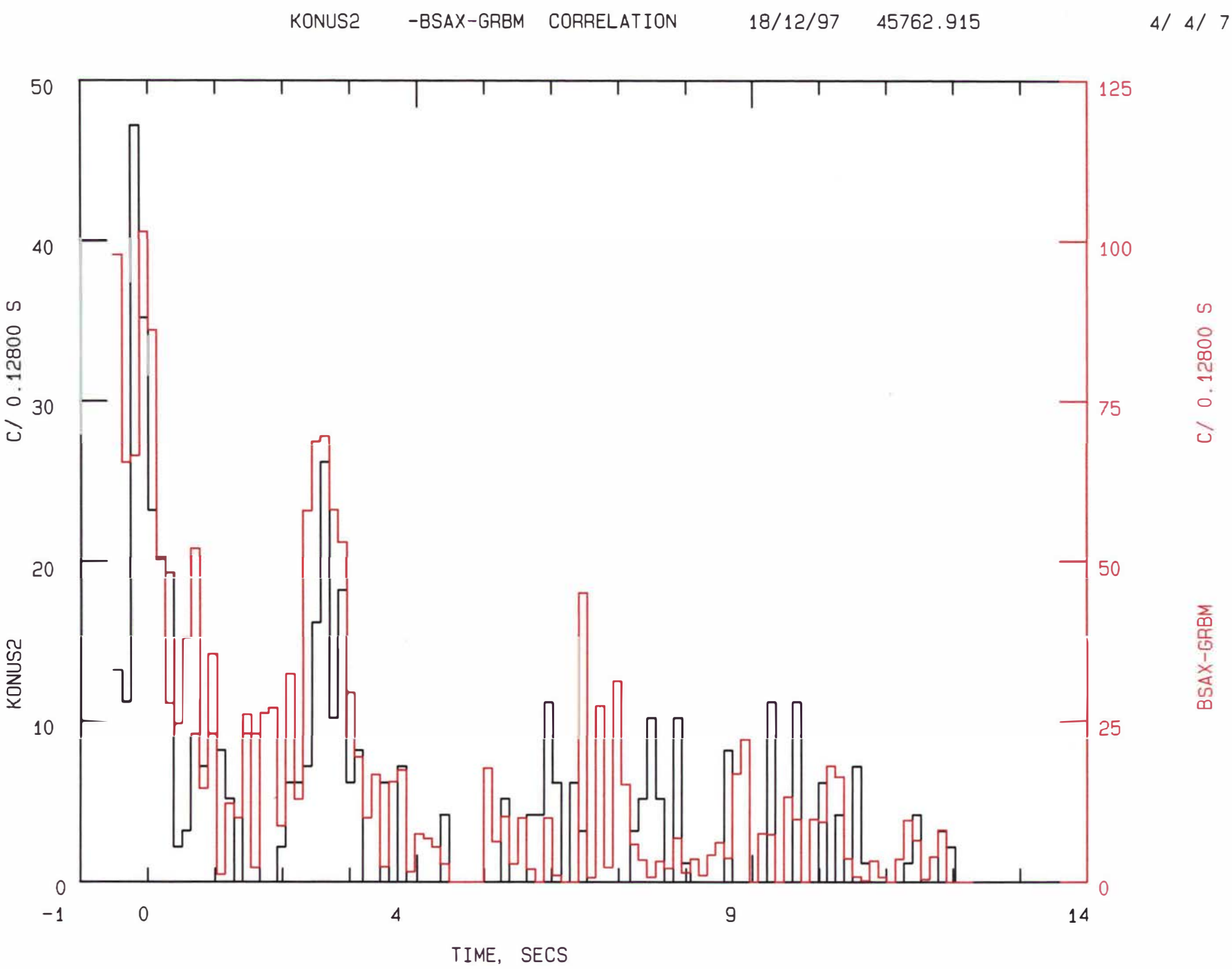


# EVENT OF DEC 18, 1997 12:42

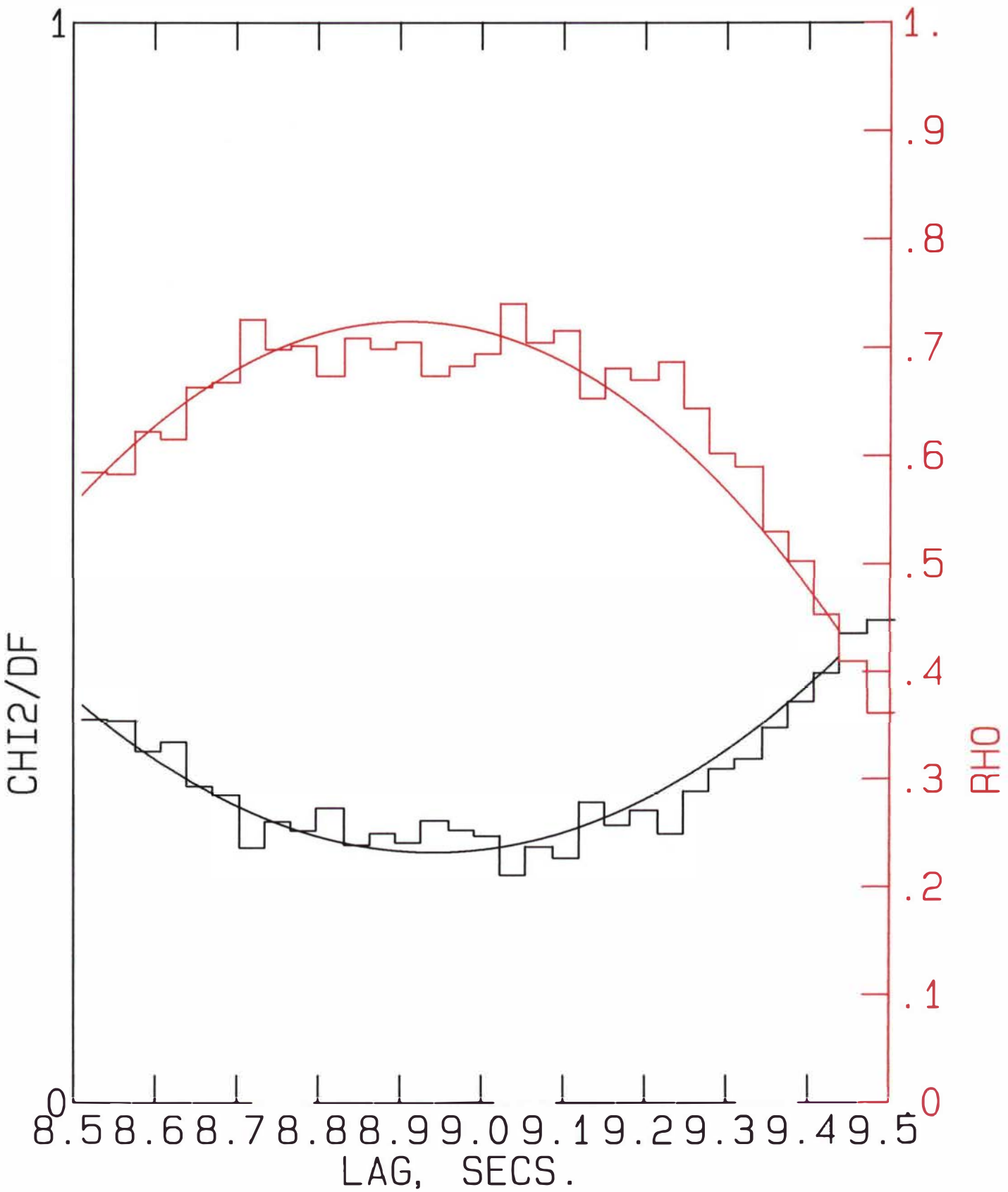
4/ 4/ 7

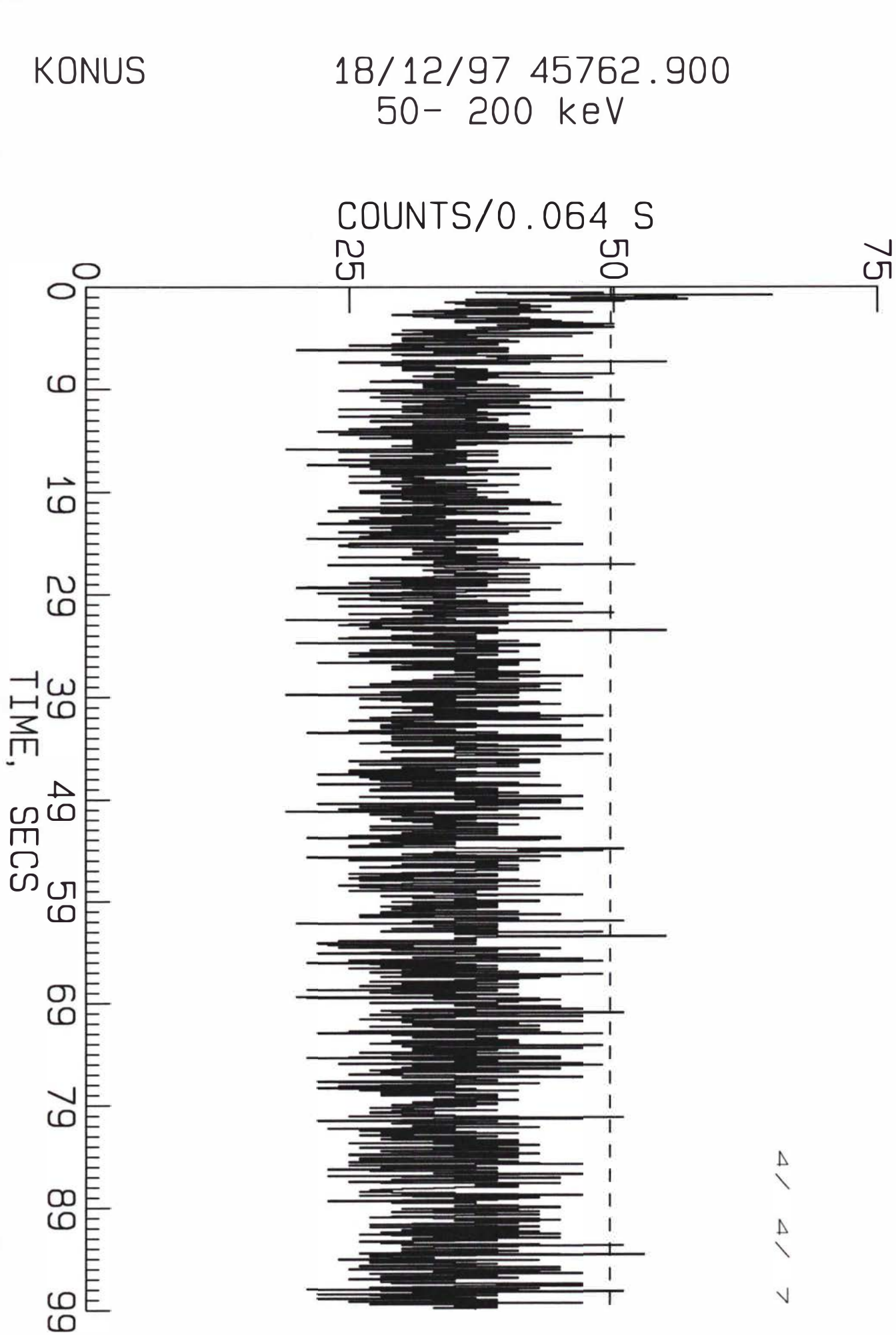
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 KONUS2 2 SAX




KONUS2 -BSAX-GRBM CORRELATION 18/12/97 45762.915 4/ 4/ 7
50
40
30
20
10
0
C/ 0.12800 S
KONUS2
125
100
75
50
25
0
C/ 0.12800 S
BSAX-GRBM
-1
0
4
9
14
TIME, SECS

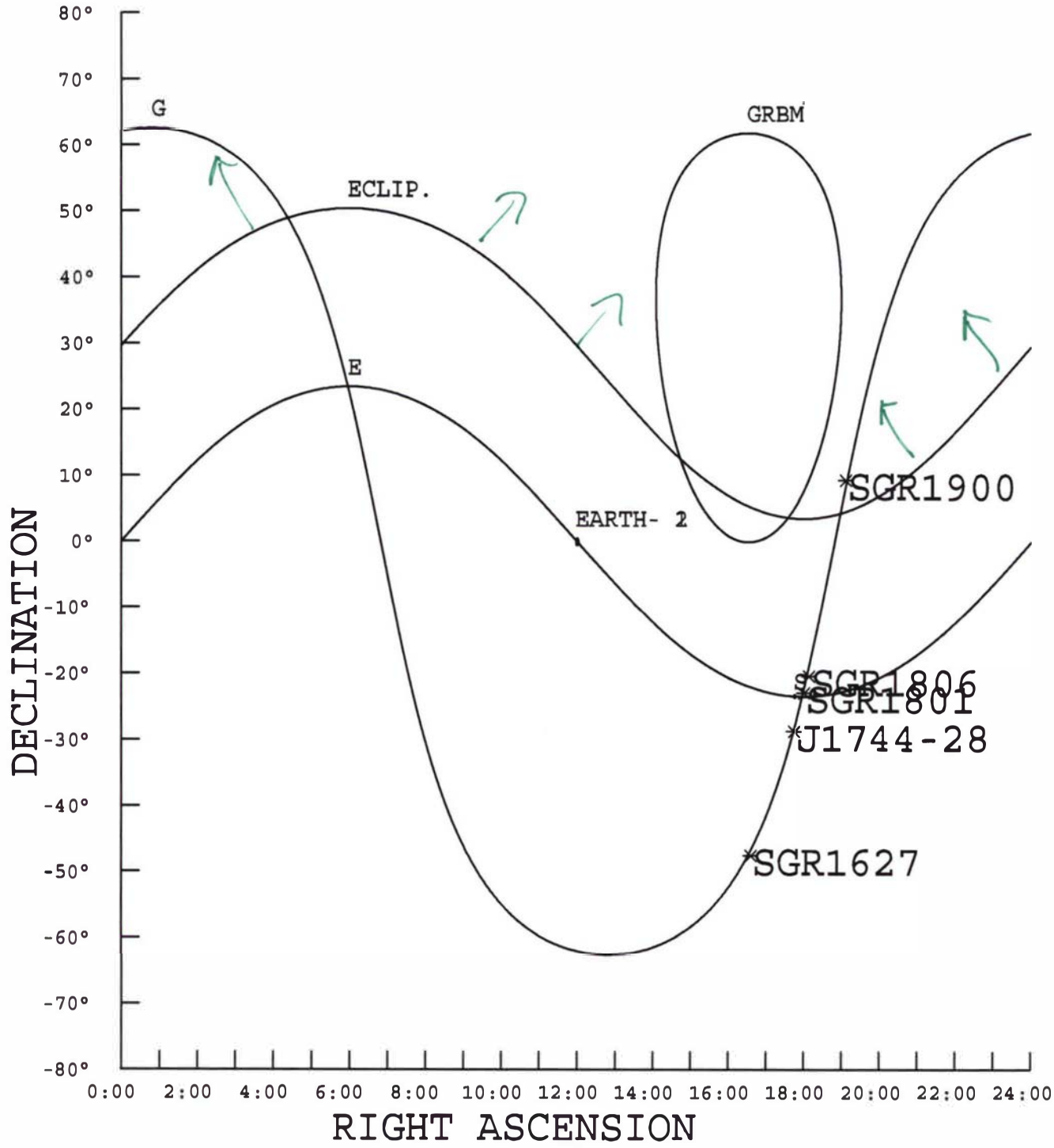
KONUS2 -BSAX-GRBM CORRELATION 18/12/97 45762.915

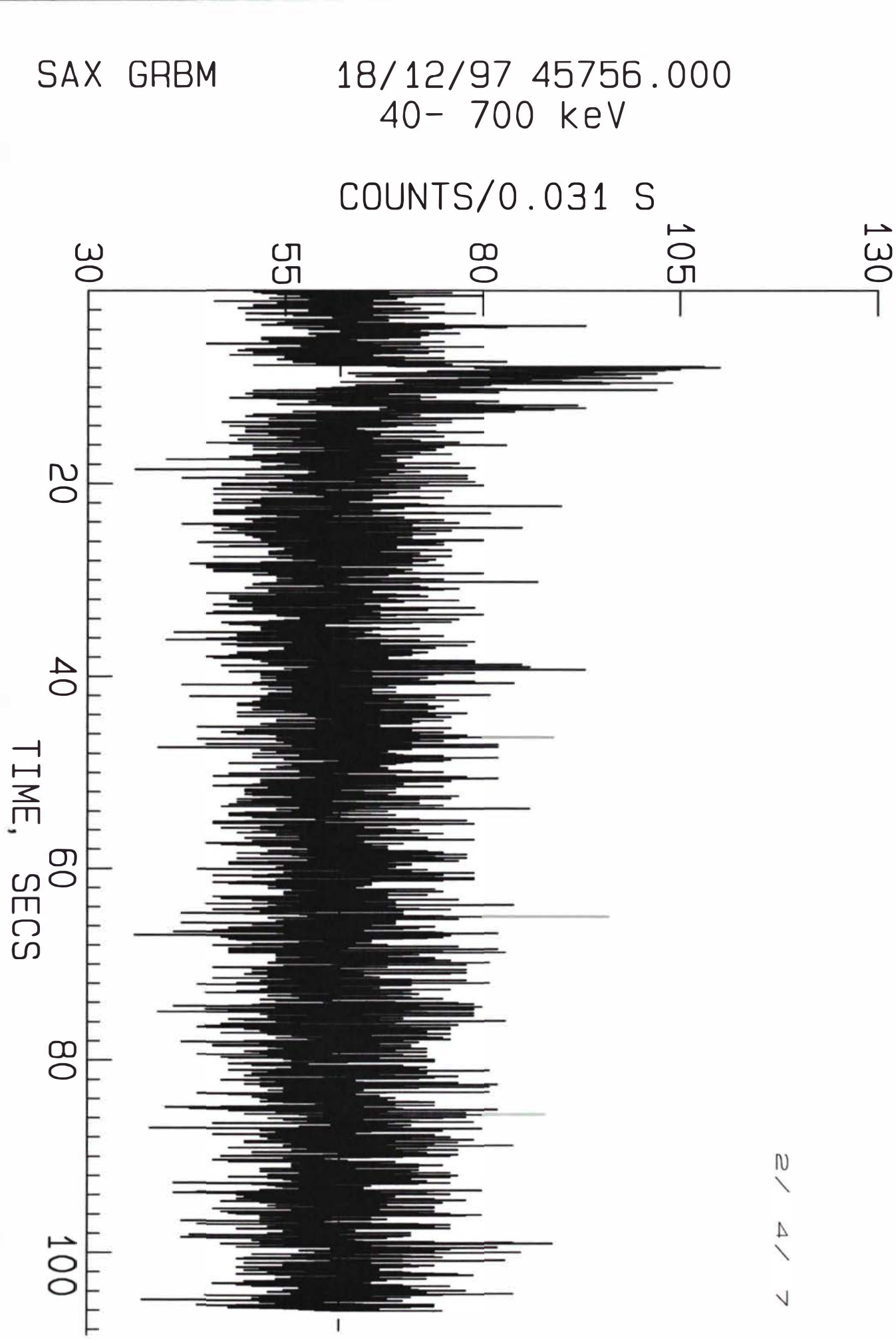



KONUS
18/12/97 45762.900
50- 200 keV
COUNTS/0.064 S
0
25
50
75
0
9
19
29
39
49
59
69
79
89
99
TIME, SECS
4/ 4/ 7

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

2/ 4/ 7




SAX GRBM
18/12/97 45756.000
40- 700 keV
COUNTS/0.031 S
30
55
80
105
130
20
40
60
80
100
TIME, SECS
2/ 4/ 7

KONUS + GRBM

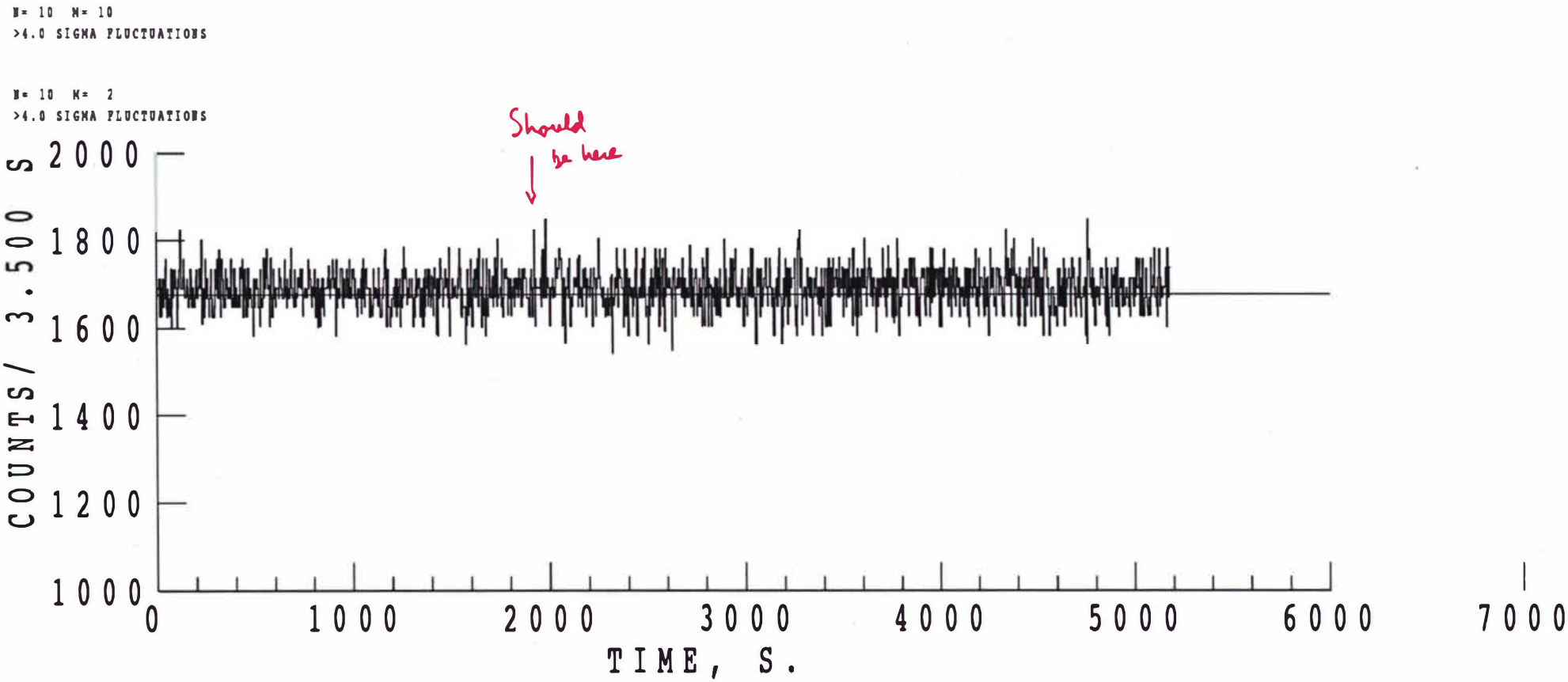
07/02/00

ULYSSES RT

18/12/97 43164.168 s

0.500 S INTERVALS REGROUPED BY 7

0- 0 keV



GRBM 19971218 45026

ULYSSES RT 02/04/07

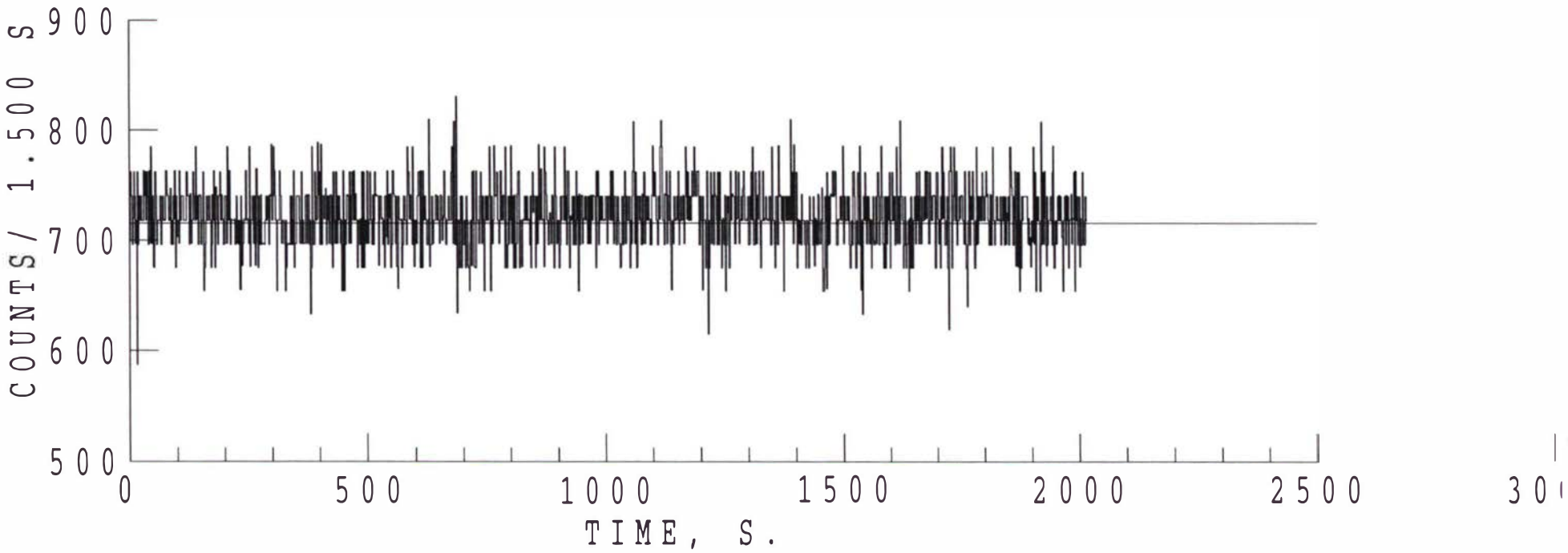
18/12/97 44028.180 s

0.500 S INTERVALS REGROUPED BY 3

0- 0 keV

N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From HENZE@SSLMOR.msfc.nasa.gov Fri Dec 19 10:59:12 1997
Return-Path: <HENZE@SSLLES.MSFC.NASA.GOV>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id KAA01120; Fri, 19 Dec 1997 10:59:07 -0800
Received: from SSLLES.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id KAA18084; Fri, 19 Dec 1997 10:59:05 -0800
Date: Fri, 19 Dec 1997 12:58:27 -0600 (CST)
From: HENZE@SSLMOR.msfc.nasa.gov
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971219125827.21e152c3@ssl.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6535
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6535
EVENT OF 1997 DEC 18 DAY OF YEAR=352
EVENT CROSSING TIME AT BATSE : 52499. S. OR 14:34:59.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 42.000 62.000
BATSE PEAK COUNTING RATE: 61000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 18/12/ 97 IS:
RA= 170.536 DEC= 11.916 DIST= 5.100 AU
BATSE-ULYSSES DISTANCE = 762908625. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 84.04 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 264.32 SECS.
CROSSING TIME AT ULYSSES IS 52763. S. OR 14:39:23 +/- 493.44 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 18/12/ 97 IS:
RA= 302.239 DEC= -21.390 DIST= 2.091 AU
MARS-BATSE DISTANCE = 312749280. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 66.66 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 413.26 SECS.
CROSSING TIME AT MARS IS 52912. S. OR 14:41:52 +/- 172.58 SECONDS

BATSE BURST TRIGGER

NO.: 6535

TIME: TJD=0800 SECONDS=52499

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=173.5 AZIMUTH= 46.4 ERROR= 1.0 DEGREES

COMMENTS:
SINGLE PULSE WITH SUBSTRUCTURE, DUR. APPROX. 2.5 S, MAX AT APPROX. T+1.1 S.
VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6535 | 971218 | 10800 | 52499 | 61000 | 042 | +62 | 2.5 |

Date: Feb 9 00

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☐ Jim Schmidling's stat file correction applied?

Helio corr removed

☐ Final ephemeris used?

☐ Final, CDROM data used?

☐ 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

☐ 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 vwx@bocc1, or from Teresa Sheets, have the correct time; files on website have incorrect times)

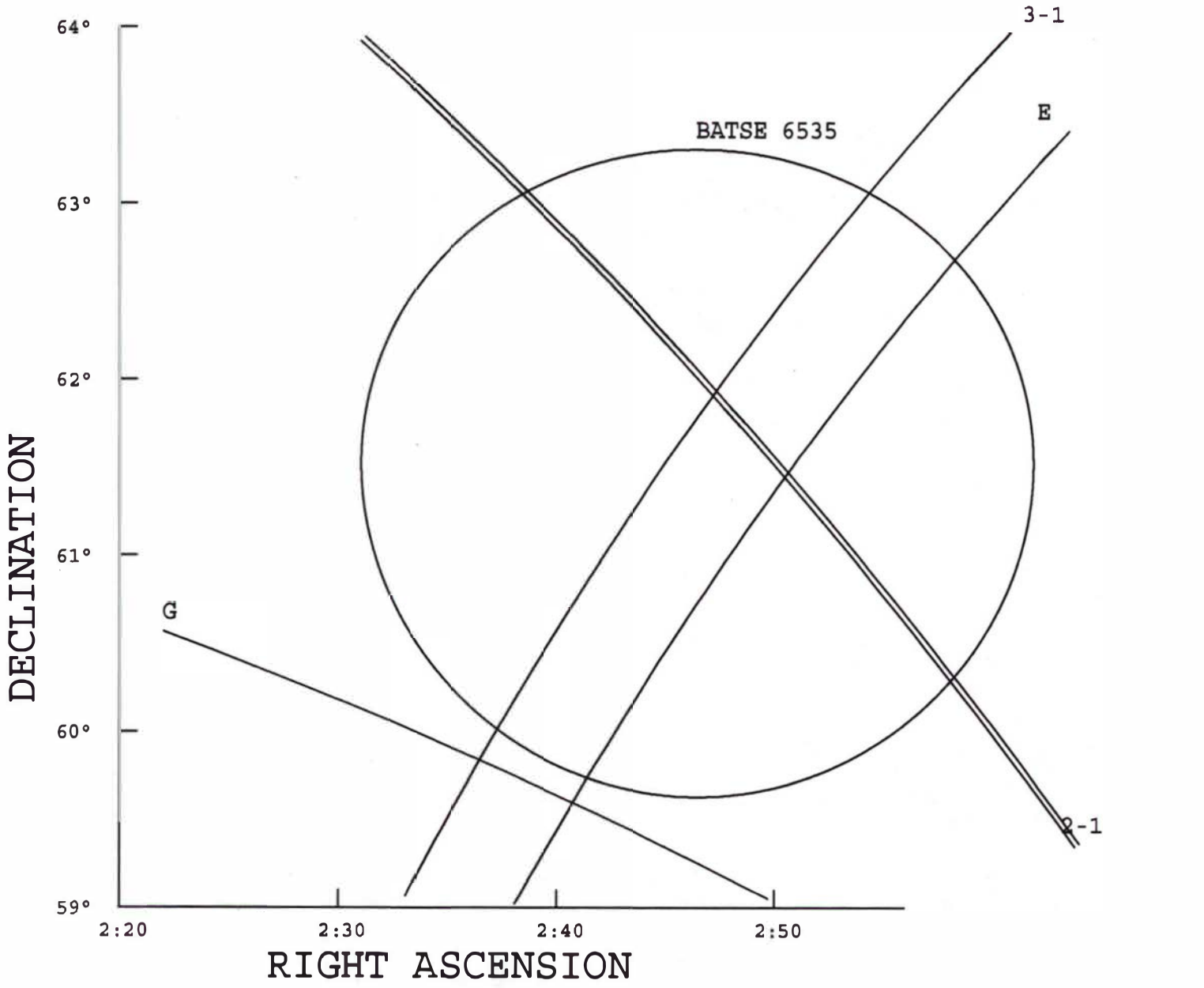
☑ BATSE >100 keV data used for NEAR correlation?

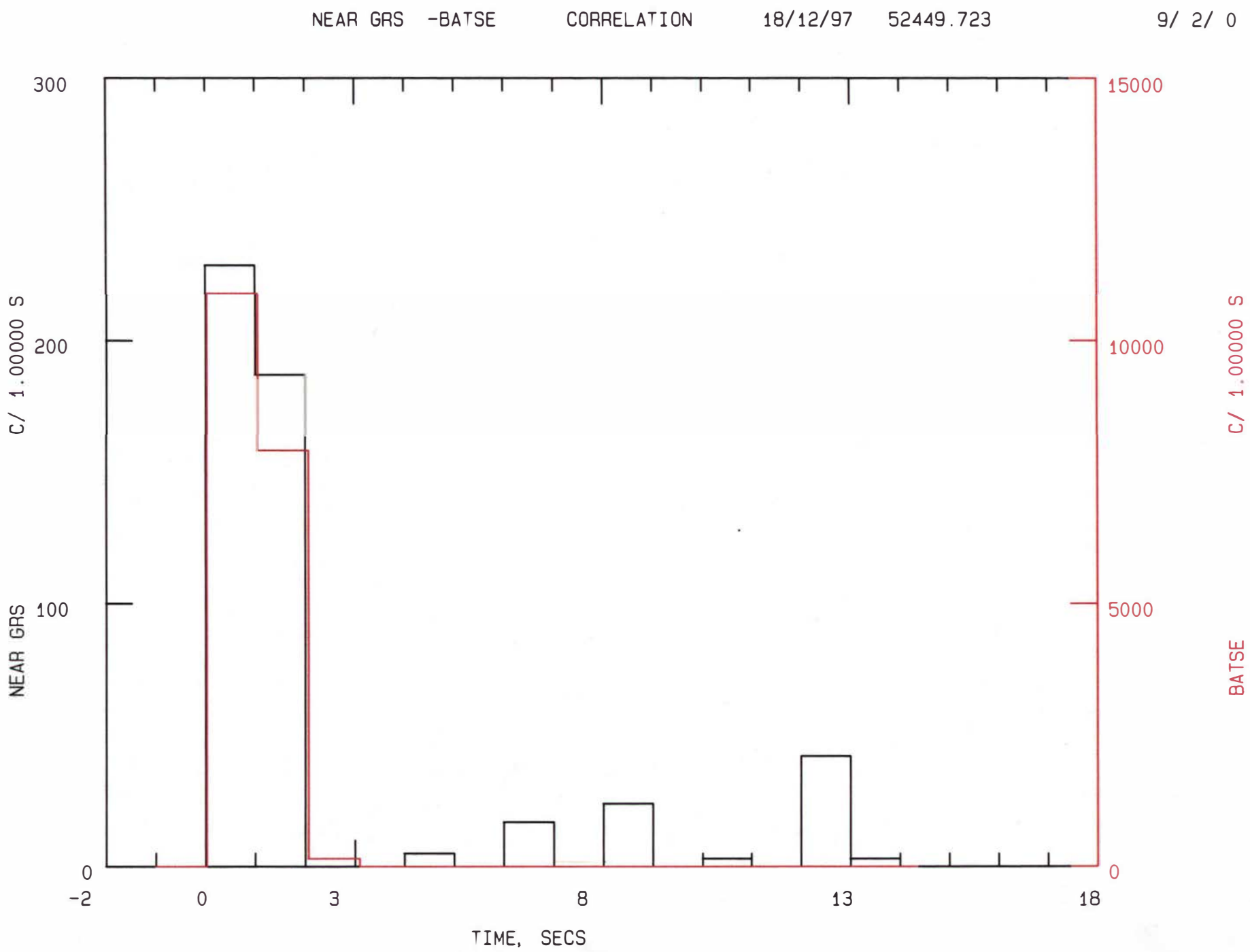
☑ ACCESS database updated?

# EVENT OF DEC 18, 1997 14:34

9/ 2/ 0

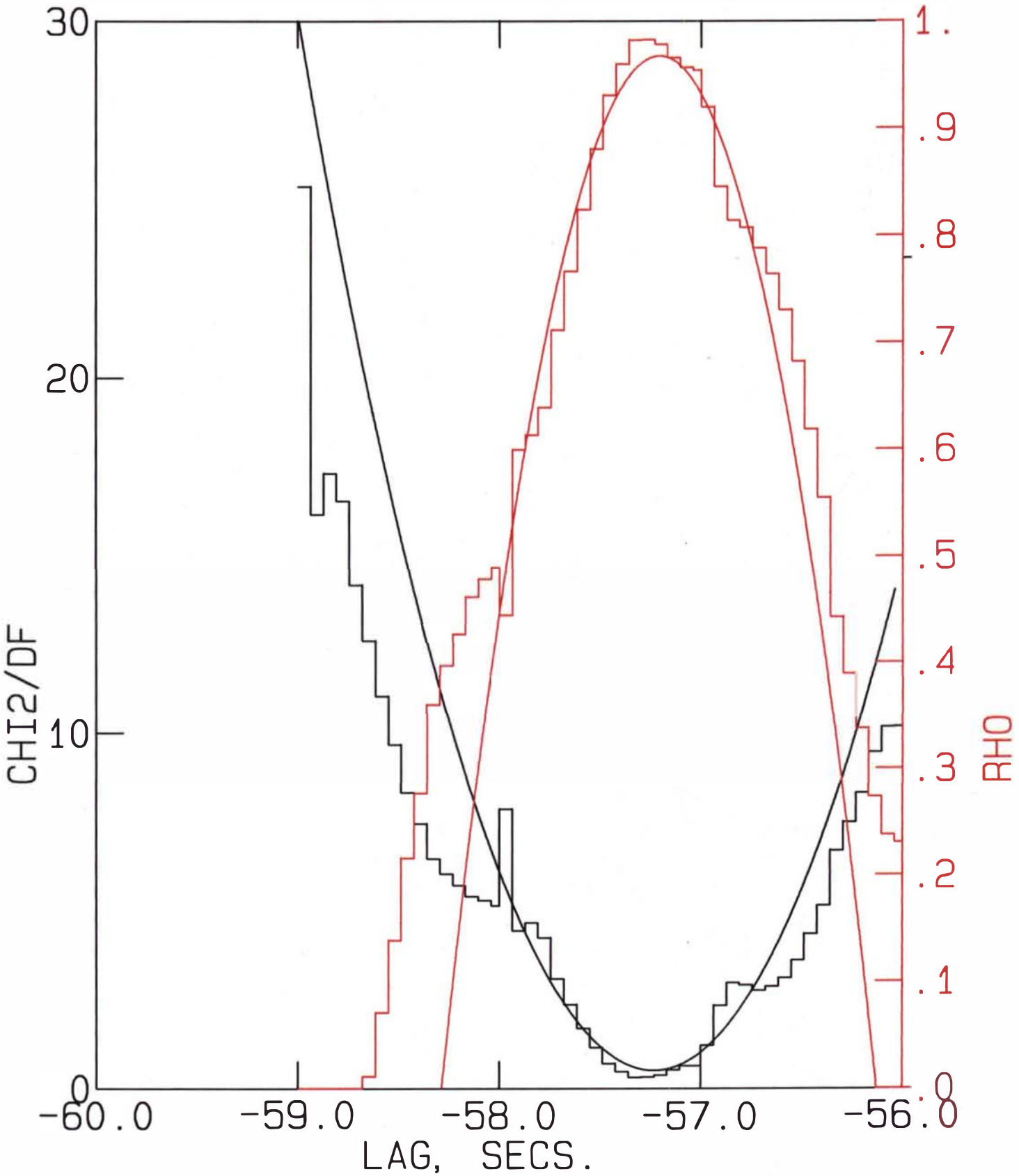
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 BATSE 2 ULYSSES 3 NEAR

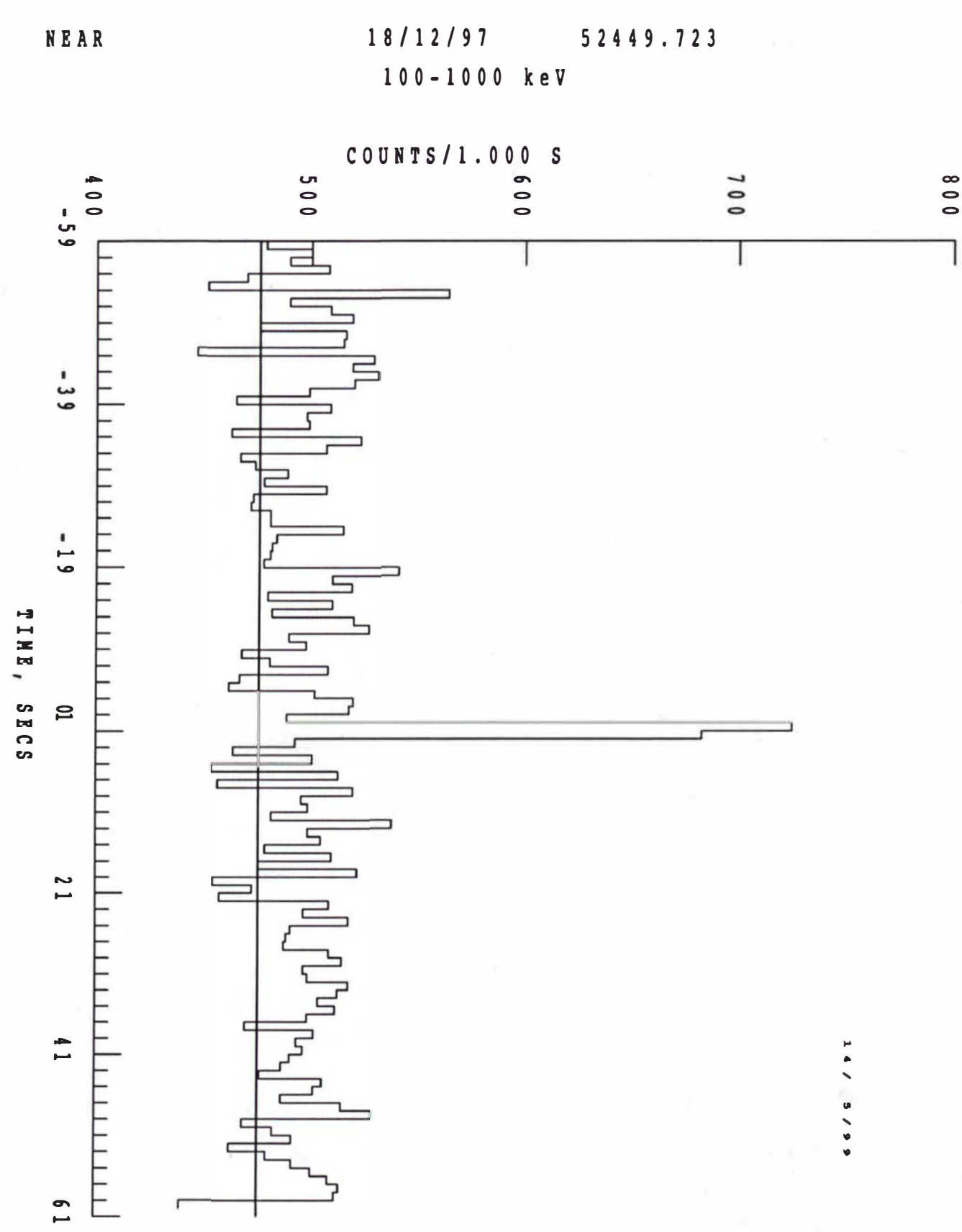



NEAR GRS -BATSE CORRELATION 18/12/97 52449.723 9/ 2/ 0
300
200
100
0
C/ 1.00000 S
NEAR GRS
15000
10000
5000
0
C/ 1.00000 S
BATSE
-2
0
3
8
13
18
TIME, SECS

9/ 2/ 0

NEAR GRS -BATSE CORRELATION 18/12/97 52449.723

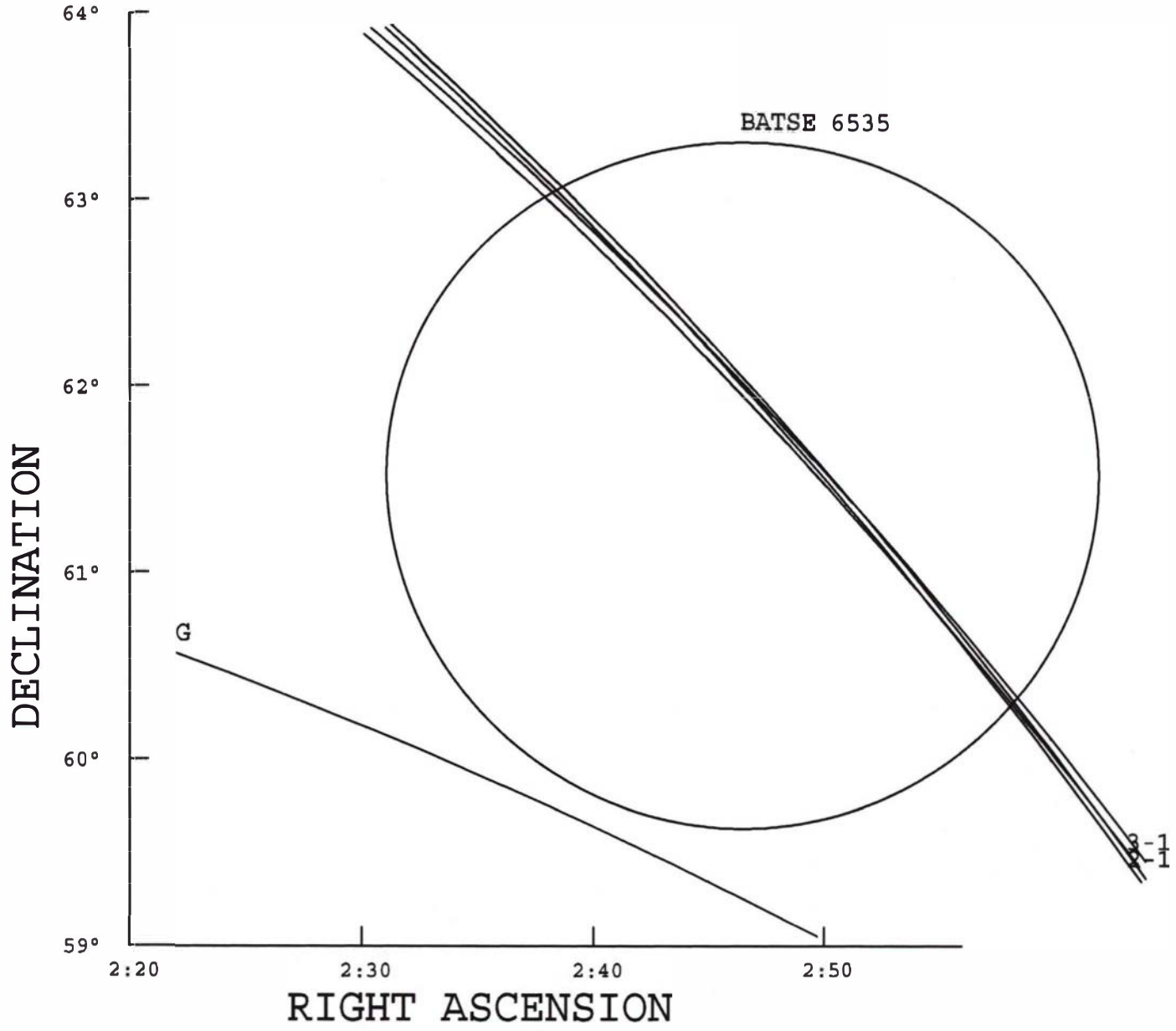


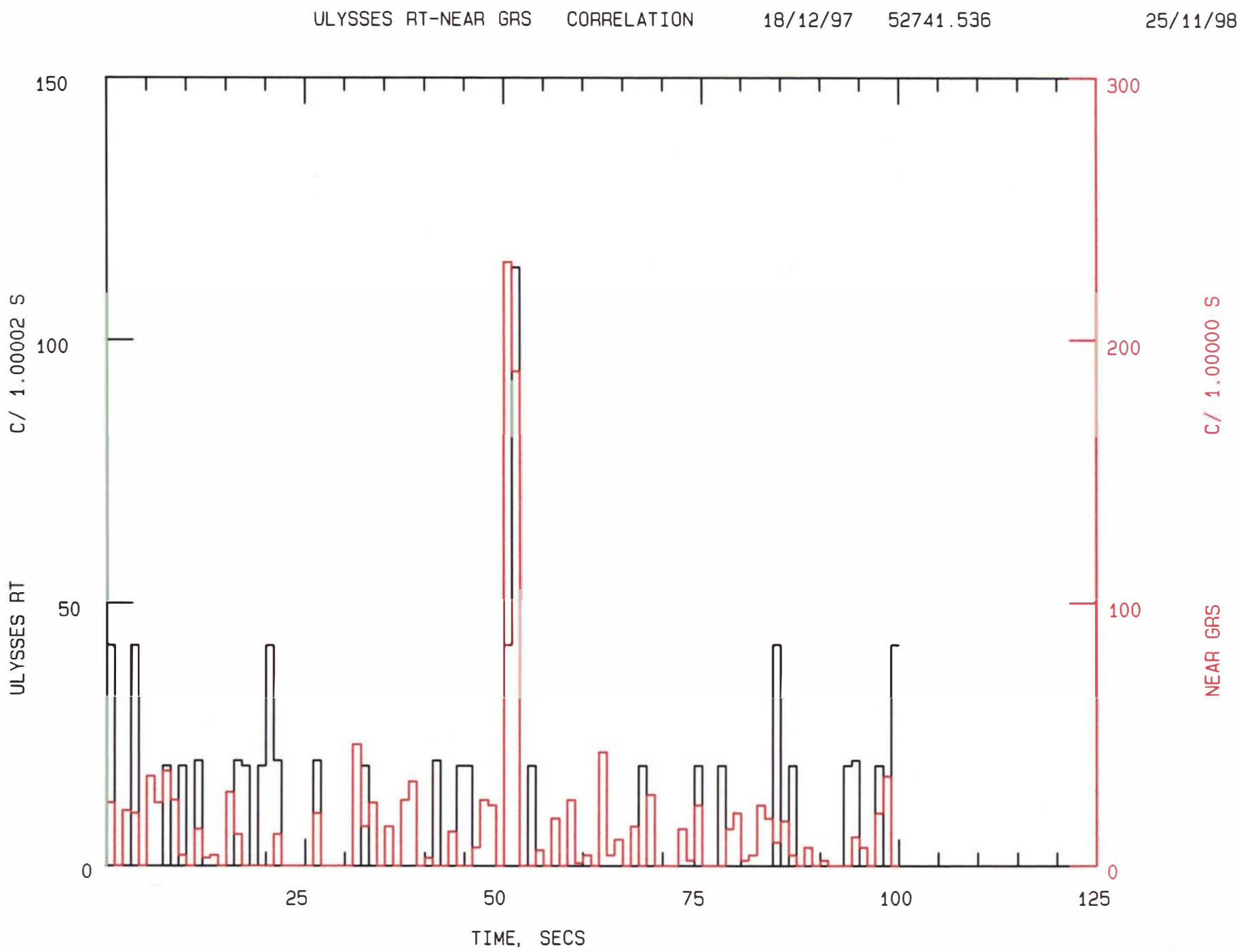

NEAR
18/12/97
52449.723
100-1000 keV
COUNTS/1.000 S
400
500
600
700
800
-59
-39
-19
01
21
41
61
TIME, SECS
14/ 5/99

# EVENT OF DEC 18, 1997 14:39

25/11/98

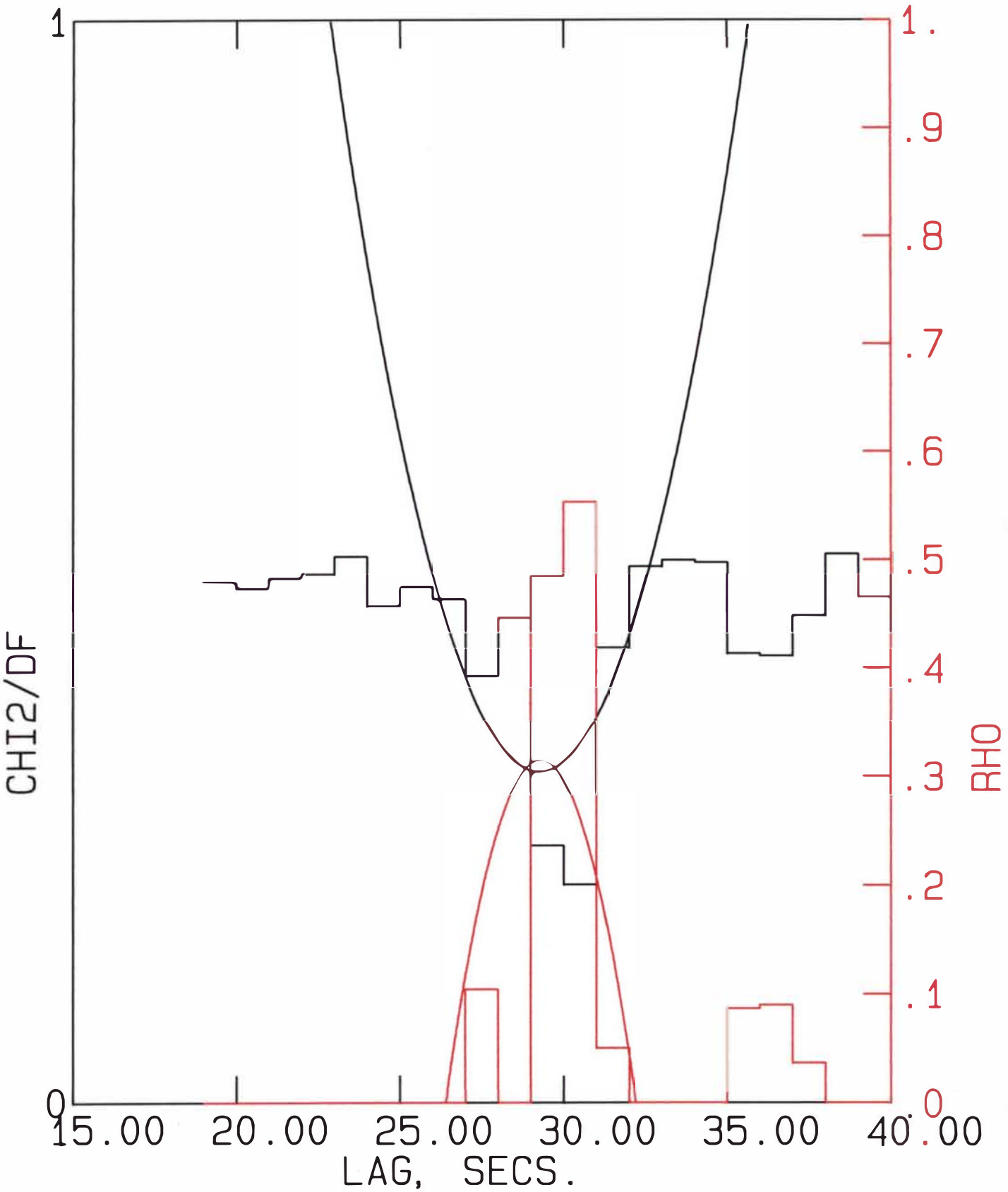
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE 3 NEAR

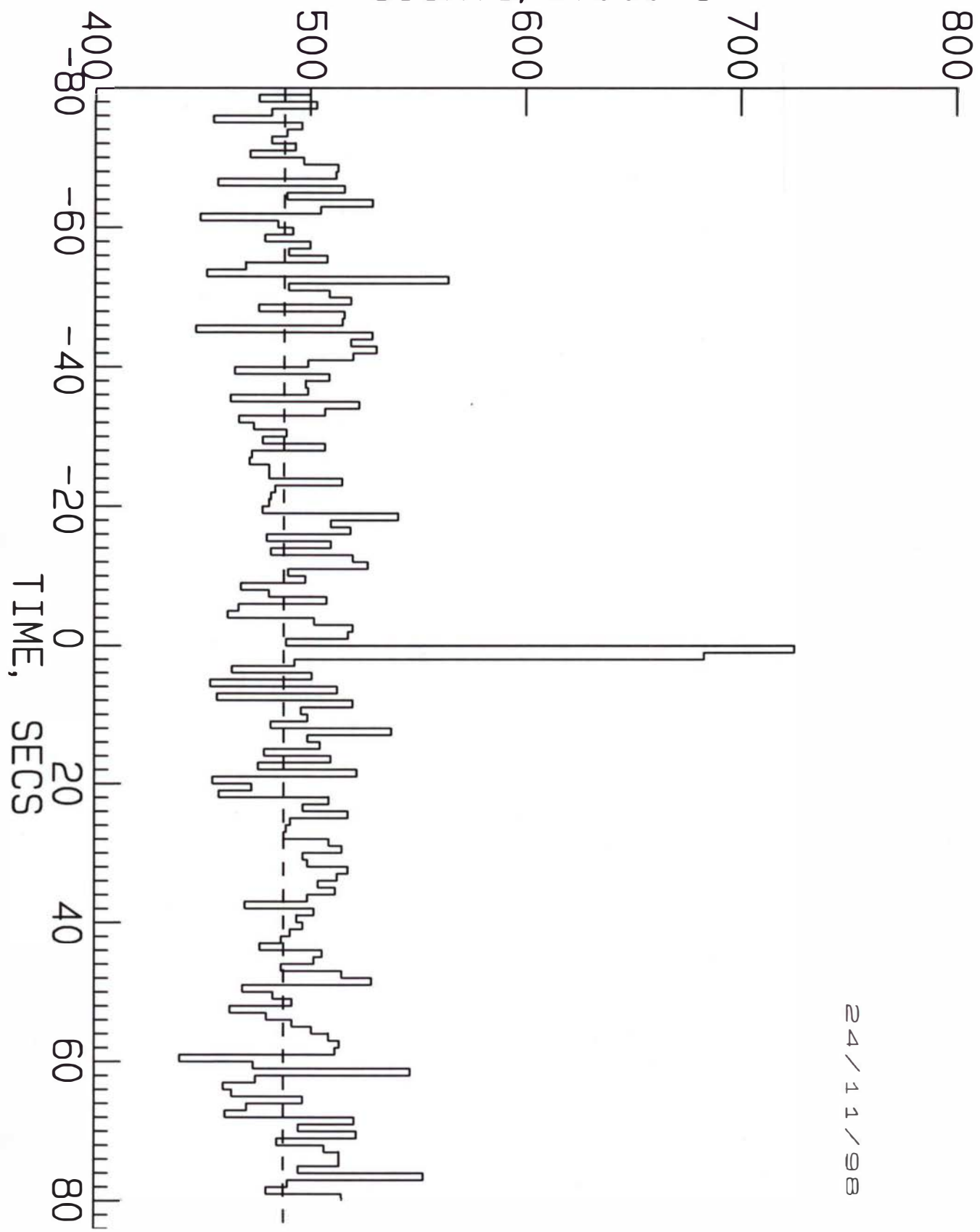



ULYSSES RT-NEAR GRS CORRELATION 18/12/97 52741.536 25/11/98
150
100
50
0
300
200
100
0
C/ 1.00002 S
ULYSSES RT
C/ 1.00000 S
NEAR GRS
25
50
75
100
125
TIME, SECS

25/11/98

ULYSSES RT-NEAR GRS CORRELATION 18/12/97 52741.536




NEAR
18/12/97 52448.816
100-2400 keV
COUNTS/1.000 S
400
500
600
700
800
-80
-60
-40
-20
0
20
40
60
80
TIME, SECS
24/11/98

```
         262 65663.9 KONUS 30S,HARD,2PKS (+UL@63120,3100LS,MOD,20S)(13NO,14NO)

970922   265  2888.4 BATSE#6392,32880/SEC
      13 265  2894.4 PEAK(50/S),2910.5(110),@97DEG,ONE-SIDED,EDGE SR. DUBIOUS
      14 265  2894.6 PKS(200/S),2910.6(500/S),@109,ONE-SIDED,EDGE SAA.DUBIOUS

970925   268 81795.8 BATSE#6397,9551/SEC
      14 268 81798.3 PEAK (70/S,<10S) @ 42DEG (13SAA)

971009   282 68215.8 BATSE#6422,10861/S@1.8S+UL@69240,3050LS,MOD+KONUS@68215.0
      14 282 68217.2 PEAK(180/S,<2S)@83 (TRIGGER PEAK 68215.64) (13NO@145)

971019   292 53754.2 KONUS,10S (+UL@51000,2950LS,MOD,10S)
      14 292 53752.6 RISE,~50SEC,SOFT,NO TRIG (13 NO)

971029   302  5318.4 BATSE#6453,4717/S@35.8S (KONUS@5351.8,120S)(UL WEAK@2820)
      14 302  5326.0 PKS, 44.0,66.0,NO TRIG,@102DEG (13NO@49DEG)

971101   305 23484.5 KONUS (10SEC,FRED)(UL@26040,MOD,10S@2950LS)
      14 305 23483.8 PEAK (200/S,<2S) (13SR) TRIGGER PEAK 23483.0

971110   314 68141.3 KONUS,100SEC (UL@67080 @2950LS,MOD)(13 SR)
      14 314 68161.3 PEAKS, 213.3, MULT PEAKS,HARD,TRIGGER PKS 68213.19,213.91

971127   331 47595.8 BATSE#6509 (139968/S)
      13 331 47595.8 PKS,613.8,759.8(240),767.8(140)
      14 331 47760.5 PKS(3000/S),47768.5(2000), INTENSE, NOTRIG

971201   335  9295.6 BATSE#6515 (8768/S)
      14 335  9306.4 PK(SOFT)+9310.4(160)+9316.4(220)+9328.4(150),NOTRIG(13NR)

971207   341 72232.9 BATSE#6525 (7892/S@12.0)
      14 341 72244.2 PK(270),268.2,284.2 (@80DEG),TRIG PK 72244.28 (13NR)

971218   352 52499.9 BATSE#6535 (9181/S@+2.3S)
      13 352 52500.2 PK(70),52536.2(?)(SOFT,@38DEG)    (14SAA)

971219   353 79974.5 KONUS,10S,SPIKE@+4 (UL 77580,15SEC,MOD) (13SAA,14NR)

980109   009  4345.6 BATSE#6564(1401/S)+SAX,25S(IAU6805)(13NO@74,14NA@144)

980113   013 14845.7 BATSE#6570 (9376/S,COMPLEX,DUR60S)
      13 013 14869.2 PKS(50),879.2(50),883.2(50) (ONE-SIDED,@119DEG)
      14 013 14848.3 PEAK(60/S,<4S), NO TRIGGER

980119   019U 5100   ULYSSES MOD(32MS) @2350LS
      14 019  5375.9 PEAK (900/S,<8S,SOFT) (TRIG PEAKS 5372.9,5374.6)(13NO)

980124   024 23673.0 BATSE#6576, 16971/S @7.7S,SPIKY,MAX@+42.5,DUR100S)
      13 024 23679.1 PEAK(90/S,<8S),23707.1,23717.1 (LAST 2 WEAK,ONE-SIDED)
      14 024 23679.6 PEAK(300/S,<10S),707.6WEAK,715.6WEAK
      14 024 23679.1 TRIGGER PKS 679.07,679.99 (.1024S); 12.8MS PEAK 23678.43

980125   025 74368.7 BATSE#6581, 34996/S,MULT PKS,MAIN PK@+40,270S
      13 025 74416.4 PEAK @108DEG(220/S,<8S) (14NO@125)

  202    033U37380   ULYSSES MODERATE, 10SEC@2265LS
      13 033 35713.6 PEAK(80/S),35717.6(70),<8SEC OVERALL
      14 033 35712.9 PEAK(200/S),35718.9(400/S),<10SEC OVERALL, NO TRIGGER
```

From TERRELL@nisdp0.lanl.gov Fri Feb 27 15:11 PST 1998
From: TERRELL@nisdp0.lanl.gov
Date: Fri, 27 Feb 1998 16:11:55 -0700
To: khurley@sunspot.ssl.berkeley.edu, bonnard@milkyway.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, cline@lheavx.gsfc.nasa.gov,
henze@fender.msfc.nasa.gov, filippo@botes1.tesre.bo.cnr.it,
kmarar@isac.ernet.in
X-Vmsmail-To: @MAILOUTUL.DIS
Subject: DMSP GRB: 1997(many),980109,980113,980119,980124,980125,980202,980203

From: jterrell@lanl.gov (James Terrell) 980227
To: khurley@sunspot.ssl.berkeley.edu, bonnard@milkyway.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, cline@lheavx.gsfc.nasa.gov,
filippo@botes1.tesre.bo.cnr.it, henze@fender.msfc.nasa.gov,
kmarar@isac.ernet.in, kraken@rosserv.gsfc.nasa.gov,
scott@milkyway.gsfc.nasa.gov, teegarden@lheavx.gsfc.nasa.gov,
vnp@isac.ernet.in, yosimori@rikkyo.ac.jp
Subj: DMSP GRB detections: 1997(many),980109,980113,980119,980124,980125,980202,980203

The following GRB were detected by DMSP13 or DMSP14 (or NOT detected, if indicated).
No detection can occur for bursts more than 118 degrees from spacecraft zenith,
or if in the presence of very high counting rates (SAA,SR,NR).
Data are normally in 2-sec counts, except when the DMSP14 trigger circuit is
tripped, giving 12.8ms data, usually reported here as 102.4ms counts.
Numerous other BATSE GRB were also detected, but not reported here; numerous
weak detections by Ulysses have not been checked because of low counting
rates expected at an indefinite time.

---

| DATE | FL | DAY | TIME | NOTES---(ND=NO DATA,NA=NOT APPARENT & NOT ANALYZED)------REPORTED<br>(NO=DATA CHECKED--SHOWS NO DETECTION)(SR=S. RADIATION BELT)<br>(NR=NORTH RADIATION BELT)(SAA=SOUTH ATLANTIC ANOMALY) | |
|---|---|---|---|---|---|
| 970111 | | 011 | 35040.2 | BATSE GRB#5773 (8727CTS/2S) (SEE IAU6569,6571,6574,6598) | |
| | | 011 | 35040.2 | BEPPO SAX TRIG,INTENSE,50S,3 PEAKS(232.10,19.67J) IAU6533 | |
| | 13 | 011 | 35040.0 | PEAKS(40/S),48.0(50/S),58.0(60/S),@24DEG,@848KM,SOFT | REP0313 |
| 970111 | | 011 | 85744.6 | KONUS (HARD,SLOW RISE) +TGR (UL:NO) (DMSP13:NO) | |
| 970117 | | 017 | 53211 | TGR+SAX GRB (KONUS INOP)+UL@54420(STRONG,20S) (13:NO) | |
| 970124 | | 024 | 44343.4 | KONUS(MULT PKS)+UL@46253@2100LS,STRONG+TGR (13SAA) | |
| 970201 | | 032 | 57250.7 | BATSE GRB#5989 (53612/SEC) +UL | |
| | 13 | 032 | 57222.1 | PEAK (100/S,~30S,SOFT,BROAD) (@111DEG) UNCONVINCING | |
| 970218 | | 049 | 50996.1 | KONUS (STRONG,5SEC) +UL@51274,2000LS (STRONG,8SEC) | |
| | 13 | 049 | 51001.0 | PEAK (320/S,<6S) | REP0624 |
| 970222 | | 053 | 86006.6 | KONUS (MOD.STRONG,SEV.SEC) +UL@85873,2000LS,MOD,2S(13NO) | |
| 970226 | | 057 | 31585.9 | KONUS (STRONG,SOFT PK@+39) +UL@30547,2000LS(V.INT,40S) | |
| | 13 | 057 | 31595.8 | PEAK (270/S,10SEC) (MODERATELY STRONG) | REP0313 |
| 970228 | | 059 | 10680.8 | BEPPOSAX(IAU6572)MOD.INT.,80S,4 PKS (75.46,11.75J)IAU6578 | |
| | | 059 | 10680.8 | INT.X-RAY,RADIO(IAU6576,6577),OPTICAL(6584),MOTION(6629) | OPTICAL |
| | 13 | 059 | 10659.1 | PKS,667.1(60/S,ONE-SIDED,SOFT,@74DEG) DOUBTFUL (+UL,WIND) | |
| 970313 | | 072 | 30096.5 | KONUS(MOD.STRONG,PK@+11,40S)+UL@28380,2000LS(MOD.INT,10S) | |
| | 13 | 072 | 28355.8 | PEAK (180/S,<2S,SOFT) (NO PEAK AT 30096!) (CONFLICT) | REP0501 |

Date: May 5 '98

# 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? N/A

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

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

## 2. BATSE Data

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

☑ BATSE ephemeris for $T_0$?

☑ Error circle position and radius from public catalog used?

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

## 3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

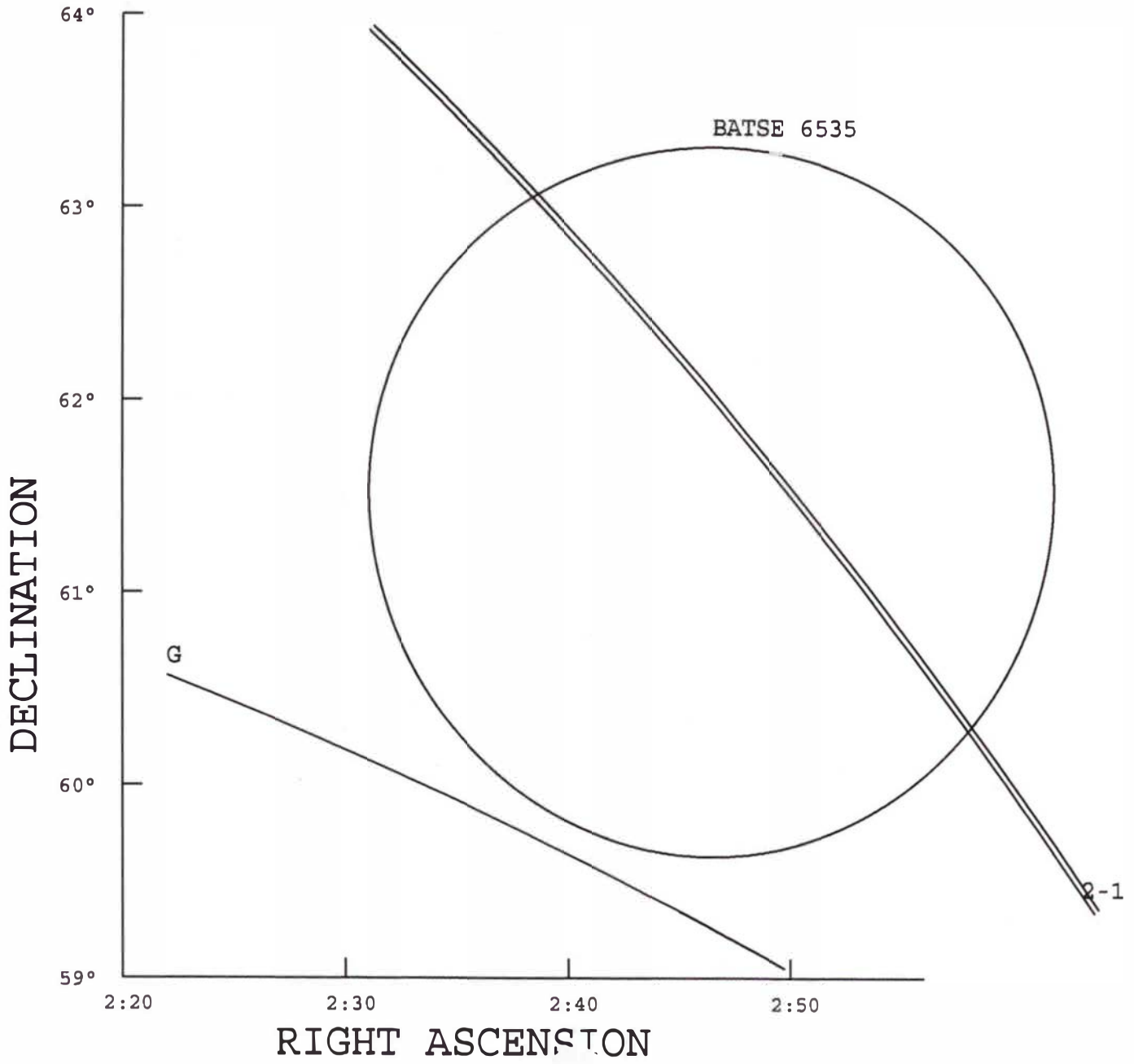
☐ Geocentric time used?

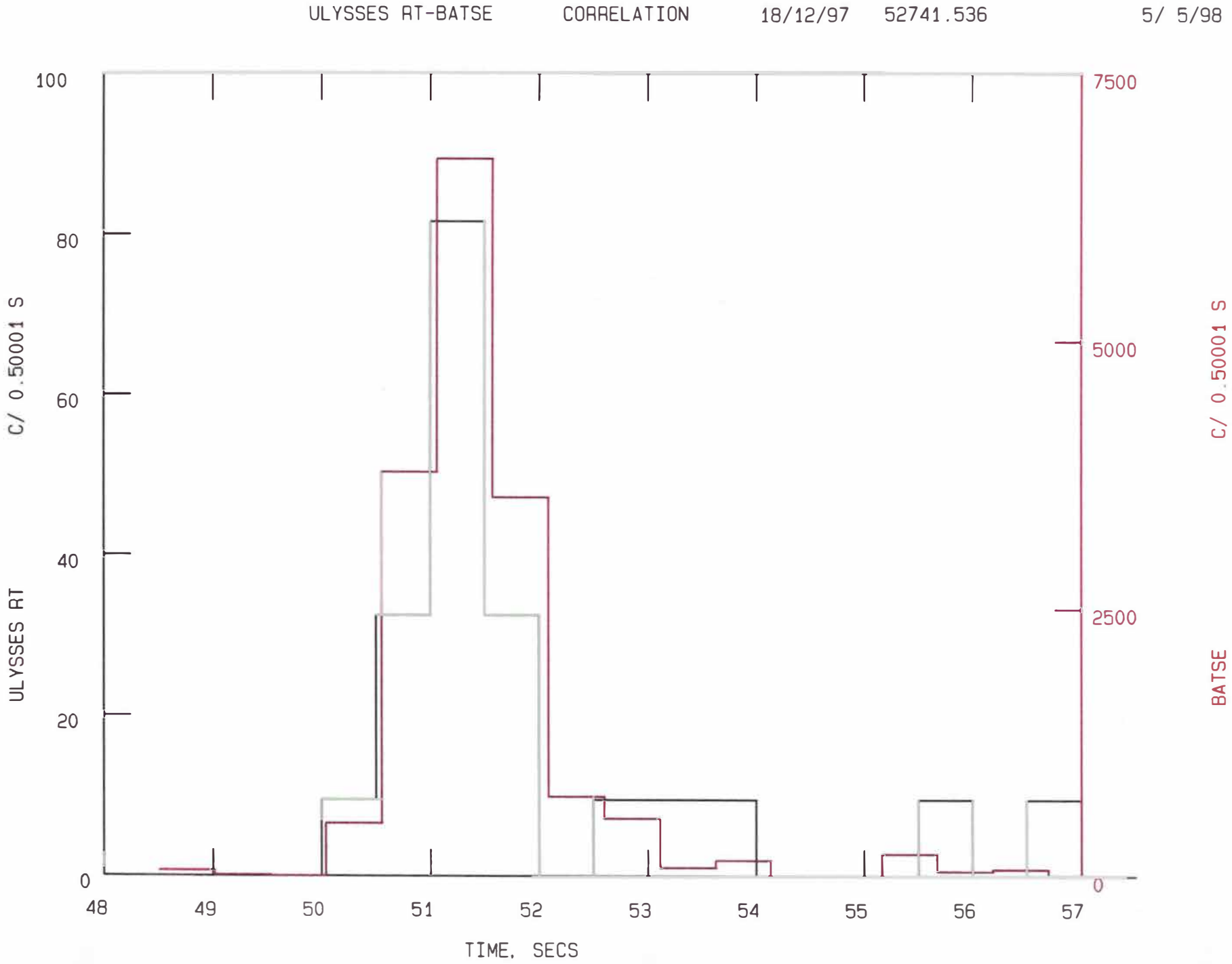
☑ ACCESS database updated?

# EVENT OF DEC 18, 1997 14:39

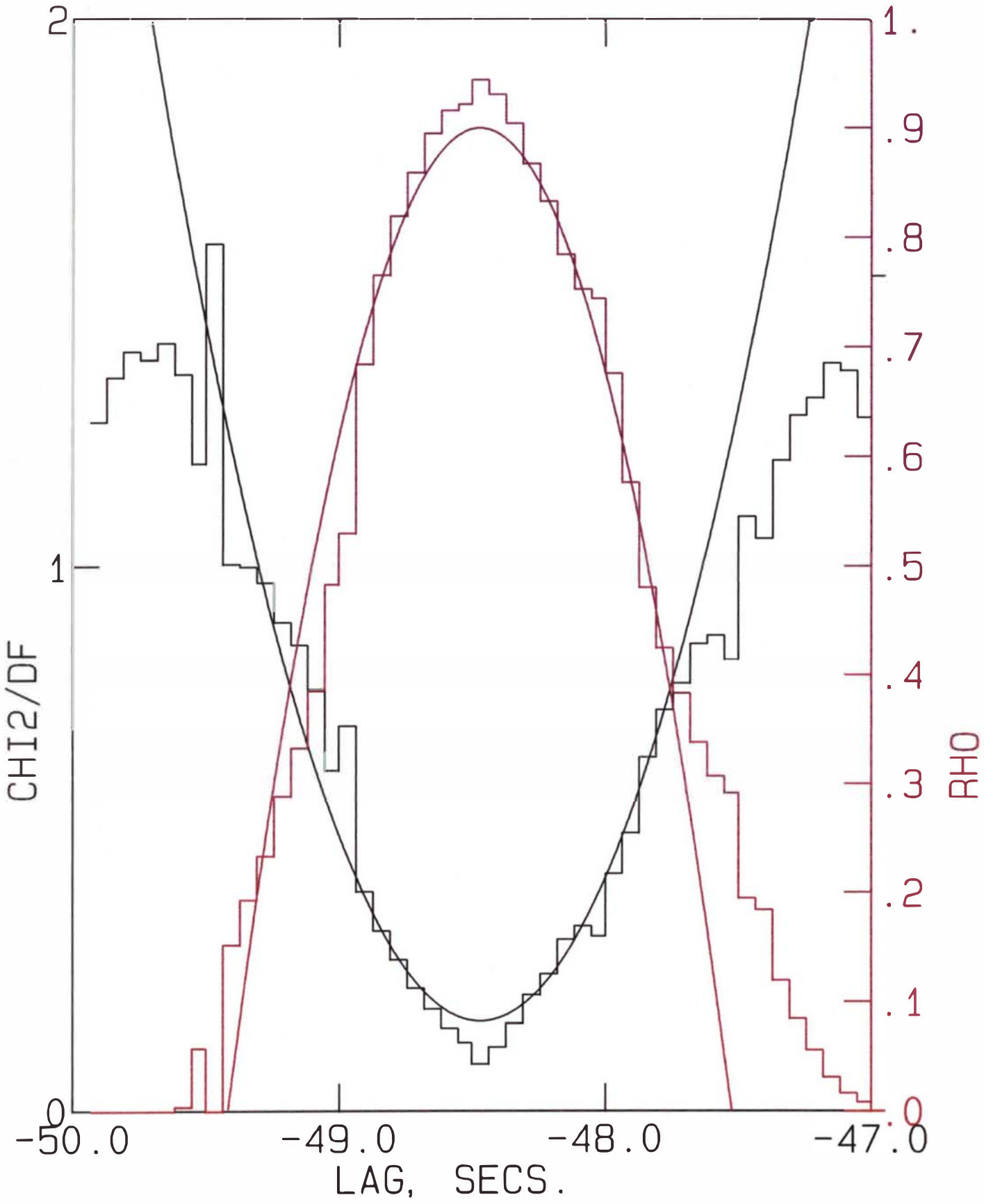
5/ 5/98

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




ULYSSES RT-BATSE CORRELATION 18/12/97 52741.536 5/ 5/98
100
80
60
40
20
0
C/ 0.50001 S
ULYSSES RT
7500
5000
2500
0
C/ 0.50001 S
BATSE
48
49
50
51
52
53
54
55
56
57
TIME, SECS

ULYSSES RT-BATSE CORRELATION 18/12/97 52741.536



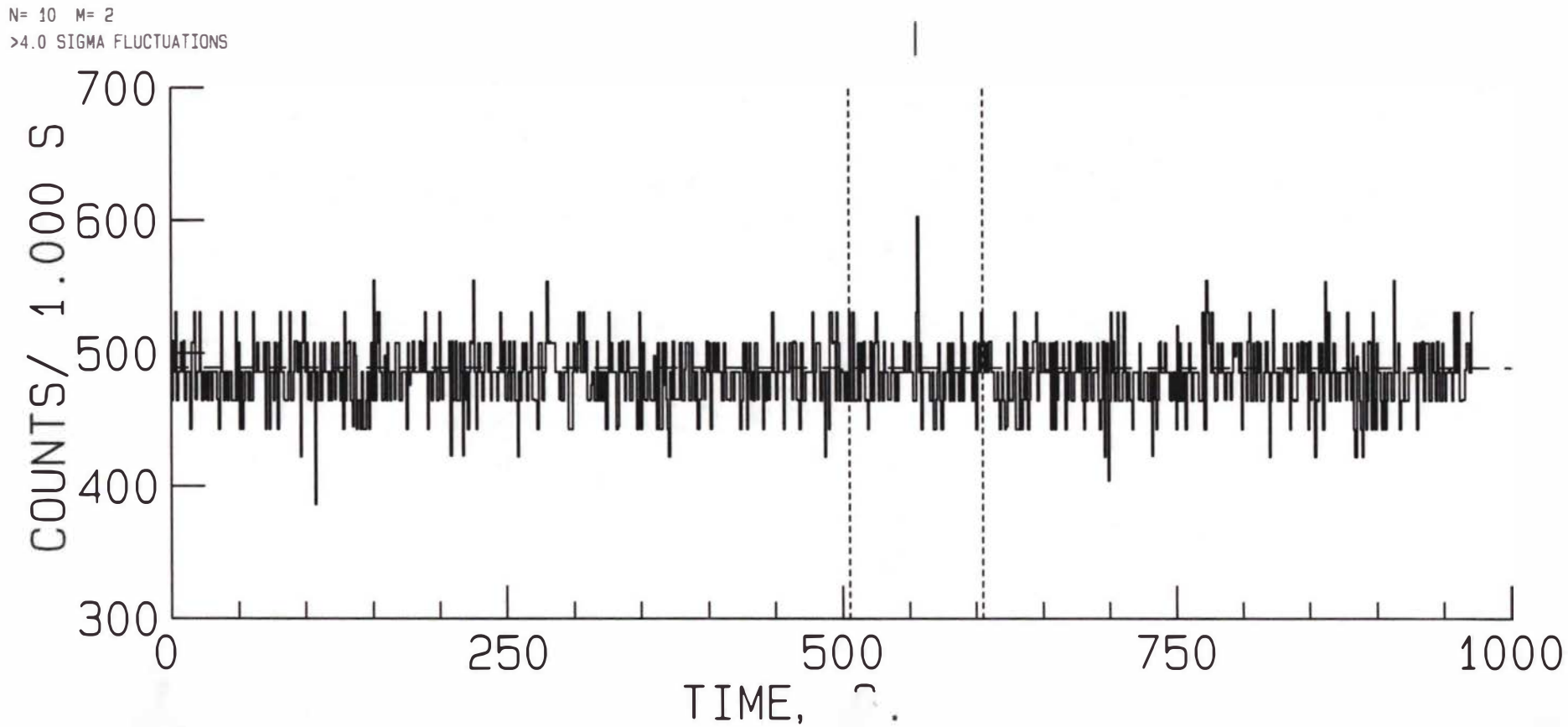
ULYSSES RT

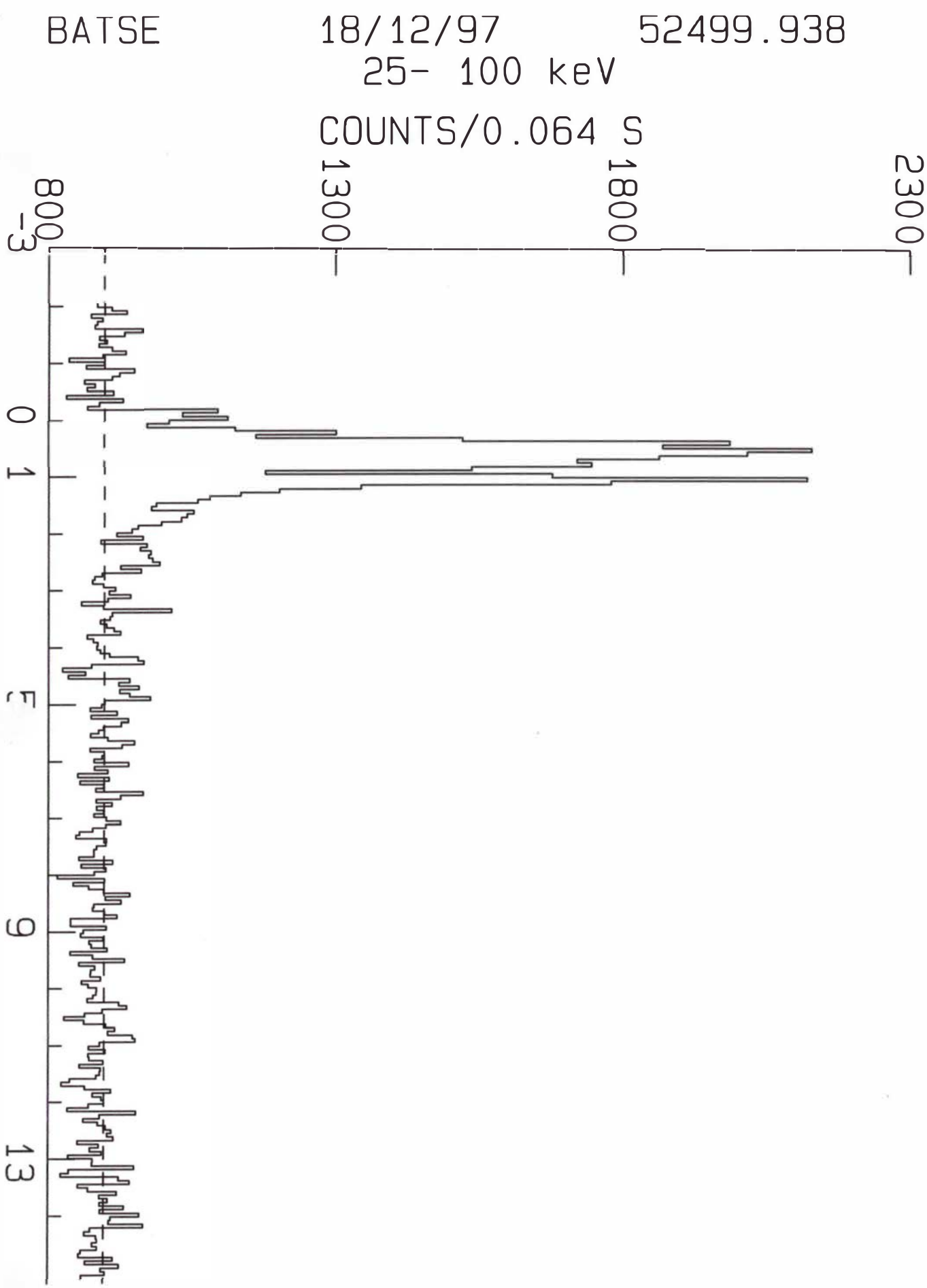
5/ 5/98

18/12/97 52236.272 s

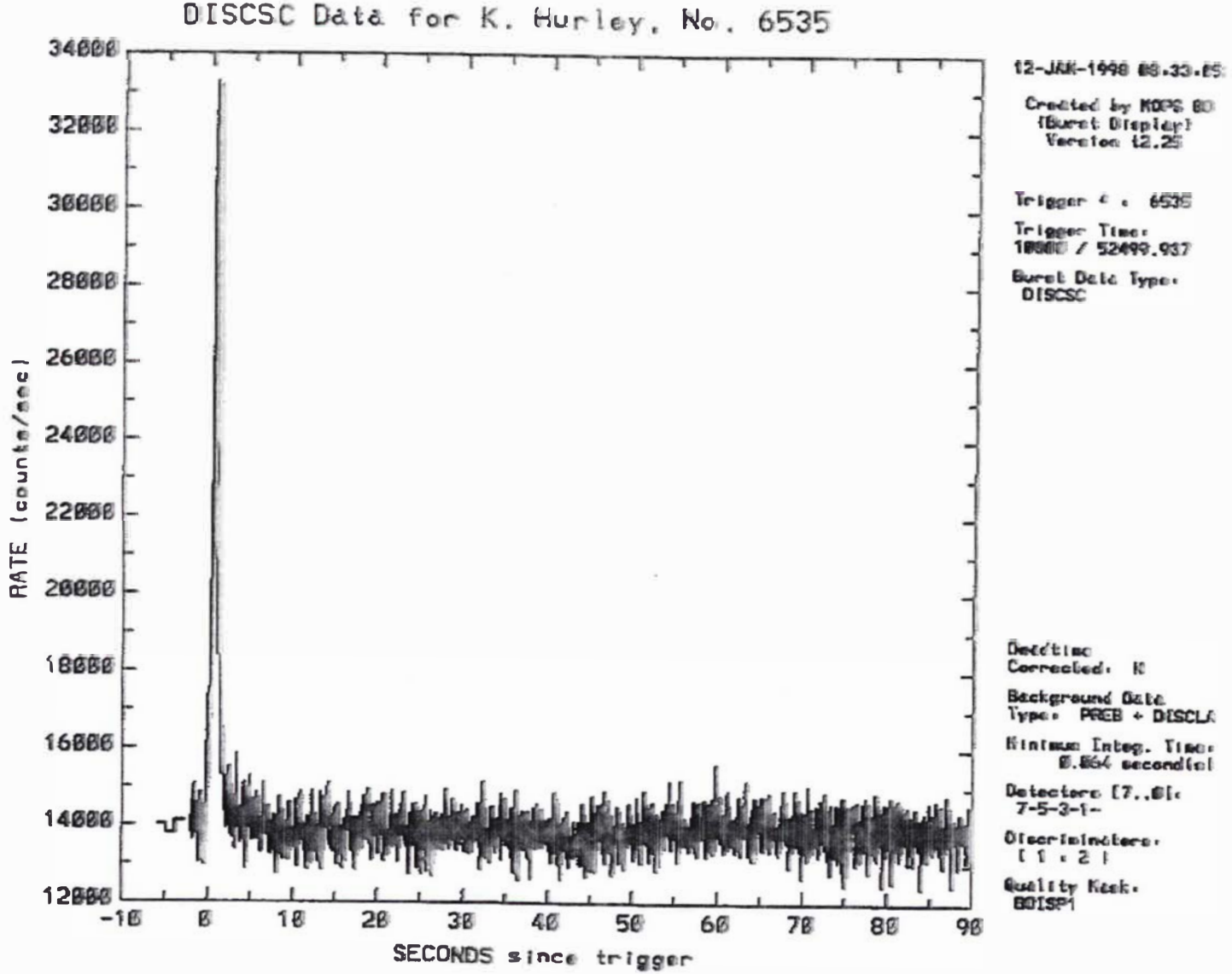
0.500 S INTERVALS REGROUPED BY 2

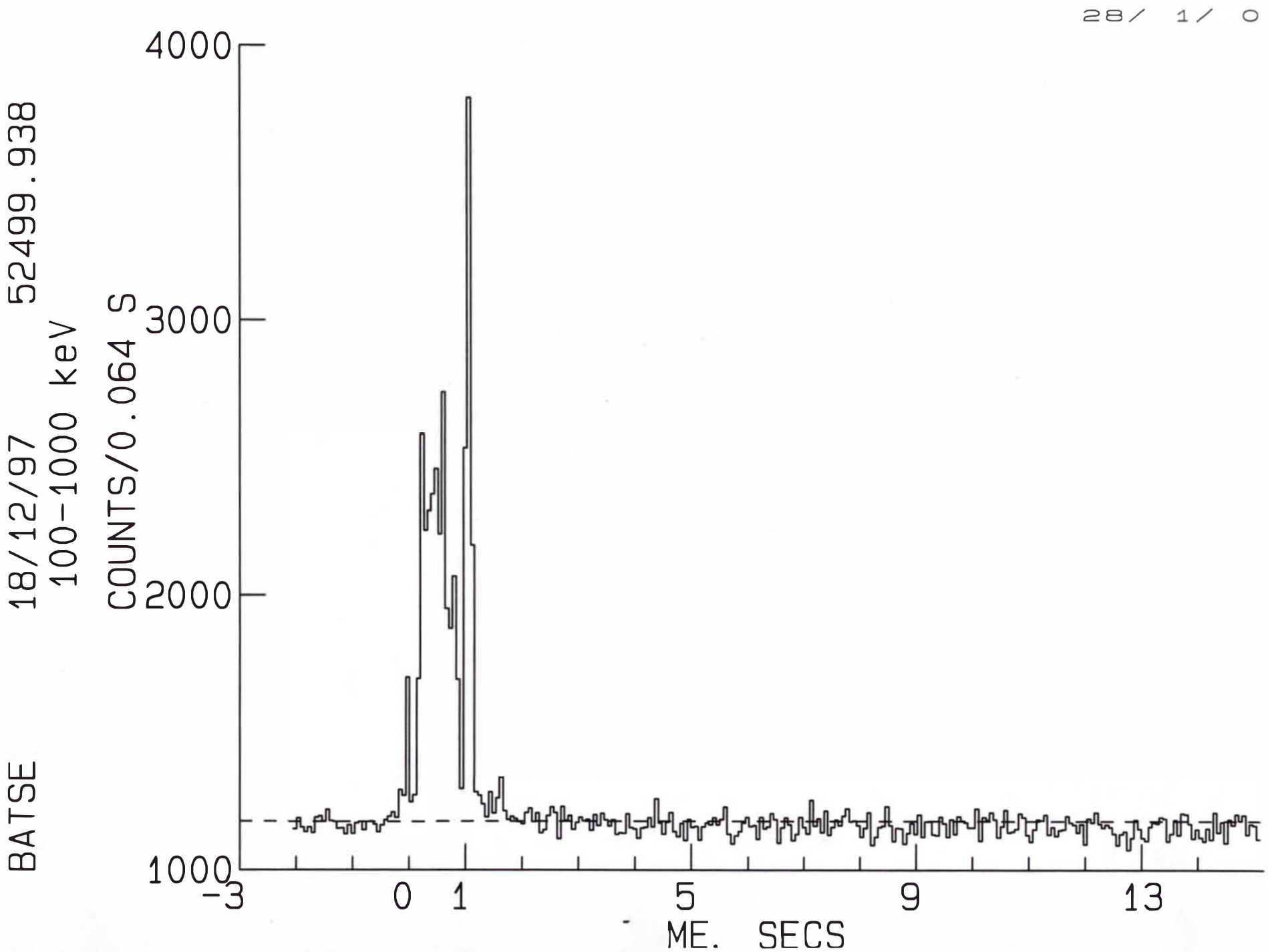
29- 200 keV

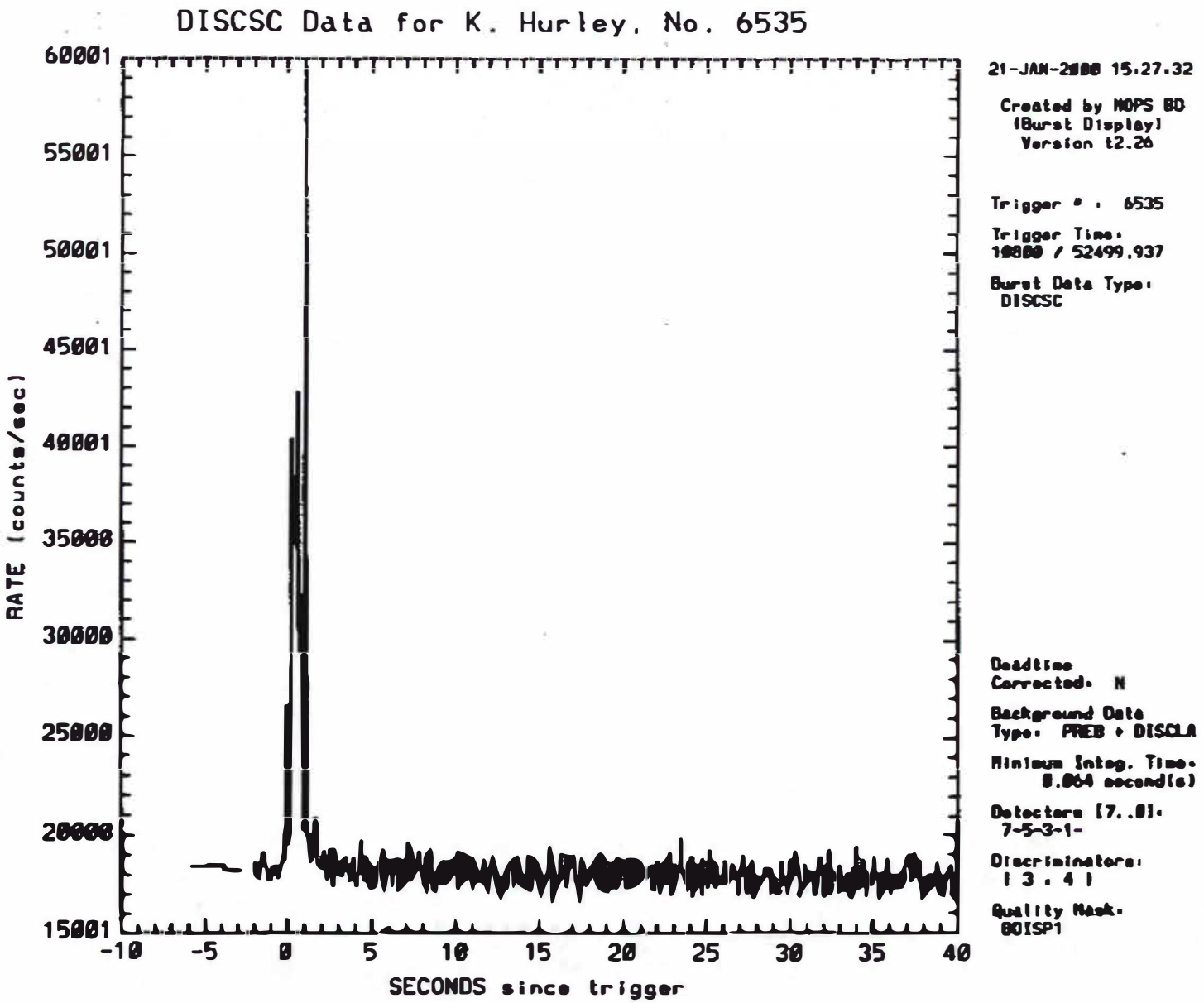



BATSE 18/12/97 52499.938
25- 100 keV
COUNTS/0.064 S
800
1300
1800
2300
-3
0
1
3
6
13

12/ 1/98


DISCSC Data for K. Hurley, No. 6535
RATE (counts/sec)
34000
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
12-JAN-1998 08.33.05
Created by MDPS BD
(Burst Display)
Version 12.25
Trigger # : 6535
Trigger Time:
18000 / 52499.937
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
7-5-3-1-
Discriminators:
[ 1 : 2 ]
Quality Mask:
BDISP1


28/ 1/ 0
BATSE 18/12/97 52499.938
100-1000 keV
COUNTS/0.064 S
4000
3000
2000
1000
-3
0
1
5
9
13
ME. SECS


DISCSC Data for K. Hurley, No. 6535
RATE (counts/sec)
60001
55001
50001
45001
40001
35000
30000
25000
20000
15001
-10
-5
0
5
10
15
20
25
30
35
40
SECONDS since trigger
21-JAN-2000 15:27.32
Created by MOPS BD
(Burst Display)
Version t2.26
Trigger # : 6535
Trigger Time:
10000 / 52499.937
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
7-5-3-1-
Discriminators:
[ 3 , 4 ]
Quality Mask:
BDISP1

From HENZE@fender.msfc.nasa.gov Mon Dec 22 12:24:06 1997
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
        id MAA18634; Mon, 22 Dec 1997 12:23:56 -0800
From: HENZE@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
        id MAA01740; Mon, 22 Dec 1997 12:23:45 -0800
Date: Mon, 22 Dec 1997 14:22:55 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971222142255.224510ee@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6536
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6536
EVENT OF 1997 DEC 18 DAY OF YEAR=352
EVENT CROSSING TIME AT BATSE : 60317. S. OR 16:45:17.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 116.000 17.000
BATSE PEAK COUNTING RATE: 2700 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 18/12/ 97 IS:
RA= 170.532 DEC= 11.915 DIST= 5.098 AU
BATSE-ULYSSES DISTANCE = 762685703. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=127.11 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1534.81 SECS.
CROSSING TIME AT ULYSSES IS 58782. S. OR 16:19:42 +/- 378.94 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 18/12/ 97 IS:
RA= 302.239 DEC= -21.390 DIST= 2.091 AU
MARS-BATSE DISTANCE = 312749280. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 7.35 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1034.66 SECS.
CROSSING TIME AT MARS IS 61352. S. OR 17:02:31 +/- 38.87 SECONDS

BATSE BURST TRIGGER

NO.: 6536

TIME: TJD=0800 SECONDS=60317

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

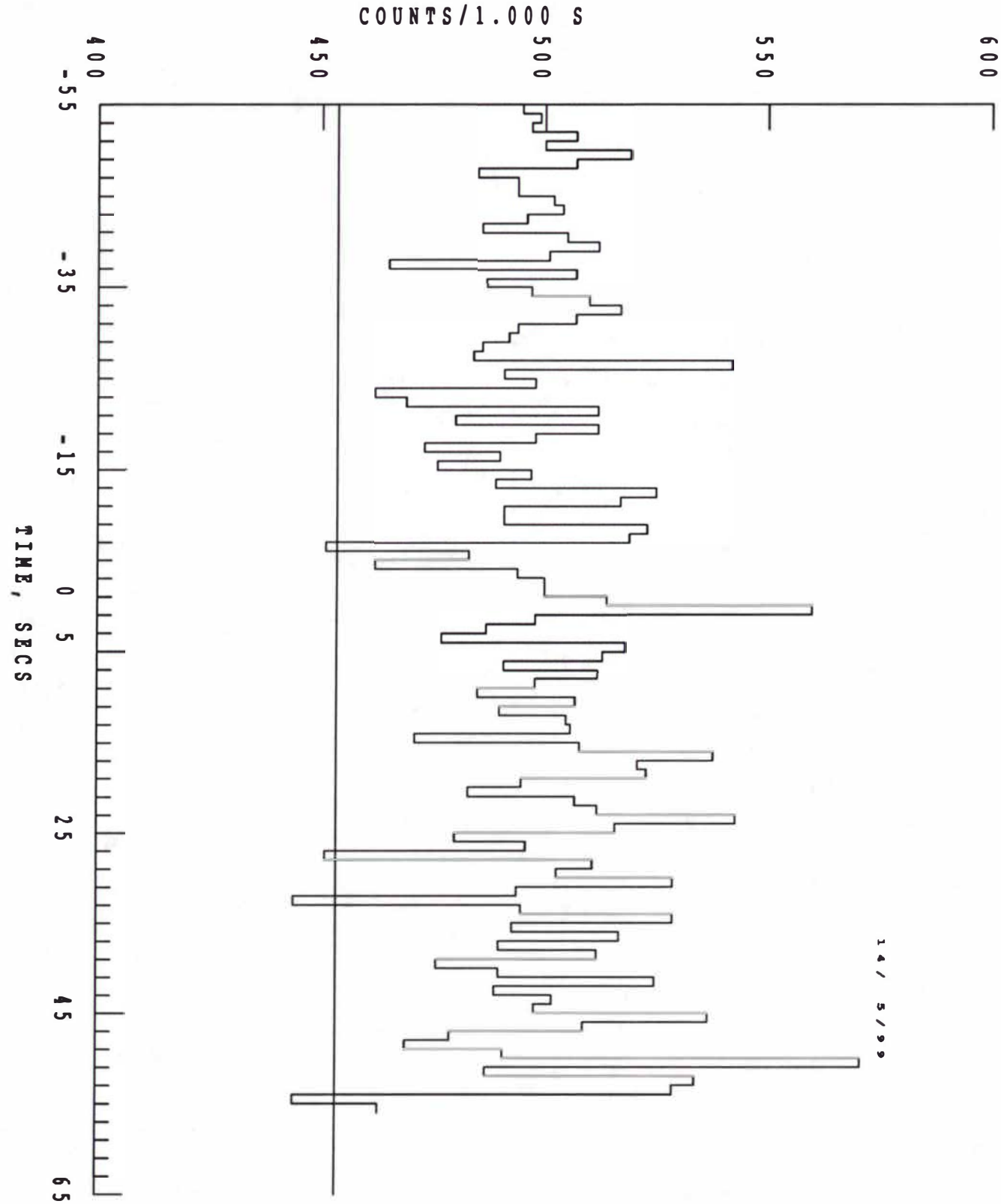
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=114.0 AZIMUTH=153.7 ERROR= 5.2 DEGREES

COMMENTS:
SINGLE PULSE, DUR. APPROX. 9 S, MAX AT APPROX. T, STARTS AT APPROX. T-4 S.
NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6536 | 971218 | 10800 | 60317 | 2700 | 116 | +17 | 9 |


NEAR
18/12/97
60249.722
100-1000 keV
COUNTS/1.000 S
400
450
500
550
600
-55
-35
-15
0
5
25
45
65
TIME, SECS
14/ 5/99

BATSE BURST# 6536

ULYSSES RT

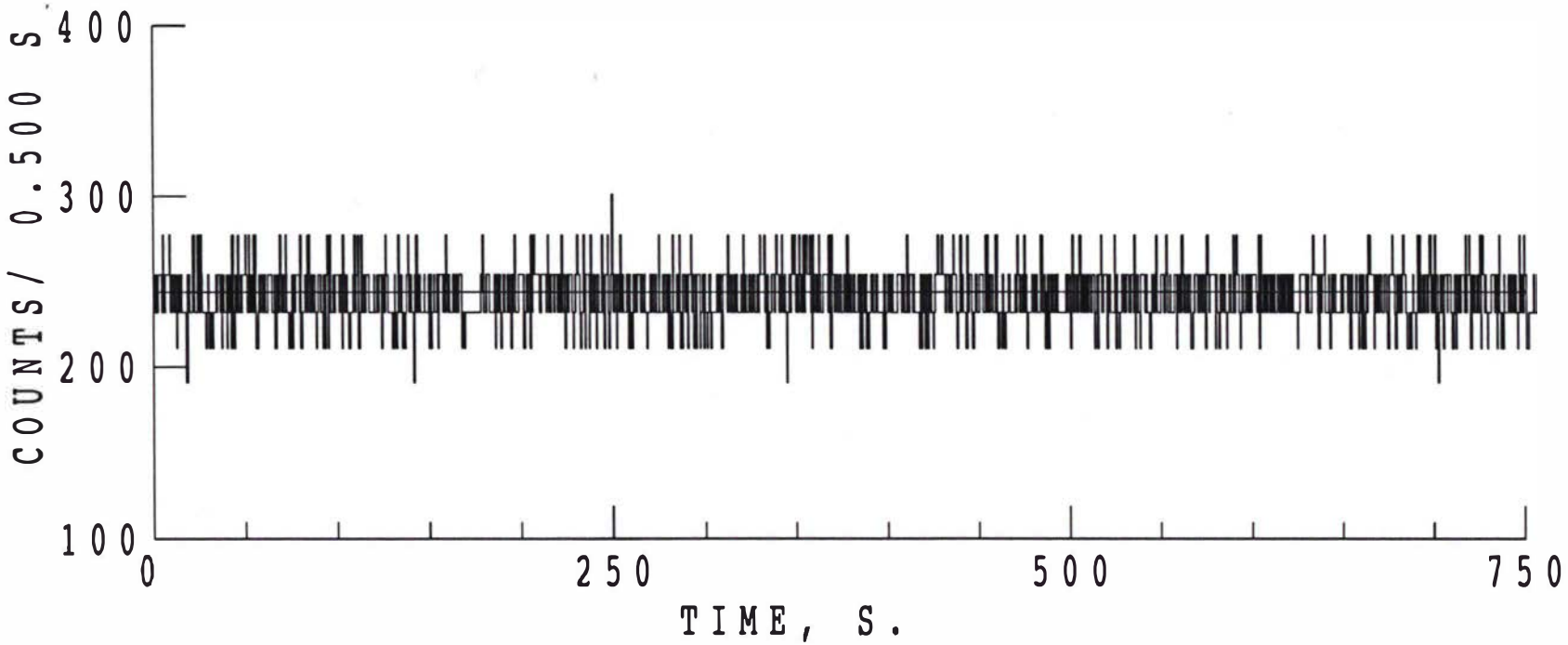
22/12/97

18/12/97 58392.410 s

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

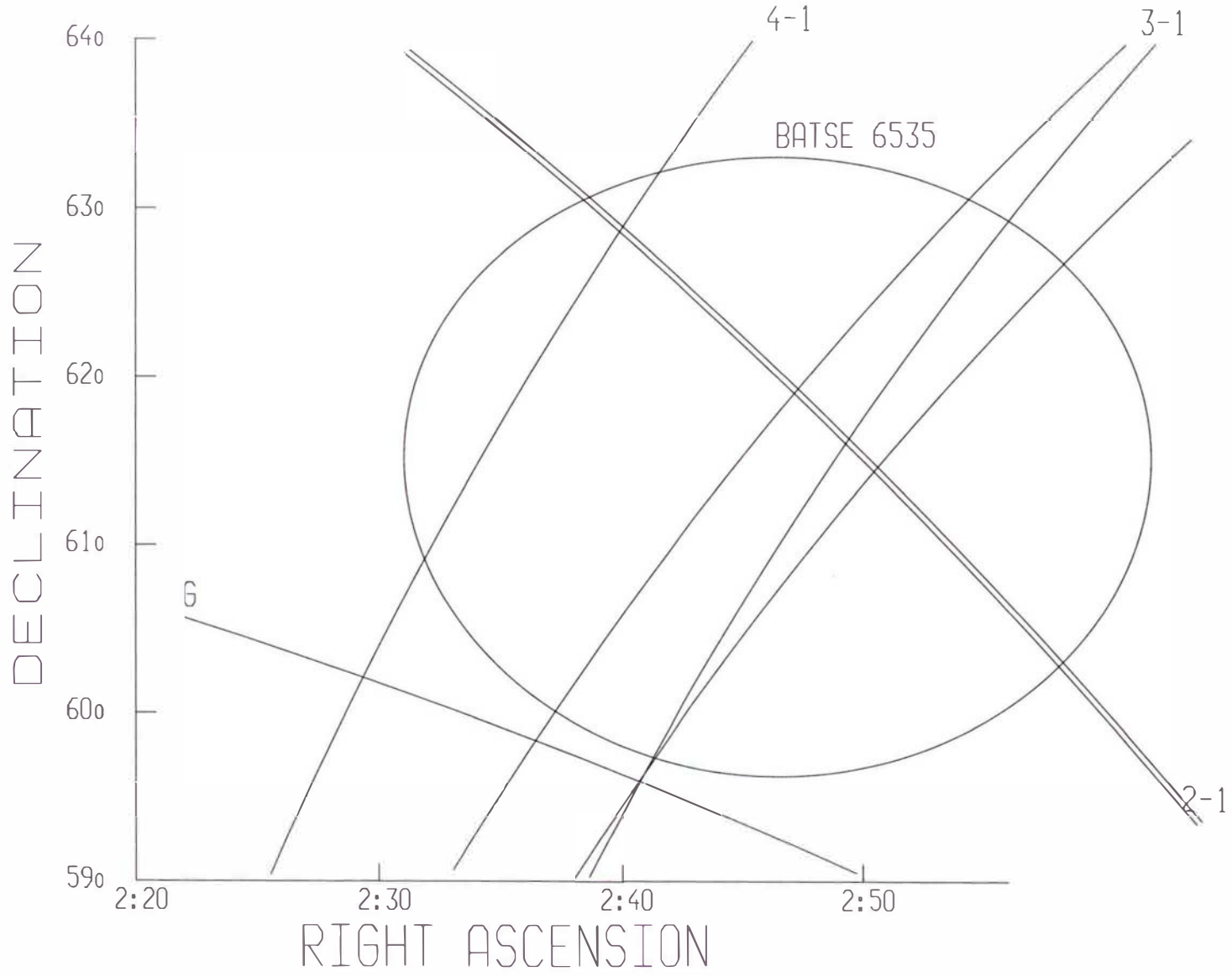
N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

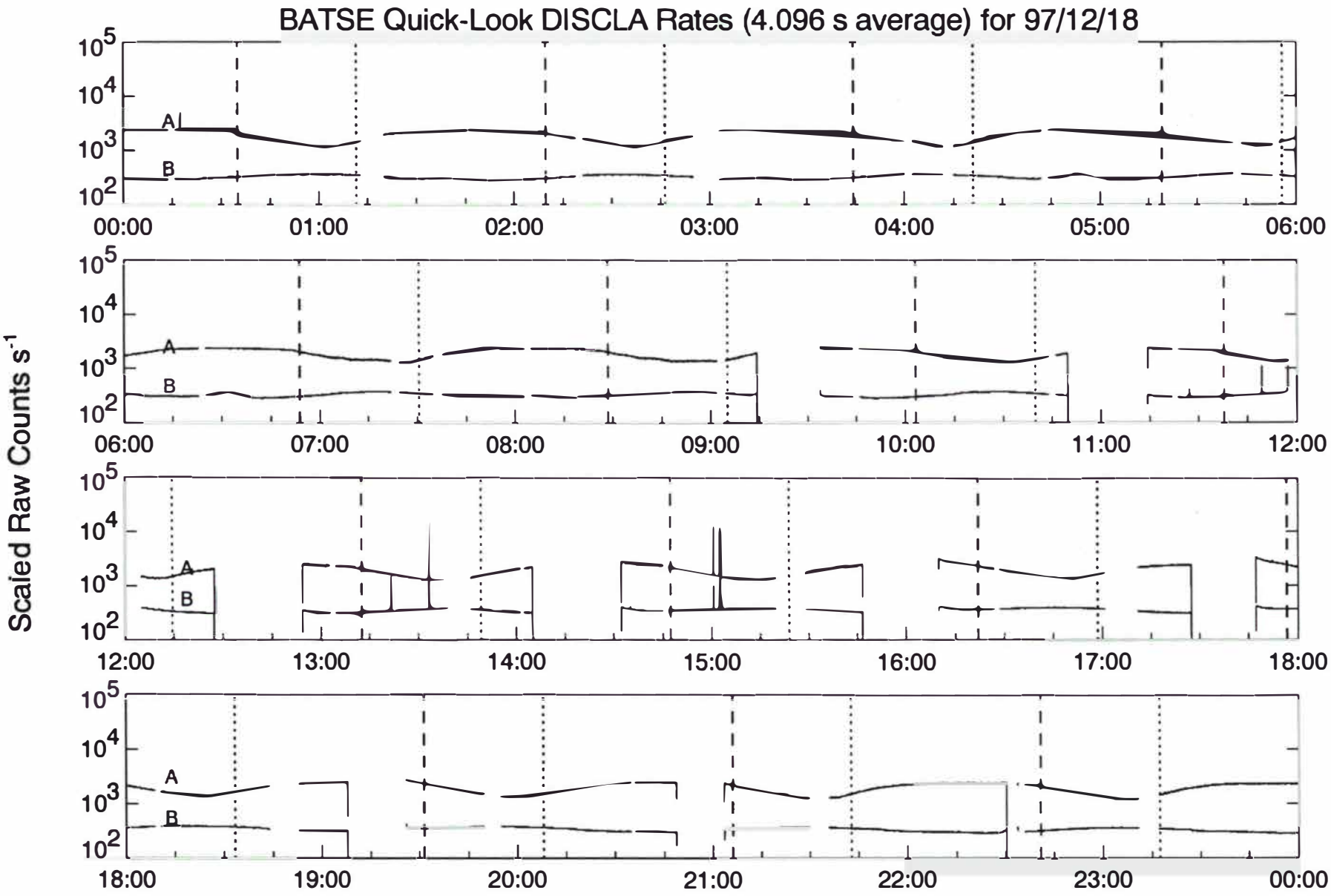


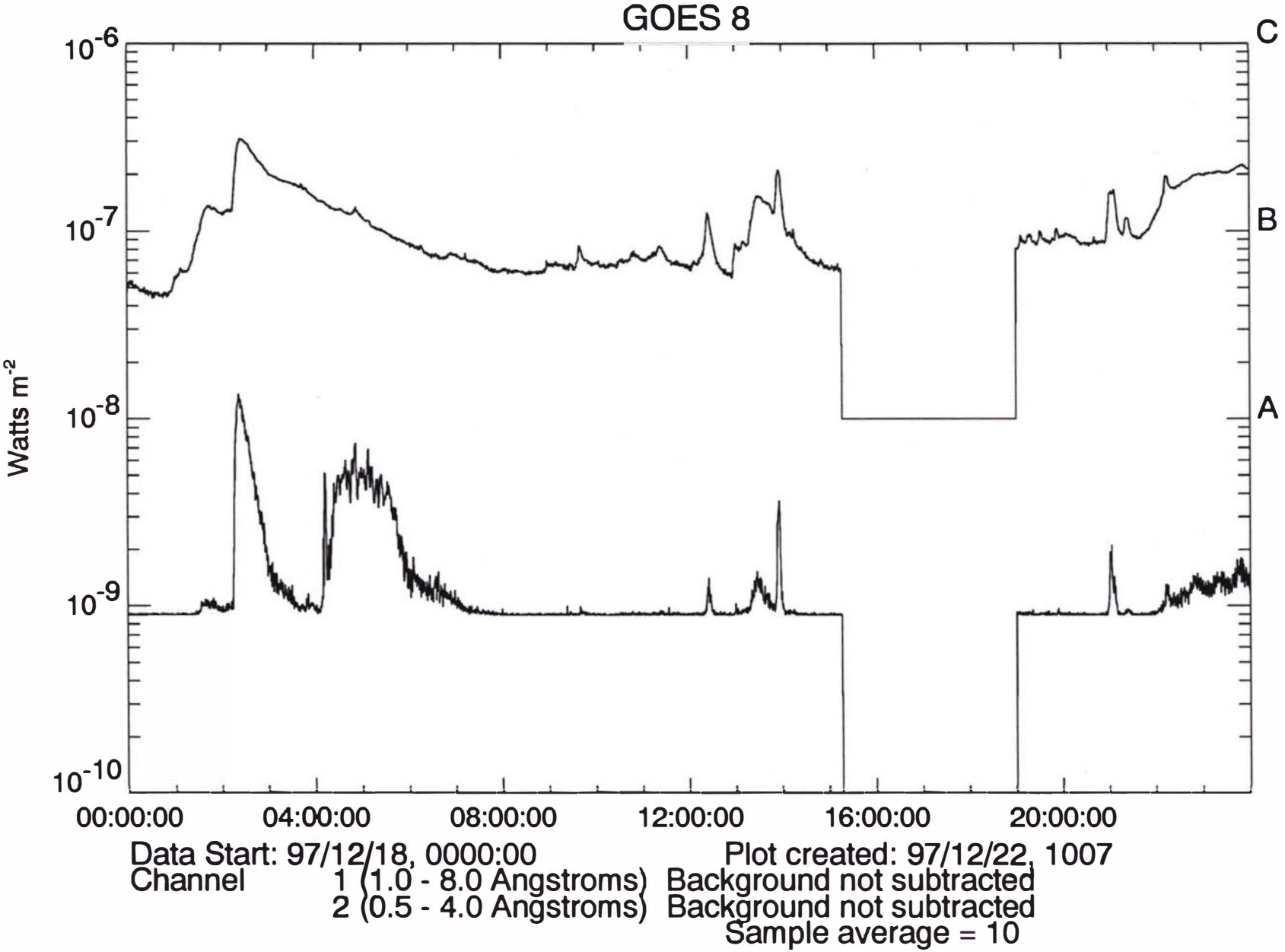
# EVENT OF DEC 18, 1997 14:34

07/05/2015

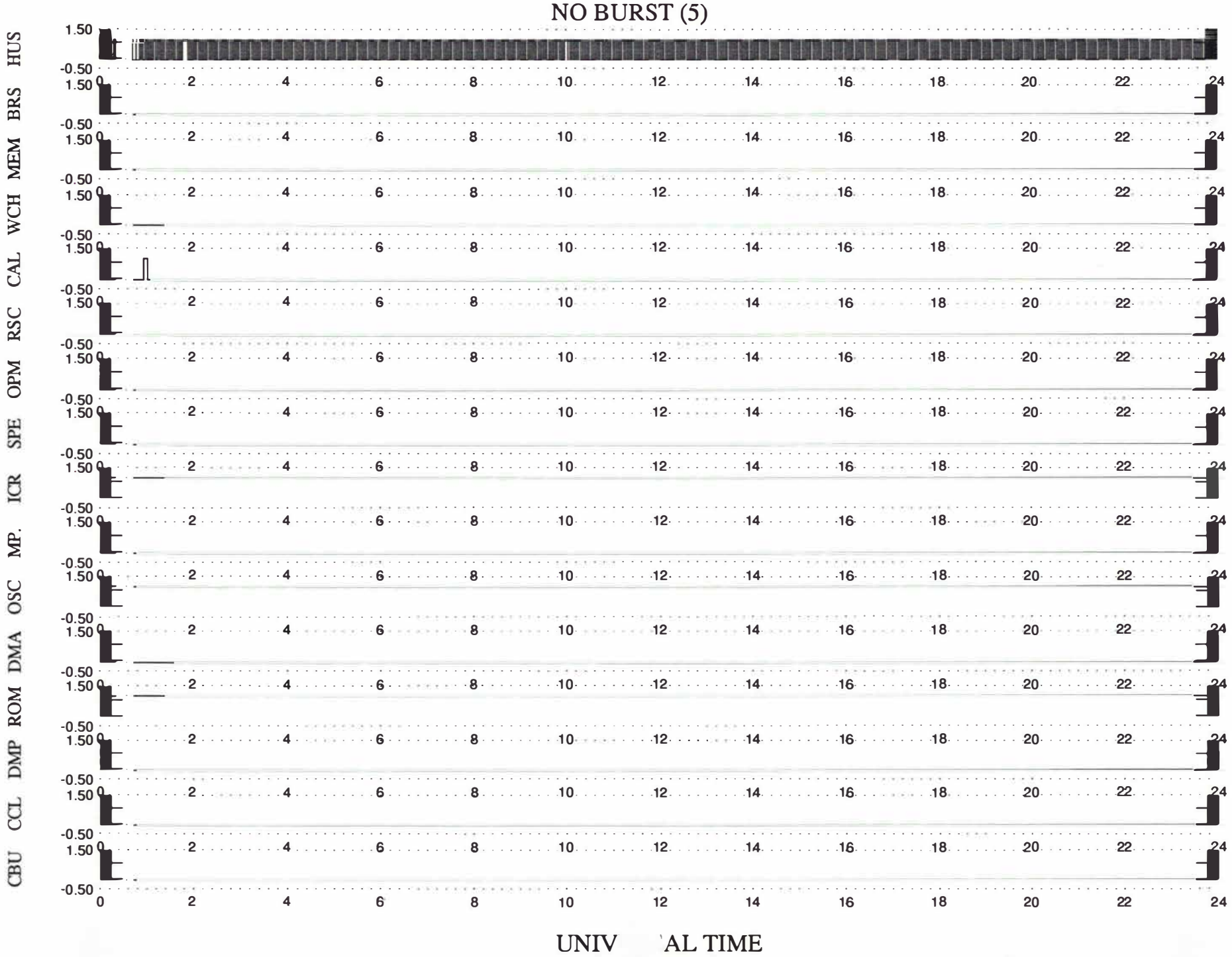
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 BATSE 2 ULYSSES 3 NEAR 4 KONUS2




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/18
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/22, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

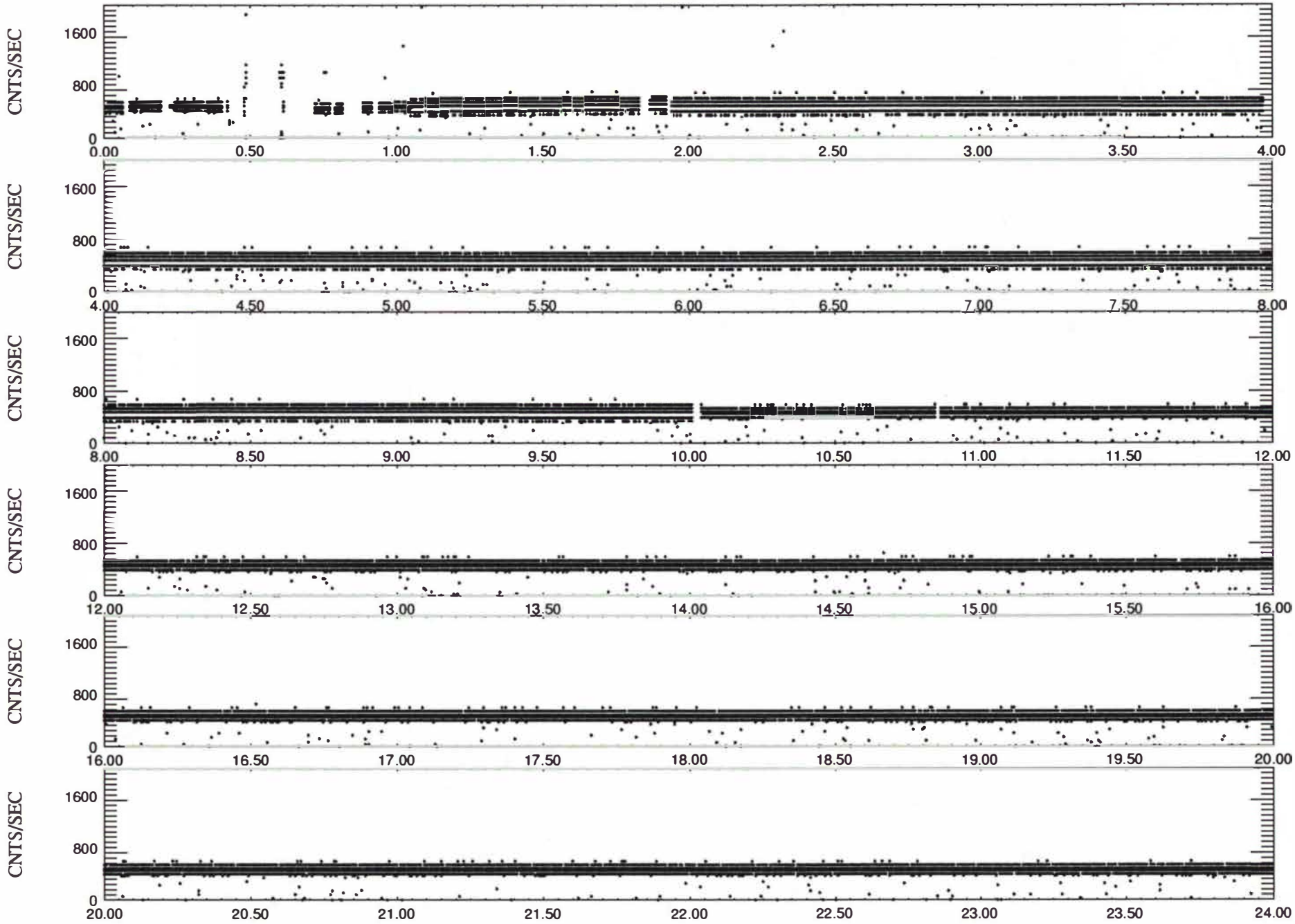

GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/18, 0000:00
Plot created: 97/12/22, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 352, year 1997 to day 352, year 1997 3/12/98



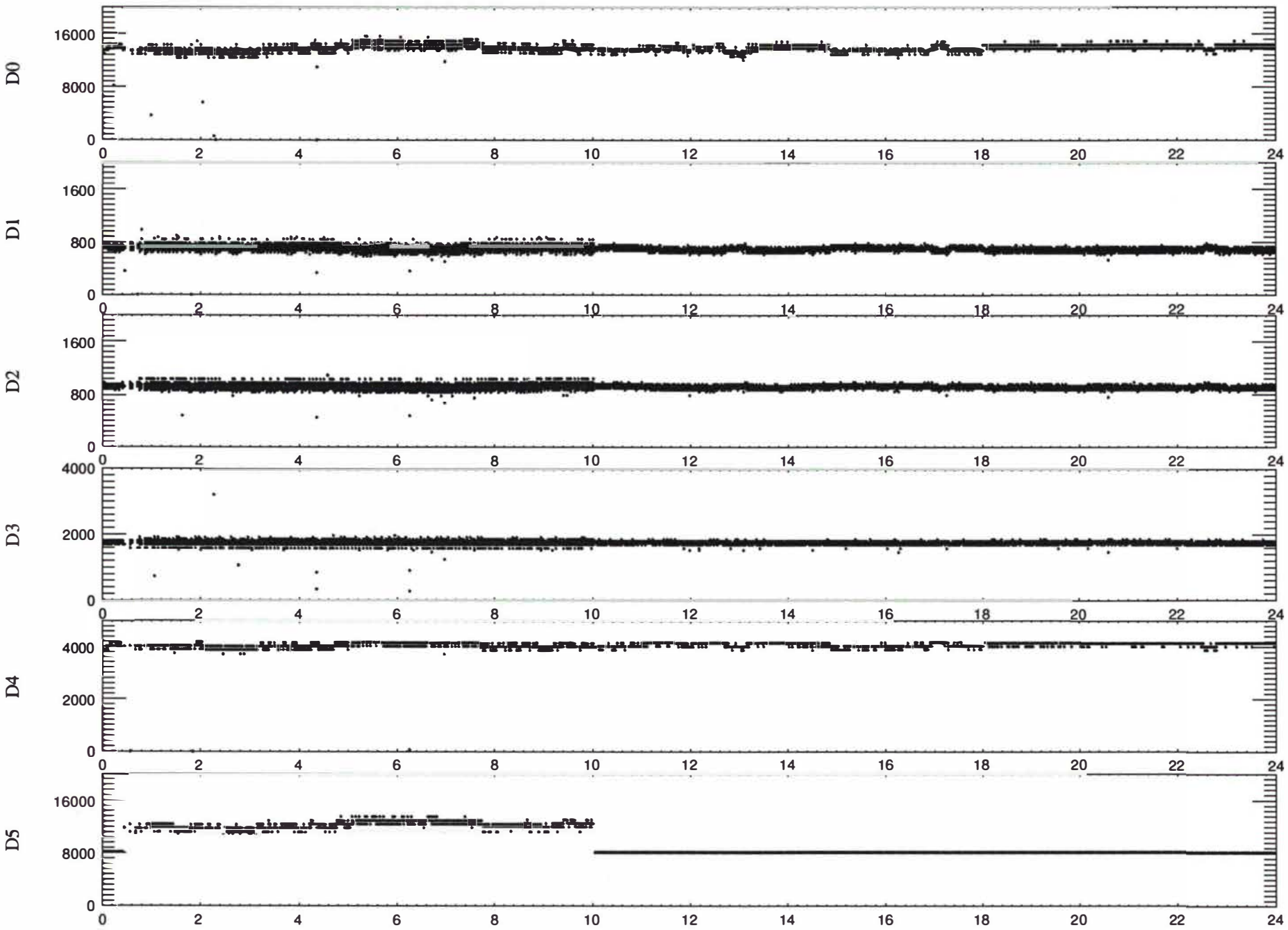
HUS 2A, MODE 1, NOT AVERAGED EDR day 352, year 1997 to day 352, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2B COUNTS / SEC EDR day 352, year 1997 to day 352, year 1997 3/12/98



From HENZE@fender.msfc.nasa.gov Mon Dec 22 10:14 PST 1997
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
        id KAA00795; Mon, 22 Dec 1997 10:14:10 -0800
Date: Mon, 22 Dec 1997 12:09:24 -0600 (CST)
From: Bill Henze (205-544-7616) <HENZE@fender.msfc.nasa.gov>
To: burst@comptel.sr.unh.edu, grobad@estsa2.estec.esa.nl,
        cline@lheavx.gsfc.nasa.gov, barthelmy@lheavx.gsfc.nasa.gov,
        bacodine@lheawww.gsfc.nasa.gov, scott@circe.gsfc.nasa.gov,
        butterworth@lheavx.gsfc.nasa.gov, band@cass09.ucsd.edu,
        gruber@cass09.ucsd.edu, matteson@cass09.ucsd.edu,
        PACIESAS@fender.msfc.nasa.gov, HORACK@fender.msfc.nasa.gov,
        khurley@sunspot.ssl.berkeley.edu, park@kabul.llnl.gov
Message-Id: <971222120924.224547b6@fender.msfc.nasa.gov>
Subject: Burst Trigger Message
Content-Type: text
Content-Length: 1215
Status: R

BATSE BURST TRIGGER

NO.: 6537

TIME: TJD=0801 SECONDS=31947

TYPE: PARTICL SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
SAA ENTRY.

SAX

HUS DATA

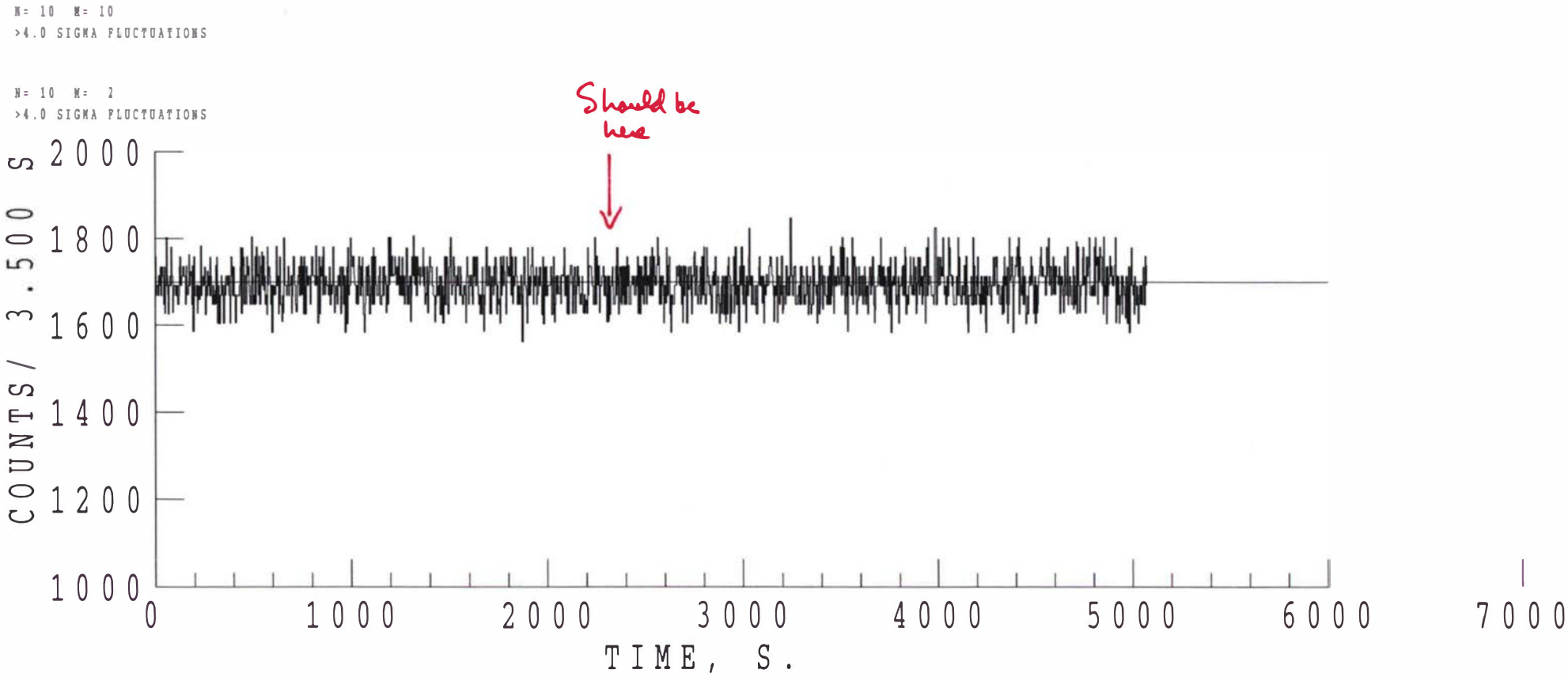
19/07/05

ULYSSES RT

19/12/97 35928.055 s

0.500 S INTERVALS REGROUPED BY 7

0- 0 keV



From SAHI@fender.msfc.nasa.gov Mon Dec 22 12:39:08 1997
Return-Path: <SAHI@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA18812; Mon, 22 Dec 1997 12:39:07 -0800
From: SAHI@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA01859; Mon, 22 Dec 1997 12:38:55 -0800
Date: Mon, 22 Dec 1997 14:38:38 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971222143838.224517a0@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6538
Content-Length: 1135
X-Lines: 26
Status: O

$X_0$ - too weak

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

BATSE BURST # 6538
EVENT OF 1997 DEC 19 DAY OF YEAR=353
EVENT CROSSING TIME AT BATSE : 70562. S. OR 19:36:02.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 357.000 35.000
BATSE PEAK COUNTING RATE: 3500 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 19/12/ 97 IS:
RA= 170.487 DEC= 11.900 DIST= 5.080 AU
BATSE-ULYSSES DISTANCE = 759983040. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 47.30 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1719.00 SECS.
CROSSING TIME AT ULYSSES IS 72281. S. OR 20:04:40 +/- 399.58 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 19/12/ 97 IS:
RA= 303.057 DEC= -21.219 DIST= 2.094 AU
MARS-BATSE DISTANCE = 313247424. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=104.00 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -252.71 SECS.
CROSSING TIME AT MARS IS 70309. S. OR 19:31:49 +/- 172.18 SECONDS

BATSE BURST TRIGGER

NO.: 6538

TIME: TJD=0801 SECONDS=70562

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

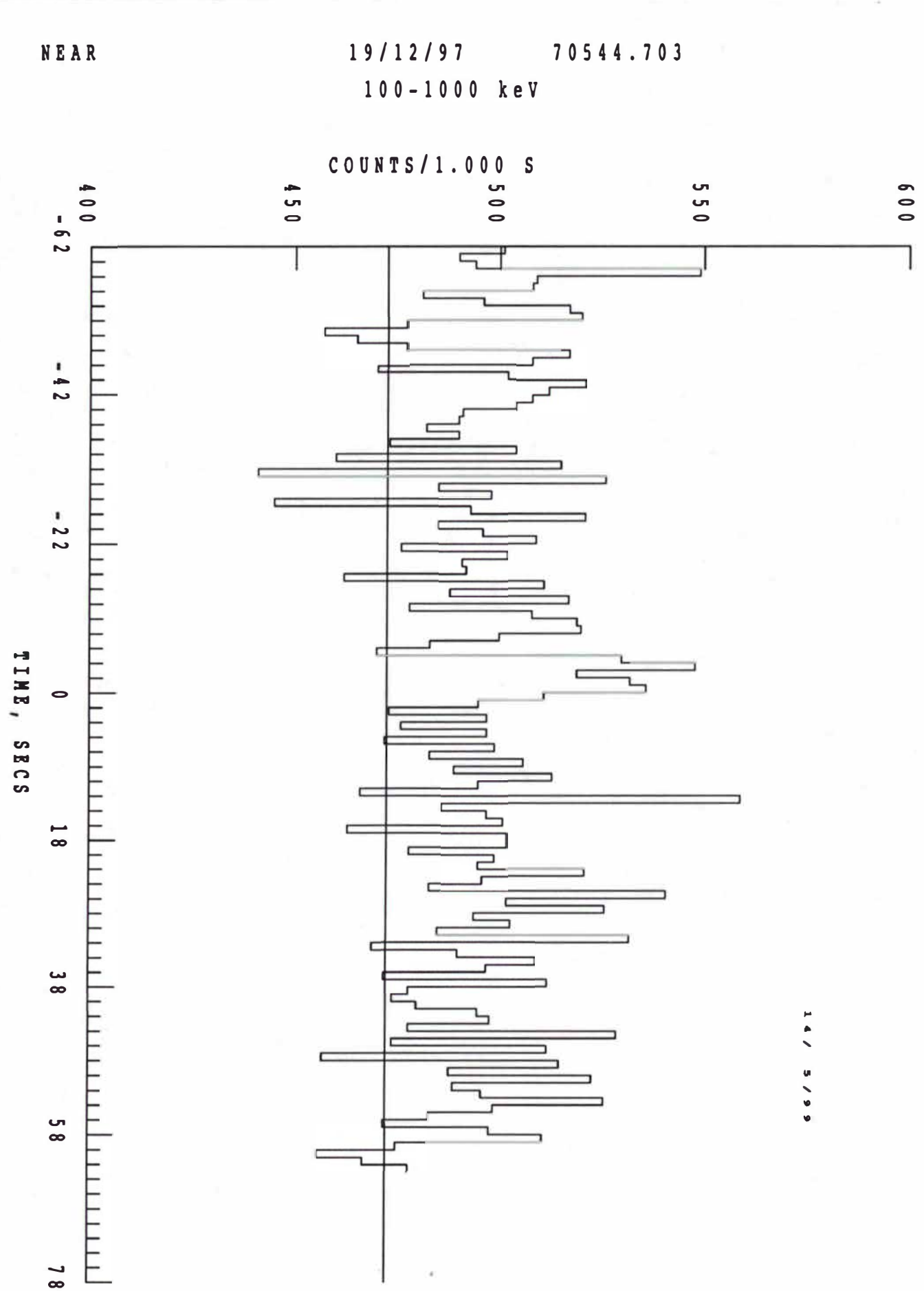
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=141.8 AZIMUTH=316.7 ERROR=2.22 DEGREES

COMMENTS:
BURST, SINGLE PULSE WITH SUBSTRUCTURE, DUR. APPROX. 40 SECS, MAX. AT APPROX. T+10 SECS. NOT VISIBLE ABOVE 300 KEV.

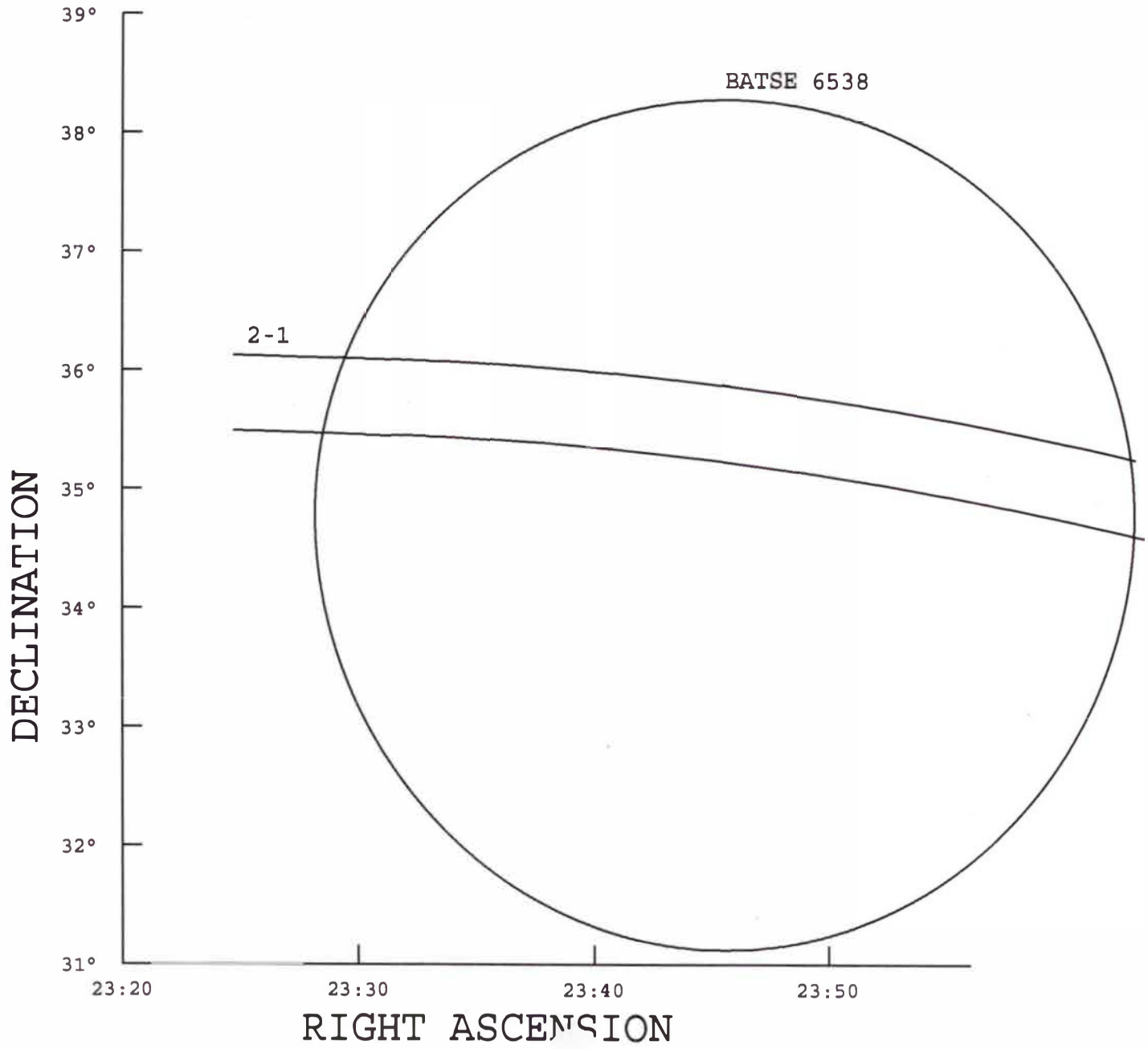
| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6538 | 971219 | 10801 | 70562 | 3500 | 357 | +35 | 40 |

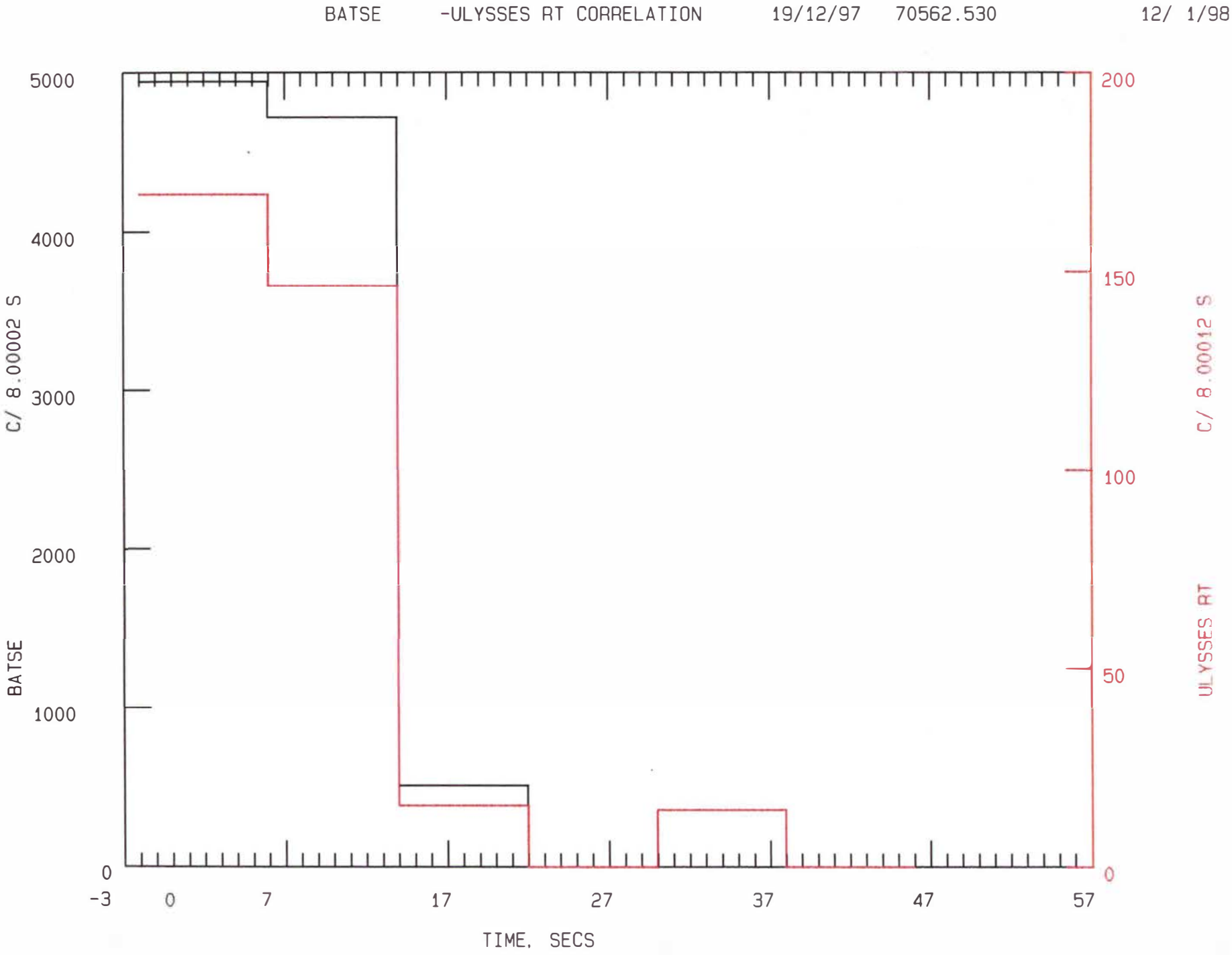

NEAR
19/12/97
70544.703
100-1000 keV
COUNTS/1.000 S
400
450
500
550
600
-62
-42
-22
0
18
38
58
78
TIME, SECS
14/ 5/99

# EVENT OF DEC 19, 1997 20:03

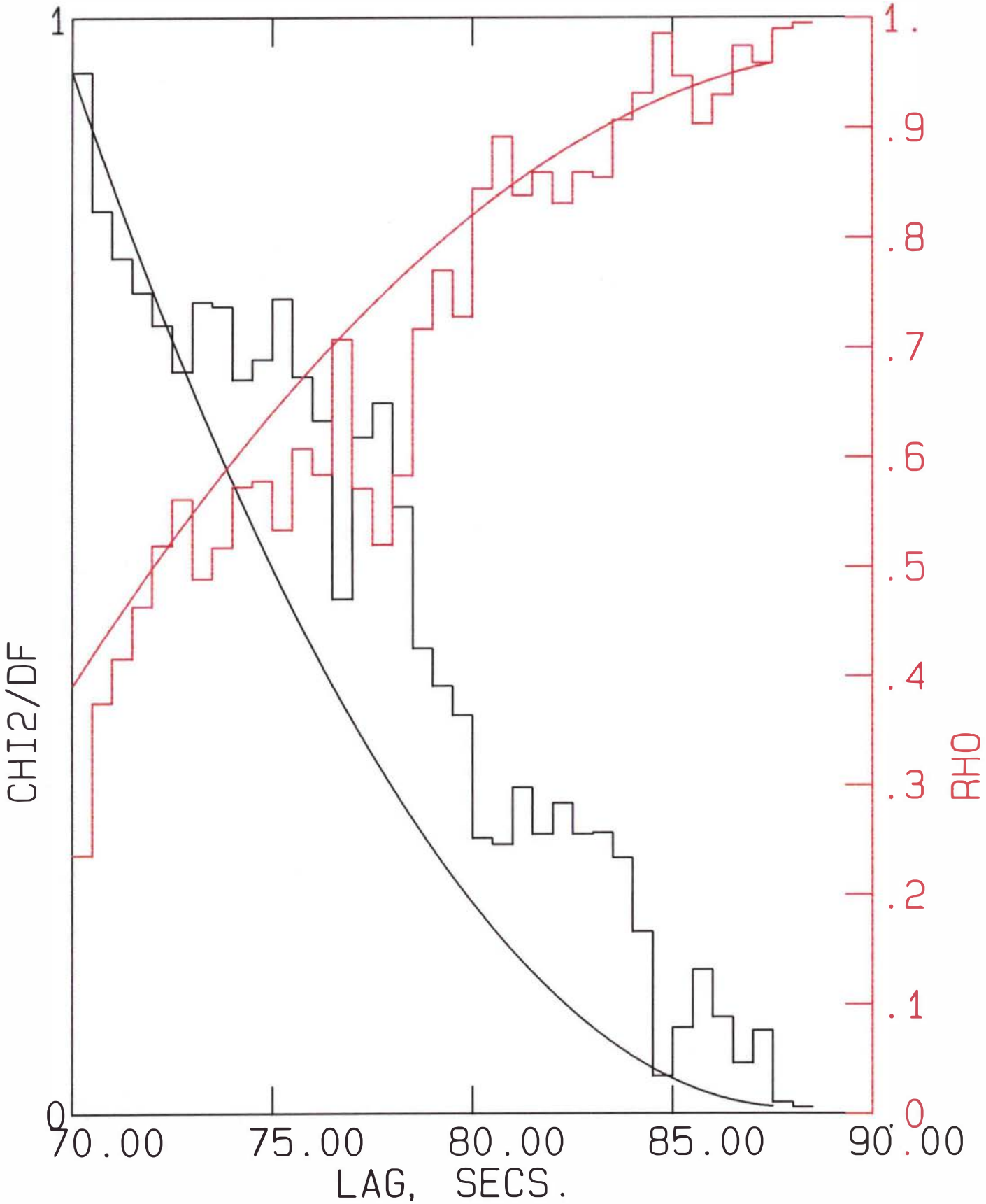
12/ 1/98

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




BATSE -ULYSSES RT CORRELATION 19/12/97 70562.530 12/ 1/98
5000
4000
3000
2000
1000
0
C/ 8.00002 S
BATSE
200
150
100
50
0
C/ 8.00012 S
ULYSSES RT
-3
0
7
17
27
37
47
57
TIME, SECS

BATSE -ULYSSES RT CORRELATION 19/12/97 70562.530

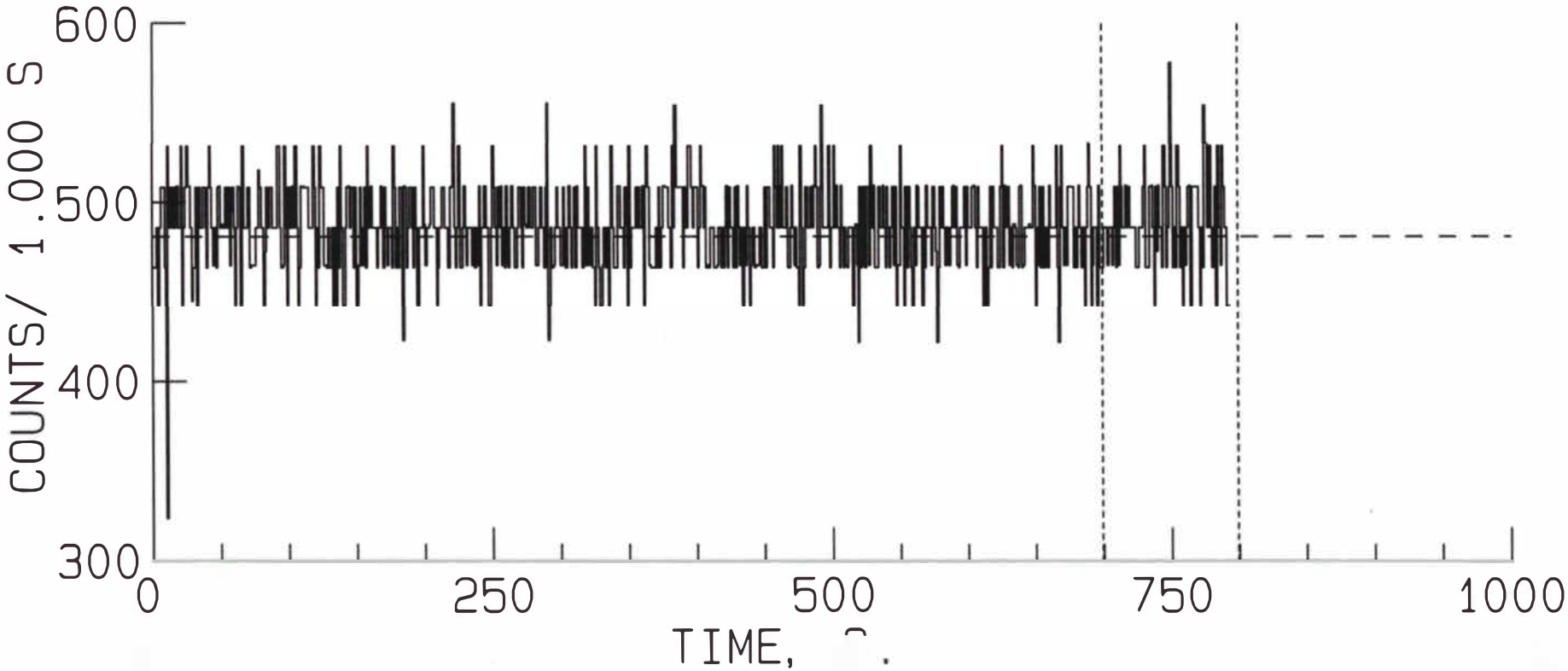


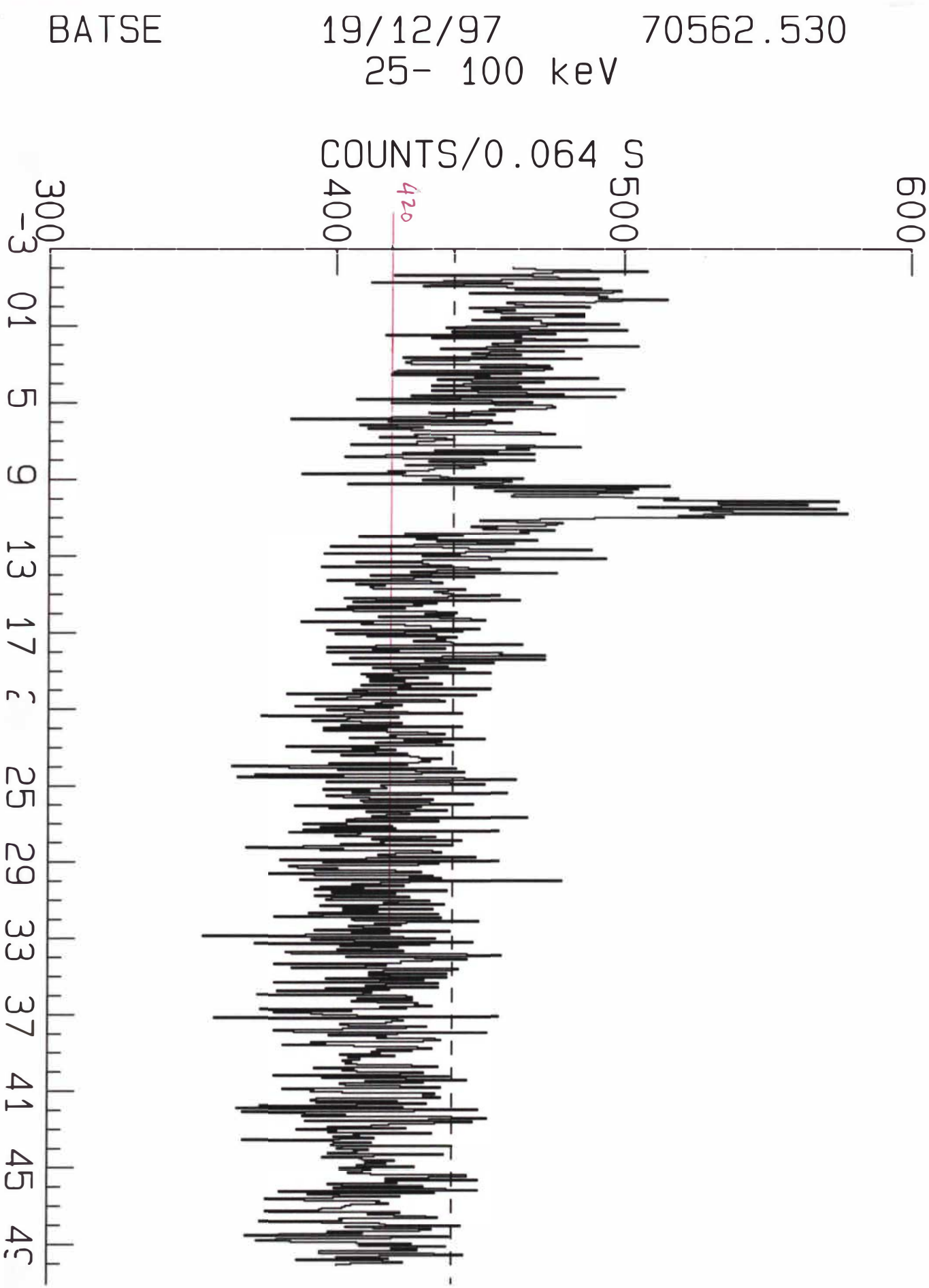
ULYSSES RT 12/ 1/98

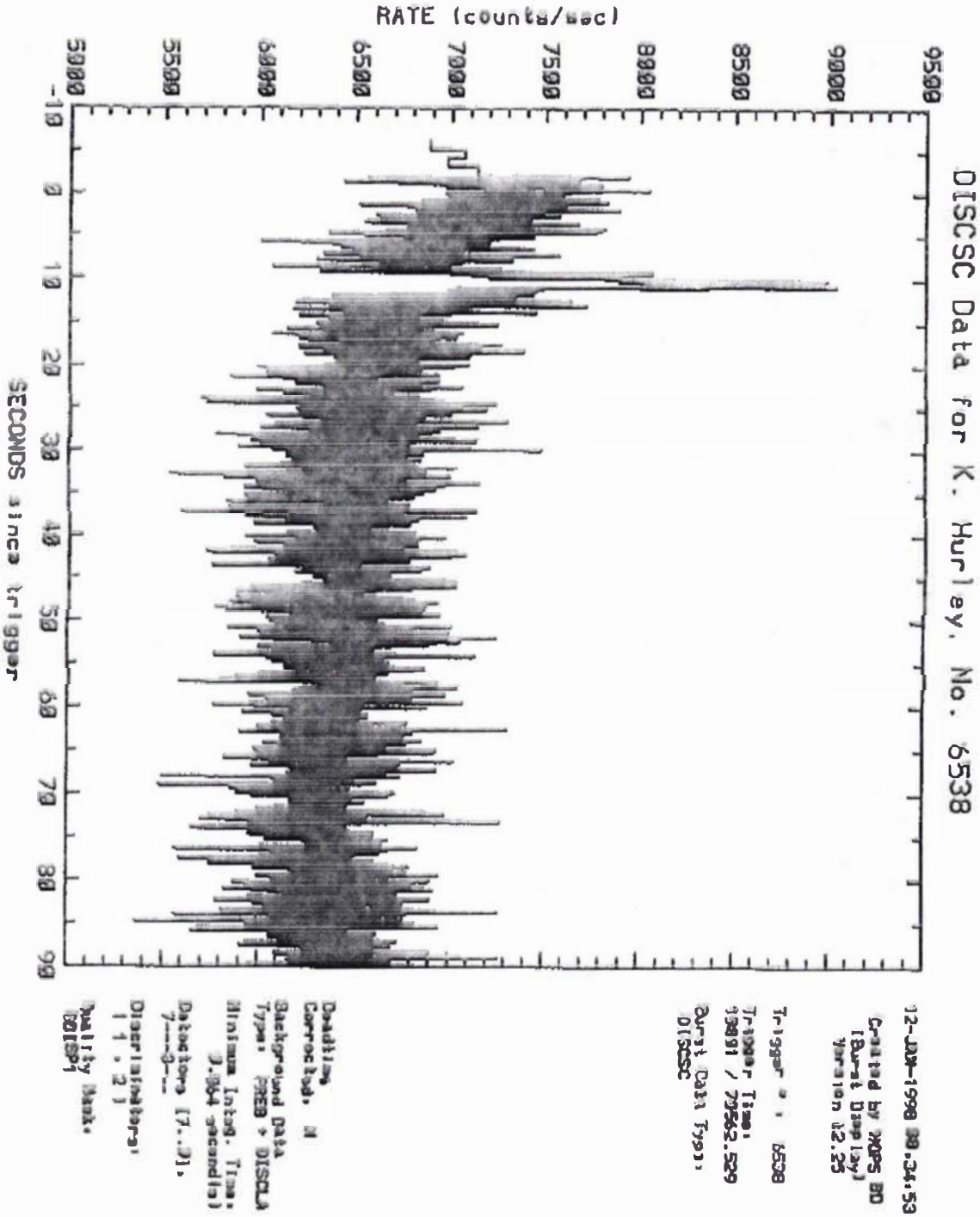
19/12/97 71892.031 s

0.500 S INTERVALS REGROUPED BY 2

22- 147 keV




BATSE 19/12/97 70562.530
25- 100 keV
COUNTS/0.064 S
300
400
420
500
600
-3
01
5
9
13
17
25
29
33
37
41
45
12/ 1/98


DISCSC Data for K. Hurley, No. 6538
RATE (counts/sec)
SECONDS since trigger
12-JAN-1998 08:34:53
Created by XOPS BD
(Burst Display)
Version 12.25
Trigger # : 6538
Trigger Time:
19991 / 79562.529
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 seconds)
Detectors (7..0):
7---0---
Discriminators:
( 1 , 2 )
Quality Mask:
(0015)

```
          262 65663.9 KONUS 30S,HARD,2PKS (+UL@63120,3100LS,MOD,20S)(13NO,14NO)

970922    265  2888.4 BATSE#6392,32880/SEC
       13 265  2894.4 PEAK(50/S),2910.5(110),@97DEG,ONE-SIDED,EDGE SR. DUBIOUS
       14 265  2894.6 PKS(200/S),2910.6(500/S),@109,ONE-SIDED,EDGE SAA.DUBIOUS

970925    268 81795.8 BATSE#6397,9551/SEC
       14 268 81798.3 PEAK (70/S,<10S) @ 42DEG (13SAA)

971009    282 68215.8 BATSE#6422,10861/S@1.8S+UL@69240,3050LS,MOD+KONUS@68215.0
       14 282 68217.2 PEAK(180/S,<2S)@83 (TRIGGER PEAK 68215.64) (13NO@145)

971019    292 53754.2 KONUS,10S (+UL@51000,2950LS,MOD,10S)
       14 292 53752.6 RISE,~50SEC,SOFT,NO TRIG (13 NO)

971029    302  5318.4 BATSE#6453,4717/S@35.8S (KONUS@5351.8,120S)(UL WEAK@2820)
       14 302  5326.0 PKS, 44.0,66.0,NO TRIG,@102DEG (13NO@49DEG)

971101    305 23484.5 KONUS (10SEC,FRED)(UL@26040,MOD,10S@2950LS)
       14 305 23483.8 PEAK (200/S,<2S) (13SR) TRIGGER PEAK 23483.0

971110    314 68141.3 KONUS,100SEC (UL@67080 @2950LS,MOD)(13 SR)
       14 314 68161.3 PEAKS, 213.3, MULT PEAKS,HARD,TRIGGER PKS 68213.19,213.91

971127    331 47595.8 BATSE#6509 (139968/S)
       13 331 47595.8 PKS,613.8,759.8(240),767.8(140)
       14 331 47760.5 PKS(3000/S),47768.5(2000), INTENSE, NOTRIG

971201    335  9295.6 BATSE#6515 (8768/S)
       14 335  9306.4 PK(SOFT)+9310.4(160)+9316.4(220)+9328.4(150),NOTRIG(13NR)

971207    341 72232.9 BATSE#6525 (7892/S@12.0)
       14 341 72244.2 PK(270),268.2,284.2 (@80DEG),TRIG PK 72244.28 (13NR)

971218    352 52499.9 BATSE#6535 (9181/S@+2.3S)
       13 352 52500.2 PK(70),52536.2(?)(SOFT,@38DEG)    (14SAA)

971219    353 79974.5 KONUS,10S,SPIKE@+4 (UL 77580,15SEC,MOD) (13SAA,14NR)

980109    009  4345.6 BATSE#6564(1401/S)+SAX,25S(IAU6805)(13NO@74,14NA@144)

980113    013 14845.7 BATSE#6570 (9376/S,COMPLEX,DUR60S)
       13 013 14869.2 PKS(50),879.2(50),883.2(50) (ONE-SIDED,@119DEG)
       14 013 14848.3 PEAK(60/S,<4S), NO TRIGGER

980119    019U 5100   ULYSSES MOD(32MS) @2350LS
       14 019  5375.9 PEAK (900/S,<8S,SOFT) (TRIG PEAKS 5372.9,5374.6)(13NO)

980124    024 23673.0 BATSE#6576, 16971/S @7.7S,SPIKY,MAX@+42.5,DUR100S)
       13 024 23679.1 PEAK(90/S,<8S),23707.1,23717.1 (LAST 2 WEAK,ONE-SIDED)
       14 024 23679.6 PEAK(300/S,<10S),707.6WEAK,715.6WEAK
       14 024 23679.1 TRIGGER PKS 679.07,679.99 (.1024S); 12.8MS PEAK 23678.43

980125    025 74368.7 BATSE#6581, 34996/S,MULT PKS,MAIN PK@+40,270S
       13 025 74416.4 PEAK @108DEG(220/S,<8S) (14NO@125)

 ,202     033U37380   ULYSSES MODERATE, 10SEC@2265LS
       13 033 35713.6 PEAK(80/S),35717.6(70),<8SEC OVERALL
       14 033 35712.9 PEAK(200/S),35718.9(400/S),<10SEC OVERALL, NO TRIGGER
```

From TERRELL@nisdp0.lanl.gov Fri Feb 27 15:11 PST 1998
From: TERRELL@nisdp0.lanl.gov
Date: Fri, 27 Feb 1998 16:11:55 -0700
To: khurley@sunspot.ssl.berkeley.edu, bonnard@milkyway.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, cline@lheavx.gsfc.nasa.gov,
henze@fender.msfc.nasa.gov, filippo@botes1.tesre.bo.cnr.it,
kmarar@isac.ernet.in
X-Vmsmail-To: @MAILOUTUL.DIS
Subject: DMSP GRB: 1997(many),980109,980113,980119,980124,980125,980202,980203

From: jterrell@lanl.gov (James Terrell) 980227
To: khurley@sunspot.ssl.berkeley.edu, bonnard@milkyway.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, cline@lheavx.gsfc.nasa.gov,
filippo@botes1.tesre.bo.cnr.it, henze@fender.msfc.nasa.gov,
kmarar@isac.ernet.in, kraken@rosserv.gsfc.nasa.gov,
scott@milkyway.gsfc.nasa.gov, teegarden@lheavx.gsfc.nasa.gov,
vnp@isac.ernet.in, yosimori@rikkyo.ac.jp
Subj: DMSP GRB detections: 1997(many),980109,980113,980119,980124,980125,980202,980203

The following GRB were detected by DMSP13 or DMSP14 (or NOT detected, if indicated).
No detection can occur for bursts more than 118 degrees from spacecraft zenith,
or if in the presence of very high counting rates (SAA,SR,NR).
Data are normally in 2-sec counts, except when the DMSP14 trigger circuit is
tripped, giving 12.8ms data, usually reported here as 102.4ms counts.
Numerous other BATSE GRB were also detected, but not reported here; numerous
weak detections by Ulysses have not been checked because of low counting
rates expected at an indefinite time.

| DATE | FL | DAY | TIME | NOTES---(ND=NO DATA,NA=NOT APPARENT & NOT ANALYZED)------(NO=DATA CHECKED--SHOWS NO DETECTION)(SR=S. RADIATION BELT)(NR=NORTH RADIATION BELT)(SAA=SOUTH ATLANTIC ANOMALY) | REPORTED |
|---|---|---|---|---|---|
| 970111 | | 011 | 35040.2 | BATSE GRB#5773 (8727CTS/2S) (SEE IAU6569,6571,6574,6598) | |
| | | 011 | 35040.2 | BEPPO SAX TRIG,INTENSE,50S,3 PEAKS(232.10,19.67J) IAU6533 | |
| | 13 | 011 | 35040.0 | PEAKS(40/S),48.0(50/S),58.0(60/S),@24DEG,@848KM,SOFT | REP0313 |
| 970111 | | 011 | 85744.6 | KONUS (HARD,SLOW RISE) +TGR (UL:NO) (DMSP13:NO) | |
| 970117 | | 017 | 53211 | TGR+SAX GRB (KONUS INOP)+UL@54420(STRONG,20S) (13:NO) | |
| 970124 | | 024 | 44343.4 | KONUS(MULT PKS)+UL@46253@2100LS,STRONG+TGR (13SAA) | |
| 970201 | | 032 | 57250.7 | BATSE GRB#5989 (53612/SEC) +UL | |
| | 13 | 032 | 57222.1 | PEAK (100/S,~30S,SOFT,BROAD) (@111DEG) UNCONVINCING | |
| 970218 | | 049 | 50996.1 | KONUS (STRONG,5SEC) +UL@51274,2000LS (STRONG,8SEC) | |
| | 13 | 049 | 51001.0 | PEAK (320/S,<6S) | REP0624 |
| 970222 | | 053 | 86006.6 | KONUS (MOD.STRONG,SEV.SEC) +UL@85873,2000LS,MOD,2S(13NO) | |
| 970226 | | 057 | 31585.9 | KONUS (STRONG,SOFT PK@+39) +UL@30547,2000LS(V.INT,40S) | |
| | 13 | 057 | 31595.8 | PEAK (270/S,10SEC) (MODERATELY STRONG) | REP0313 |
| 970228 | | 059 | 10680.8 | BEPPOSAX(IAU6572)MOD.INT.,80S,4 PKS (75.46,11.75J)IAU6578 | |
| | | 059 | 10680.8 | INT.X-RAY,RADIO(IAU6576,6577),OPTICAL(6584),MOTION(6629) | OPTICAL |
| | 13 | 059 | 10659.1 | PKS,667.1(60/S,ONE-SIDED,SOFT,@74DEG) DOUBTFUL (+UL,WIND) | |
| 970313 | | 072 | 30096.5 | KONUS(MOD.STRONG,PK@+11,40S)+UL@28380,2000LS(MOD.INT,10S) | |
| | 13 | 072 | 28355.8 | PEAK (180/S,<2S,SOFT) (NO PEAK AT 30096!) (CONFLICT) | REP0501 |

---

:mber 17 1997 02:08  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

November 18 1997 11:22  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

November 29 1997 20:25  Ulysses time; weak burst, 100 ms long

This event was not detected by Konus.

---

December 7 1997 11:24  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

December 11 1997 20:22  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.

---

December 14 1997 08:44  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.

---

December 19 1997 21:33  Ulysses time; moderate burst, 15 s long

Konus triggered at 22:12:54.241 in the North-facing detector.  The event consisted of a single broad soft peak lasting 10 seconds, with a 50-200 keV spike 4 seconds after the trigger and lasting 0.5 seconds.

---

·ember 25 1997 17:23  Ulysses time; weak burst, 32 ms long

Konus waiting-mode data records a couple of events during the period of interest.  There was a weak to moderate North-facing detector soft event lasting 60 seconds, with a peak at 18:00:35.  A single 3-second timebin

From David.M.Palmer.1@gsfc.nasa.gov Mon Jan 5 12:18 PST 1998
X-Sender: palmer@lheapop.gsfc.nasa.gov
Mime-Version: 1.0
Date: Mon, 5 Jan 1998 15:20:17 -0500
khurley@sunspot.ssl.berkeley.edu (Kevin Hurley)
From: David Palmer <David.M.Palmer.1@gsfc.nasa.gov>
Subject: No TGRS events for 971219 nor 971225

TGRS saw neither of these, with neither trigger nor rate increase.

>December 19 1997 21:33 Ulysses time; moderate burst, 15 s long
>
>December 25 1997 17:23 Ulysses time; weak burst, 32 ms long

It did see a burst at 971225_54409 (= 15:06:49)

David Palmer
palmer@lheamail.gsfc.nasa.gov
USA (301) 286-2739 Voice
USA (301) 286-1684 Fax

Date: Oct 8 '09

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

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

## 2. For Konus events

☑ Konus ecliptic latitude used with latest calibration?

## 2. For Odyssey events

☐ Was CHECKMO run to eliminate data gaps?

☐ Did the Odyssey ephemeris correspond to the event time? (When there is data in the database, the ephemeris is for the start of record, usually ~1320 s prior to the request time; when there is no data in the database, the ephemeris is for the request time in the e-mail, so the request time in mosearch should be equal to the GRB time. Note that the time in the return e-mail will be ~1320 s prior to the time requested, in the line "no HEND data…")

☐ Was Mars-blocking used?

☐ For cruise phase data (April – October 2001), was the updated data used? (Old data has timing errors)

☐ GRS database searched for triggered data? Database data between August 2005 and January 2006 should be re-extracted, due to timing errors. (E-mailed data should be OK).

☐ GRS and HEND data cross-correlated to check timing?

## 2. For 3 or More Spacecraft events

☐ $\Sigma$ $3\Delta t$'s calculated, and/or BMAPSUM executed?

## 3. For INTEGRAL events

☐ INTEGRAL SPI-ACS website checked for bursts that weren't transmitted automatically?

☐ 125 ms added to INTEGRAL SPI-ACS time for bursts prior to April 2 2004 11:00 UT?

☐ Updated ephemeris used for bursts prior to September 30, 2003?

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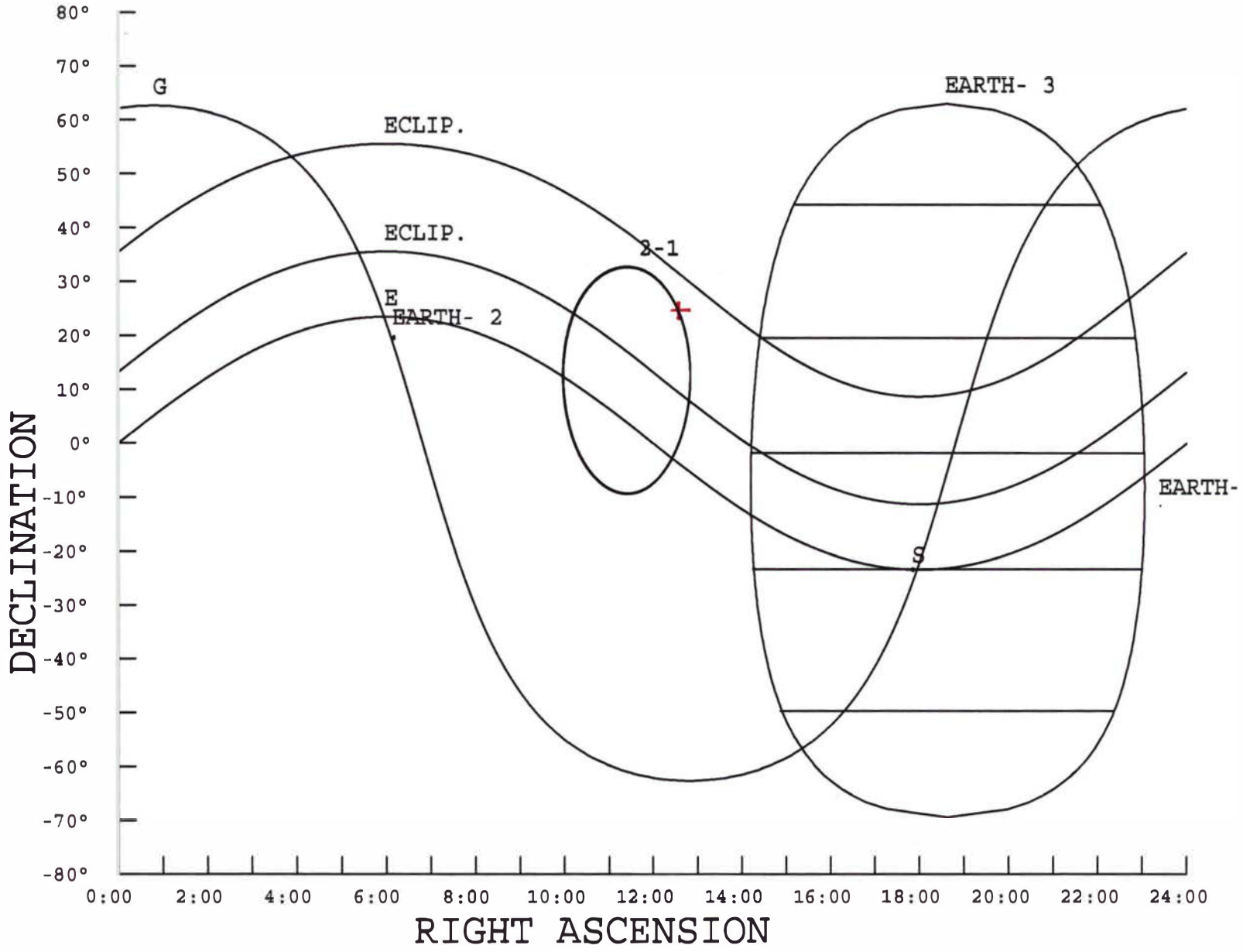
☑ ACCESS and MBL4 databases updated?

SAX added Jan 8

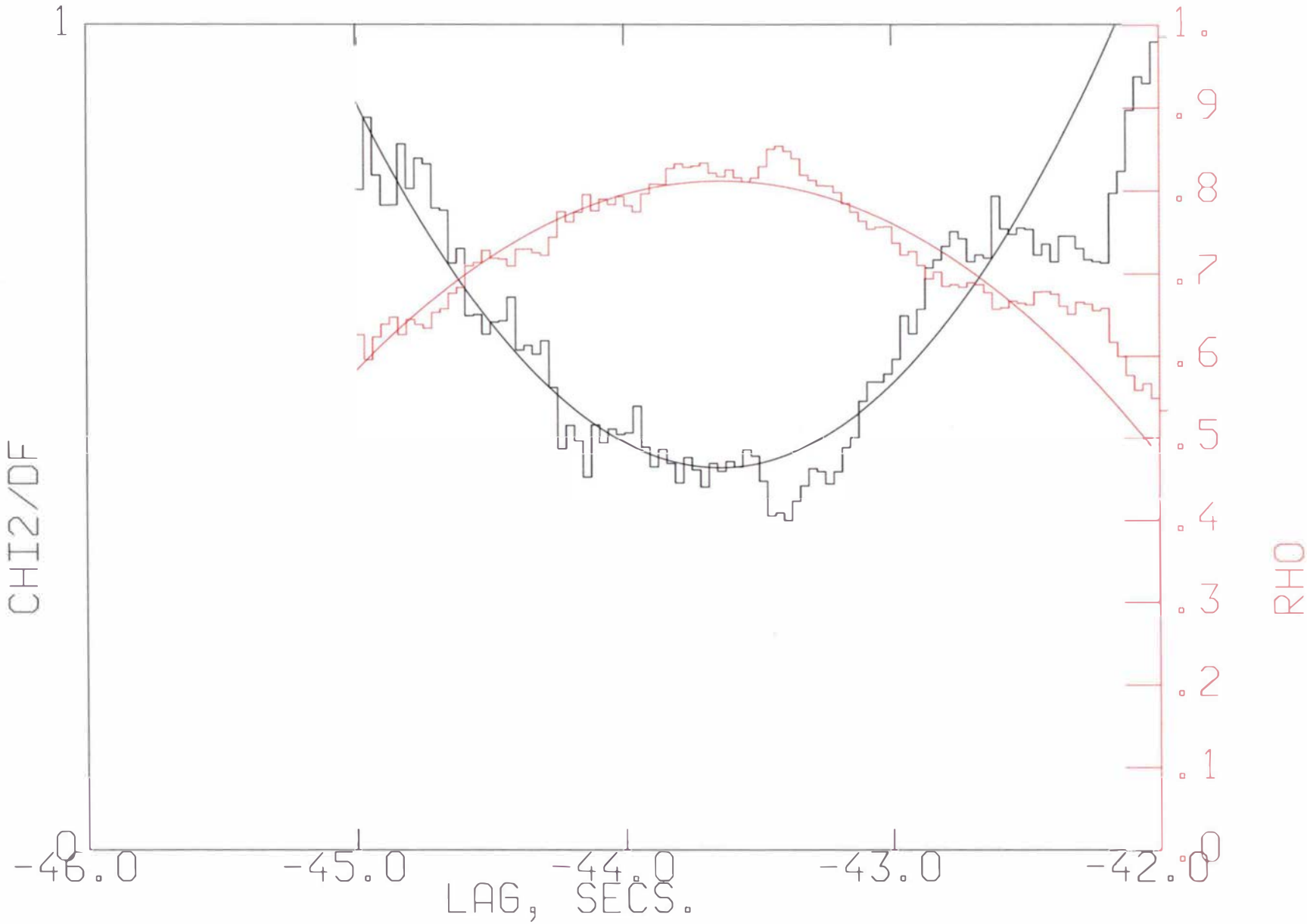
# EVENT OF DEC 19, 1997 21:32

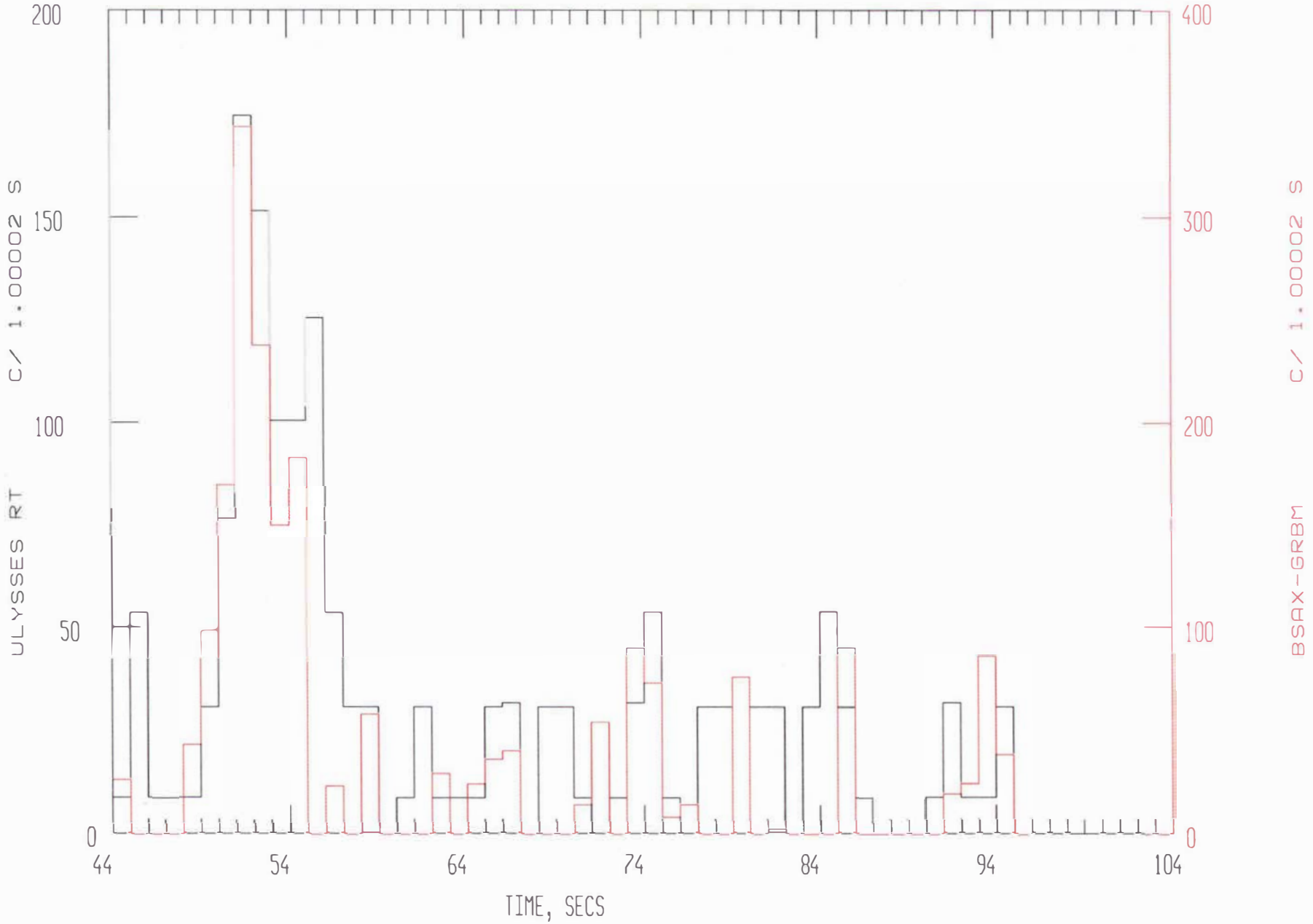
8/ 1/10

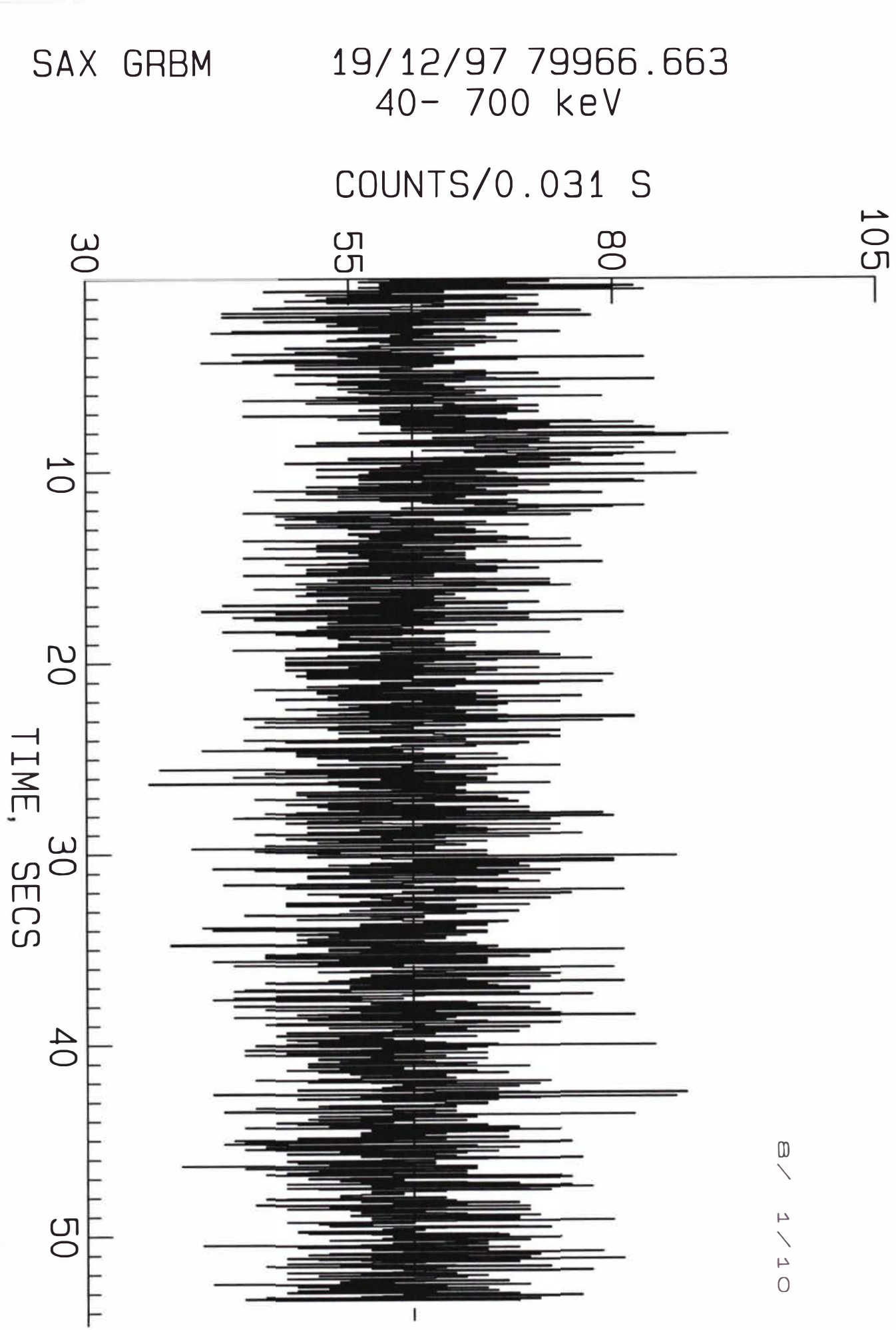
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 KONUS2 3 SAX

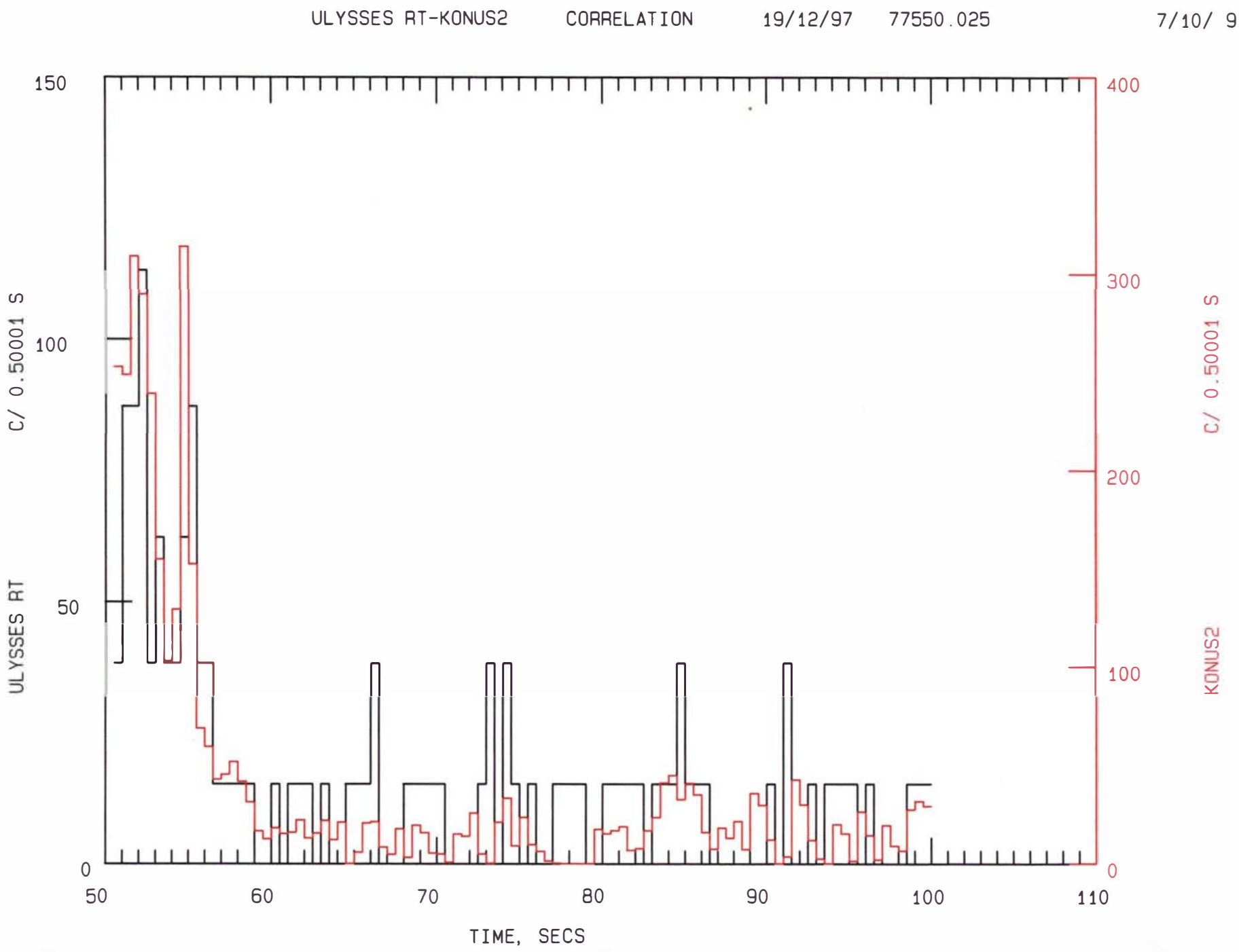


ULYSSES RT-BSAX-GRBM CORRELATION 19/12/97 77550.025

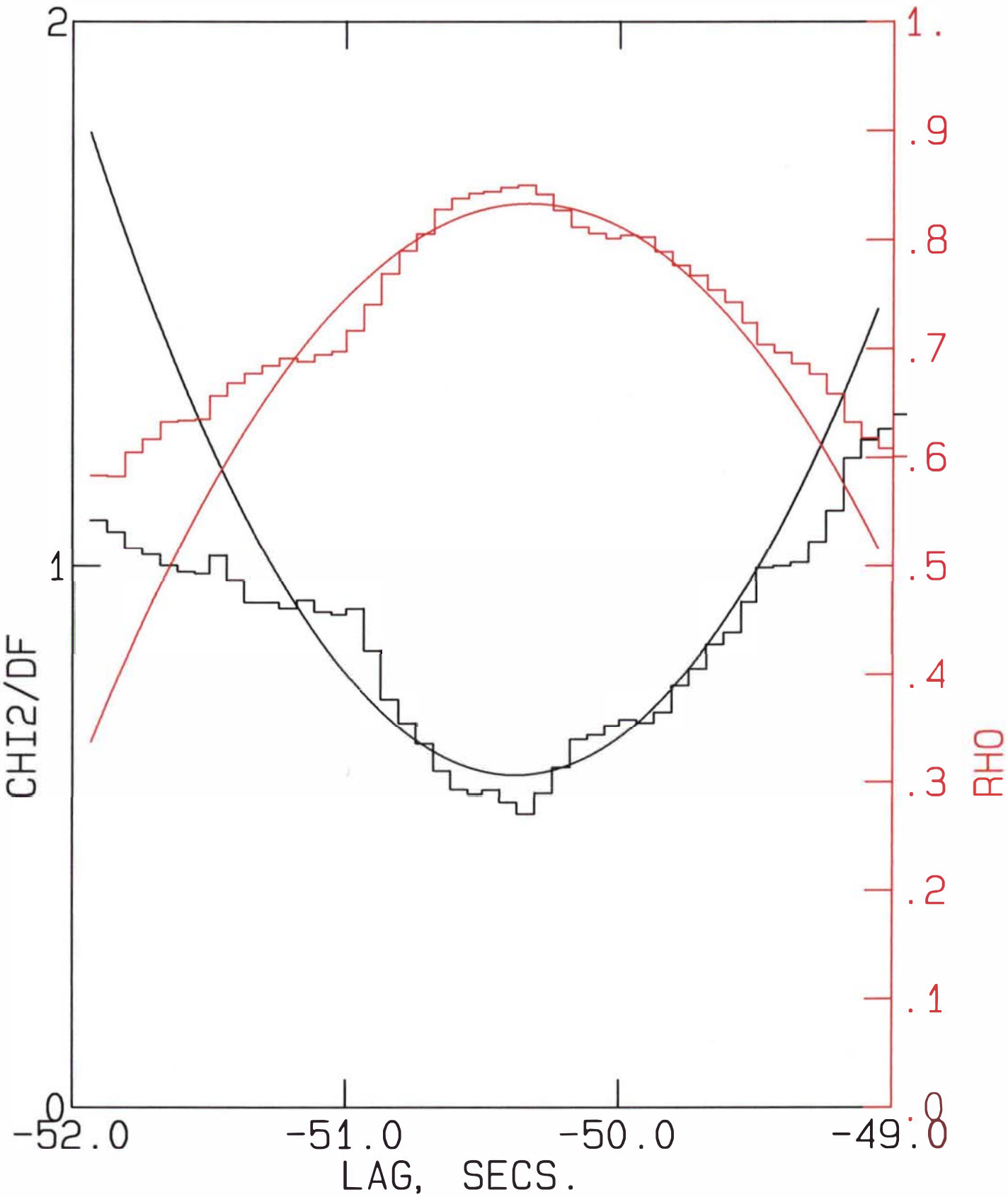



200
150
100
50
0
400
300
200
100
0
44
54
64
74
84
94
104
TIME, SECS
ULYSSES RT
C/ 1.00002 S
BSAX-GRBM
C/ 1.00002 S


SAX GRBM
19/12/97 79966.663
40- 700 keV
COUNTS/0.031 S
30
55
80
105
10
20
30
40
50
TIME, SECS
8/ 1/10


ULYSSES RT-KONUS2 CORRELATION 19/12/97 77550.025 7/10/ 9
150
100
50
0
400
300
200
100
0
50
60
70
80
90
100
110
C/ 0.50001 S
ULYSSES RT
C/ 0.50001 S
KONUS2
TIME, SECS

ULYSSES RT-KONUS2 CORRELATION 19/12/97 77550.025



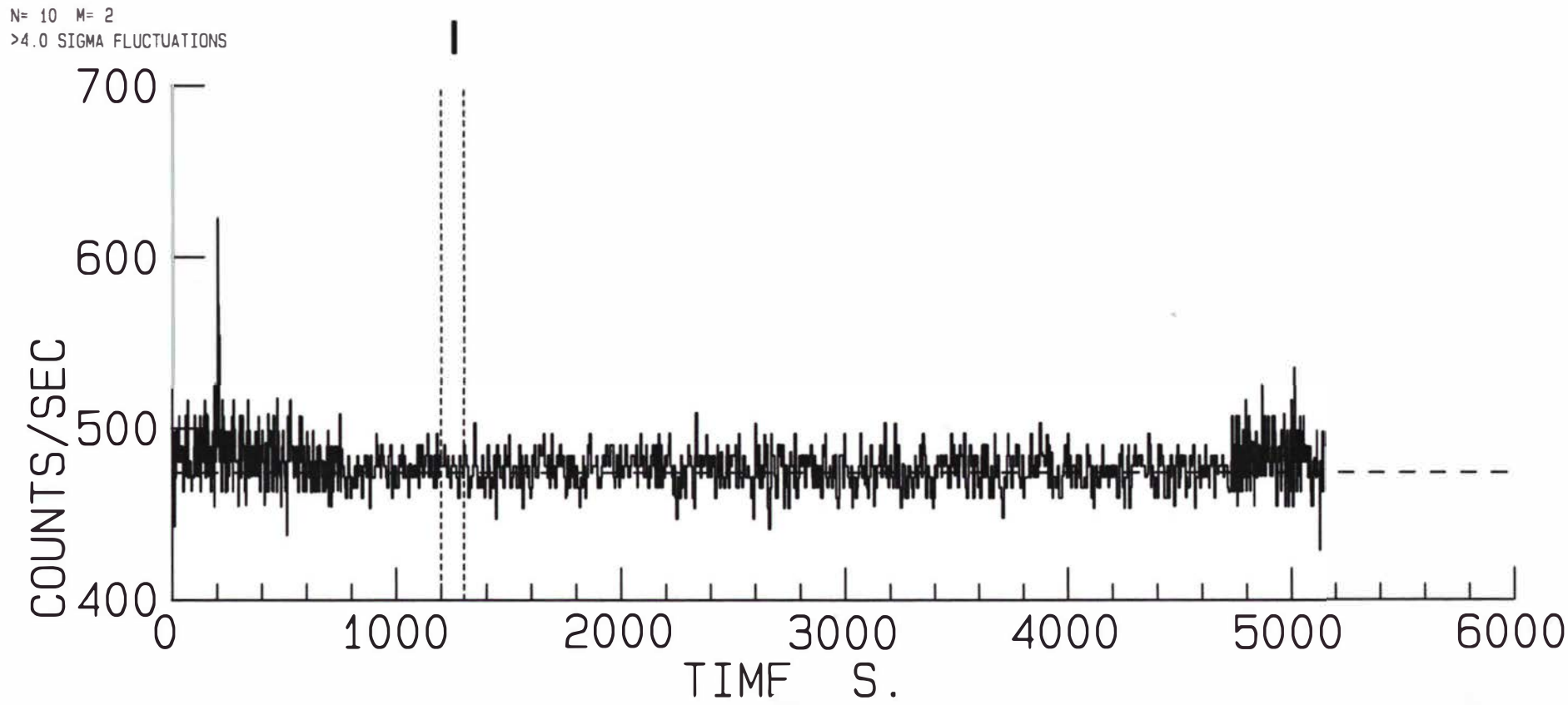
ULYSSES RT

7/10/ 9

19/12/97 77400.016 s

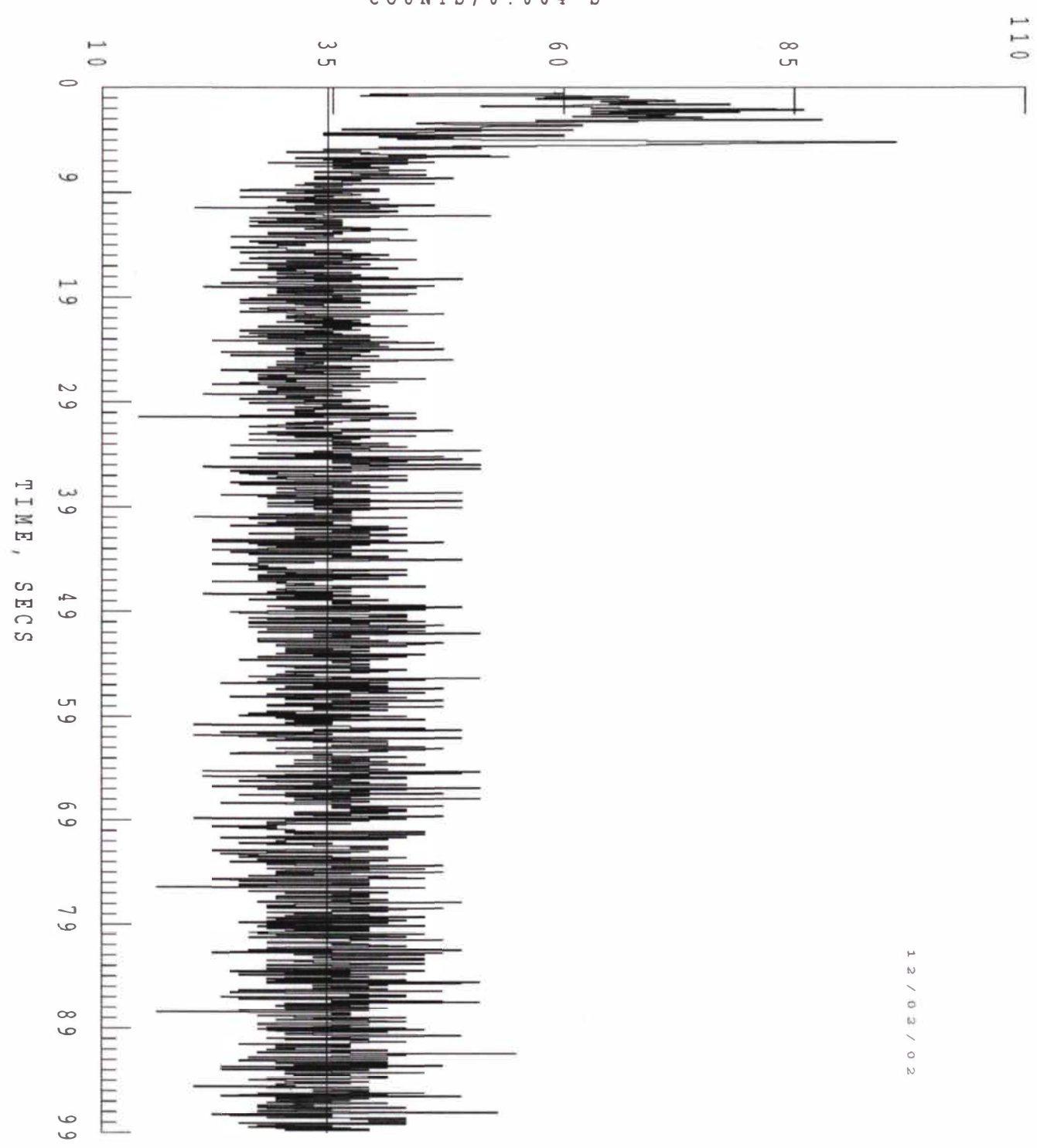
INTERVALS REGROUPED BY 5

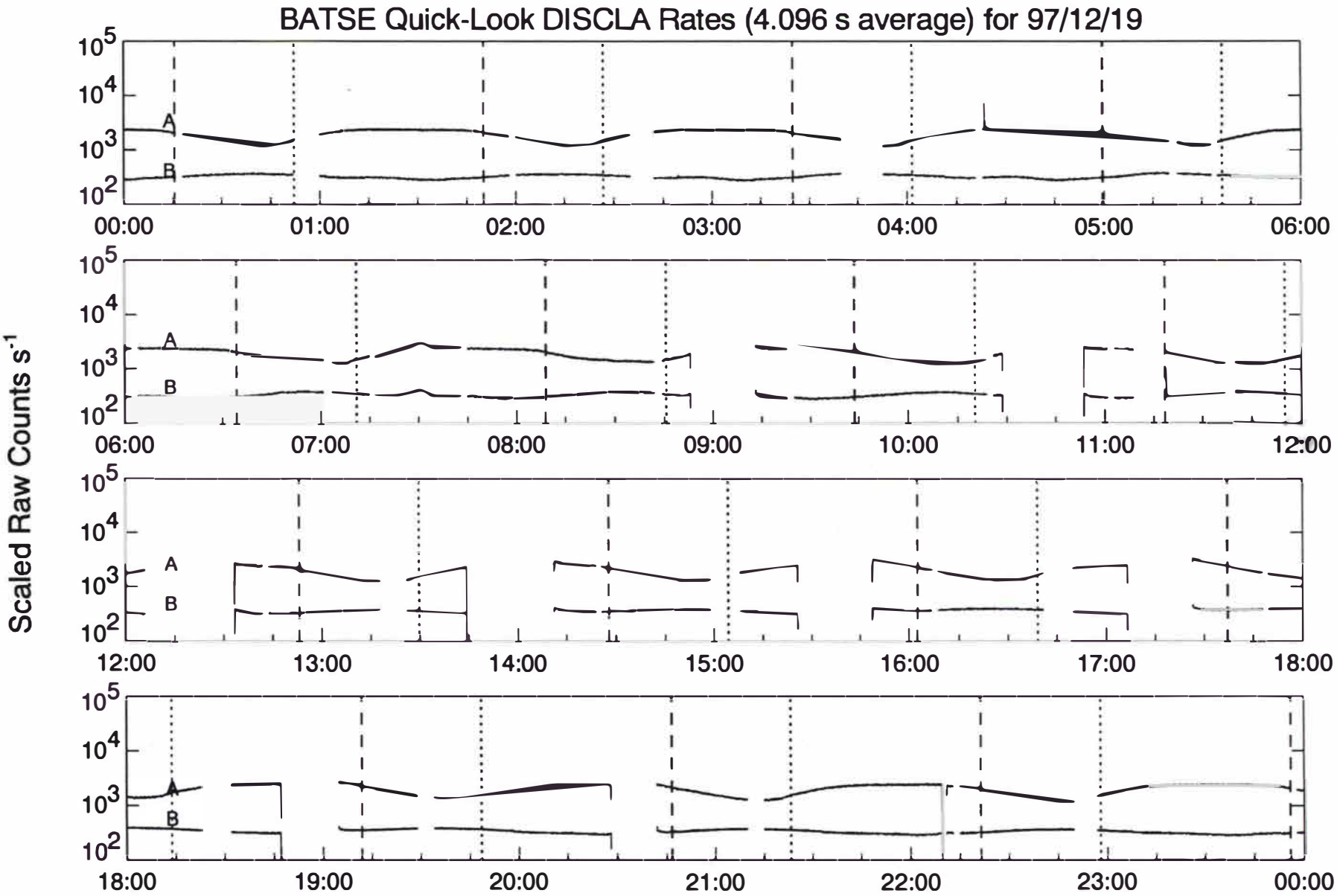
22- 148 keV

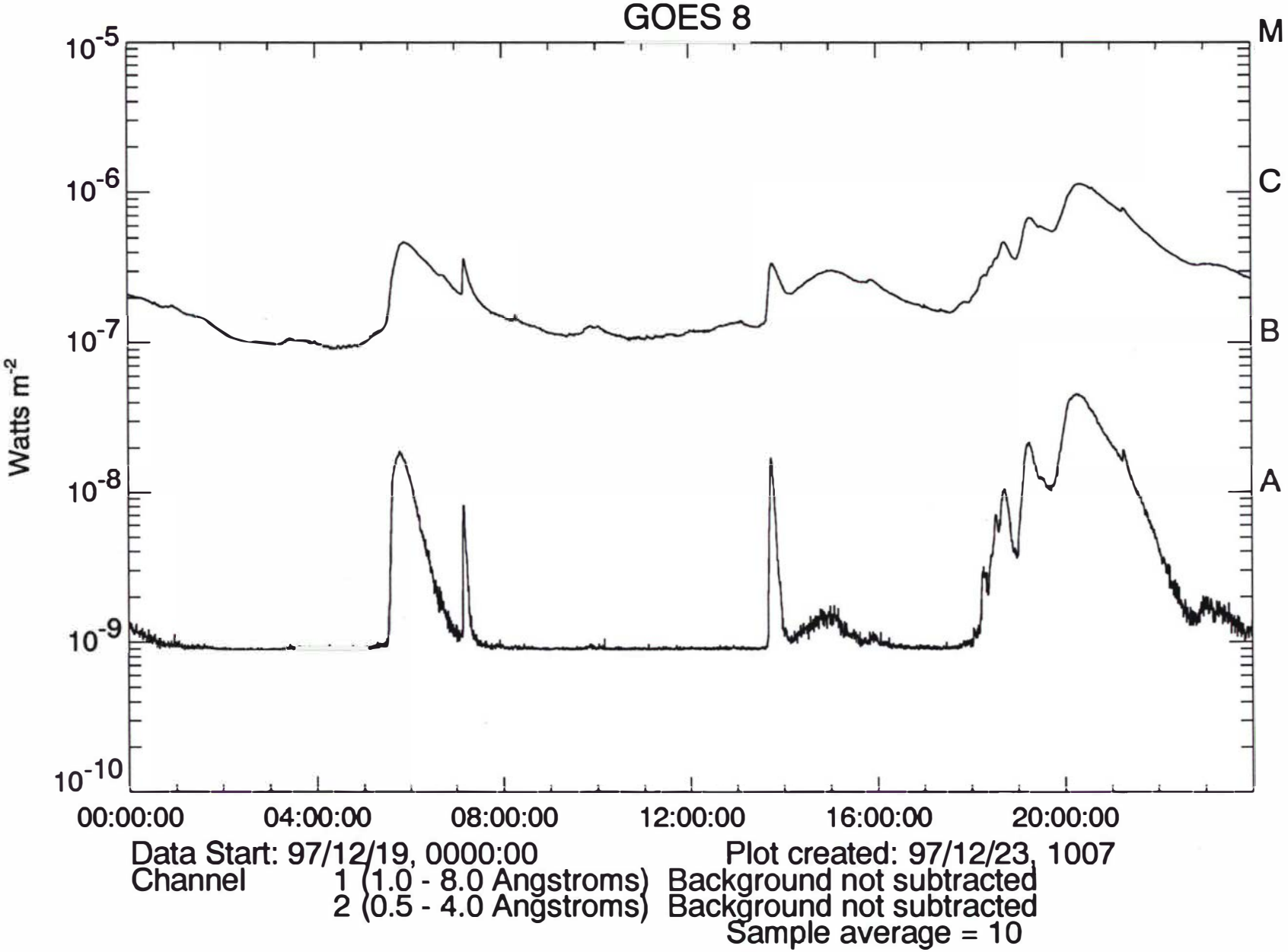


KONUS2 19/12/97 79974.241

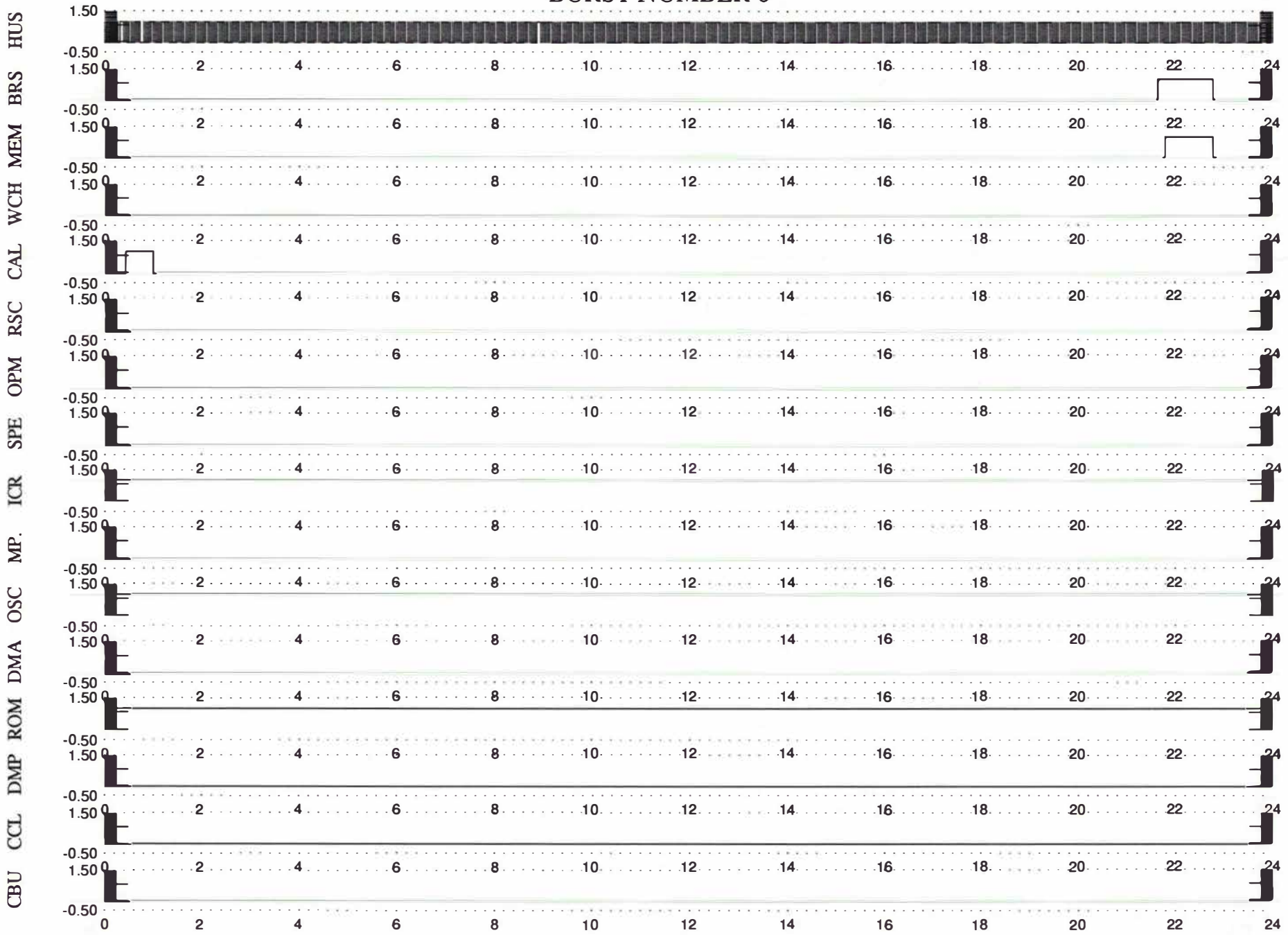
50- 200 keV




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/19
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/23, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare


GOES 8
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/19, 0000:00
Plot created: 97/12/23, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

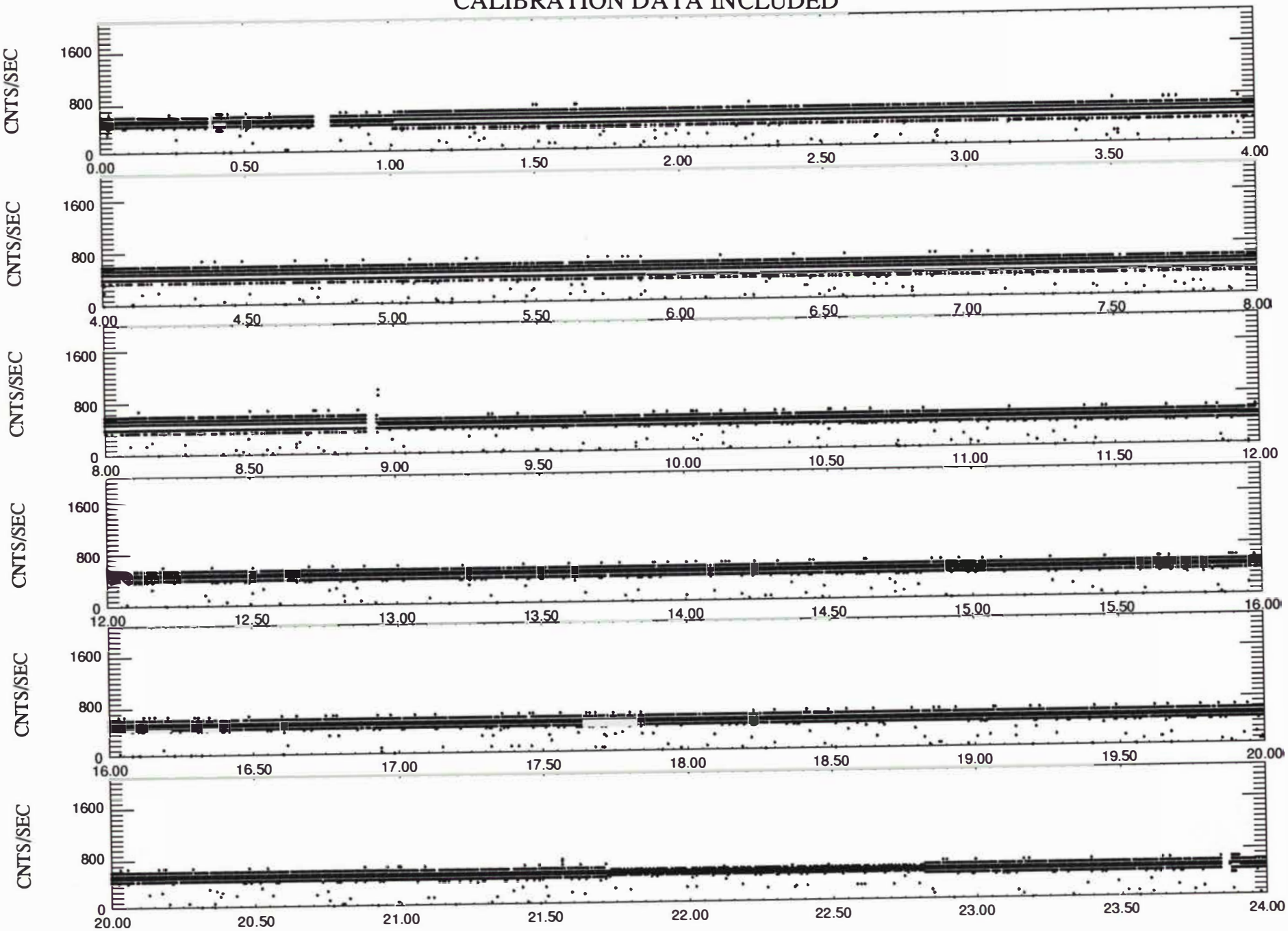
BURST NUMBER 6




UNIV AL TIME

HUS 2A, MODE 1, NOT AVERAGED EDR day 353, year 1997 to day 353, year 1997 3/12/98

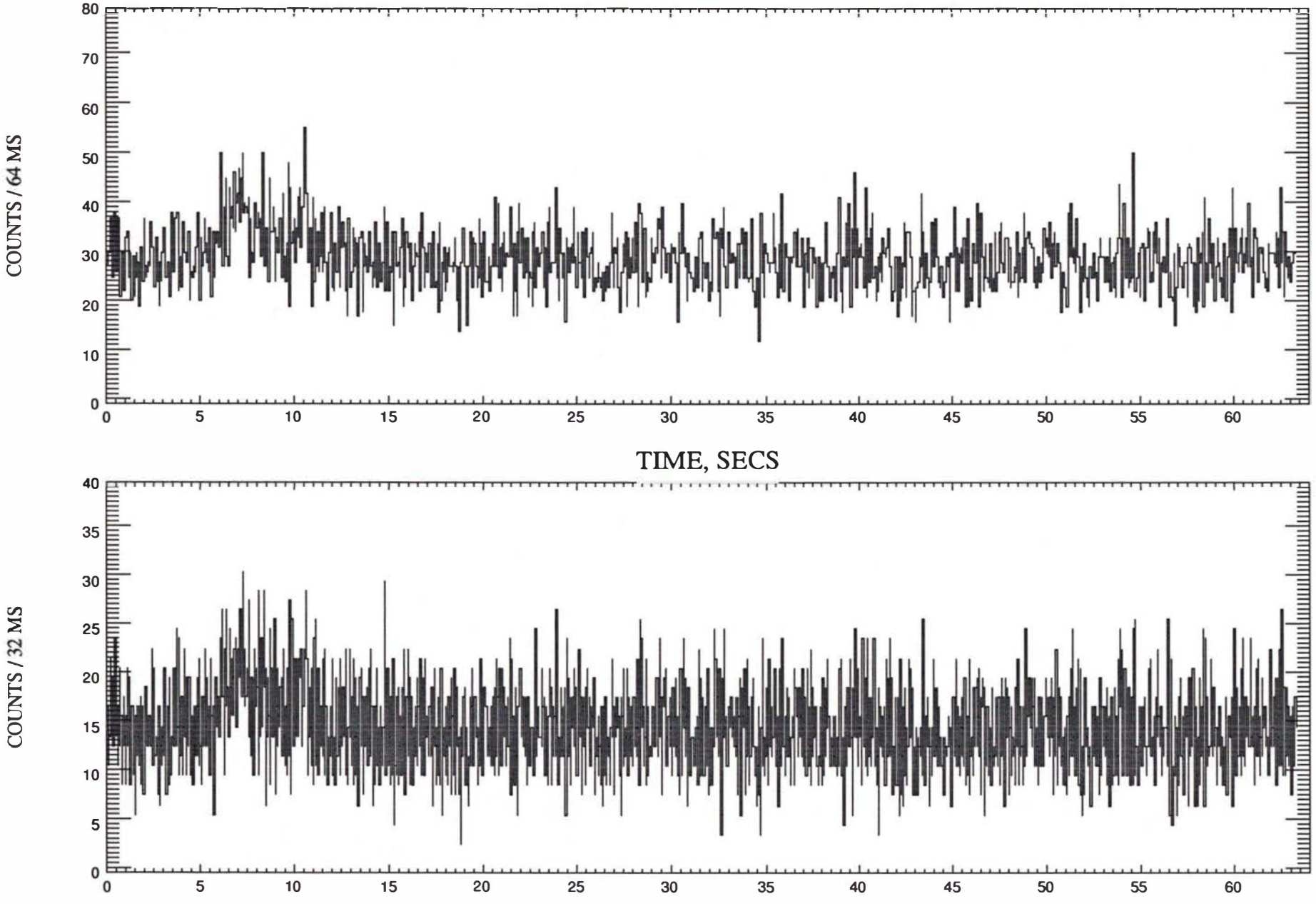
CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2A TRIGGERED DATA EDR day 353, year 1997 3/11/98

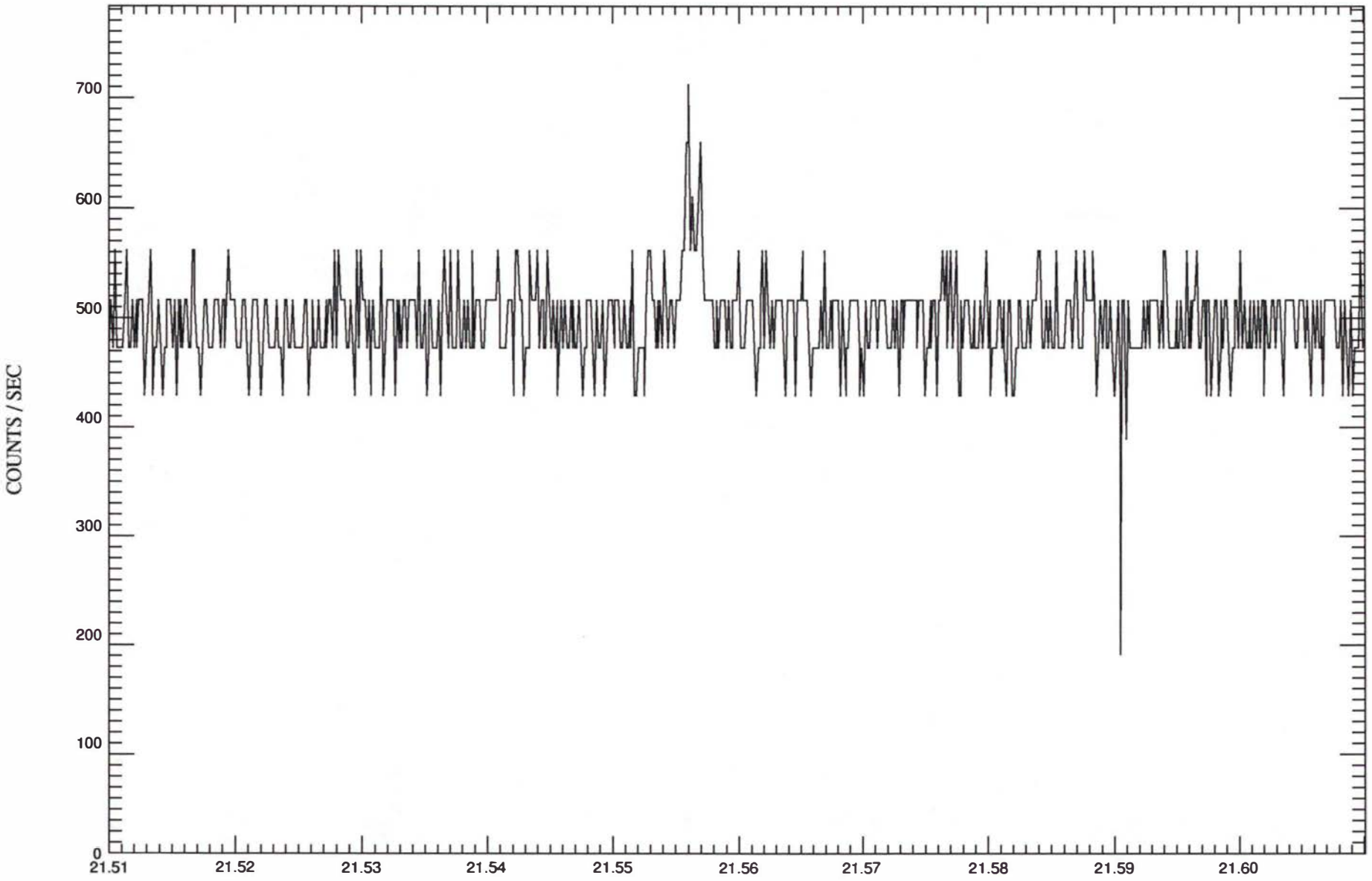
Burst Counter 6 at UT=21.556183327569 h=77602.260 s 21:33:22.260



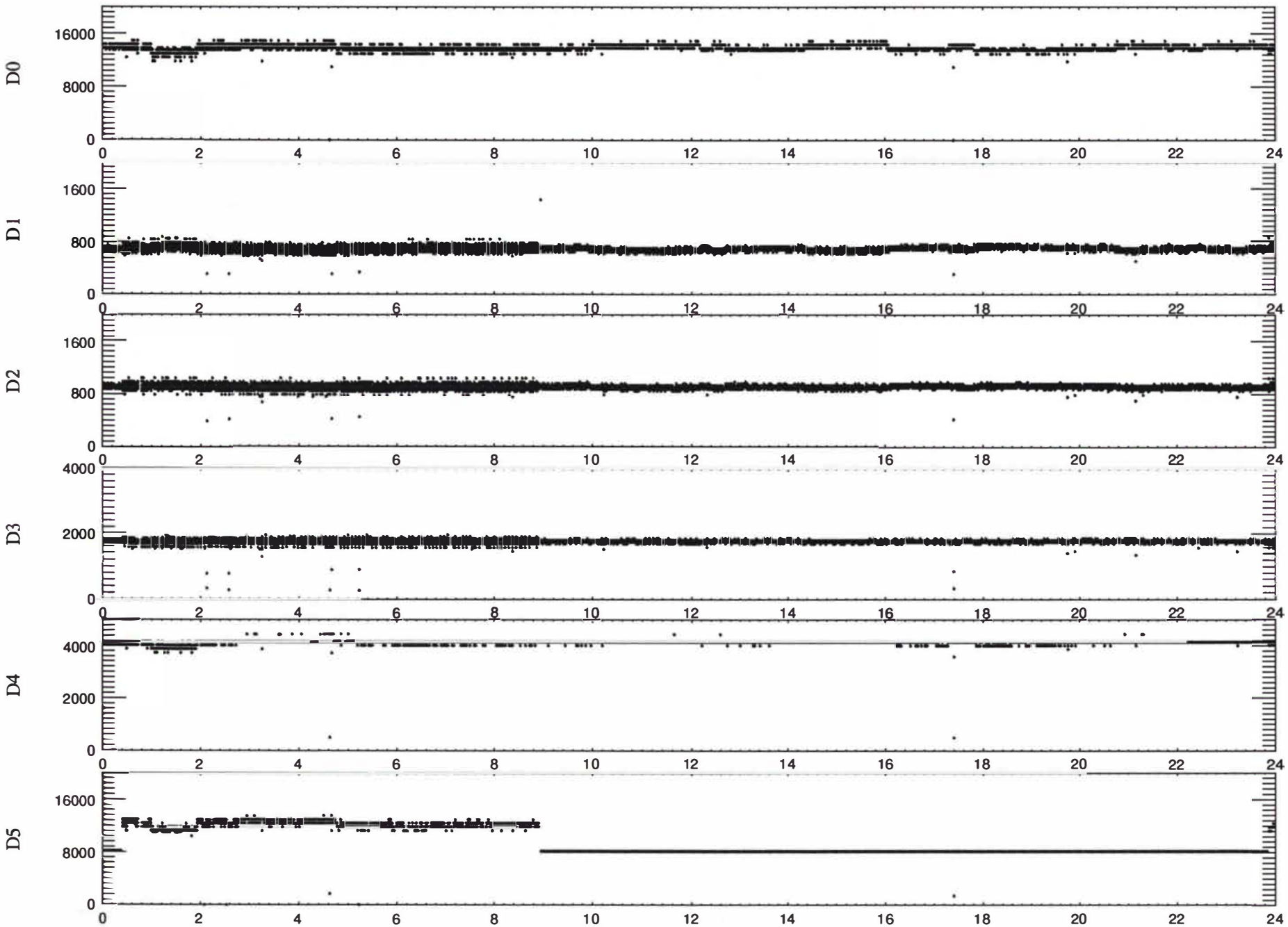

B# 1

HUS 2A, MODE 1, NOT AVERAGED EDR day 353, year 1997 to day 353, year 1997 3/11/98

CALIBRATION DATA INCLUDED



HUS 2B COUNTS / SEC EDR day 353, year 1997 to day 353, year 1997 3/12/98



From HENZE@fender.msfc.nasa.gov Tue Dec 23 09:50:34 1997
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA27233; Tue, 23 Dec 1997 09:50:24 -0800
From: HENZE@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id JAA07144; Tue, 23 Dec 1997 09:50:23 -0800
Date: Tue, 23 Dec 1997 11:49:41 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971223114941.22456e72@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6539
Content-Length: 1135
X-Lines: 26
Status: O

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

BATSE BURST # 6539
EVENT OF 1997 DEC 20 DAY OF YEAR=354
EVENT CROSSING TIME AT BATSE : 14793. S. OR 04:06:33.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 33.000 -39.000
BATSE PEAK COUNTING RATE: 7200 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 20/12/ 97 IS:
RA= 170.471 DEC= 11.896 DIST= 5.074 AU
BATSE-ULYSSES DISTANCE = 759122671. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 46.36 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1747.53 SECS.
CROSSING TIME AT ULYSSES IS 16541. S. OR 04:35:40 +/- 394.69 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 20/12/ 97 IS:
RA= 303.874 DEC= -21.045 DIST= 2.097 AU
MARS-BATSE DISTANCE = 313744704. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=103.71 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -248.08 SECS.
CROSSING TIME AT MARS IS 14545. S. OR 04:02:24 +/- 172.75 SECONDS

BATSE BURST TRIGGER

NO.: 6539

TIME: TJD=0802 SECONDS=14793

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= 85.9 AZIMUTH=247.3 ERROR= 1.7 DEGREES

COMMENTS:
SINGLE PULSE, DUR. APPROX. 16 S. HARD SPECTRUM, VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6539 | 971220 | 10802 | 14793 | 7200 | 033 | -39 | 16 |

Date: Feb 9 00

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data N/A

☐ Jim Schmidling's stat file correction applied?

☐ Final ephemeris used?

☐ Final, CDROM data used?

☐ 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

☑ BATSE ephemeris for $T_0$?

☑ Error circle position and radius from public catalog used?

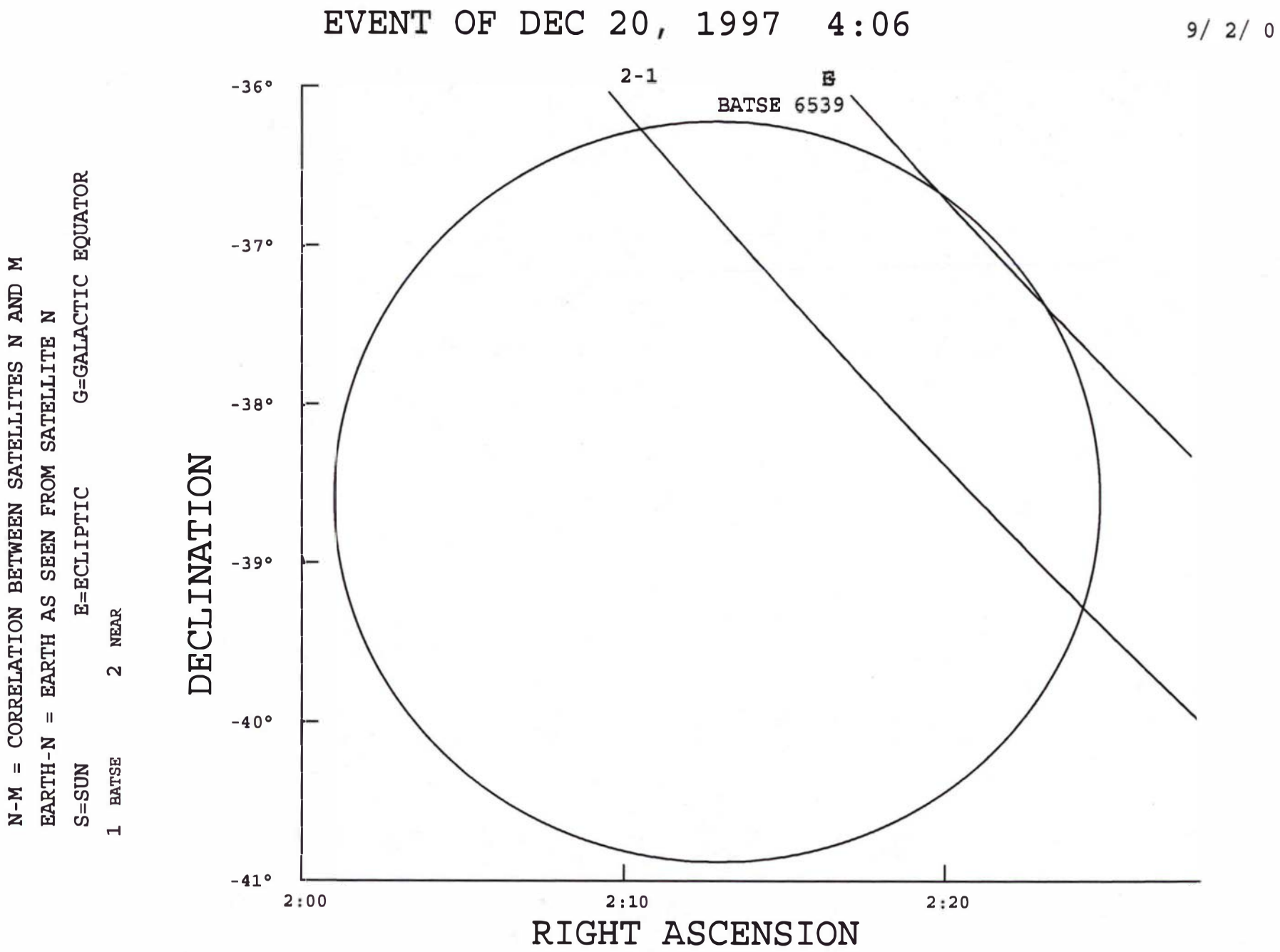
☐ If MER data were used, is a 30 ms systematic error included?

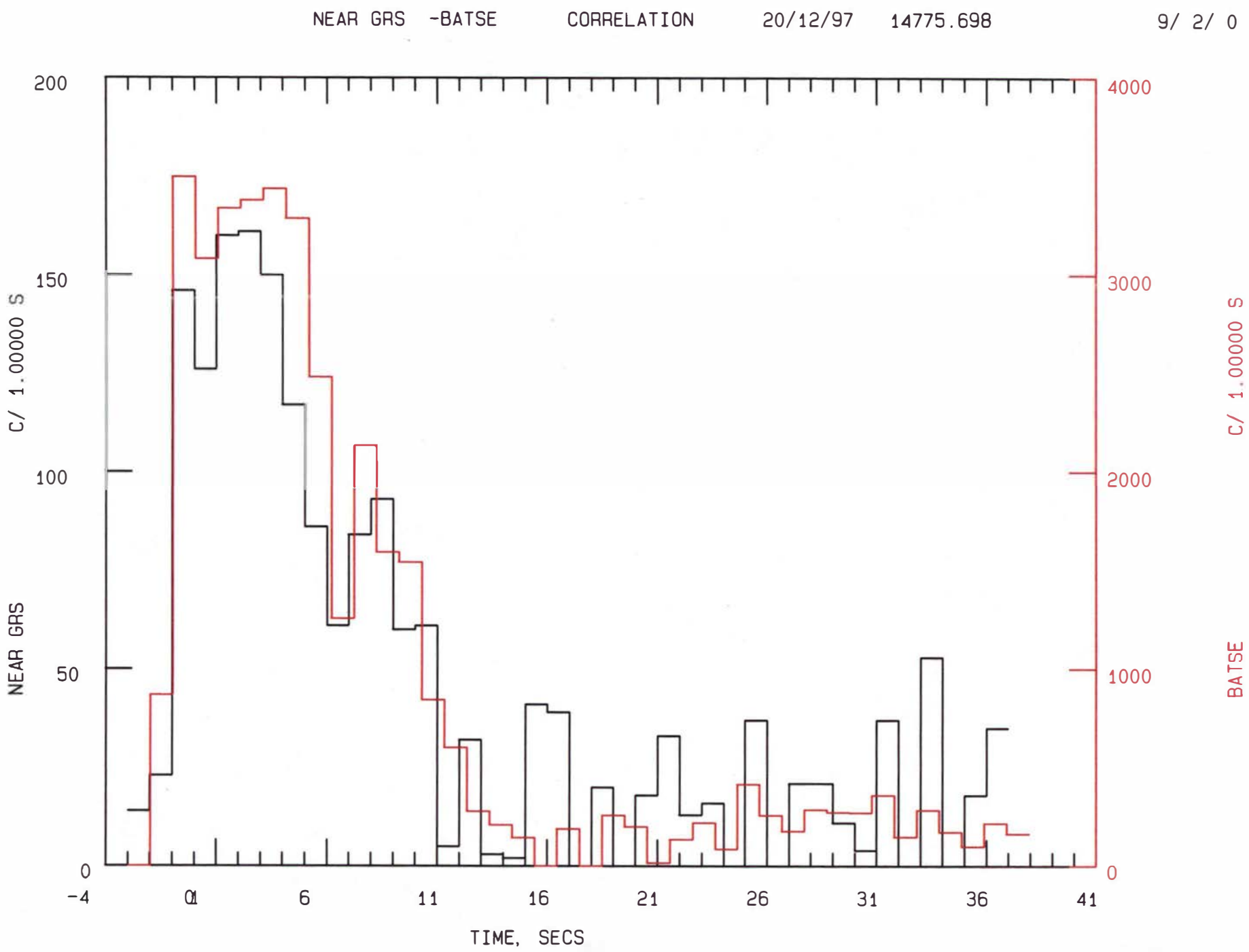
## 3. NEAR Data

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

☑ BATSE >100 keV data used for NEAR correlation?

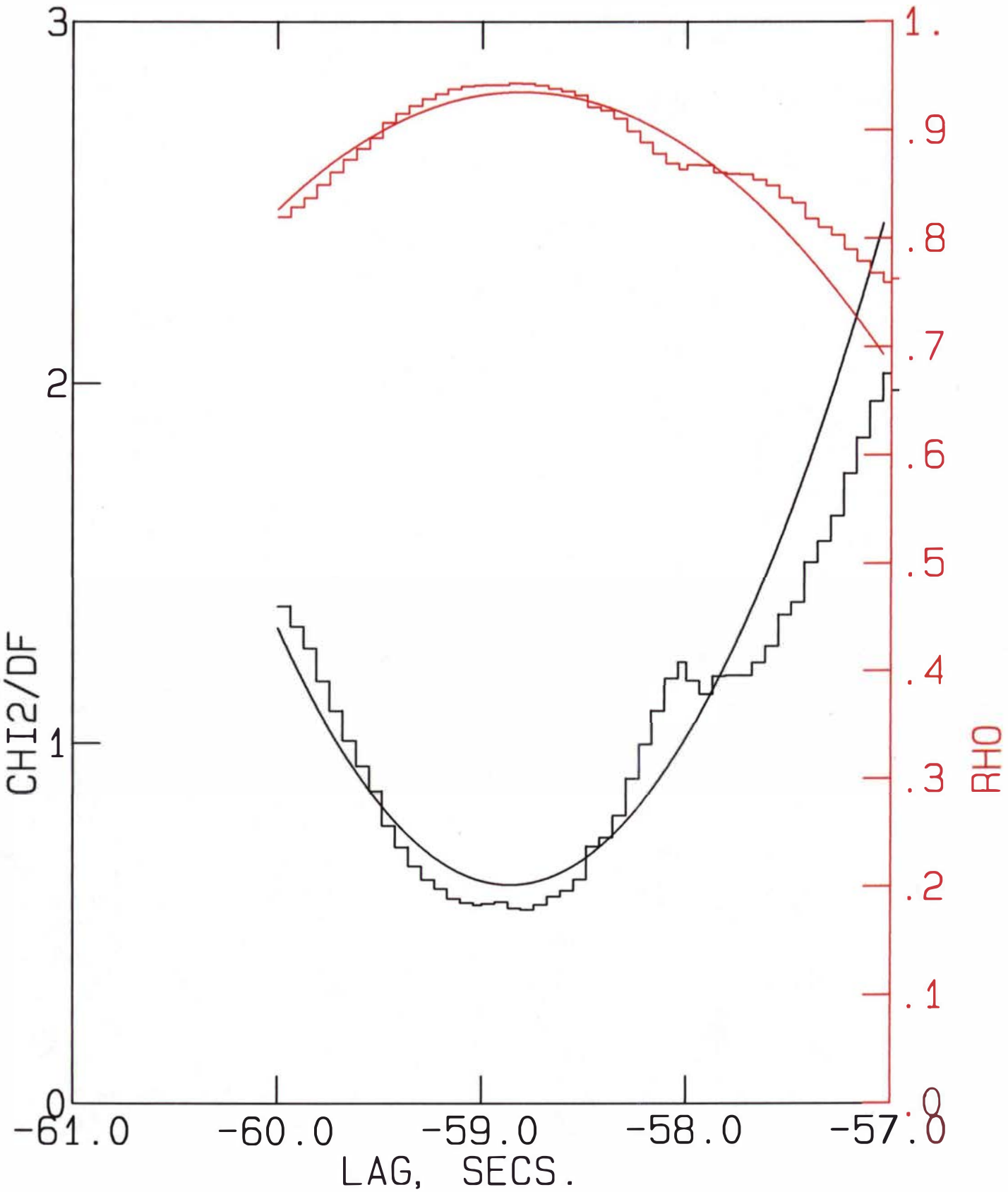
☑ ACCESS database updated?

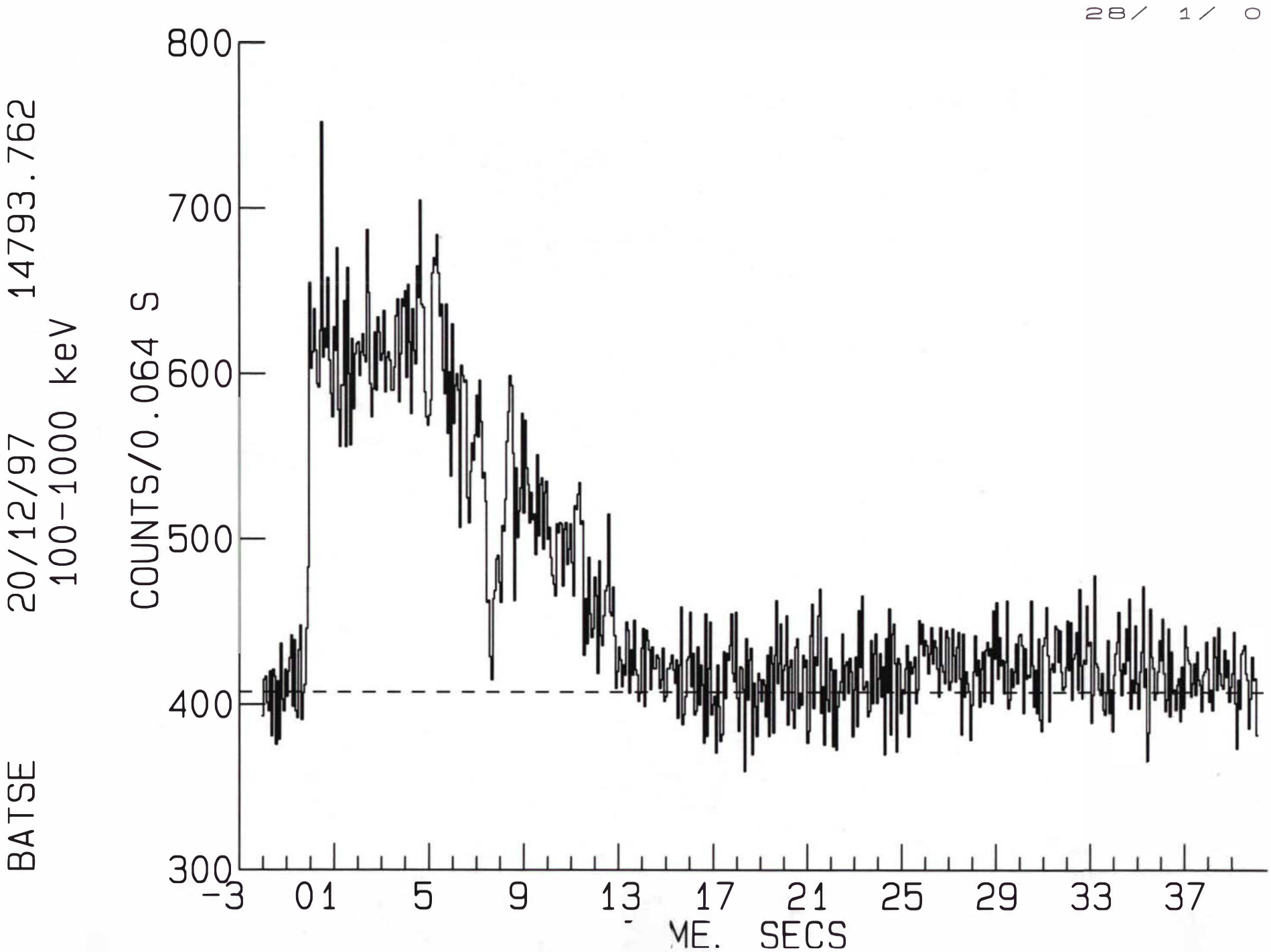

EVENT OF DEC 20, 1997 4:06
9/ 2/ 0
2-1
E
BATSE 6539
-36°
-37°
-38°
-39°
-40°
-41°
DECLINATION
2:00
2:10
2:20
RIGHT ASCENSION
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 BATSE 2 NEAR


NEAR GRS -BATSE CORRELATION 20/12/97 14775.698 9/ 2/ 0
200
150
100
50
0
4000
3000
2000
1000
0
C/ 1.00000 S
NEAR GRS
C/ 1.00000 S
BATSE
-4
1
6
11
16
21
26
31
36
41
TIME, SECS

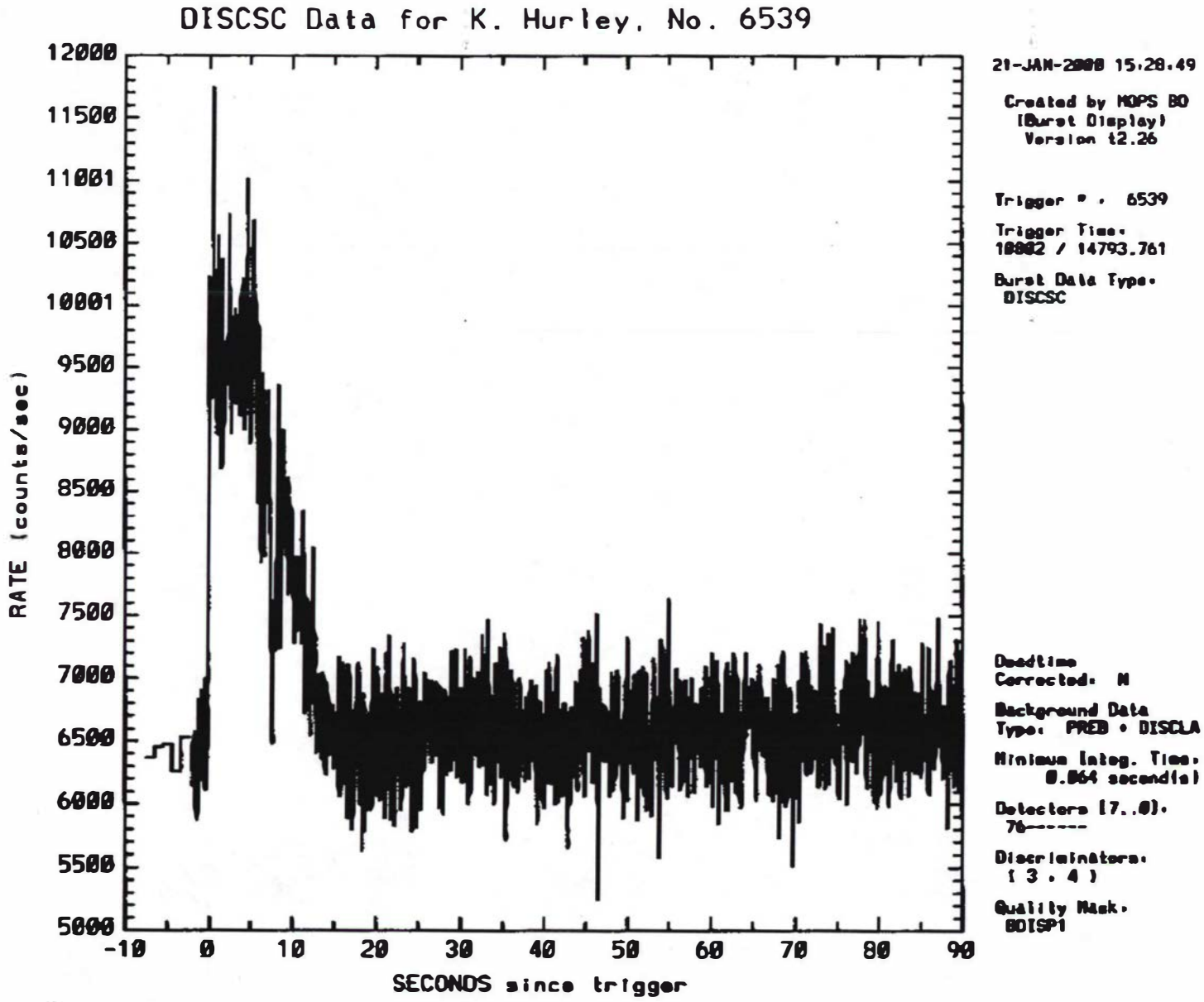
9/ 2/ 0

NEAR GRS -BATSE CORRELATION 20/12/97 14775.698



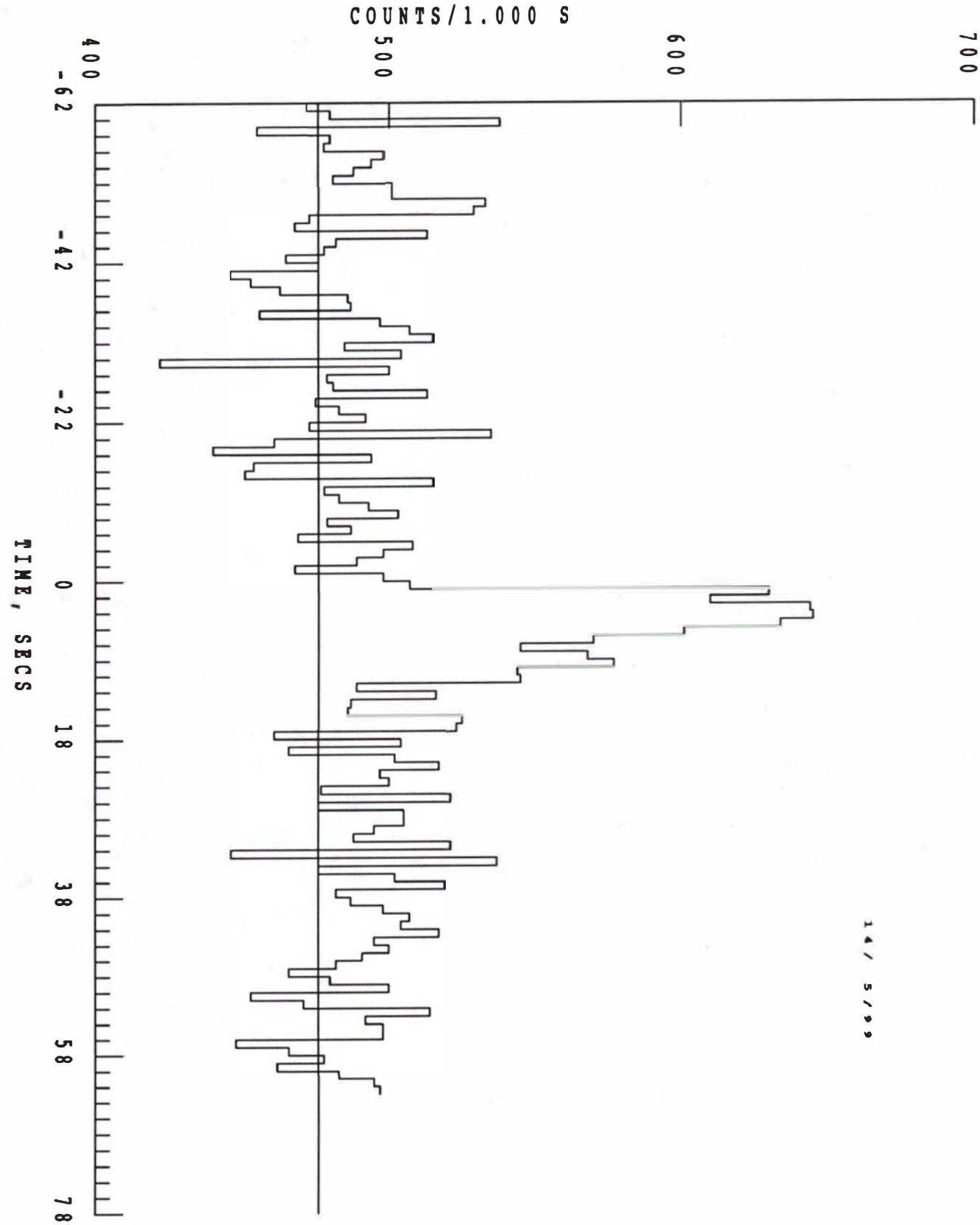

28/ 1/ 0
BATSE 20/12/97 14793.762
100-1000 keV
COUNTS/0.064 S
800
700
600
500
400
300
-3
01
5
9
13
17
21
25
29
33
37
ME. SECS

BATSE 2565445800 01-21-2000 16:08



NEAR 20/12/97 14775.698

100-1000 keV



KNEAR GRS 19971220 14775

ULYSSES RT 14/ 5/99

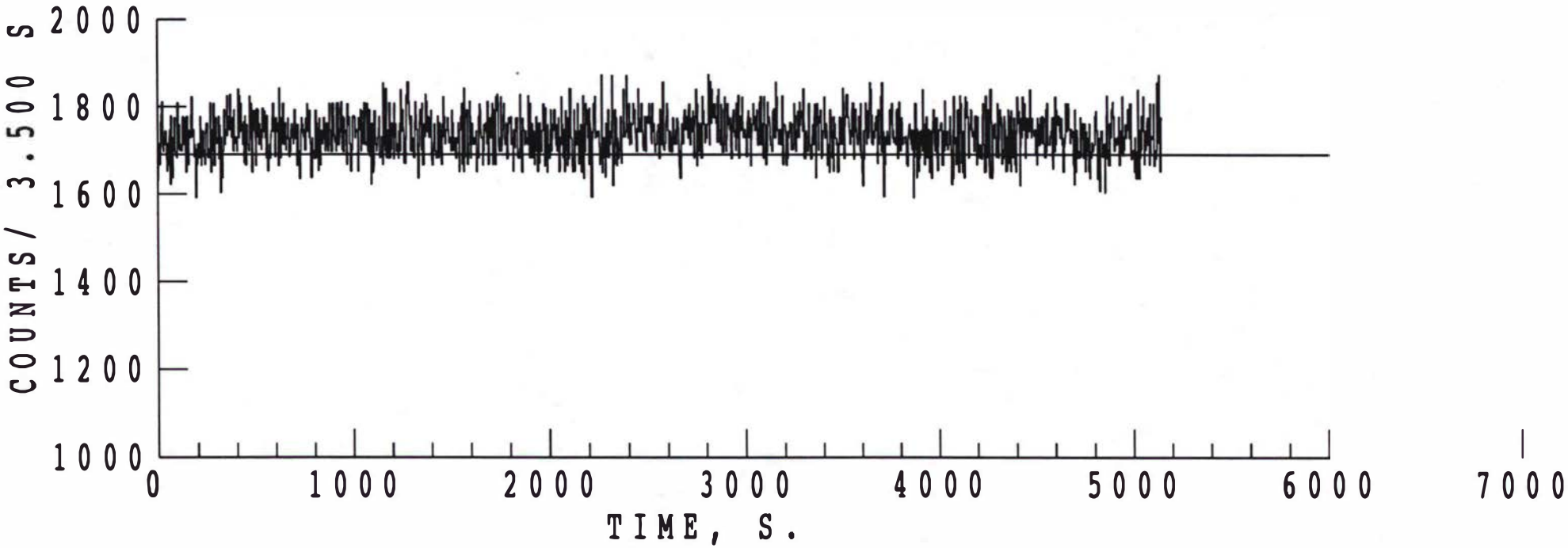
20/12/97 12204.003 s

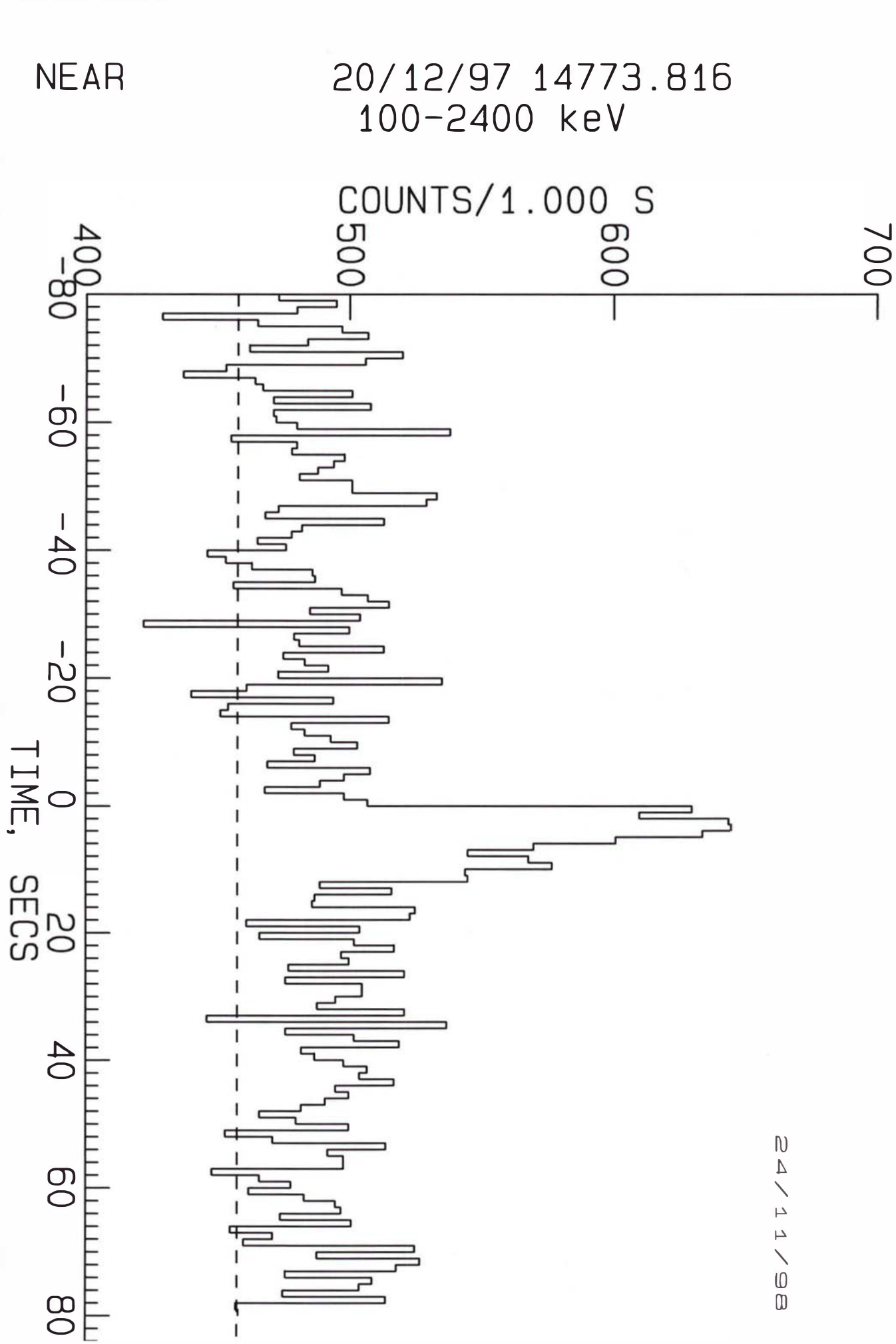
0.250 S INTERVALS REGROUPED BY 14

0- 0 keV

N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS




NEAR
20/12/97 14773.816
100-2400 keV
COUNTS/1.000 S
400
500
600
700
-80
-60
-40
-20
0
20
40
60
80
TIME, SECS
24/11/98

BATSE BURST# 6539

ULYSSES RT 23/12/97

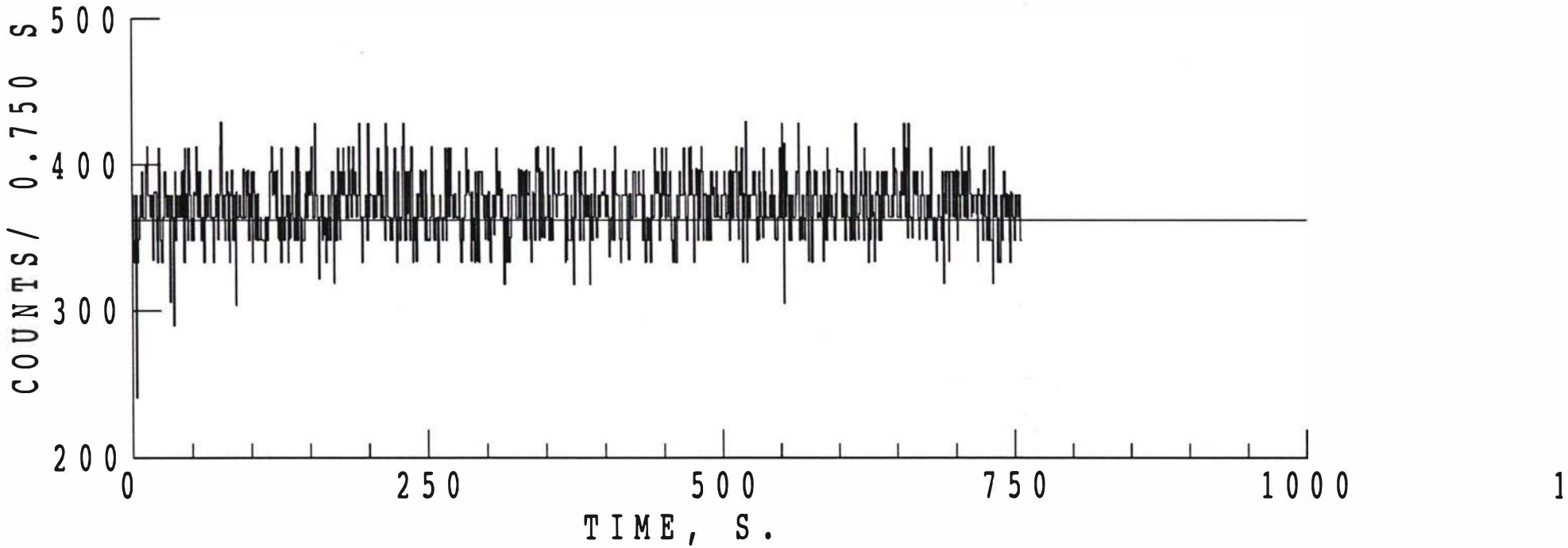
20/12/97 16164.127 s

0.250 S INTERVALS REGROUPED BY 3

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From SAHI@fender.msfc.nasa.gov Mon Dec 22 12:40:30 1997
Return-Path: <SAHI@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA18833; Mon, 22 Dec 1997 12:40:29 -0800
From: SAHI@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA01887; Mon, 22 Dec 1997 12:40:25 -0800
Date: Mon, 22 Dec 1997 14:40:10 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971222144010.224517a0@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6540
Content-Length: 1135
X-Lines: 26
Status: O

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

BATSE BURST # 6540
EVENT OF 1997 DEC 20 DAY OF YEAR=354
EVENT CROSSING TIME AT BATSE : 70300. S. OR 19:31:40.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 205.000 59.000
BATSE PEAK COUNTING RATE: 8000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 20/12/ 97 IS:
RA= 170.442 DEC= 11.888 DIST= 5.064 AU
BATSE-ULYSSES DISTANCE = 757579556. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=126.27 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1495.09 SECS.
CROSSING TIME AT ULYSSES IS 68805. S. OR 19:06:44 +/- 381.00 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 20/12/ 97 IS:
RA= 303.874 DEC= -21.045 DIST= 2.097 AU
MARS-BATSE DISTANCE = 313744704. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 67.55 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 399.73 SECS.
CROSSING TIME AT MARS IS 70700. S. OR 19:38:19 +/- 173.99 SECONDS

BATSE BURST TRIGGER
NO.: 6540

TIME: TJD=0802 SECONDS=70300

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

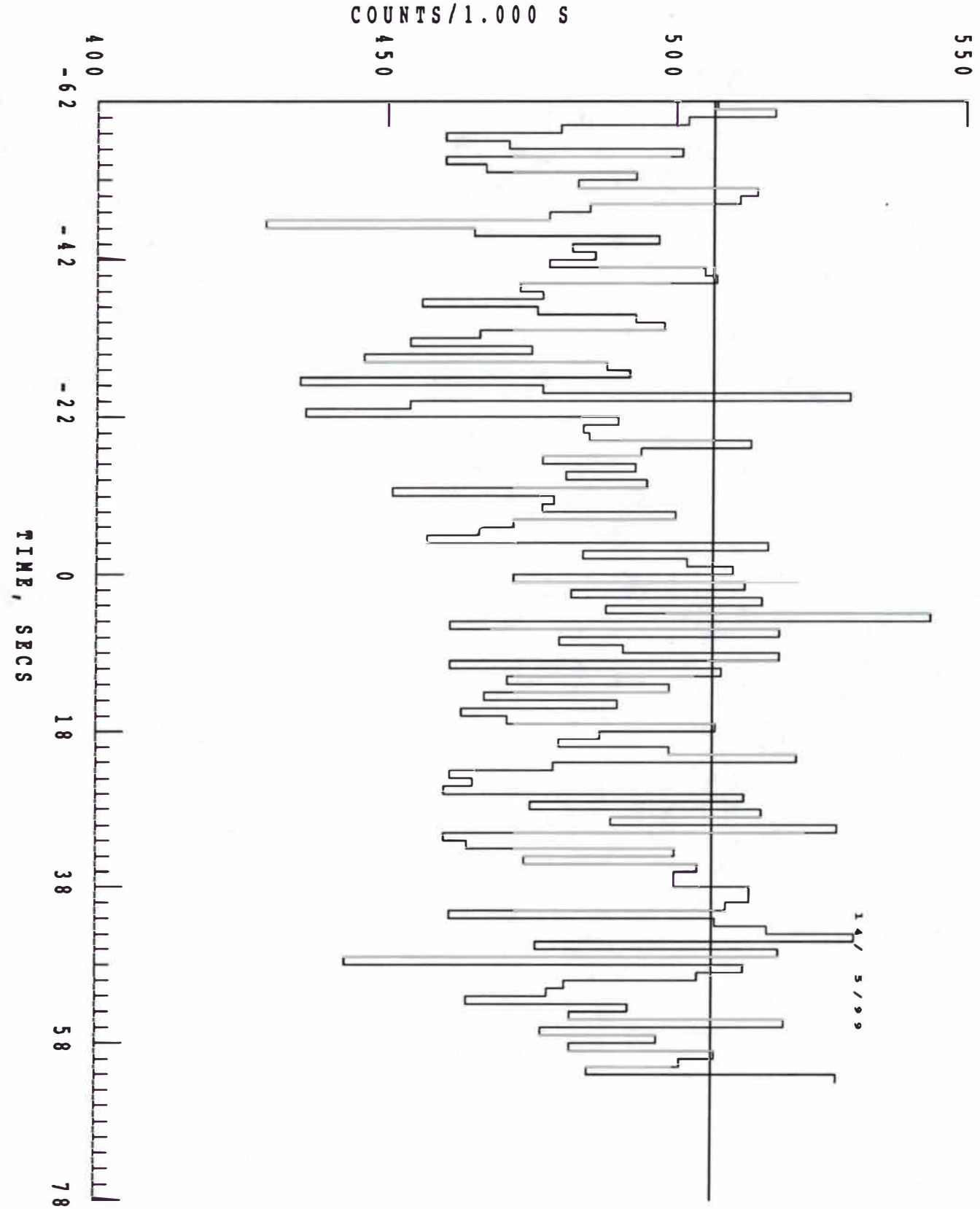
LOCATION: ZENITH=114.9 AZIMUTH=69.2 ERROR=6.44 DEGREES

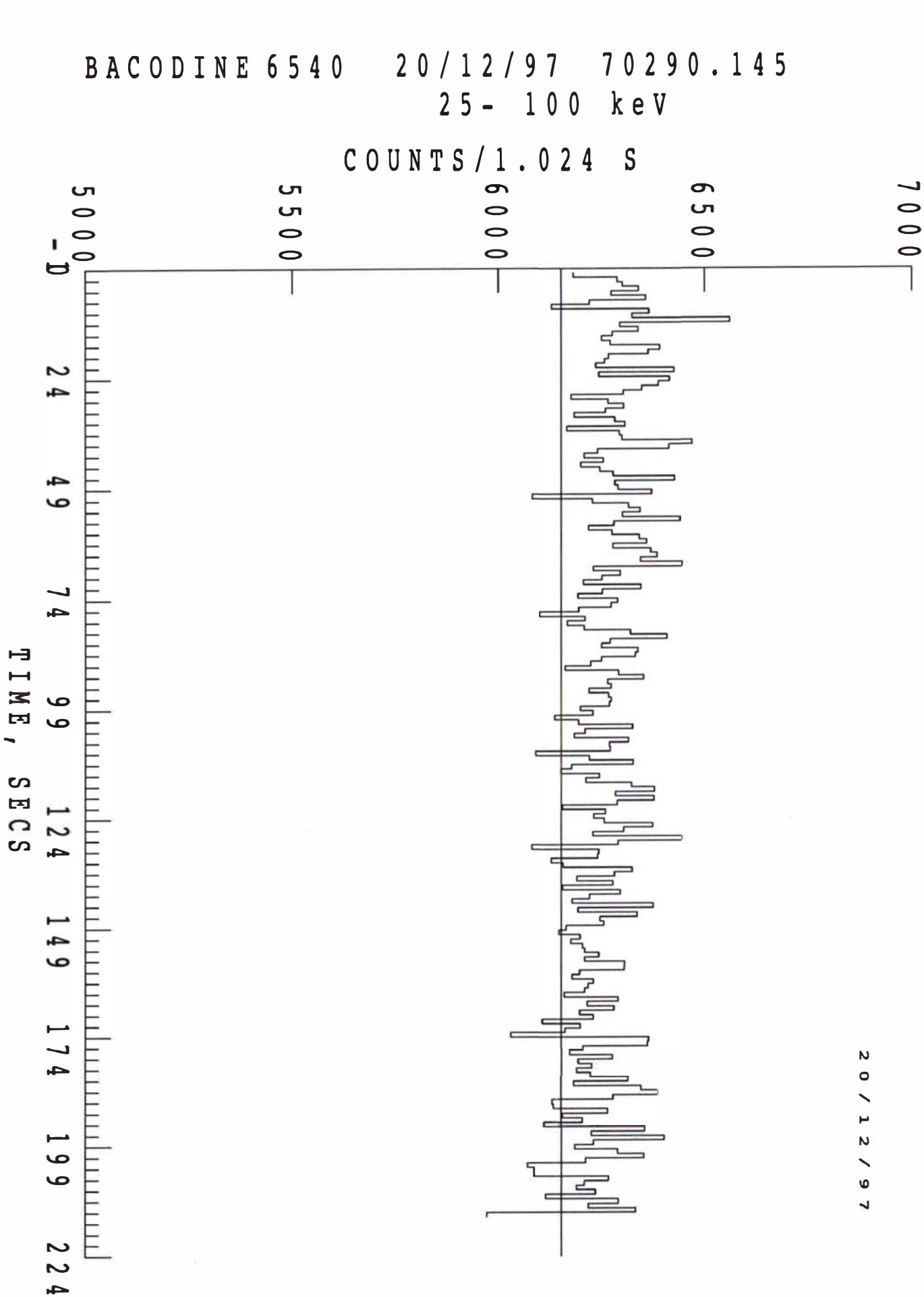
COMMENTS:
BURST, SINGLE SPIKE, DUR. APPROX. 0.04 SECS. NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6540 | 971220 | 10802 | 70300 | 8000 | 205 | +59 | .04 |

NEAR 20/12/97 70295.687

100-1000 keV




BACODINE 6540 20/12/97 70290.145
25- 100 keV
COUNTS/1.024 S
5000
5500
6000
6500
7000
-D
24
49
74
99
124
149
174
199
224
TIME, SECS
20/12/97

BATSE BURST# 6540

ULYSSES RT 22/12/97

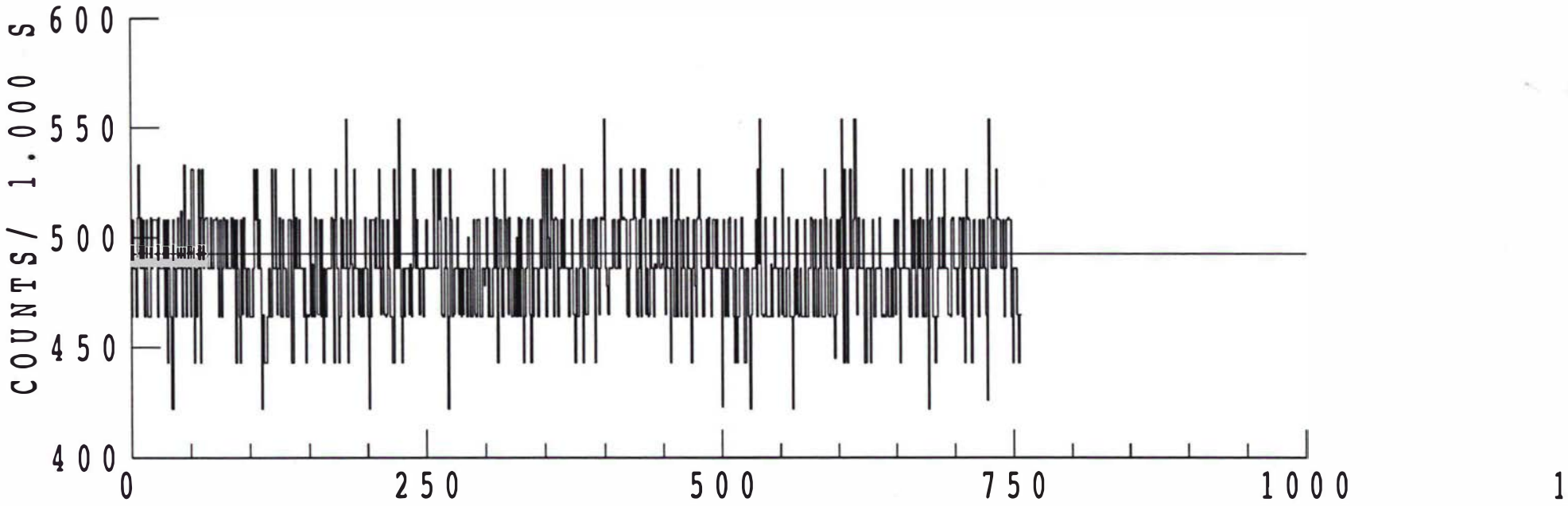
20/12/97 68436.453 s

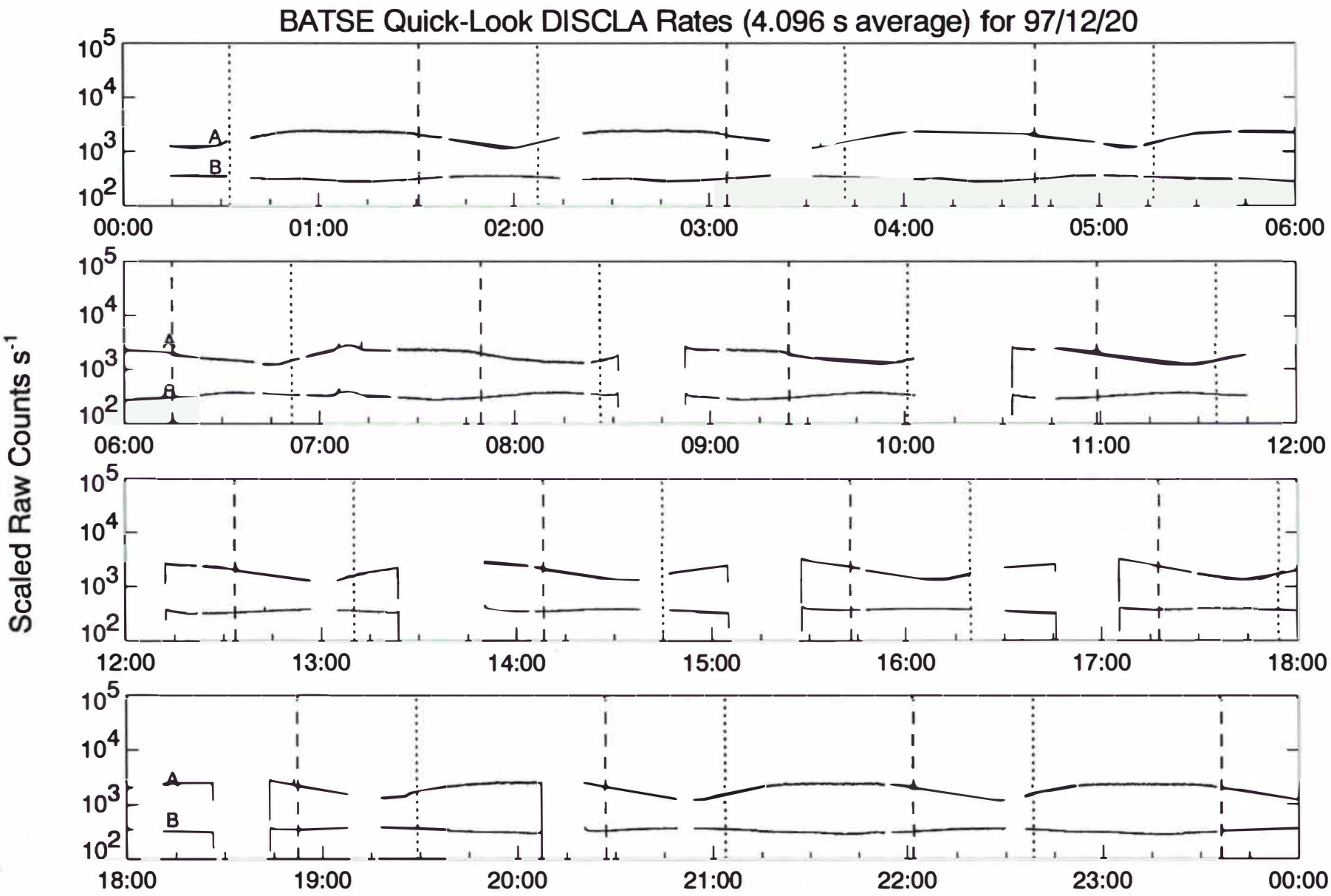
0.500 S INTERVALS REGROUPED BY 2

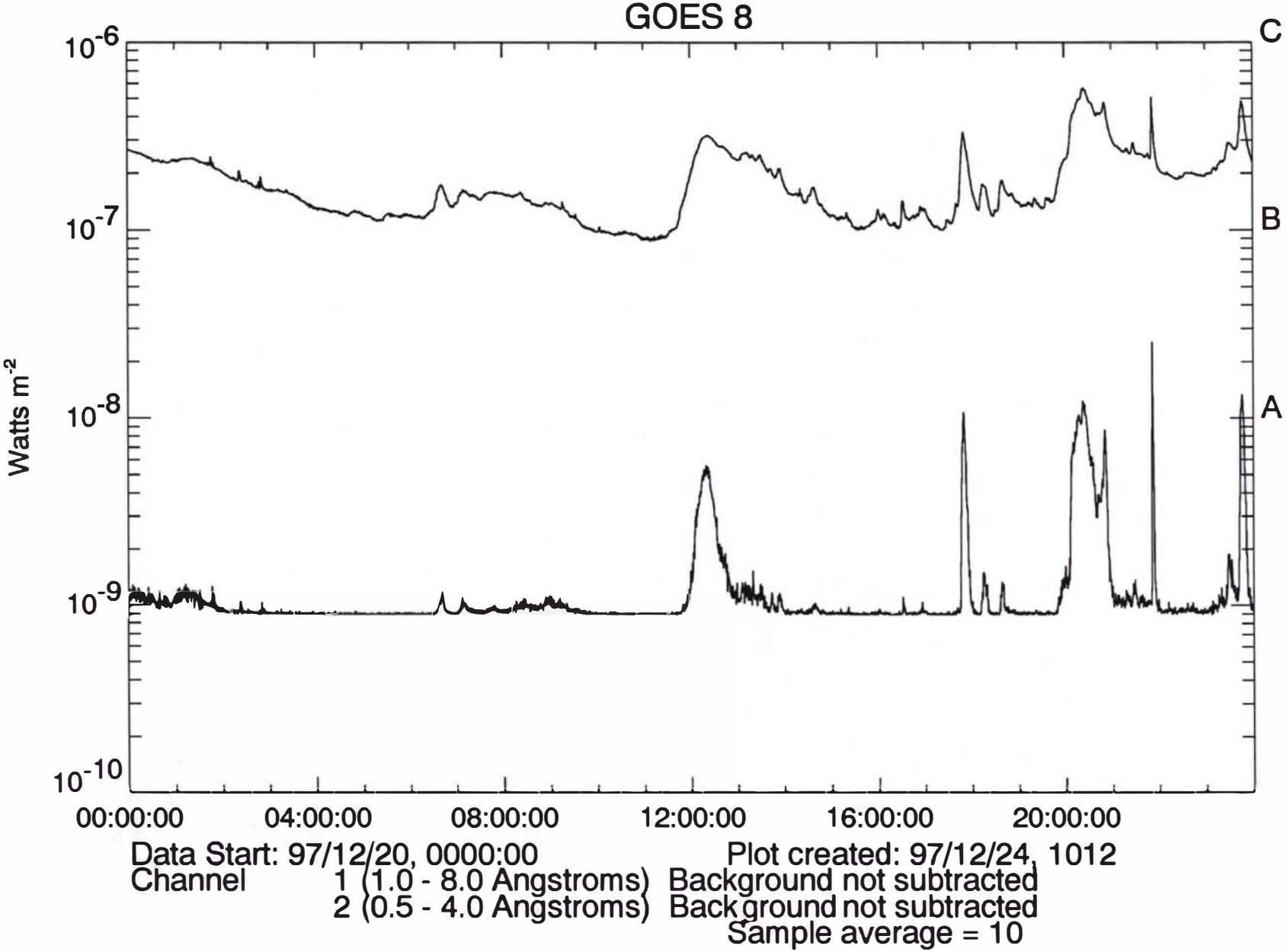
0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

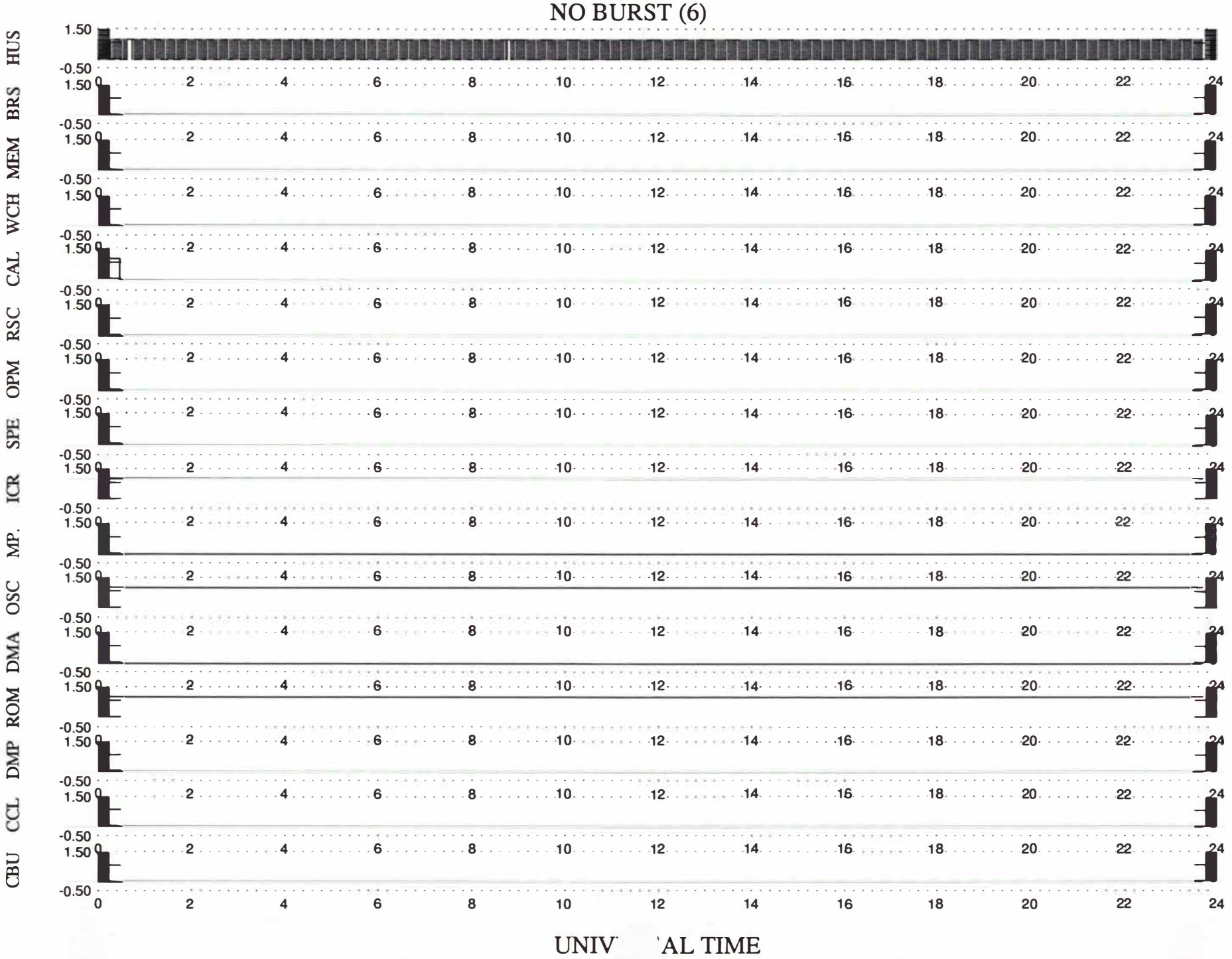
N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/20
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/24, 1016 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

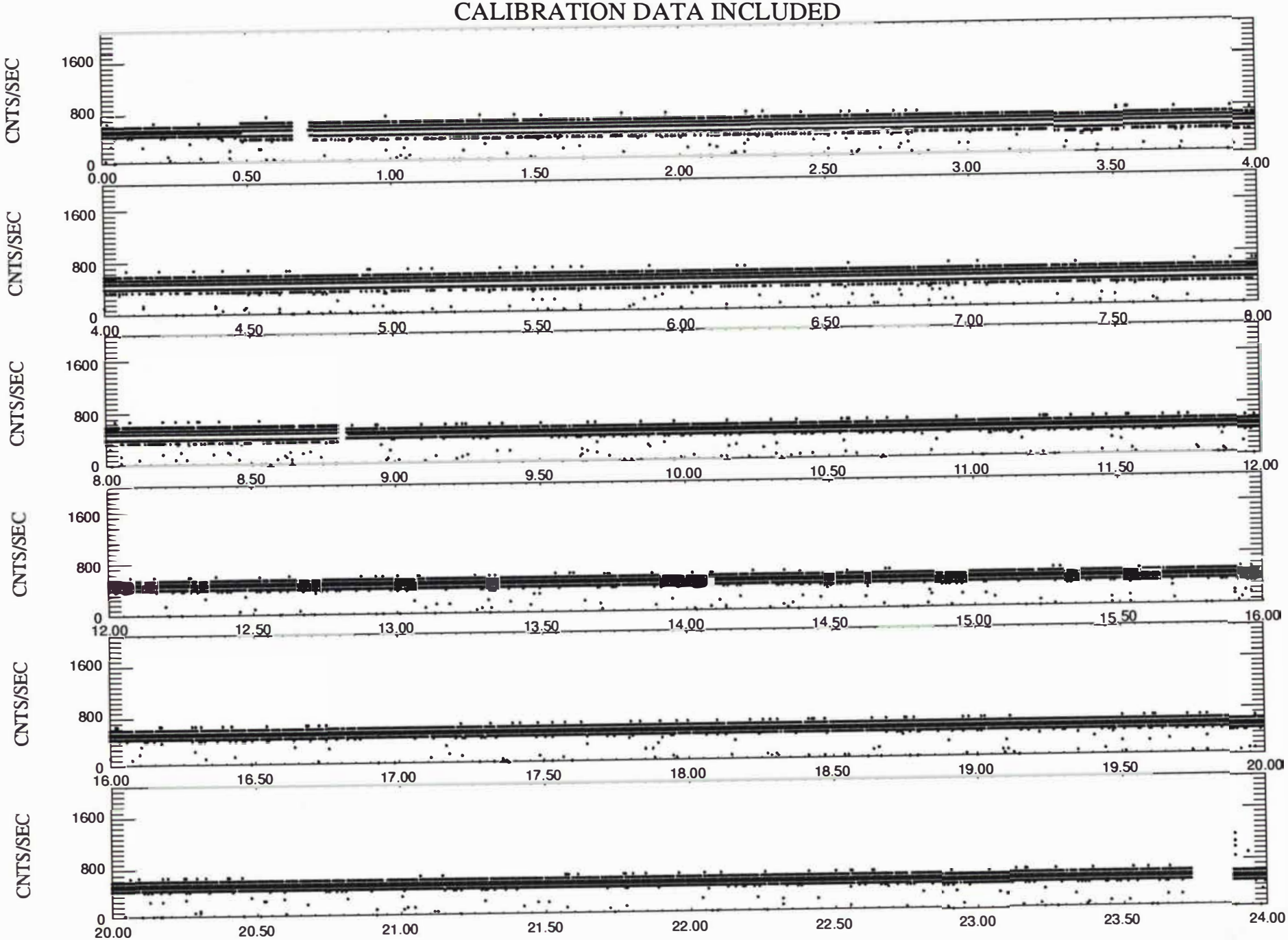

GOES 8
C
B
A
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/20, 0000:00
Plot created: 97/12/24, 1012
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 354, year 1997 to day 354, year 1997 3/12/98



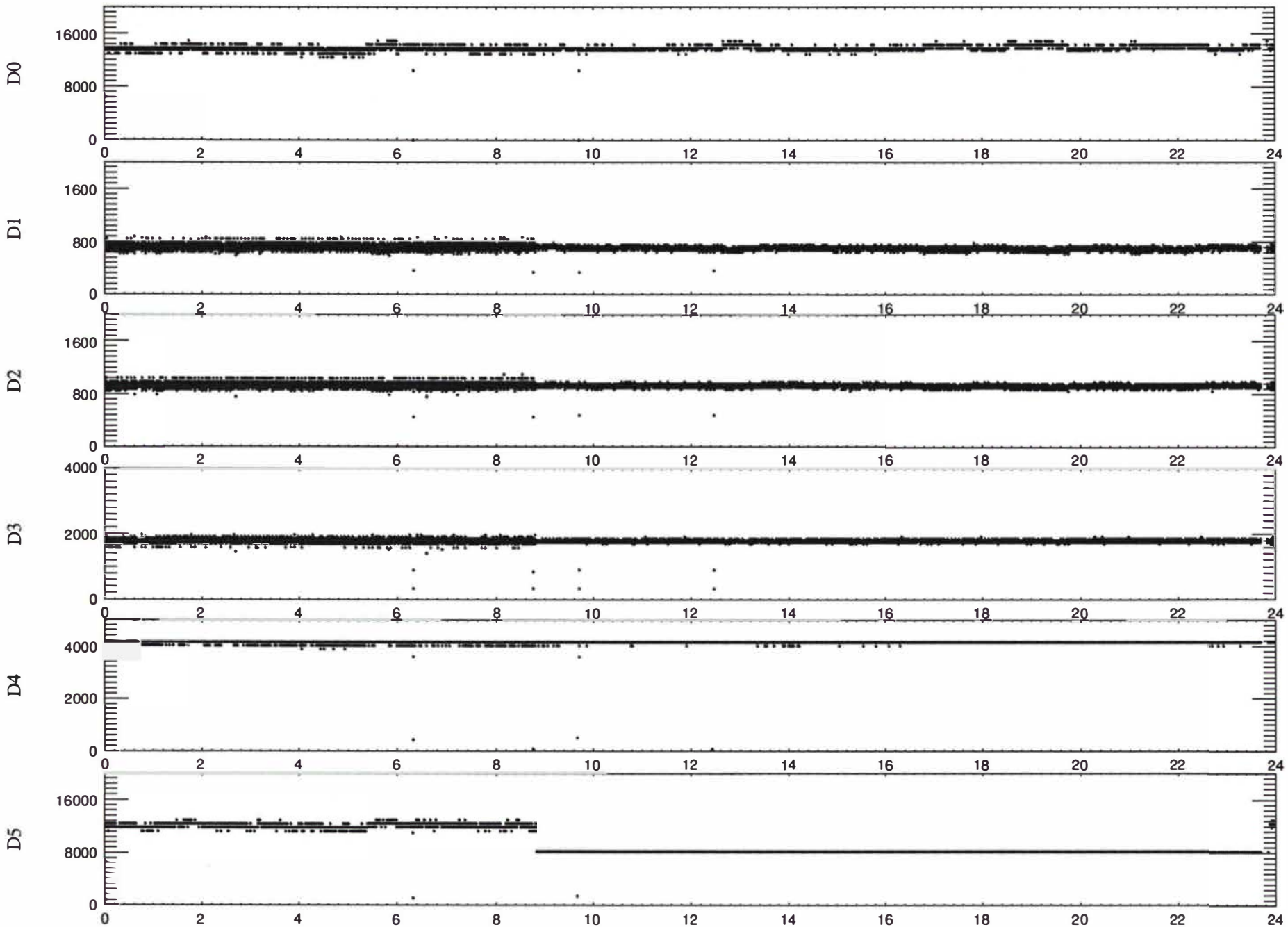
HUS 2A, MODE 1, NOT AVERAGED EDR day 354, year 1997 to day 354, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV 'AL TIME

HUS 2B COUNTS / SEC EDR day 354, year 1997 to day 354, year 1997 3/12/98



From SAHI@fender.msfc.nasa.gov Wed Dec 24 08:51:43 1997
From: SAHI@fender.msfc.nasa.gov
Date: Wed, 24 Dec 1997 10:51:24 -0600 (CST)
To: burst@comptel.sr.unh.edu, grobad@estsa2.estec.esa.nl,
cline@lheavx.gsfc.nasa.gov, barthelmy@lheavx.gsfc.nasa.gov,
bacodine@lheawww.gsfc.nasa.gov, scott@circe.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, band@cass09.ucsd.edu,
gruber@cass09.ucsd.edu, matteson@cass09.ucsd.edu,
PACIESAS@fender.msfc.nasa.gov, HORACK@fender.msfc.nasa.gov,
khurley@sunspot.ssl.berkeley.edu, park@kabul.llnl.gov
Subject: Burst Trigger Message

BATSE BURST TRIGGER

NO.: 6541

TIME: TJD=0803 SECONDS=24284

TYPE: ELECTRO SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
ELECTRON EVENT.

From SAHI@fender.msfc.nasa.gov Mon Dec 29 12:08:14 1997
Return-Path: <SAHI@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA11938; Mon, 29 Dec 1997 12:08:13 -0800
From: SAHI@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA11472; Mon, 29 Dec 1997 12:08:11 -0800
Date: Mon, 29 Dec 1997 14:08:06 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971229140806.2245c26f@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6542
Content-Length: 1135
X-Lines: 26
Status: O

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

BATSE BURST # 6542
EVENT OF 1997 DEC 21 DAY OF YEAR=355
EVENT CROSSING TIME AT BATSE : 44015. S. OR 12:13:35.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 74.000 5.000
BATSE PEAK COUNTING RATE: 7000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 21/12/ 97 IS:
RA= 170.409 DEC= 11.881 DIST= 5.053 AU
BATSE-ULYSSES DISTANCE = 755906112. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 84.79 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 229.14 SECS.
CROSSING TIME AT ULYSSES IS 44244. S. OR 12:17:24 +/- 489.43 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 21/12/ 97 IS:
RA= 304.690 DEC= -20.866 DIST= 2.101 AU
MARS-BATSE DISTANCE = 314241088. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 51.63 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 650.68 SECS.
CROSSING TIME AT MARS IS 44666. S. OR 12:24:25 +/- 152.56 SECONDS

BATSE BURST TRIGGER

NO.: 6542

TIME: TJD=0803 SECONDS=44015

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

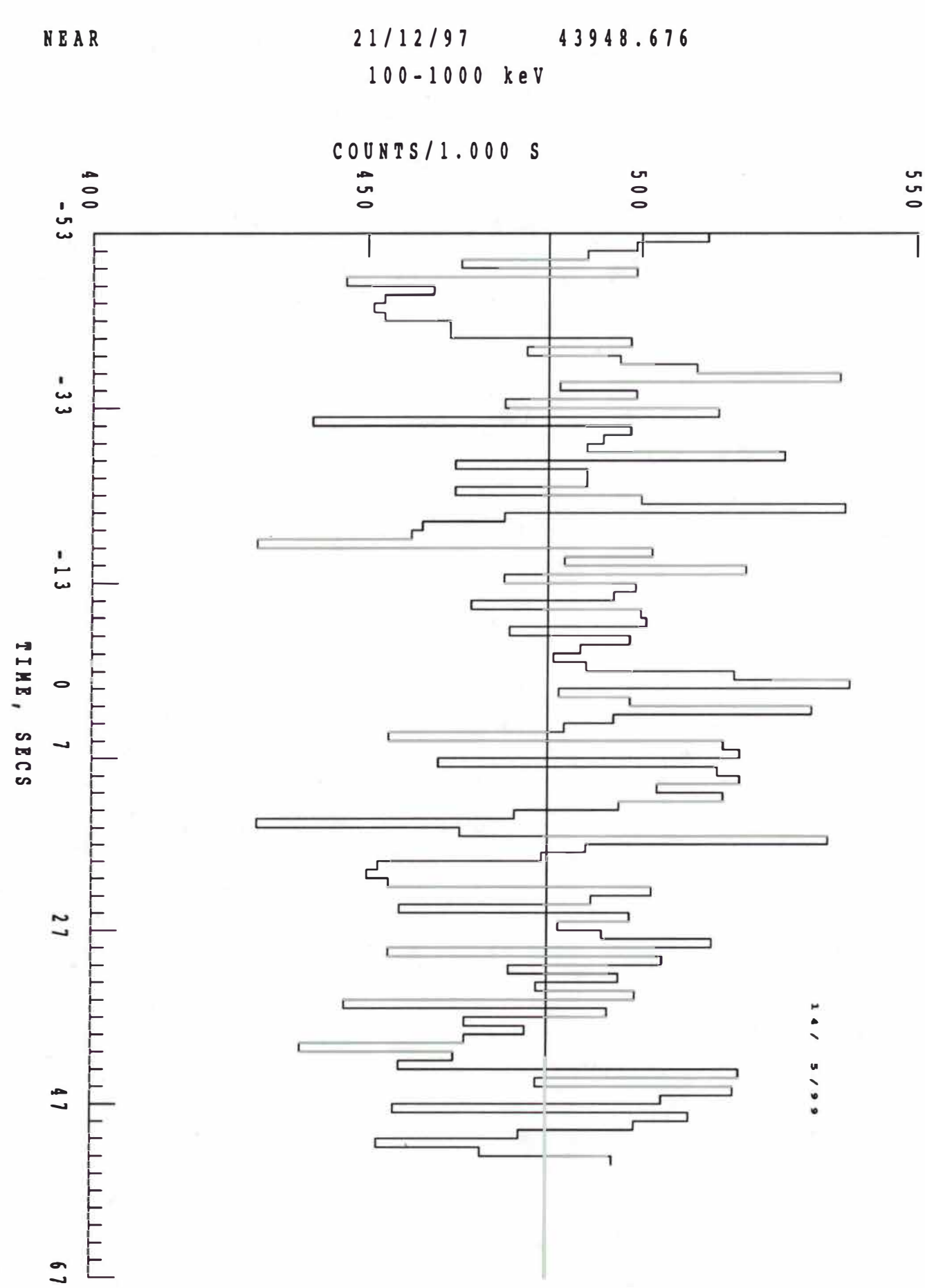
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=124.4 AZIMUTH=202.2 ERROR=6.3 DEGREES

COMMENTS:
BURST, SINGLE SPIKE, DUR. APPROX. 0.06 SECS. NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6542 | 971221 | 10803 | 44015 | 7000 | 074 | +05 | .06 |


NEAR
21/12/97
43948.676
100-1000 keV
COUNTS/1.000 S
400
450
500
550
-53
-33
-13
0
7
27
47
67
TIME, SECS
14/ 5/99

BATSE BURST# 6542

ULYSSES RT 29/12/97

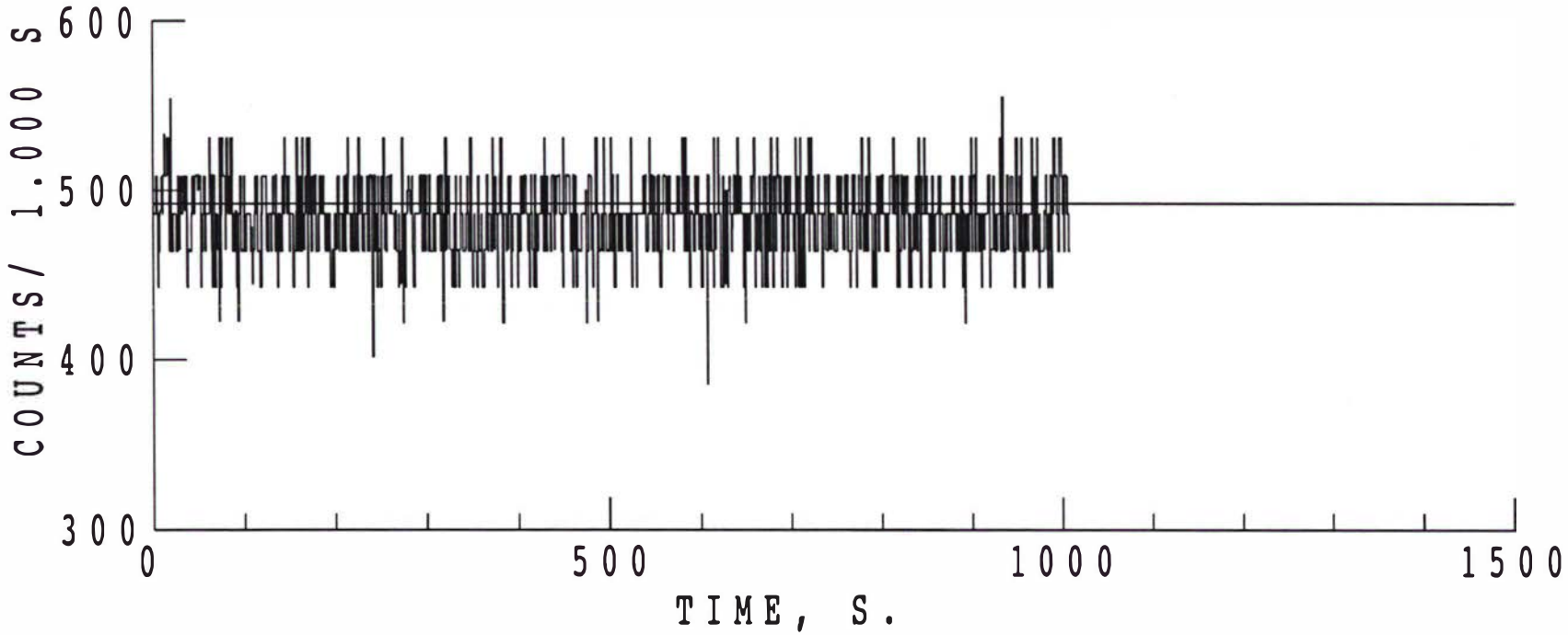
21/12/97 43740.152 s

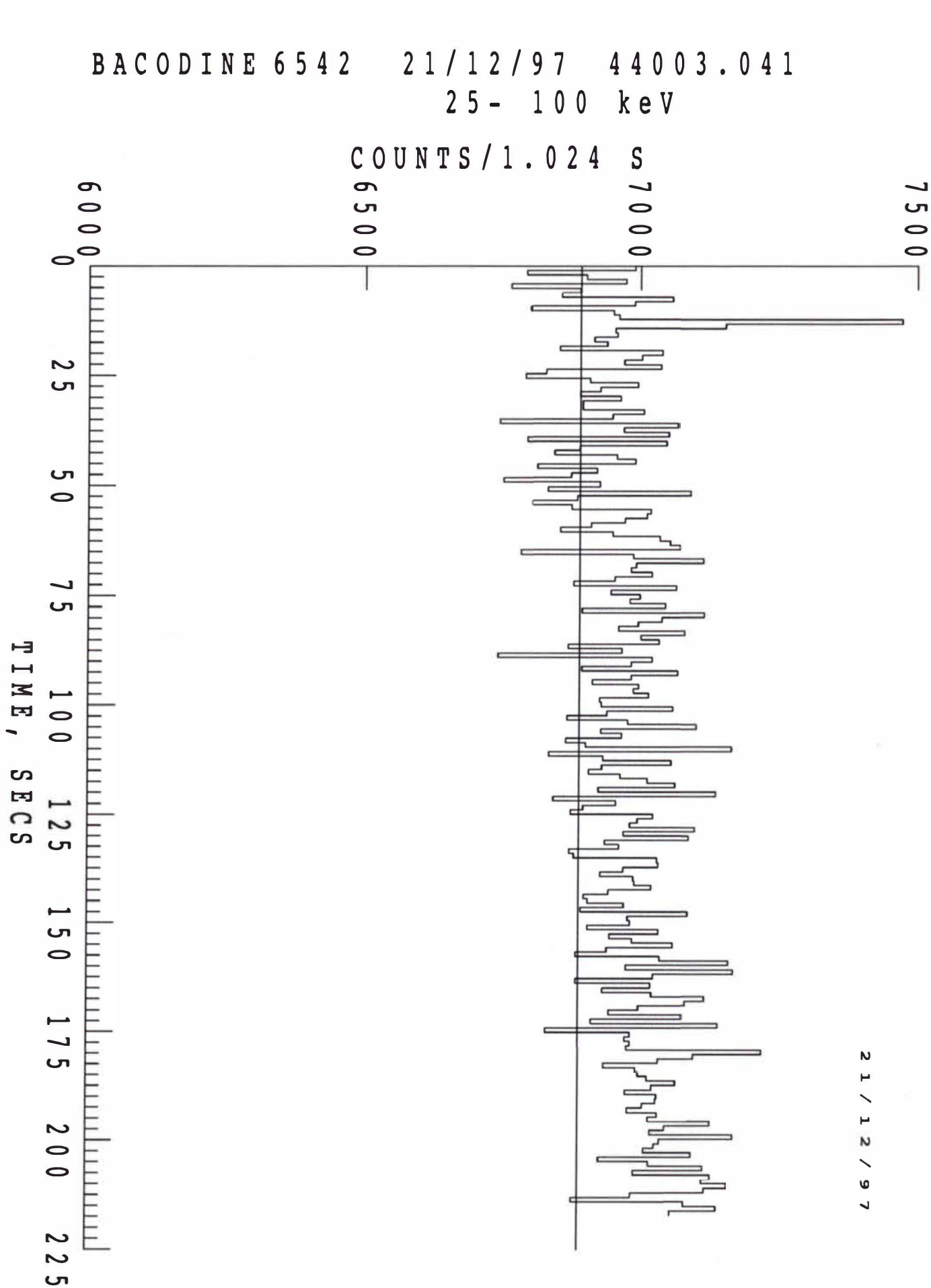
0.500 S INTERVALS REGROUPED BY 2

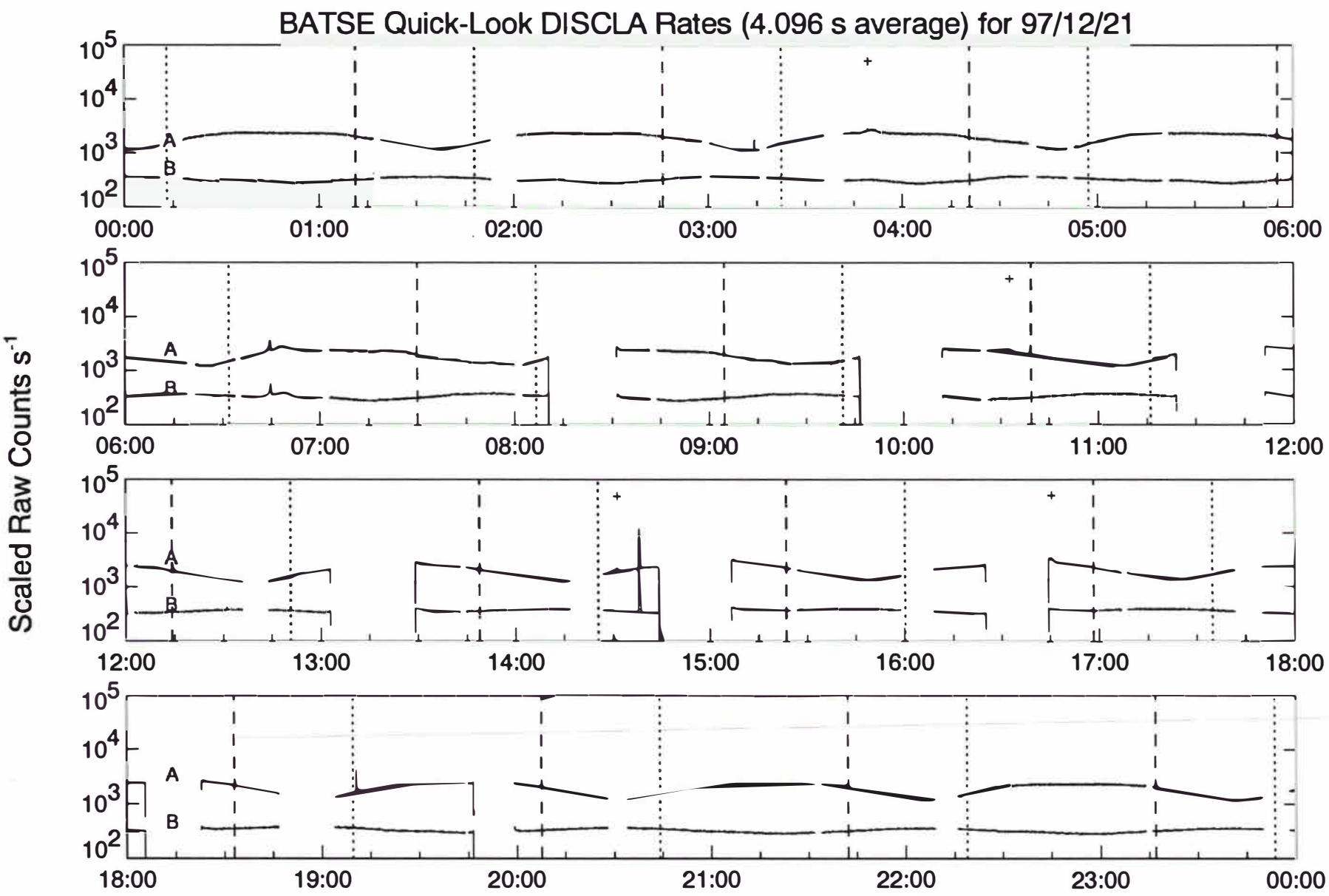
0- 0 keV

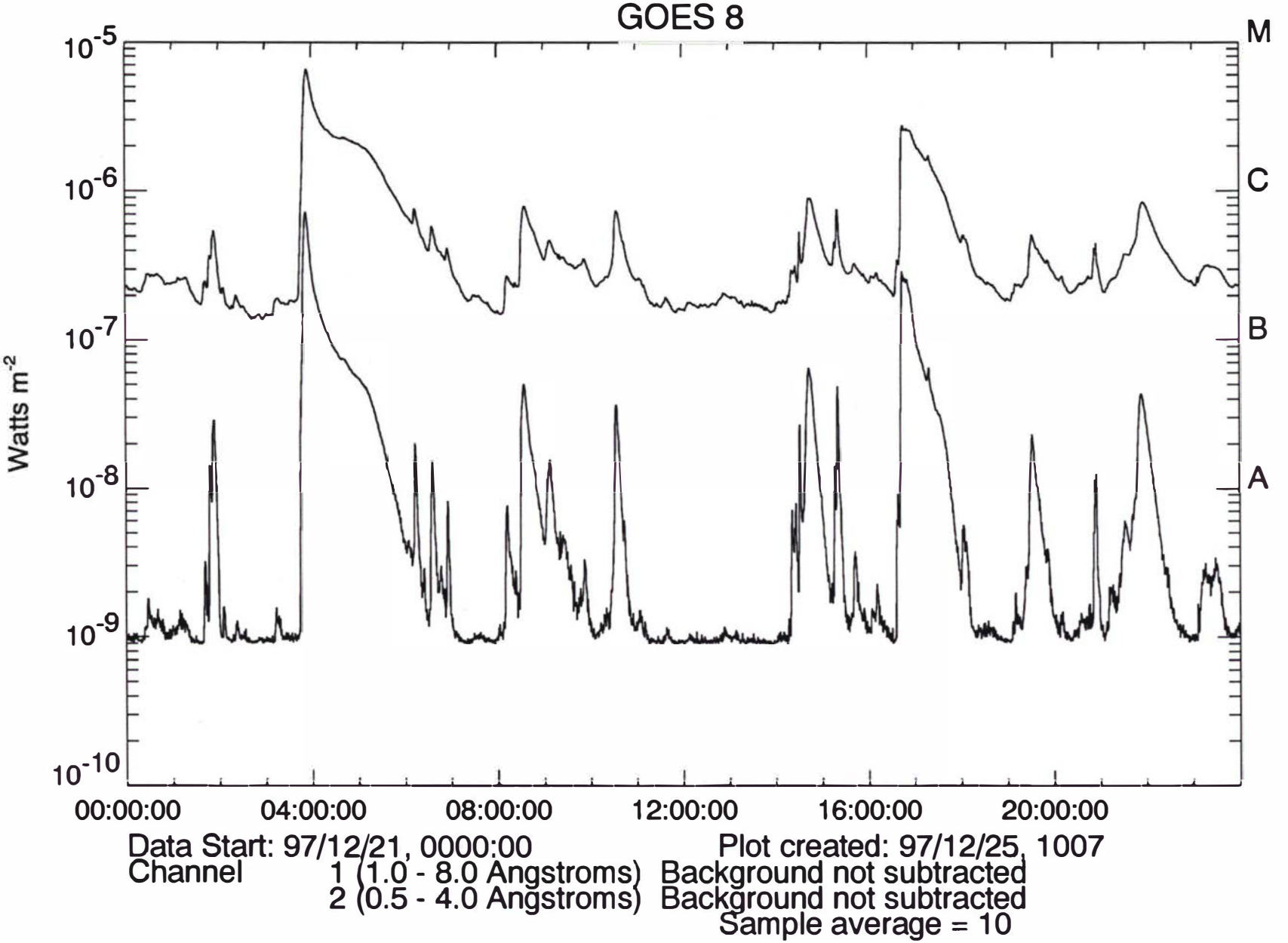
N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

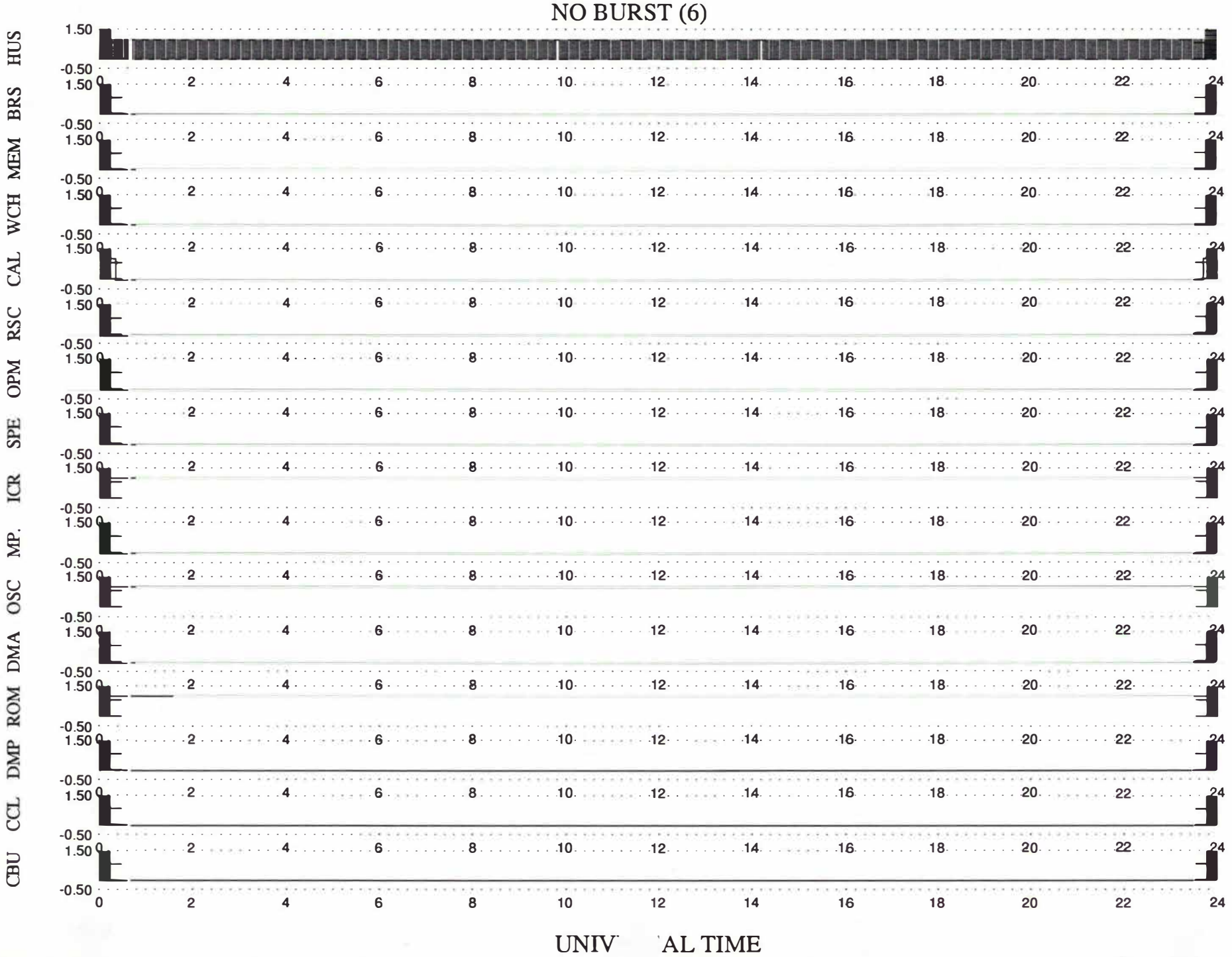



BACODINE 6542 21/12/97 44003.041
25- 100 keV
COUNTS/1.024 S
6000
6500
7000
7500
0
25
50
75
100
125
150
175
200
225
TIME, SECS
21/12/97


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/21
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/25, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

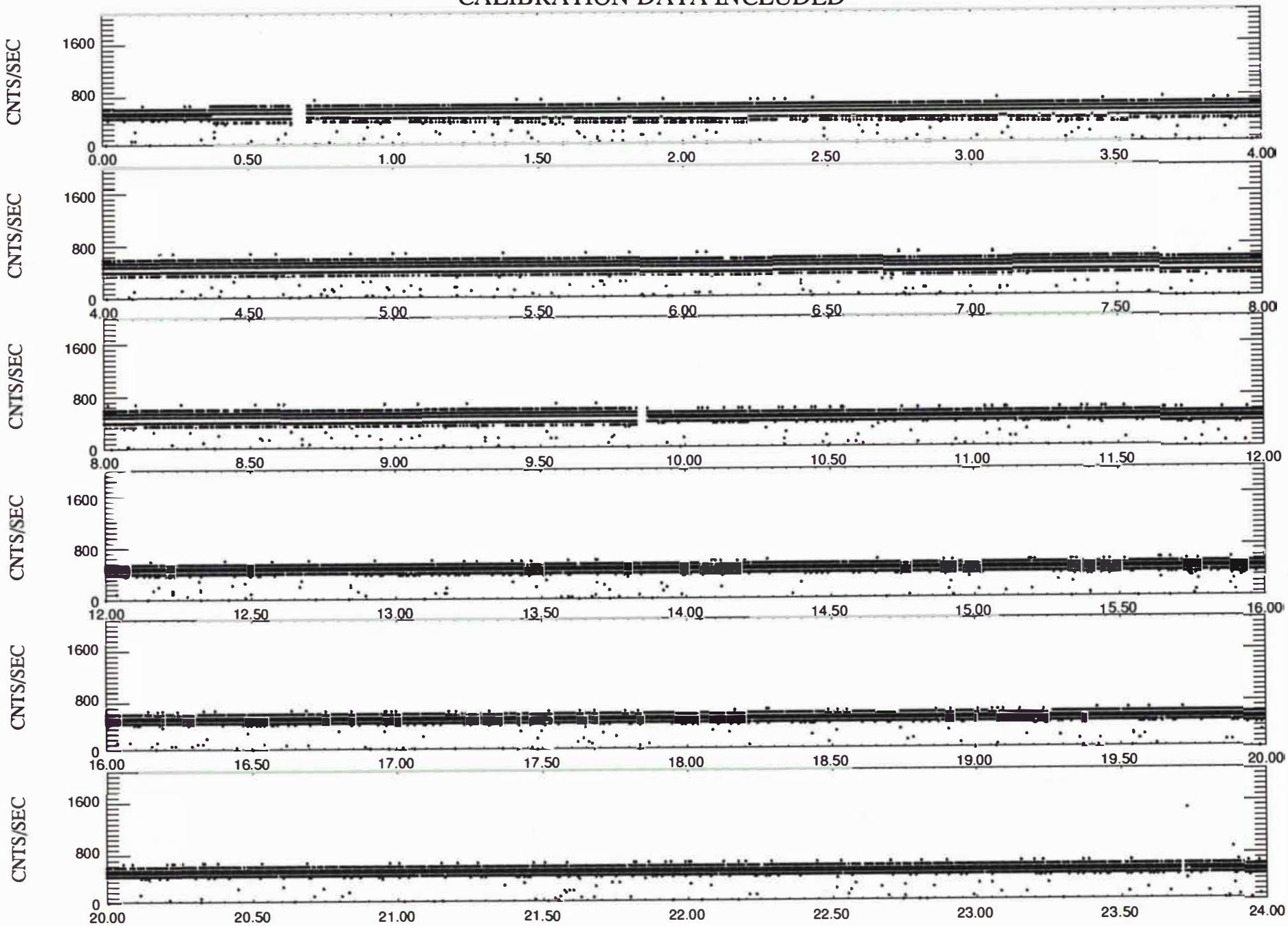

GOES 8
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/21, 0000:00
Plot created: 97/12/25, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 355, year 1997 to day 355, year 1997 3/12/98



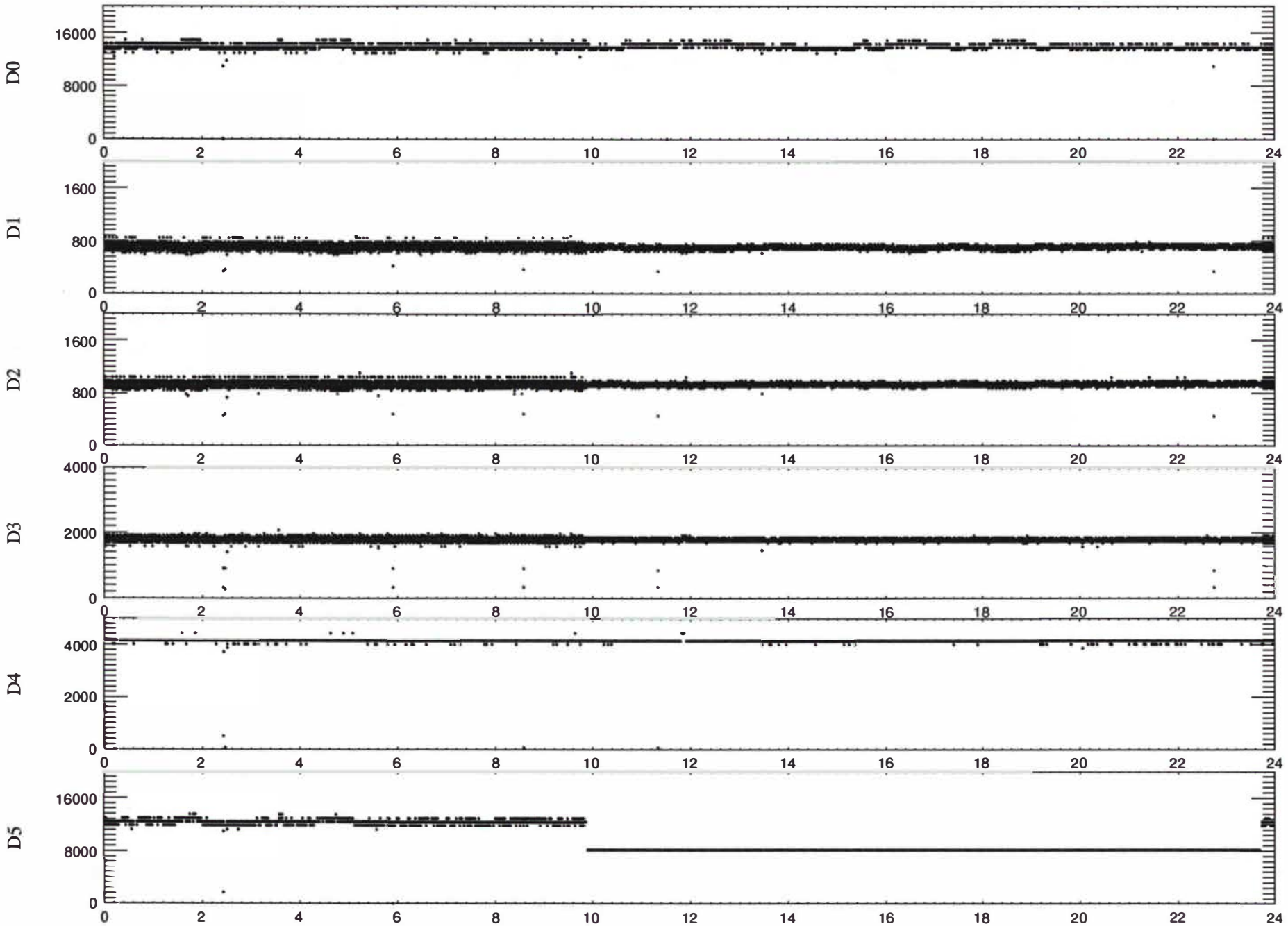
HUS 2A, MODE 1, NOT AVERAGED EDR day 355, year 1997 to day 355, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2B COUNTS / SEC EDR day 355, year 1997 to day 355, year 1997 3/12/98



From HENZE@fender.msfc.nasa.gov Wed Dec 24 13:42:21 1997
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id NAA07513; Wed, 24 Dec 1997 13:42:20 -0800
From: HENZE@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id NAA13232; Wed, 24 Dec 1997 13:42:18 -0800
Date: Wed, 24 Dec 1997 15:42:12 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971224154212.22454ea9@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6543
Content-Length: 1135
X-Lines: 26
Status: RO

Too weak
U/B ratio too high

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

BATSE BURST # 6543
EVENT OF 1997 DEC 22 DAY OF YEAR=356
EVENT CROSSING TIME AT BATSE : 41814. S. OR 11:36:54.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 290.000 -18.000
BATSE PEAK COUNTING RATE: 11000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 22/12/ 97 IS:
RA= 170.360 DEC= 11.871 DIST= 5.037 AU
BATSE-ULYSSES DISTANCE = 753570324. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 58.41 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1316.79 SECS.
CROSSING TIME AT ULYSSES IS 43131. S. OR 11:58:50 +/- 441.73 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 22/12/ 97 IS:
RA= 305.504 DEC= -20.683 DIST= 2.104 AU
MARS-BATSE DISTANCE = 314736576. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=165.13 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1014.71 SECS.
CROSSING TIME AT MARS IS 40799. S. OR 11:19:59 +/- 31.35 SECONDS

BATSE BURST TRIGGER

NO.: 6543

TIME: TJD=0804 SECONDS=41814

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

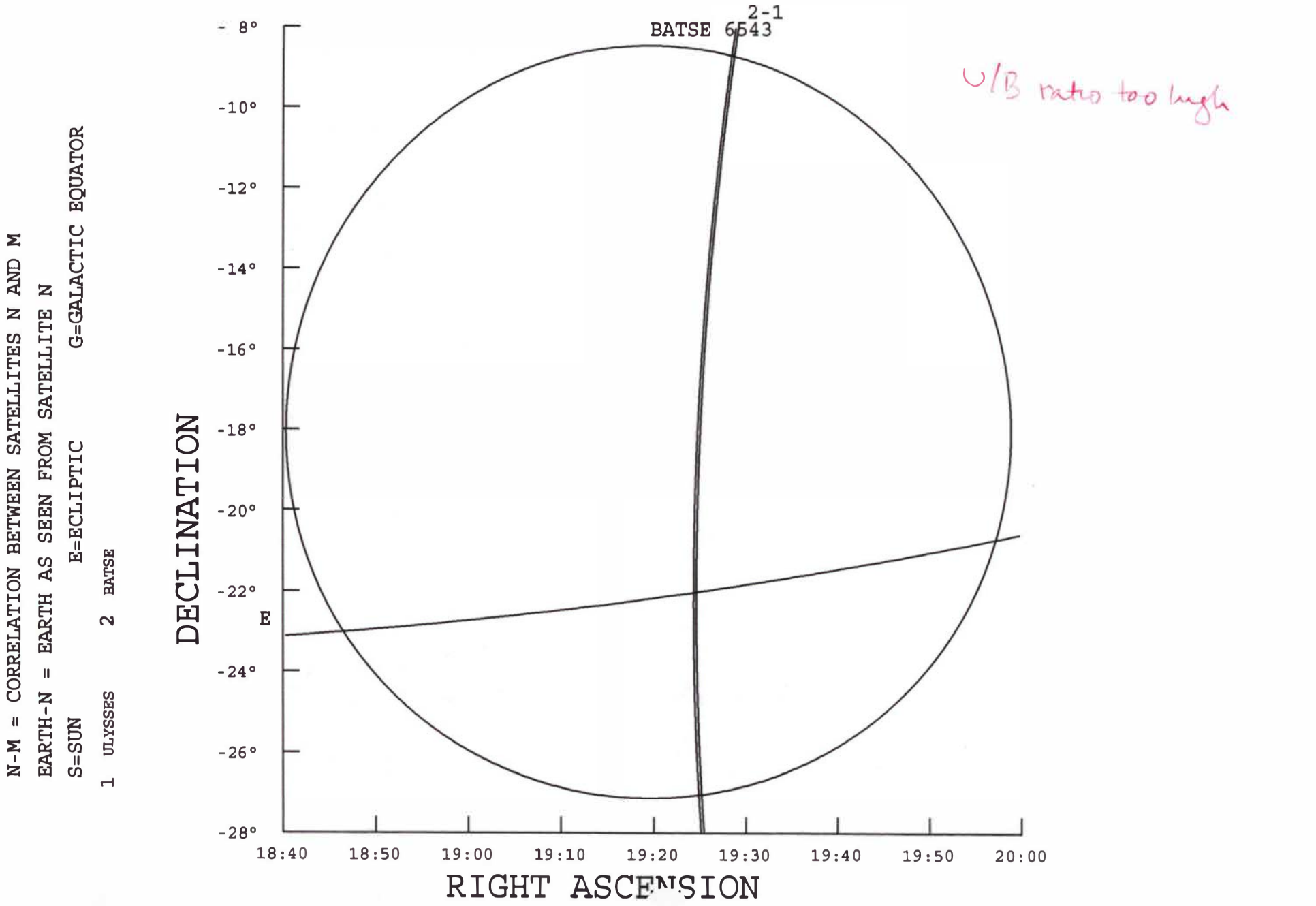
LOCATION: ZENITH= 61.5 AZIMUTH=338.3 ERROR= 9.2 DEGREES

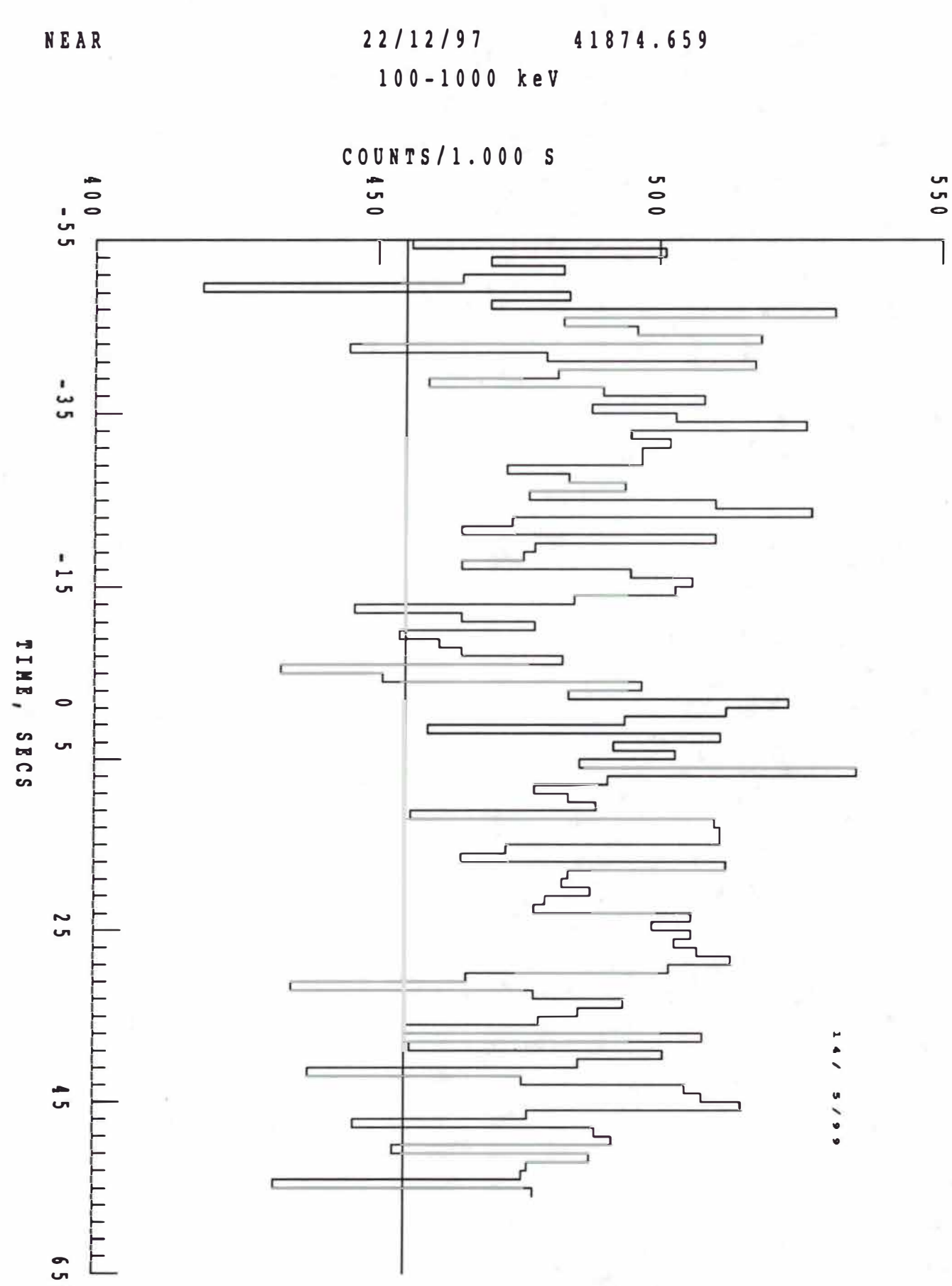
COMMENTS:
SINGLE SPIKE, DUR. APPROX. 0.13 S. MARGINALLY OR NOT VISIBLE ABOVE 300 KEV.

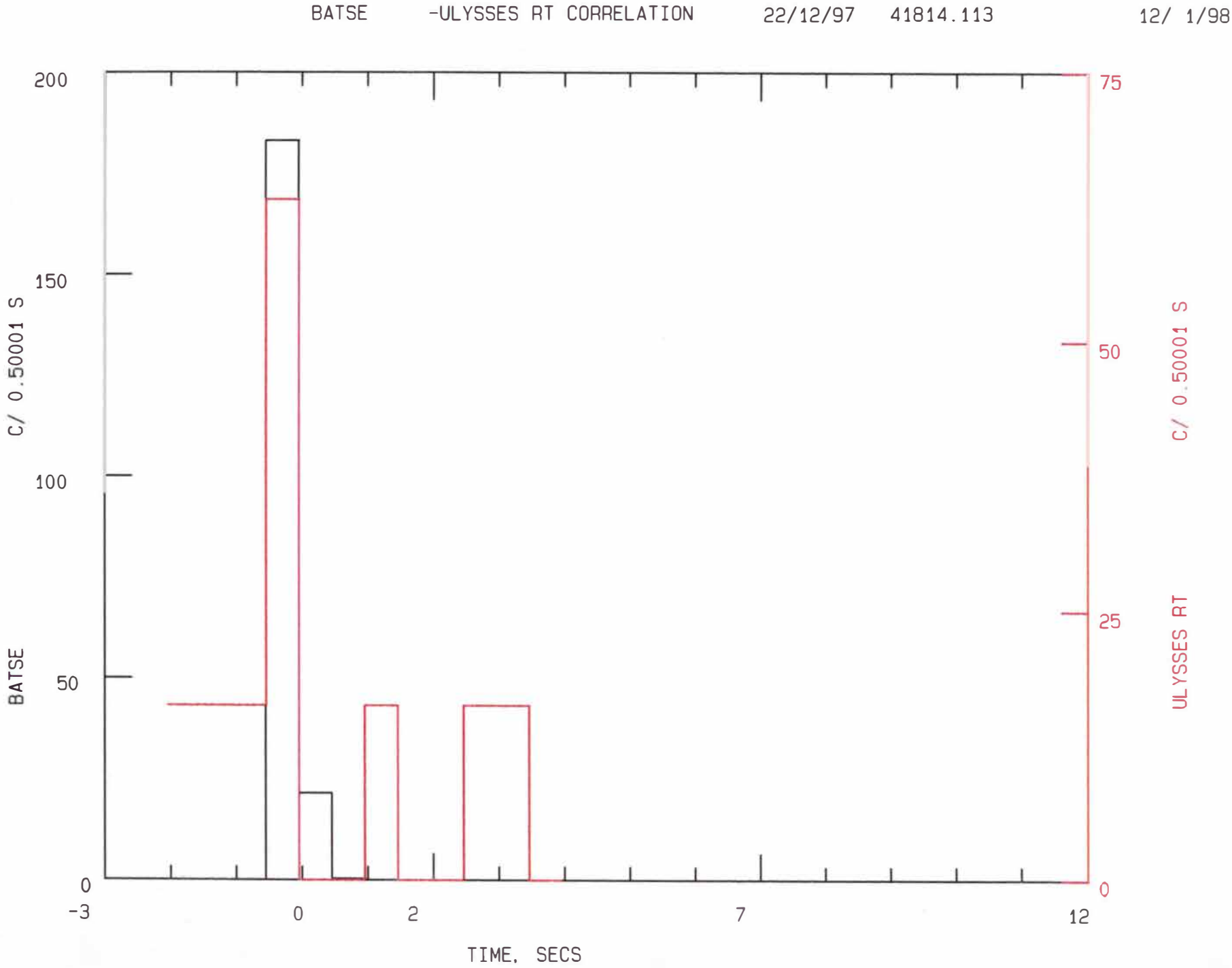
| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6543 | 971222 | 10804 | 41814 | 11000 | 290 | -18 | .13 |

# EVENT OF DEC 22, 1997 11:58

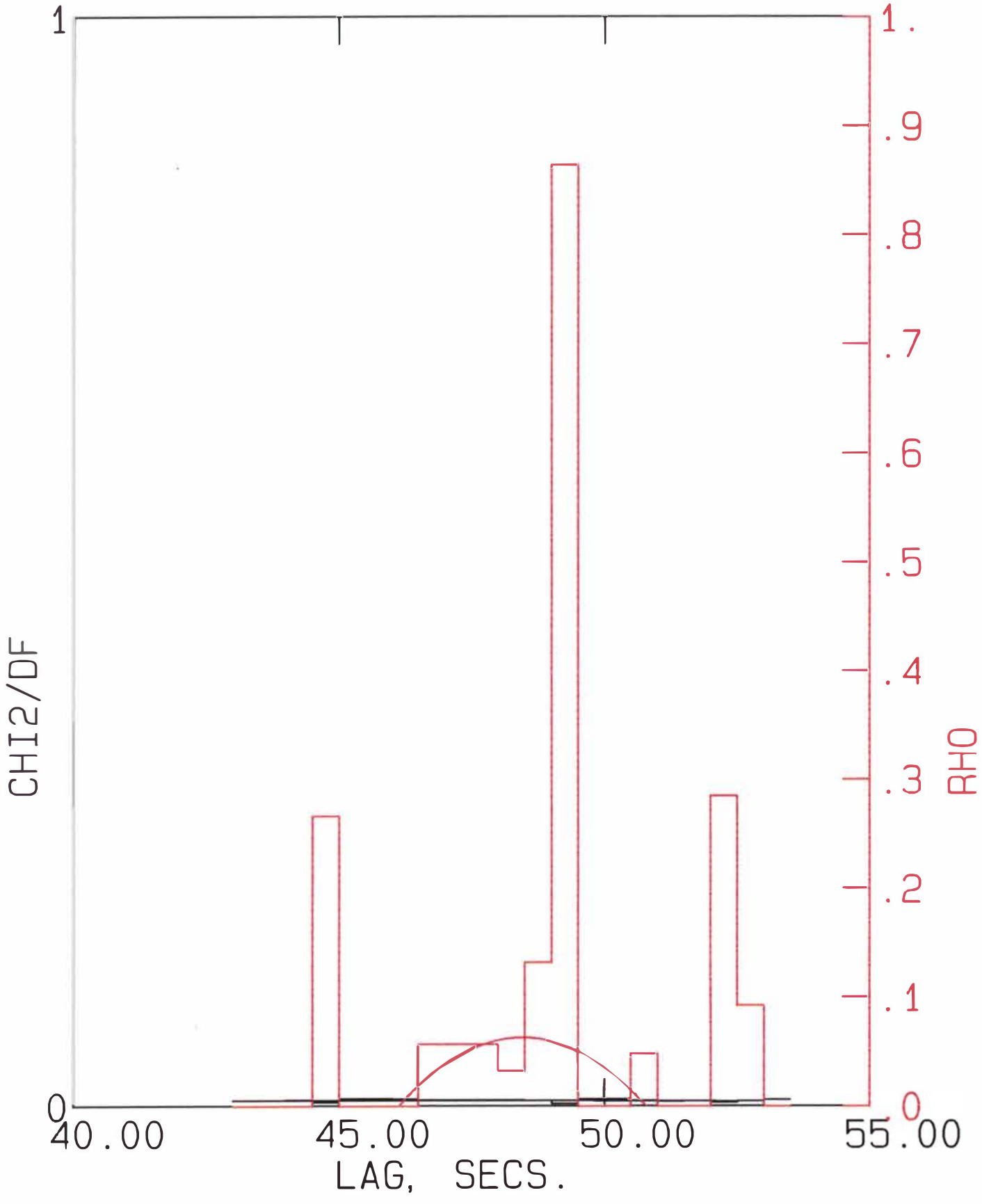
12/ 1/98




NEAR
22/12/97
41874.659
100-1000 keV
COUNTS/1.000 S
400
450
500
550
-55
-35
-15
0
5
25
45
65
TIME, SECS
14/ 5/99


BATSE -ULYSSES RT CORRELATION 22/12/97 41814.113 12/ 1/98
200
150
100
50
0
C/ 0.50001 S
BATSE
75
50
25
0
C/ 0.50001 S
ULYSSES RT
-3
0
2
7
12
TIME, SECS

BATSE -ULYSSES RT CORRELATION 22/12/97 41814.113



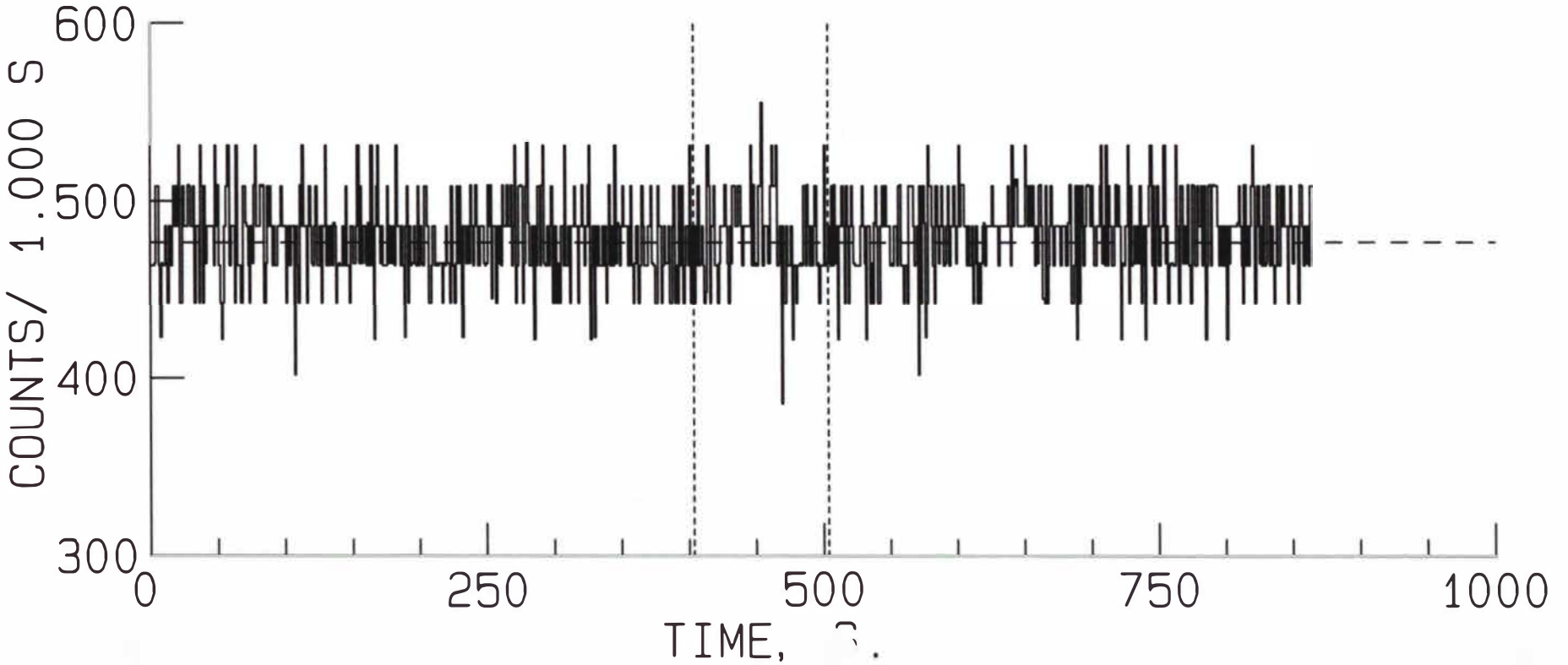
ULYSSES RT

12/ 1/98

22/12/97 42696.104 s

0.500 S INTERVALS REGROUPED BY 2

22- 147 keV



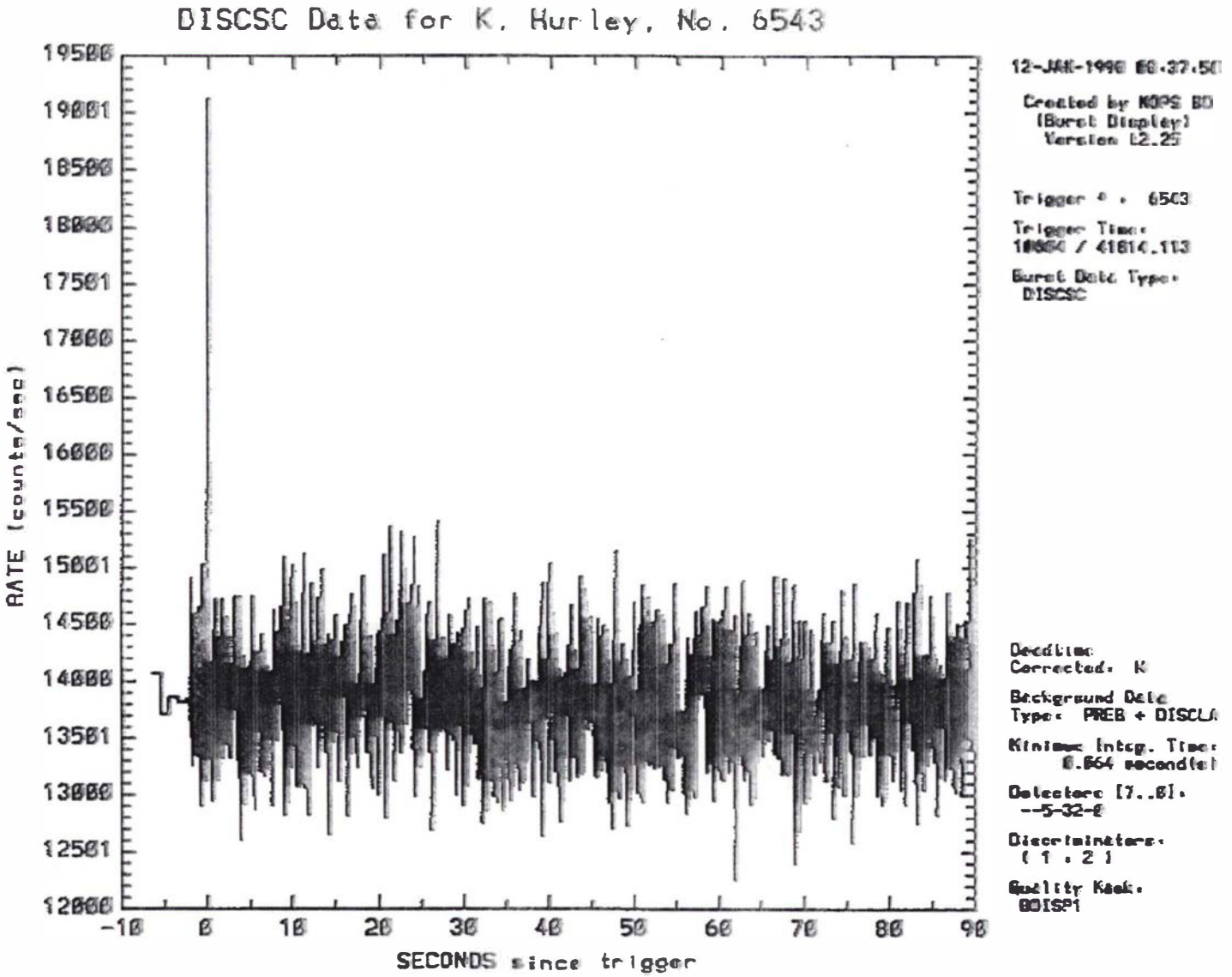
BATSE 22/12/97 41814.113

25- 100 keV

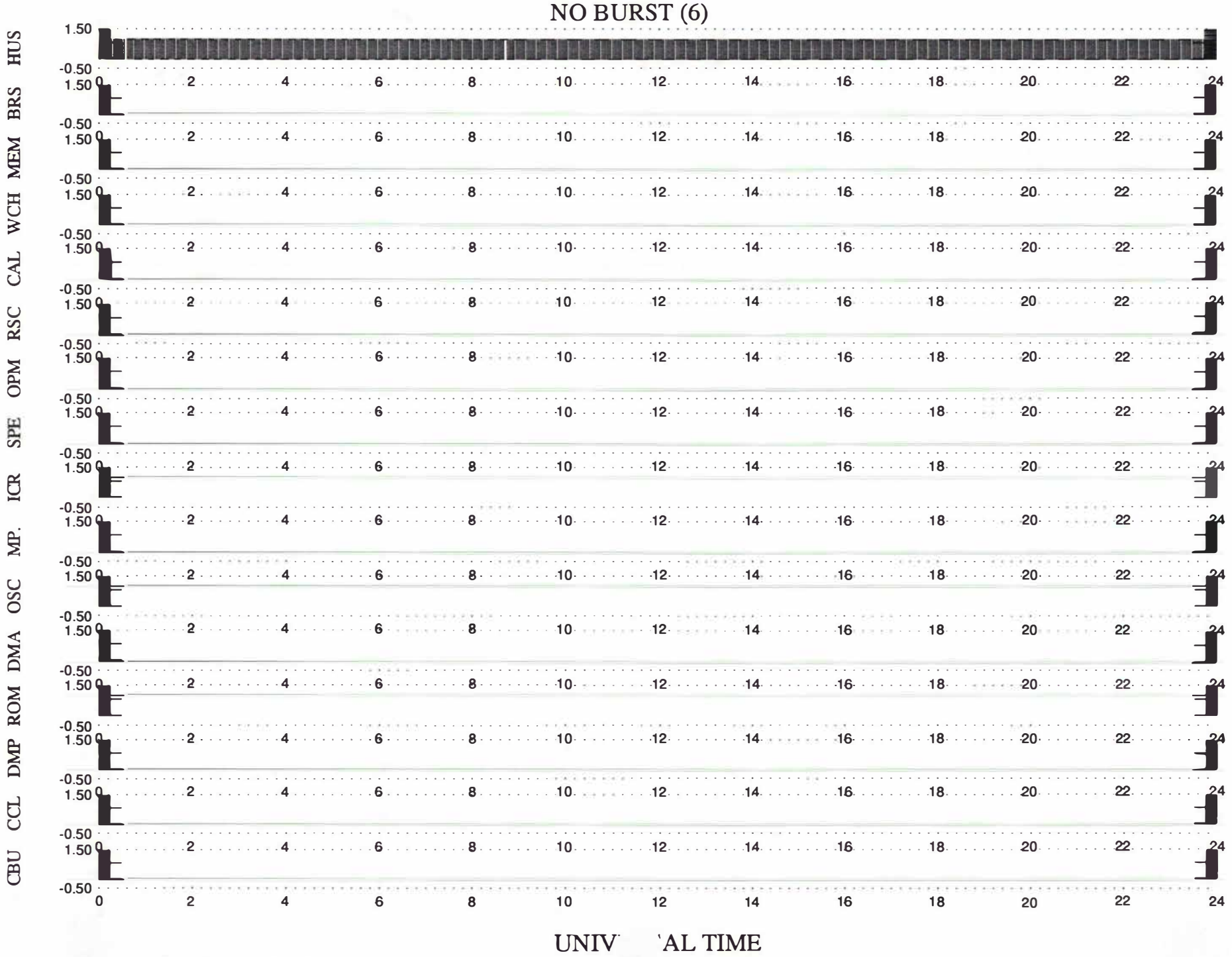
COUNTS/0.064 S




12/ 1/98

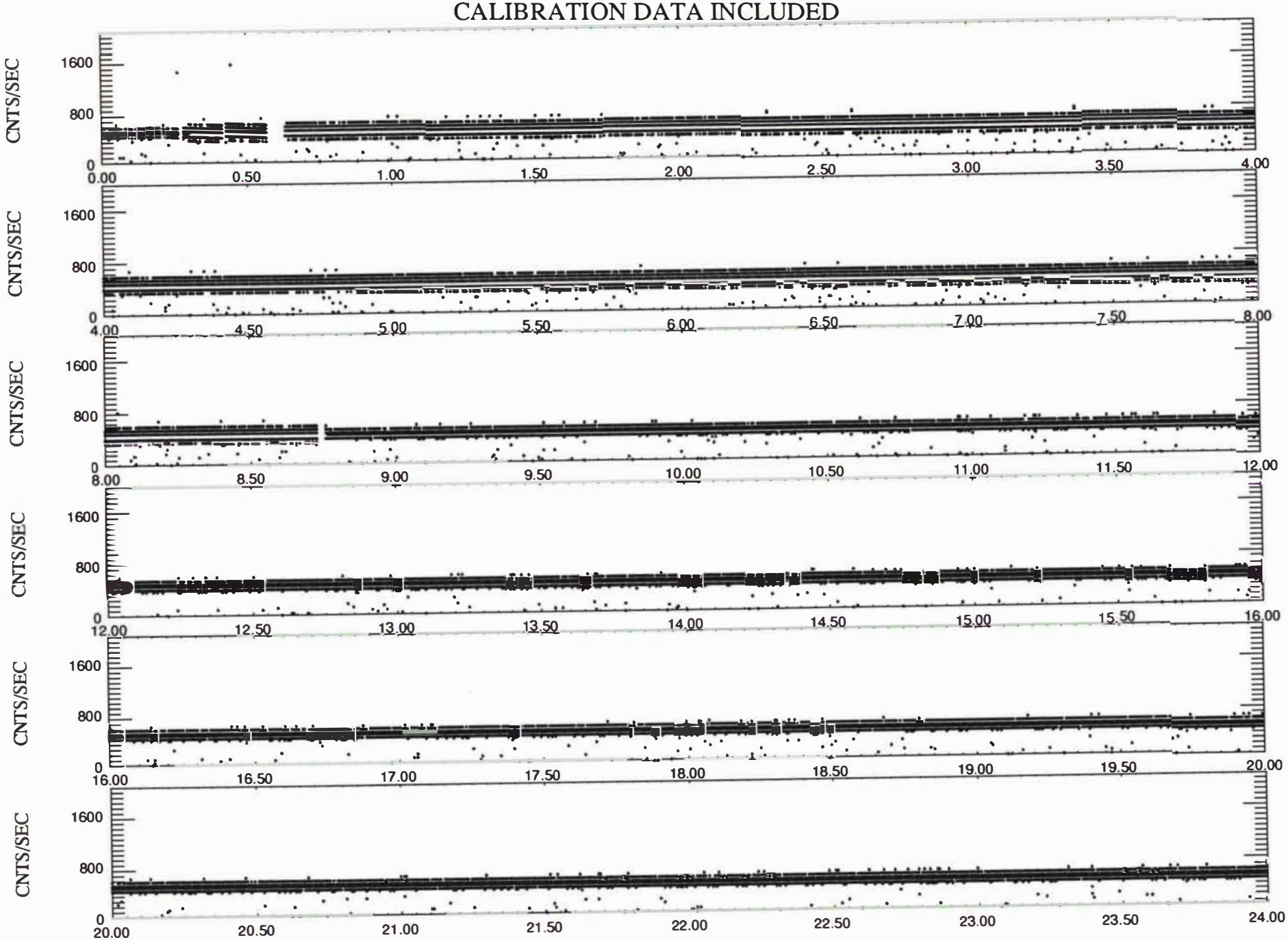

DISCSC Data for K. Hurley, No. 6543
RATE (counts/sec)
19500
19001
18500
18000
17501
17000
16500
16000
15500
15001
14500
14000
13501
13000
12501
12000
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
12-JAN-1998 08:37:50
Created by MOPS BD
(Burst Display)
Version 02.25
Trigger # : 6543
Trigger Time:
18864 / 41814.113
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Kinimax Integ. Time:
0.064 second(s)
Detectors [7..0]:
--5-32-0
Discriminators:
( 1 , 2 )
Quality Kode:
BDIS01

HUS MODES EDR day 356, year 1997 to day 356, year 1997 3/12/98



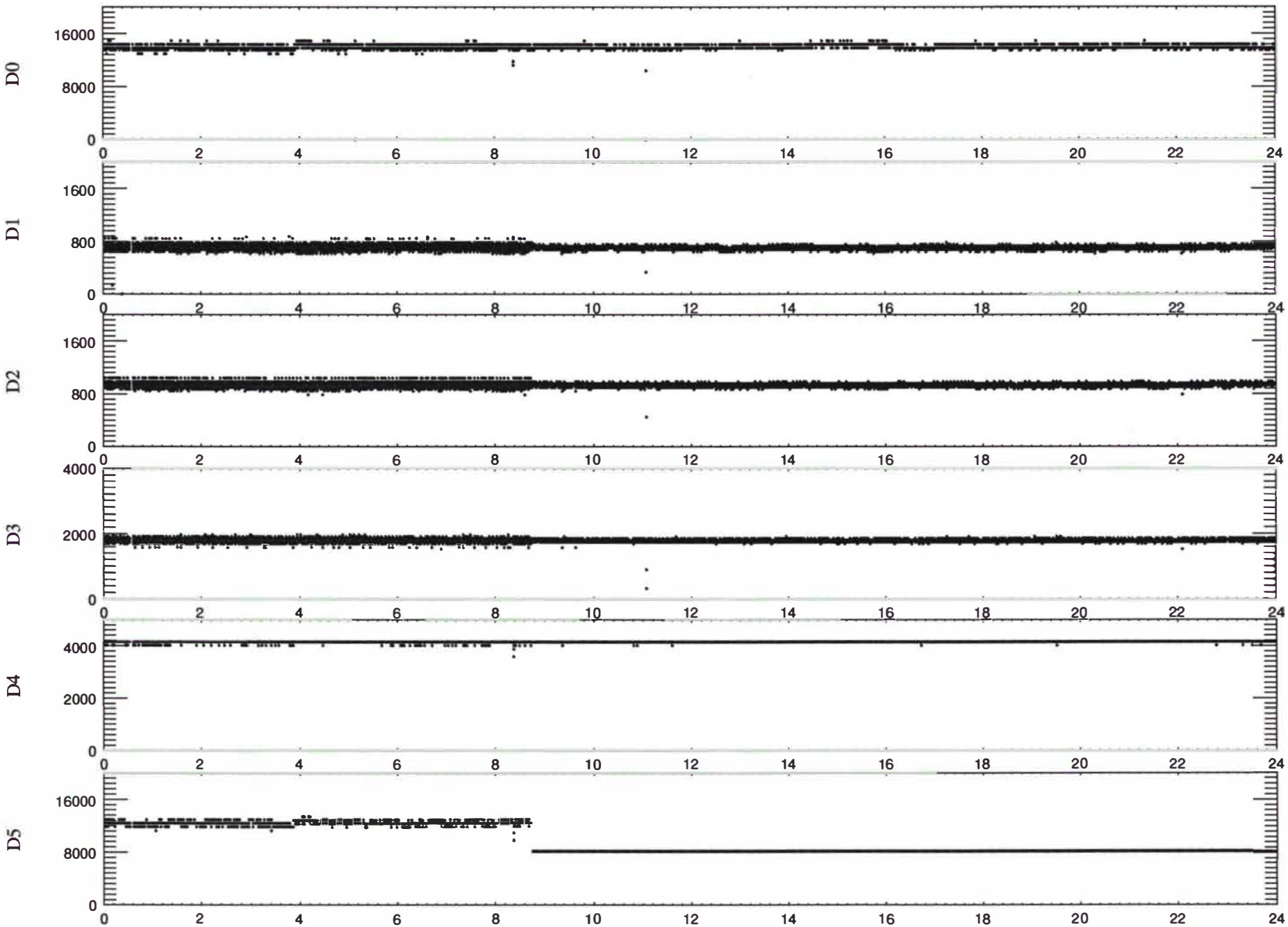
HUS 2A, MODE 1, NOT AVERAGED EDR day 356, year 1997 to day 356, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2B COUNTS / SEC EDR day 356, year 1997 to day 356, year 1997 3/12/98



From HENZE@fender.msfc.nasa.gov Wed Dec 24 14:27:09 1997
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id OAA07673; Wed, 24 Dec 1997 14:27:08 -0800
From: HENZE@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id OAA13370; Wed, 24 Dec 1997 14:27:01 -0800
Date: Wed, 24 Dec 1997 16:26:51 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971224162651.22454ea9@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6544
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6544
EVENT OF 1997 DEC 23 DAY OF YEAR=357
EVENT CROSSING TIME AT BATSE : 2284. S. OR 00:38:04.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 222.000 51.000
BATSE PEAK COUNTING RATE: 4500 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 23/12/ 97 IS:
RA= 170.331 DEC= 11.866 DIST= 5.029 AU
BATSE-ULYSSES DISTANCE = 752272101. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=122.80 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1359.46 SECS.
CROSSING TIME AT ULYSSES IS 925. S. OR 00:15:24 +/- 395.54 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 23/12/ 97 IS:
RA= 306.317 DEC= -20.497 DIST= 2.107 AU
MARS-BATSE DISTANCE = 315231168. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 77.66 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 224.76 SECS.
CROSSING TIME AT MARS IS 2509. S. OR 00:41:48 +/- 181.75 SECONDS

BATSE BURST TRIGGER
NO.: 6544

TIME: TJD=0805 SECONDS= 2284

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

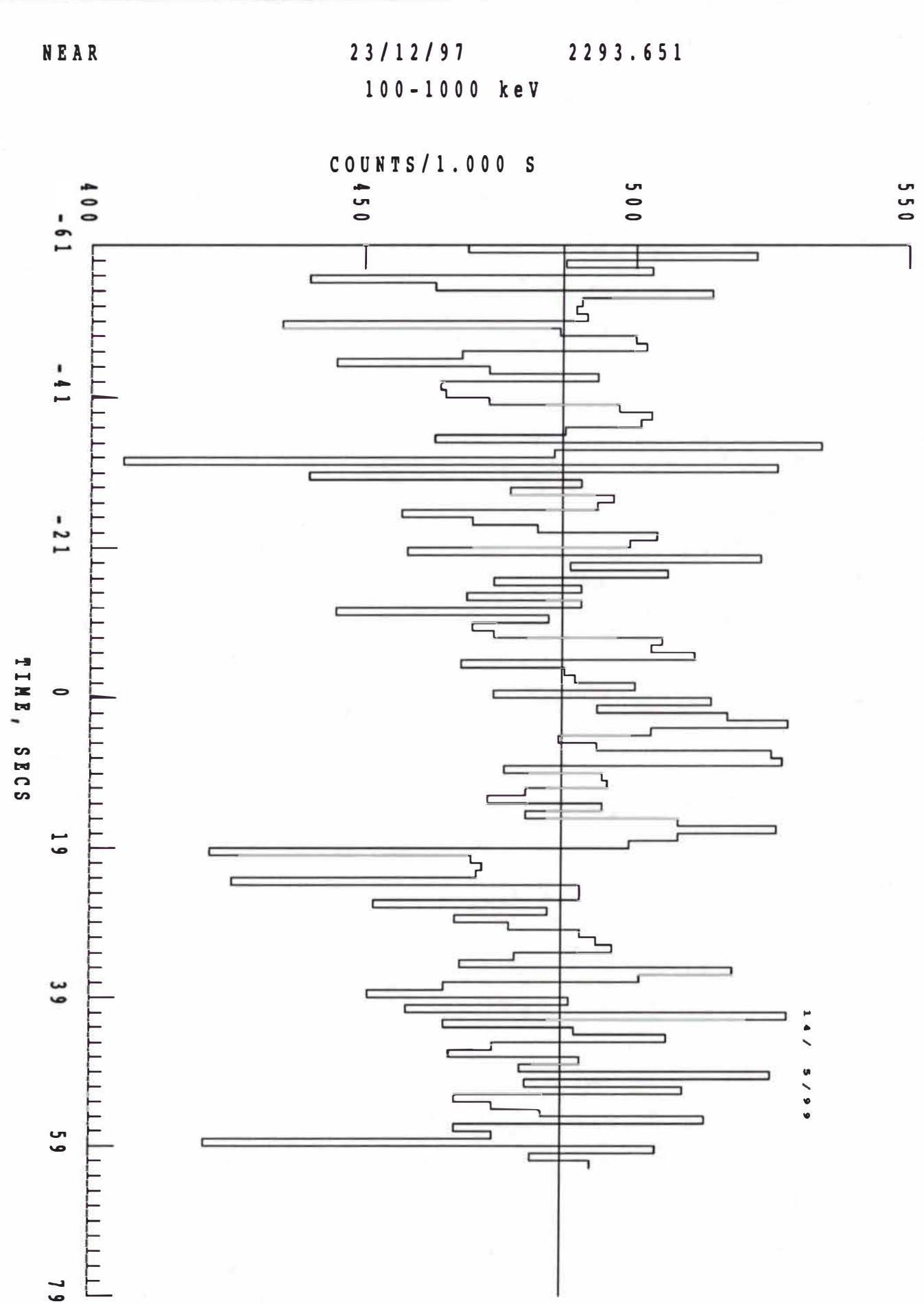
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=105.6 AZIMUTH= 60.3 ERROR= 2.2 DEGREES

COMMENTS:
SINGLE PULSE, DUR. APPROX. 45 S. MARGINALLY VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6544 | 971223 | 10805 | 02284 | 4500 | 222 | +51 | 45 |

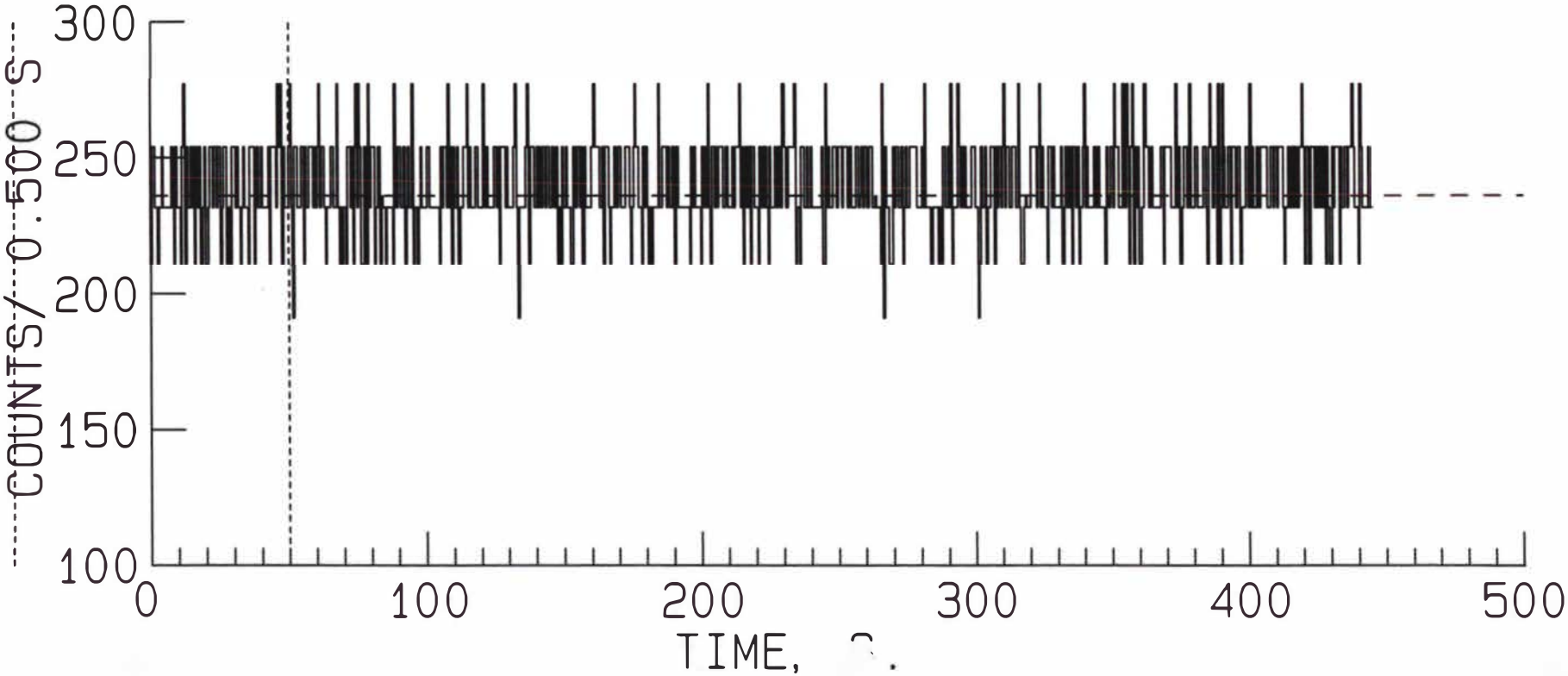

NEAR
23/12/97
2293.651
100-1000 keV
COUNTS/1.000 S
400
450
500
550
-61
-41
-21
0
19
39
59
79
TIME, SECS
14/ 5/99

ULYSSES RT

2/ 1/98

23/12/97 1296.110 s

22- 147 keV

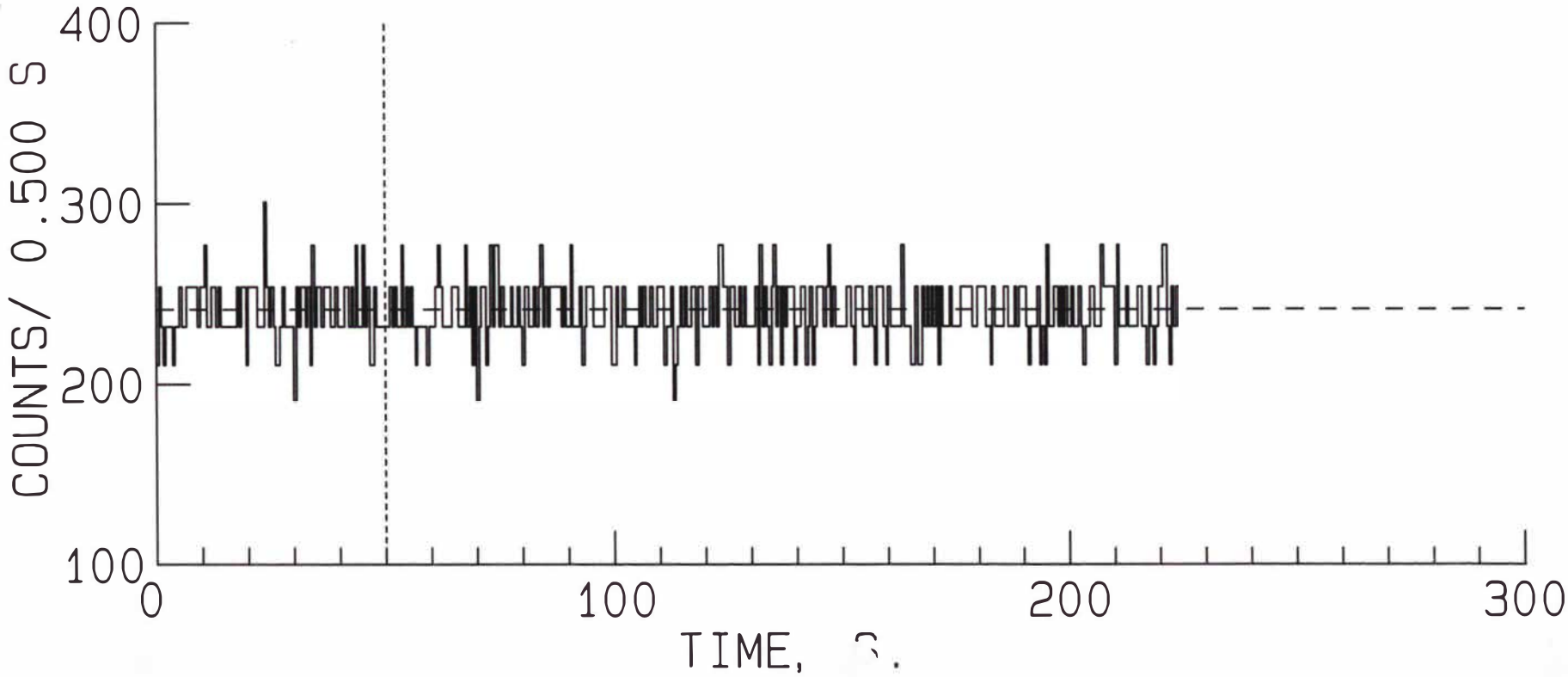


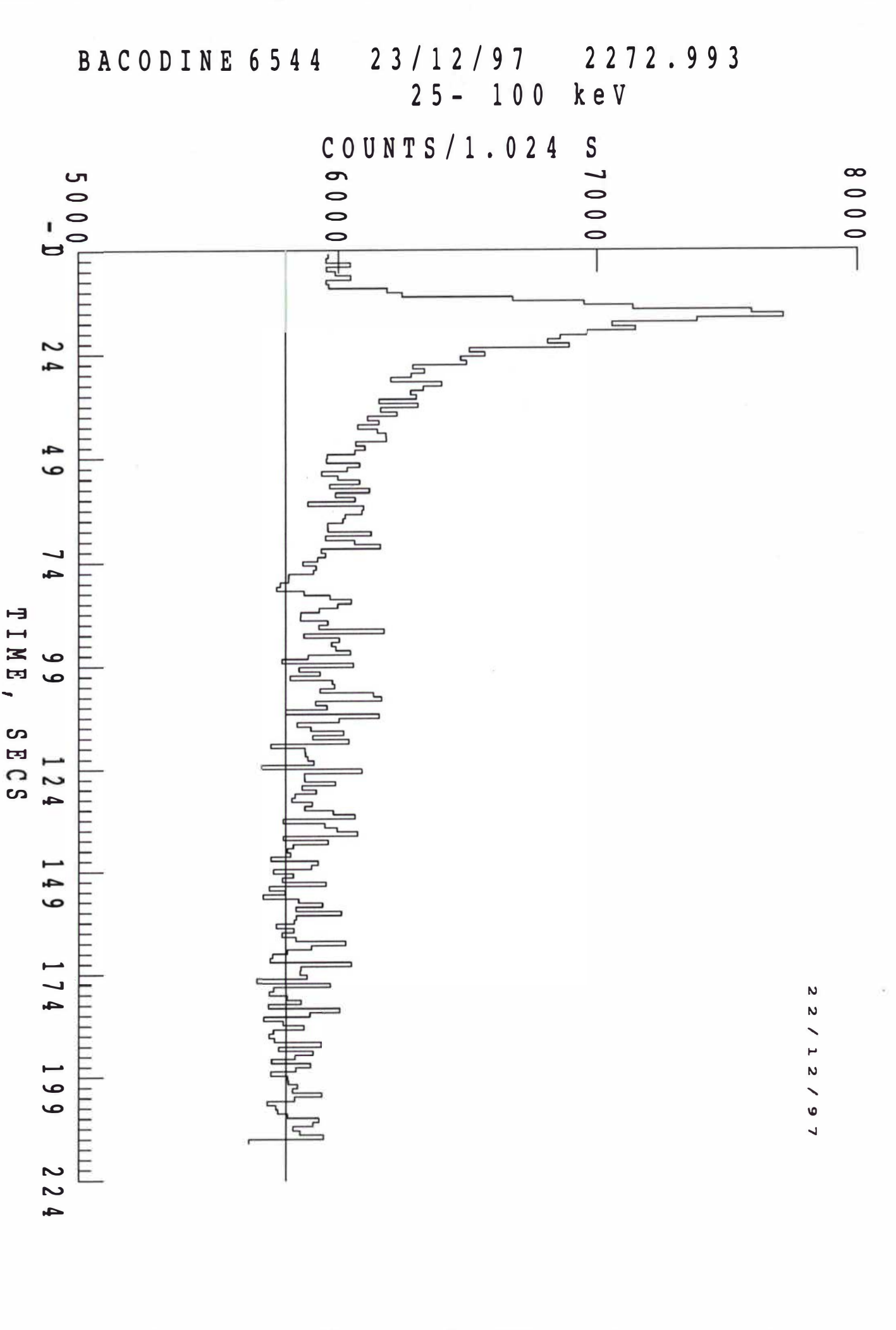
ULYSSES RT

2/ 1/98

23/12/97 1071.108 s

22- 147 keV




BACODINE 6544 23/12/97 2272.993
25- 100 keV
COUNTS/1.024 S
5000
6000
7000
8000
0
24
49
74
99
124
149
174
199
224
TIME, SECS
22/12/97

From kraken@rosserv.gsfc.nasa.gov Fri May 8 09:08 PDT 1998
X-Sender: kraken@kangaroo.gsfc.nasa.gov (Unverified)
Mime-Version: 1.0
Date: Fri, 8 May 1998 12:08:43 -0500
khurley@sunspot.ssl.berkeley.edu
From: Peter Kurczynski <kraken@rosserv.gsfc.nasa.gov>
Subject: TGRS/Ulysses bursts
Cc: TEEGARDEN@tgrs2.gsfc.nasa.gov

Hi Kevin,

Here's the results of a search through TGRS data for recent
Ulysses bursts not seen by BATSE.

December 23 1997 10:59 Ulysses time; moderate burst, 15 s long

corresponds to TGRS 661
occurred at 38209s on December 23, 1997
100-300 keV range:
Peak Flux 131 cts/s
T90: 62 s
T50: 12 s

THESE BURSTS WERE NOT SEEN BY TGRS

December 24 1997 19:29 Ulysses time; weak burst, 64 ms long
April 5 1998 14:48 Ulysses time; weak burst, 64 ms long
April 6 1998 07:45 Ulysses time; weak burst, 64 ms long
April 7 1998 15:44 Ulysses time; weak burst, 64 ms long
April 8 1998 02:51 Ulysses time; weak burst, 64 ms long
April 09 1998 07:03 Ulysses time; weak burst, 64 ms long
April 09 1998 19:19 Ulysses time; weak burst, 32 ms long
April 15 1998 12:23 Ulysses time; weak burst, 32 ms long

N-M = CORRELATION BETWEEN SATELLITES N AND M

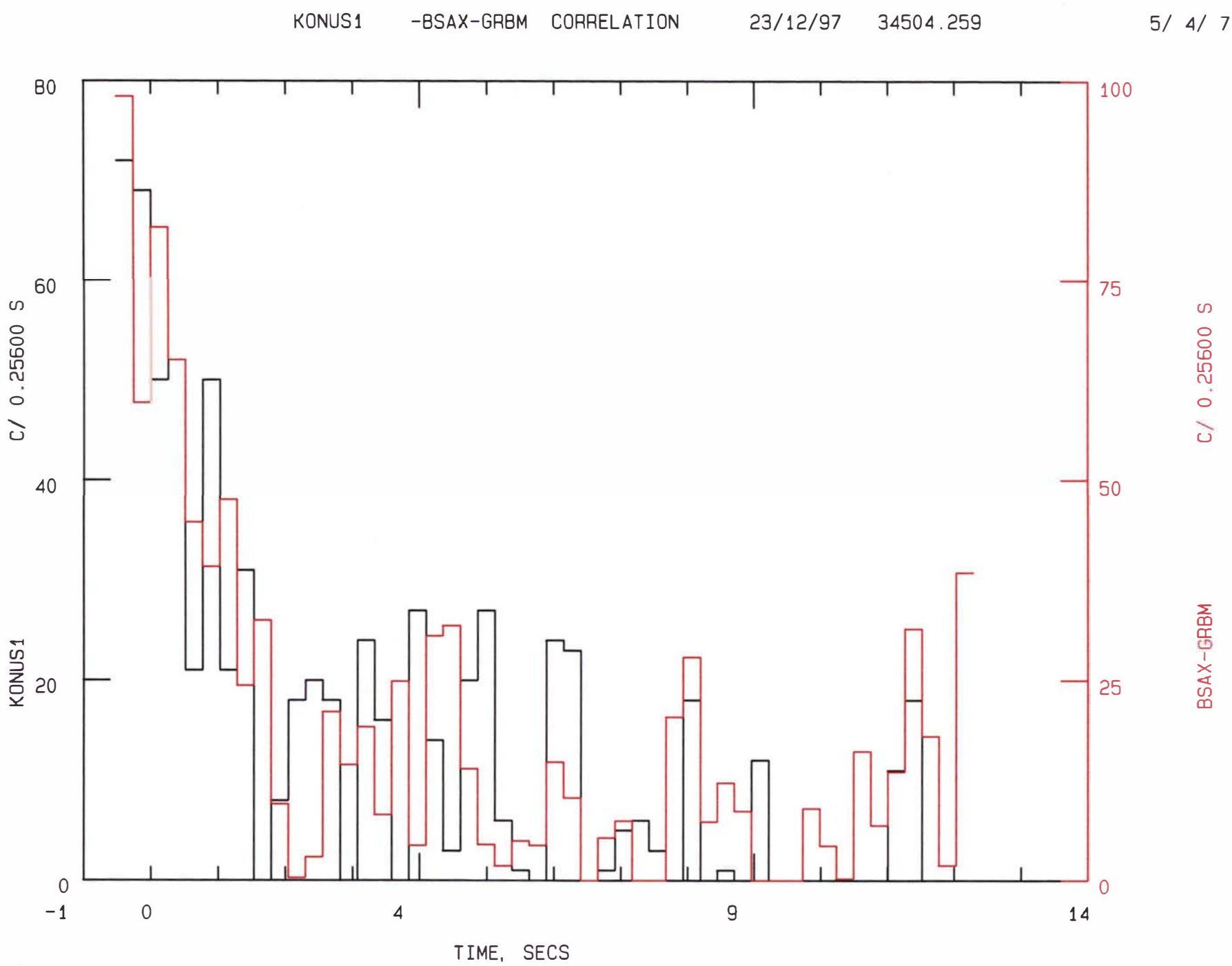
EARTH-N = EARTH AS SEEN FROM SATELLITE N

S=SUN E=ECLIPTIC G=GALACTIC EQUATOR

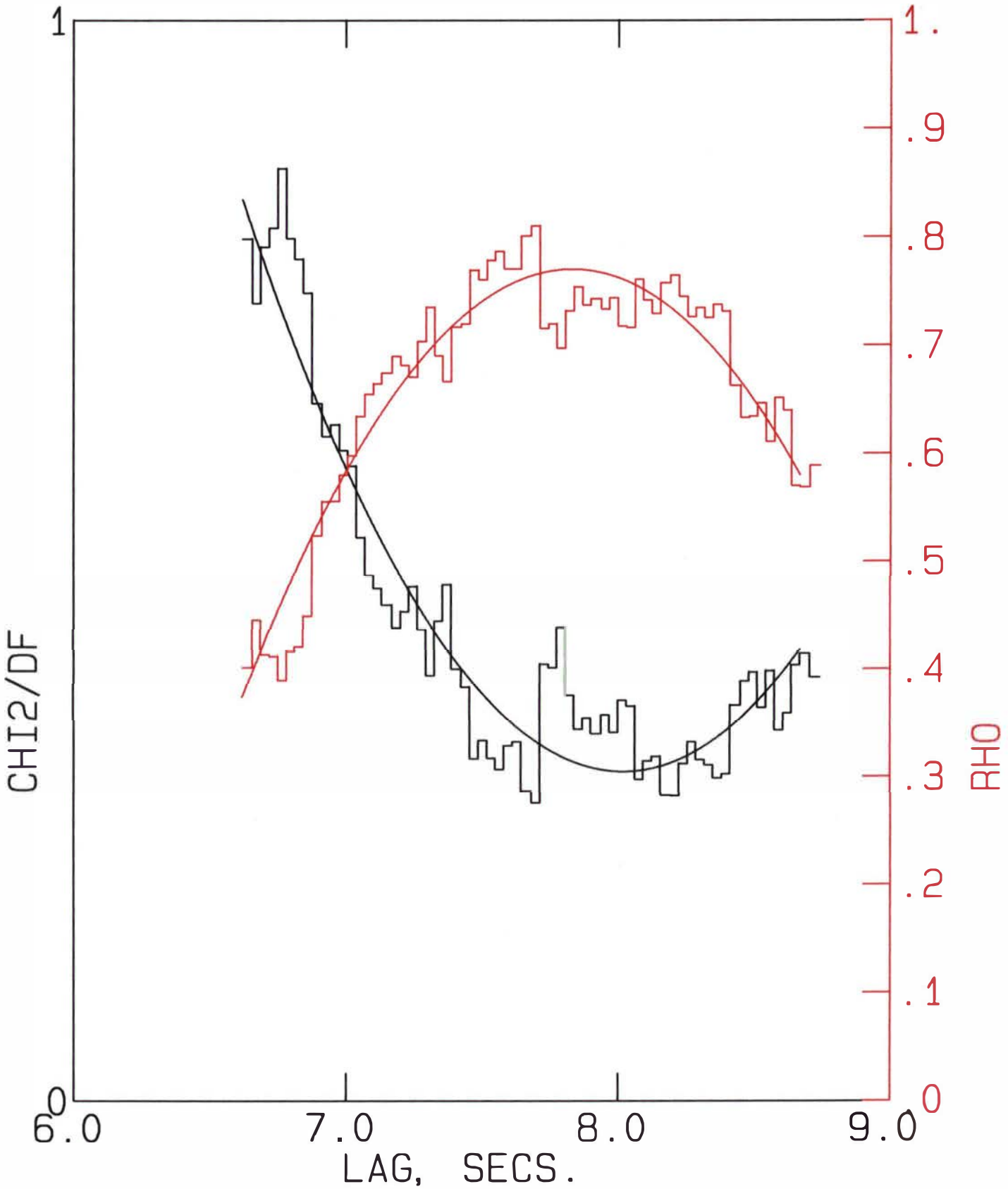
1 KONUS1 2 SAX

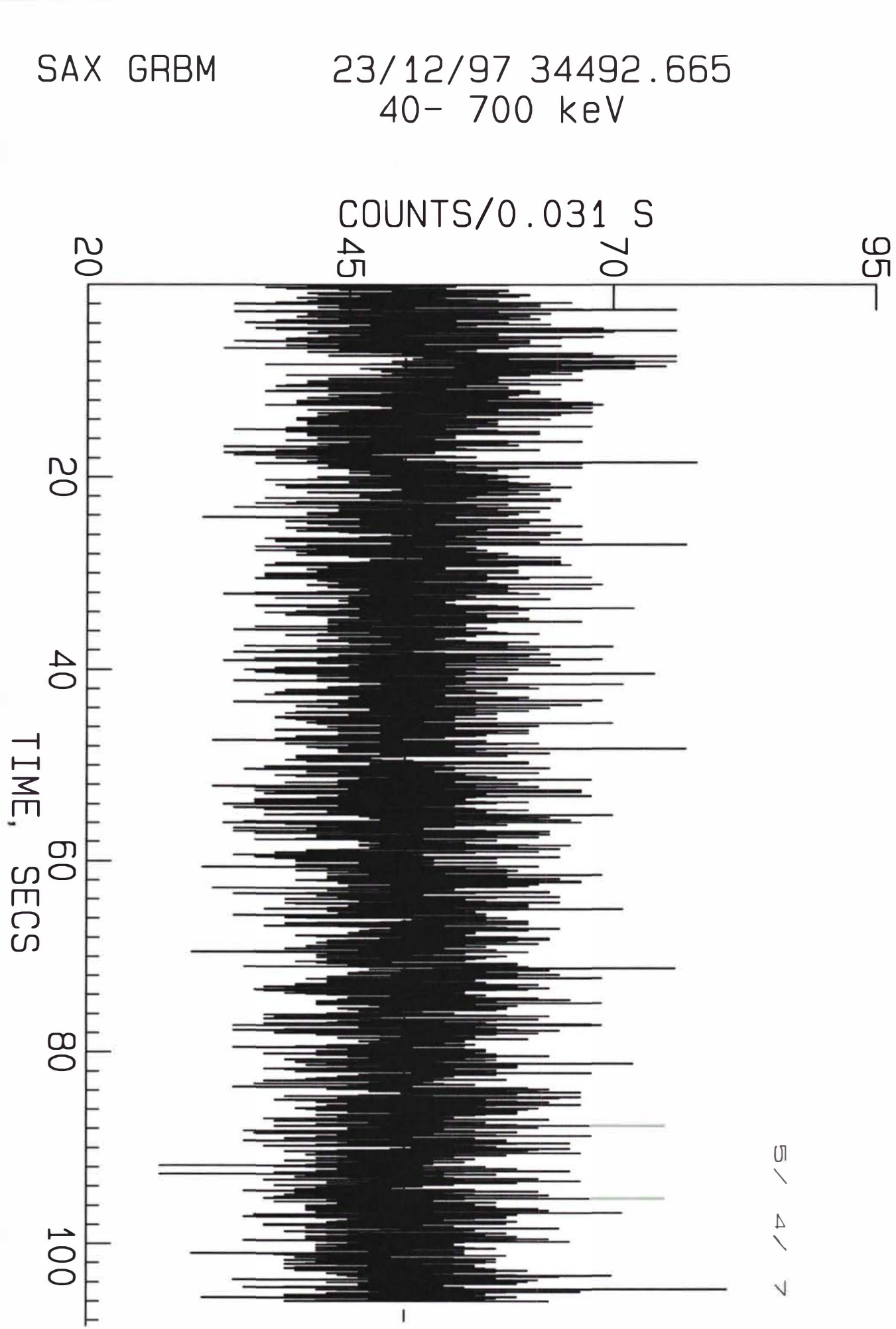


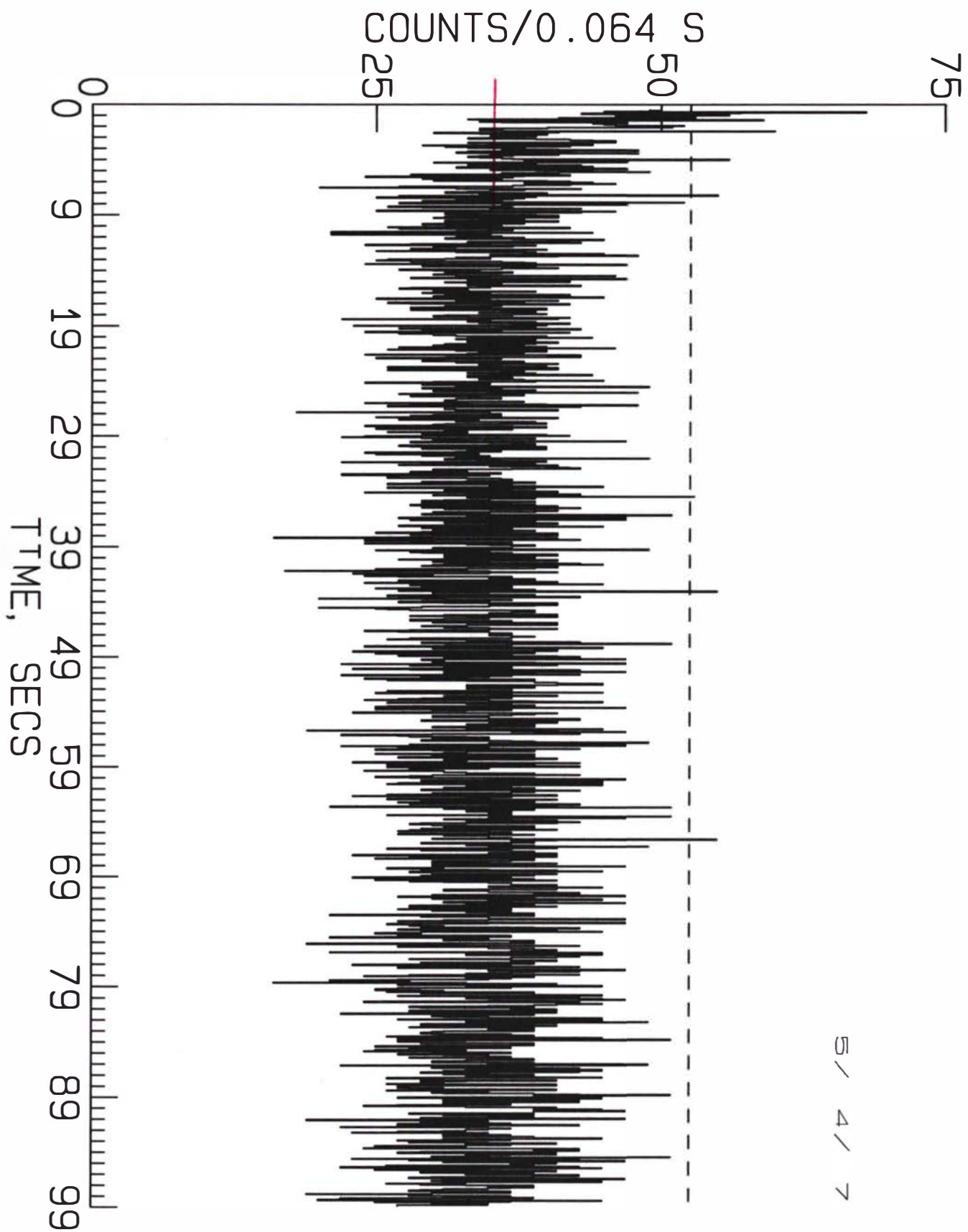

5/ 4/ 7


KONUS1 -BSAX-GRBM CORRELATION 23/12/97 34504.259 5/ 4/ 7
80
60
40
20
0
C/ 0.25600 S
KONUS1
100
75
50
25
0
C/ 0.25600 S
BSAX-GRBM
-1
0
4
9
14
TIME, SECS

KONUS1 -BSAX-GRBM CORRELATION 23/12/97 34504.259




SAX GRBM
23/12/97 34492.665
40- 700 keV
COUNTS/0.031 S
20
45
70
95
20
40
60
80
100
TIME, SECS
5/4/7


KONUS
23/12/97 34504.200
50- 200 keV
COUNTS/0.064 S
0
25
50
75
0
9
19
29
39
49
59
69
79
89
99
TIME, SECS
5/4/7

KONUS + GRB971223

07/02/00

ULYSSES RT

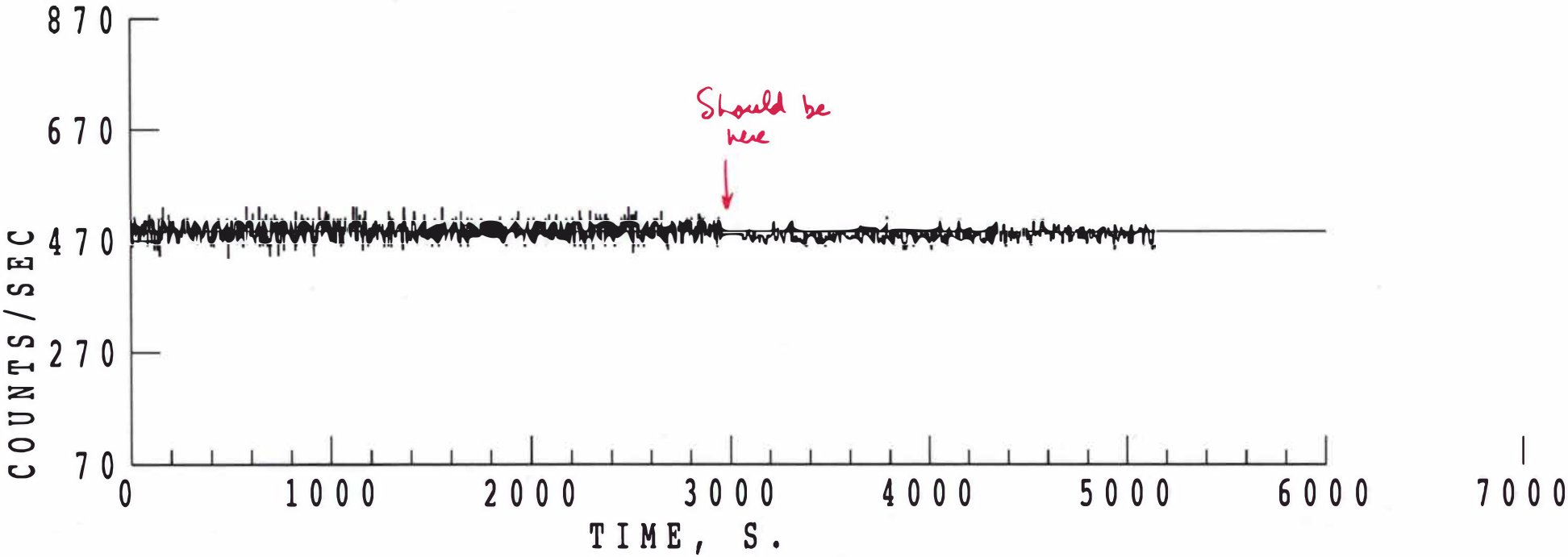
23/12/97 31932.111 s

INTERVALS REGROUPED BY 11

0- 0 keV

N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



Date: Apr 2 2007

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

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

## 2. For Konus events N/A

☐ Konus ecliptic latitude used with latest calibration?

## 2. For Odyssey events

☐ Was CHECKMO run to eliminate data gaps?

☐ Did the Odyssey ephemeris correspond to the event time? (When there is data in the database, the ephemeris is for the start of record, usually ~1320 s prior to the request time; when there is no data in the database, the ephemeris is for the request time in the e-mail, so the request time in mosearch should be equal to the GRB time. Note that the time in the return e-mail will be ~1320 s prior to the time requested, in the line "no HEND data…")

☐ Was Mars-blocking used?

☐ For cruise phase data (April – October 2001), was the updated data used? (Old data has timing errors)

☐ GRS database searched for triggered data? Database data between August 2005 and January 2006 should be re-extracted, due to timing errors. (E-mailed data should be OK).

☐ GRS and HEND data cross-correlated to check timing?

## 2. For 3 or More Spacecraft events

☐ $\Sigma$ 3$\Delta$t's calculated, and/or BMAPSUM executed?

## 3. For INTEGRAL events

☐ INTEGRAL SPI-ACS website checked for bursts that weren't transmitted automatically?

☐ 125 ms added to INTEGRAL SPI-ACS time for bursts prior to April 2 2004 11:00 UT?

☐ Updated ephemeris used for bursts prior to September 30, 2003?

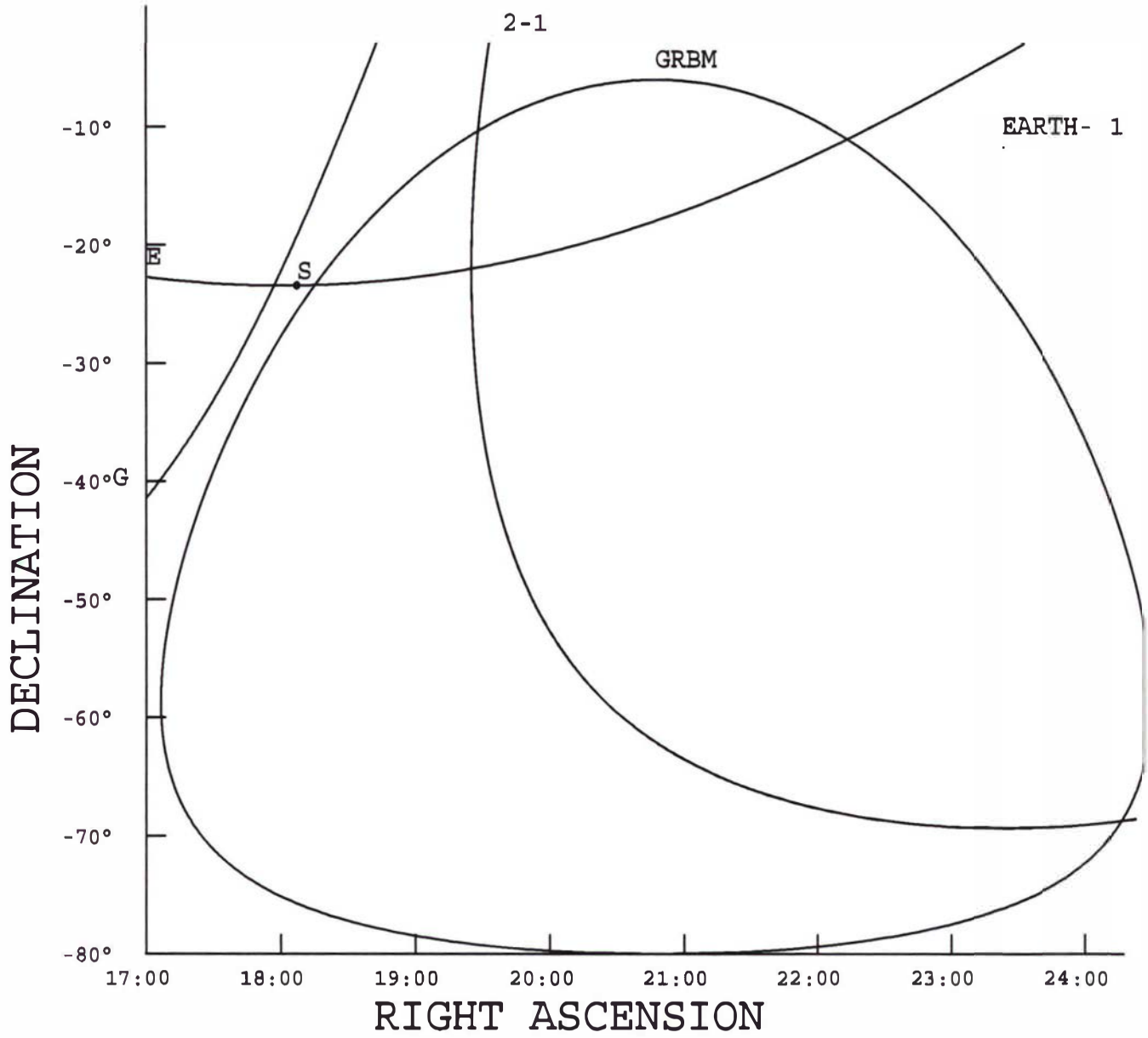
---

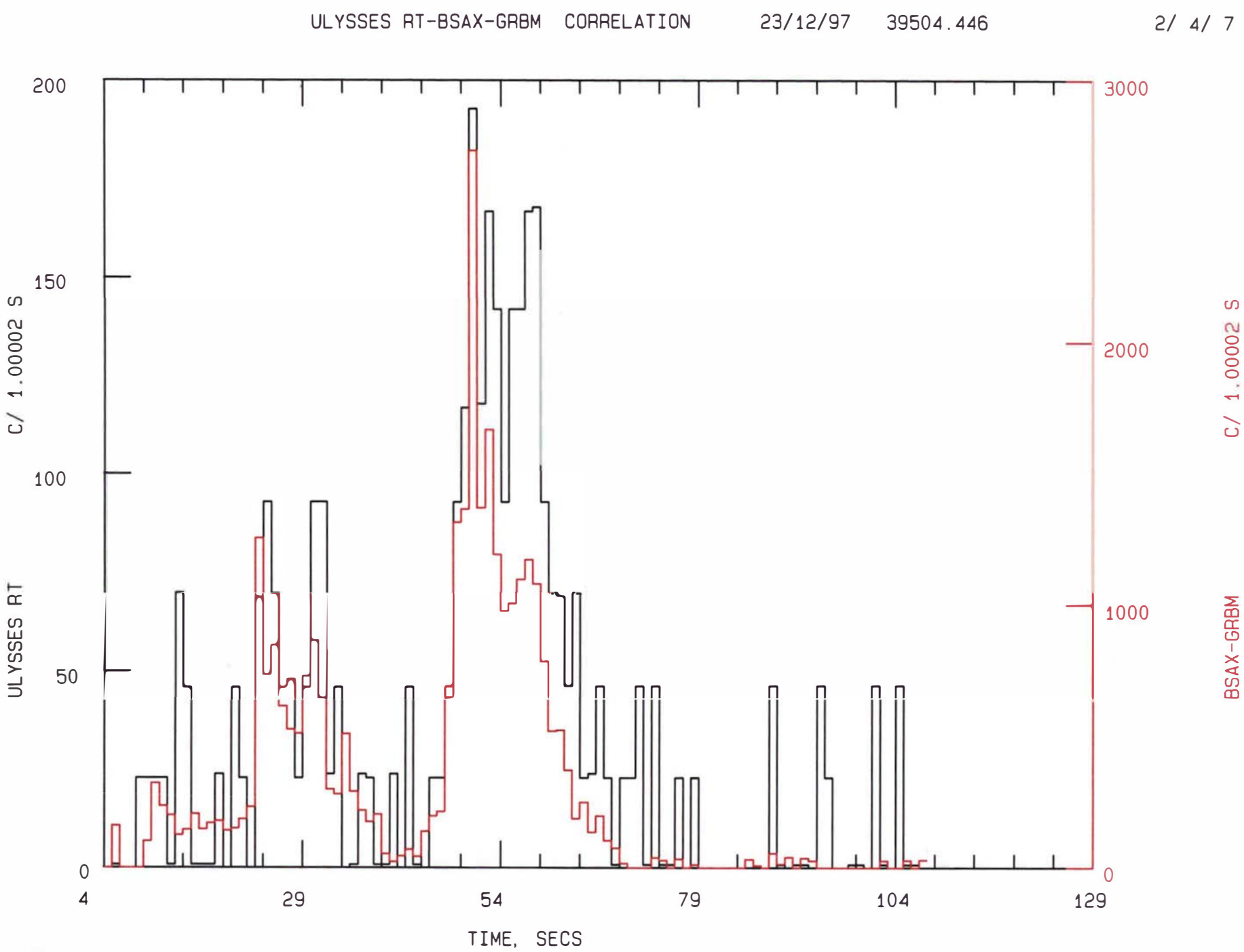
☑ ACCESS and MBL4 databases updated?

# EVENT OF DEC 23, 1997 10:58

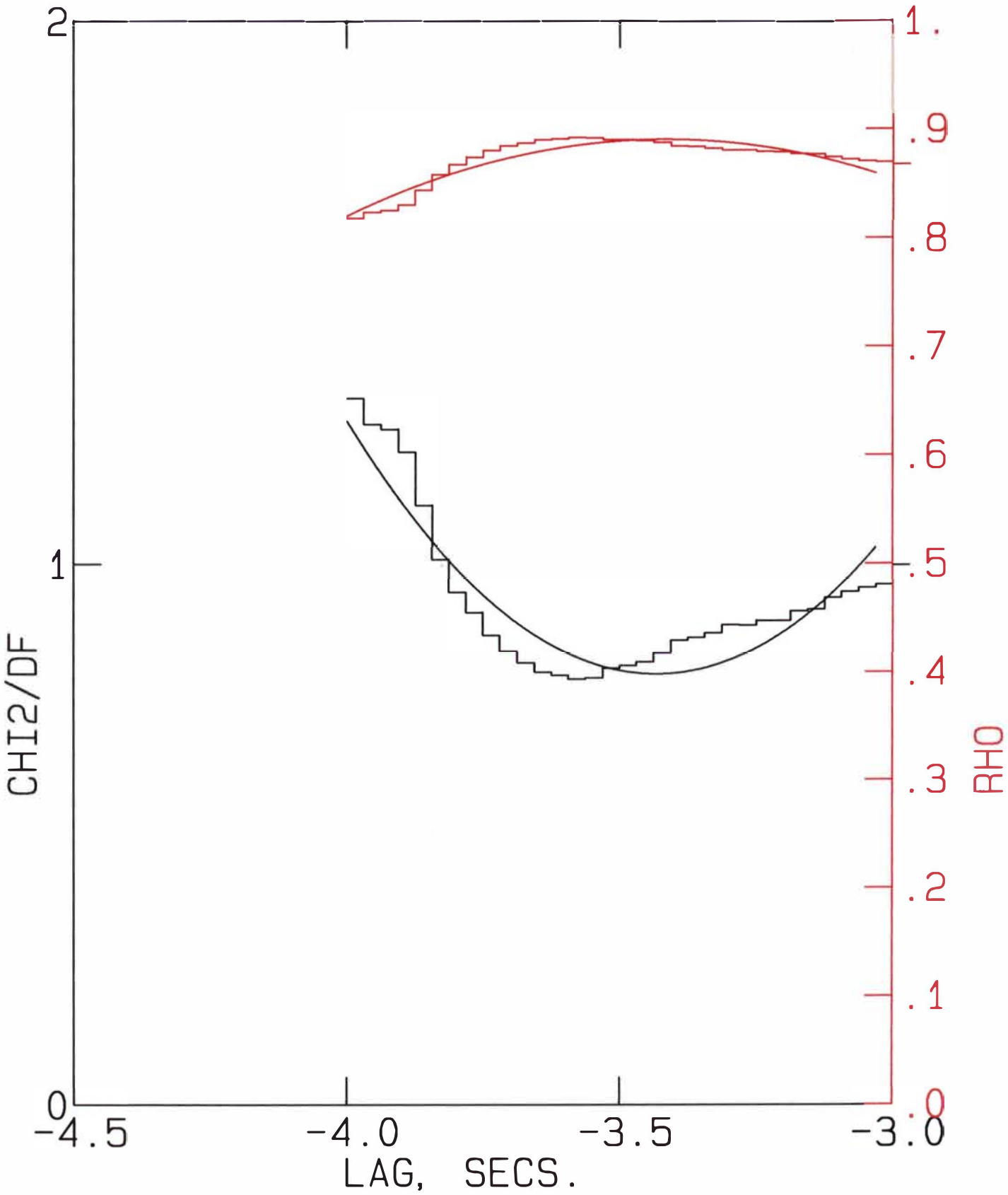


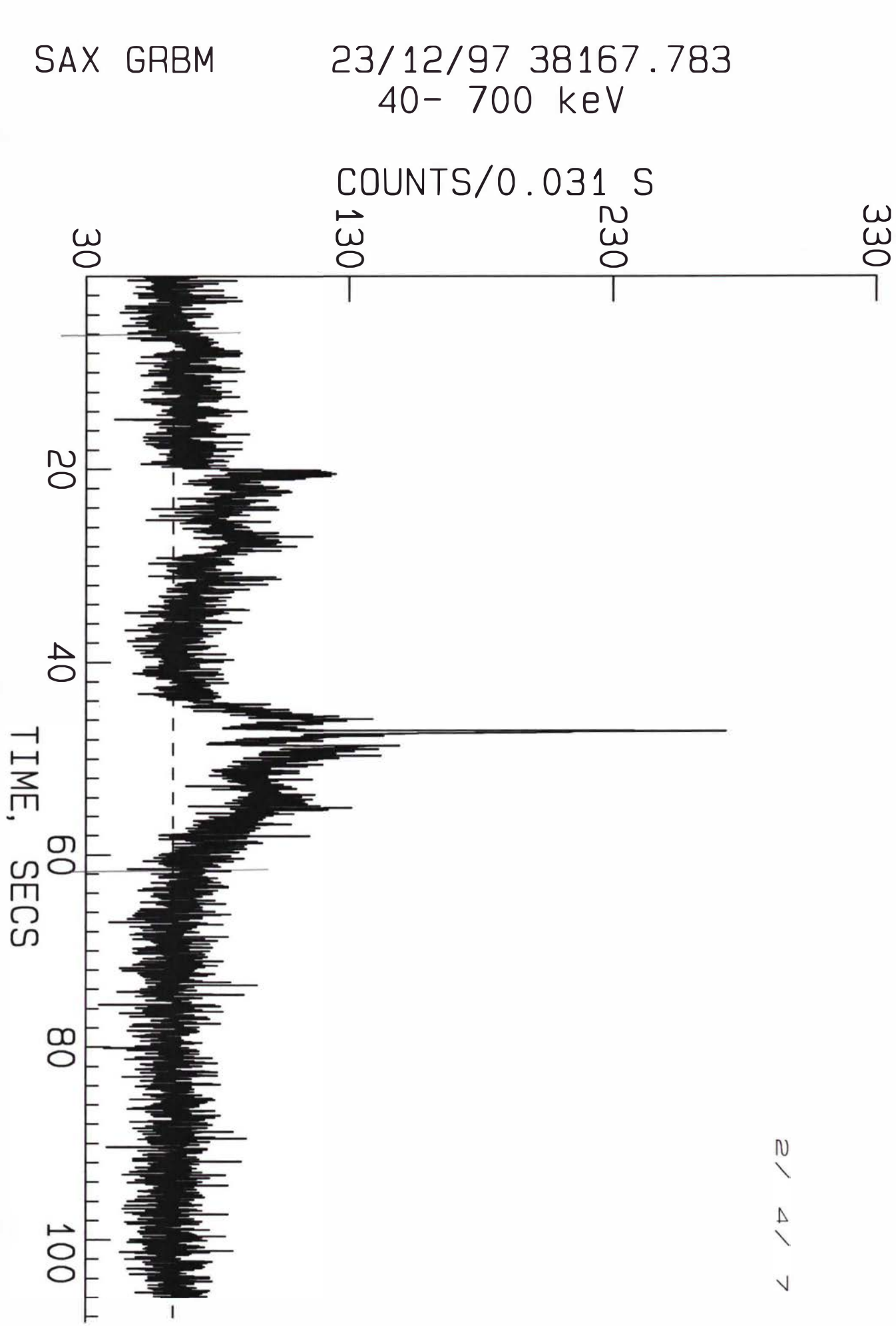
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 SAX




ULYSSES RT-BSAX-GRBM CORRELATION 23/12/97 39504.446 2/ 4/ 7
200
150
100
50
0
C/ 1.00002 S
ULYSSES RT
3000
2000
1000
0
C/ 1.00002 S
BSAX-GRBM
4
29
54
79
104
129
TIME, SECS

ULYSSES RT-BSAX-GRBM CORRELATION 23/12/97 39504.446




SAX GRBM
23/12/97 38167.783
40- 700 keV
COUNTS/0.031 S
30
130
230
330
20
40
60
80
100
TIME, SECS

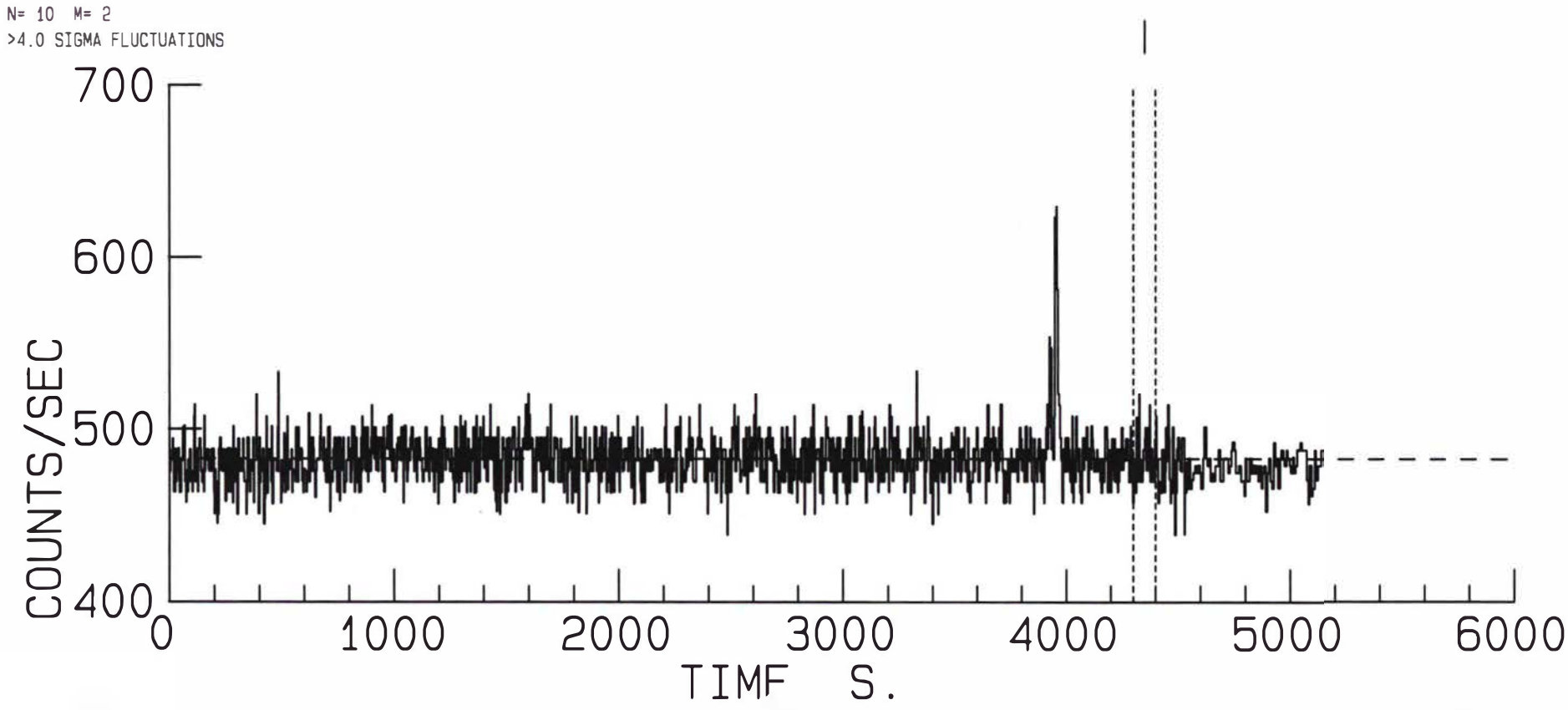
ULYSSES RT

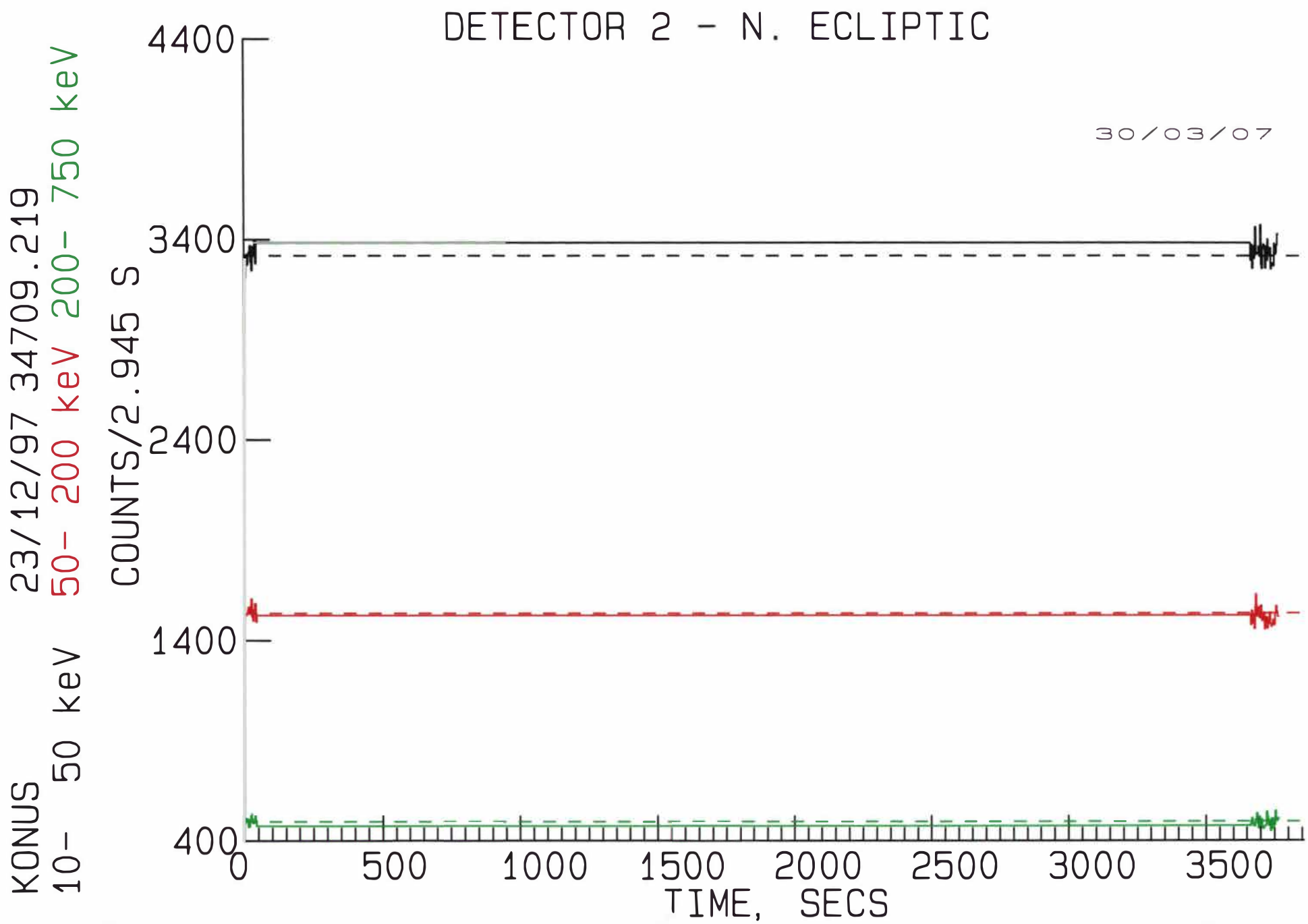
30/ 3/ 7

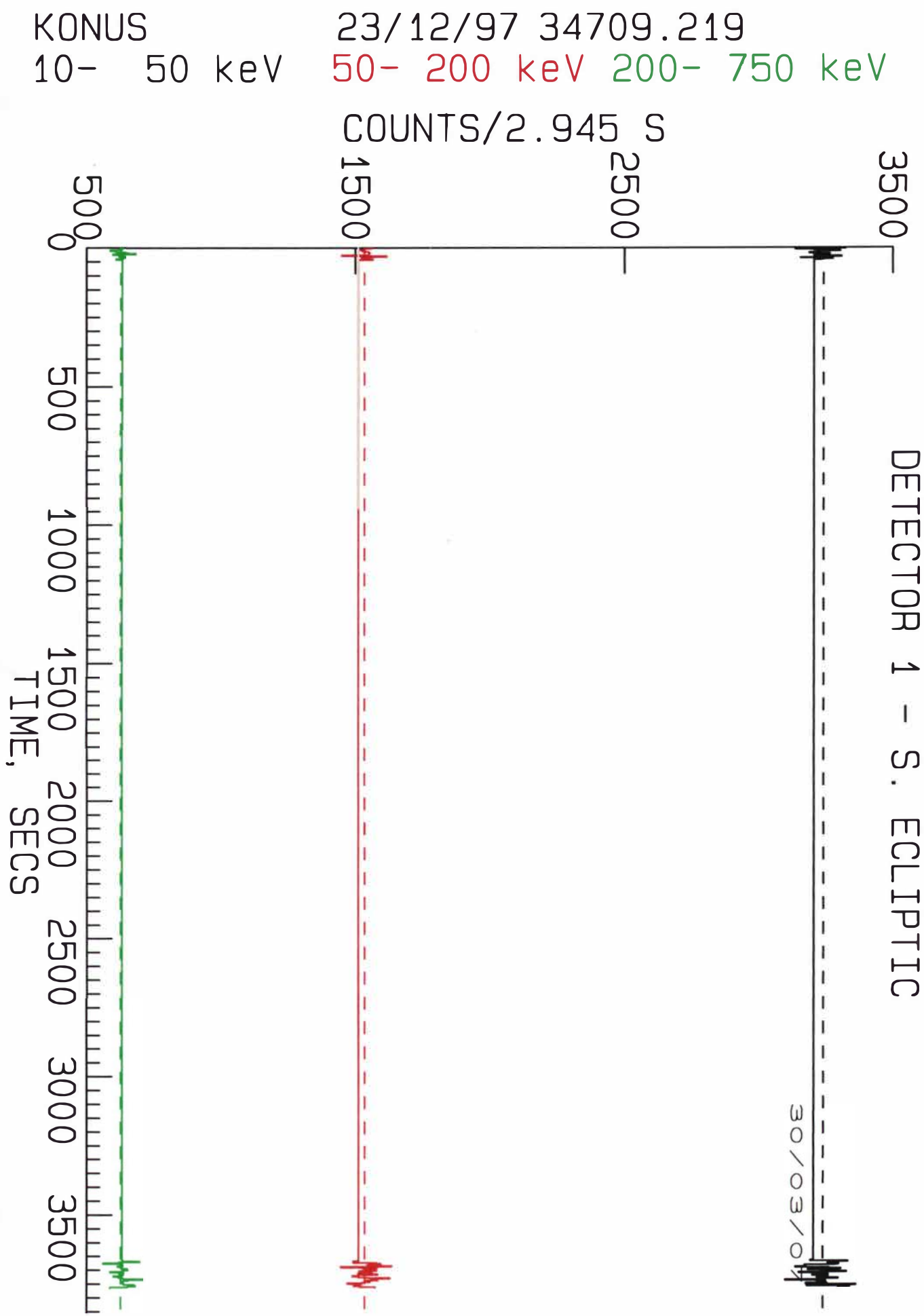
23/12/97 35604.398 s

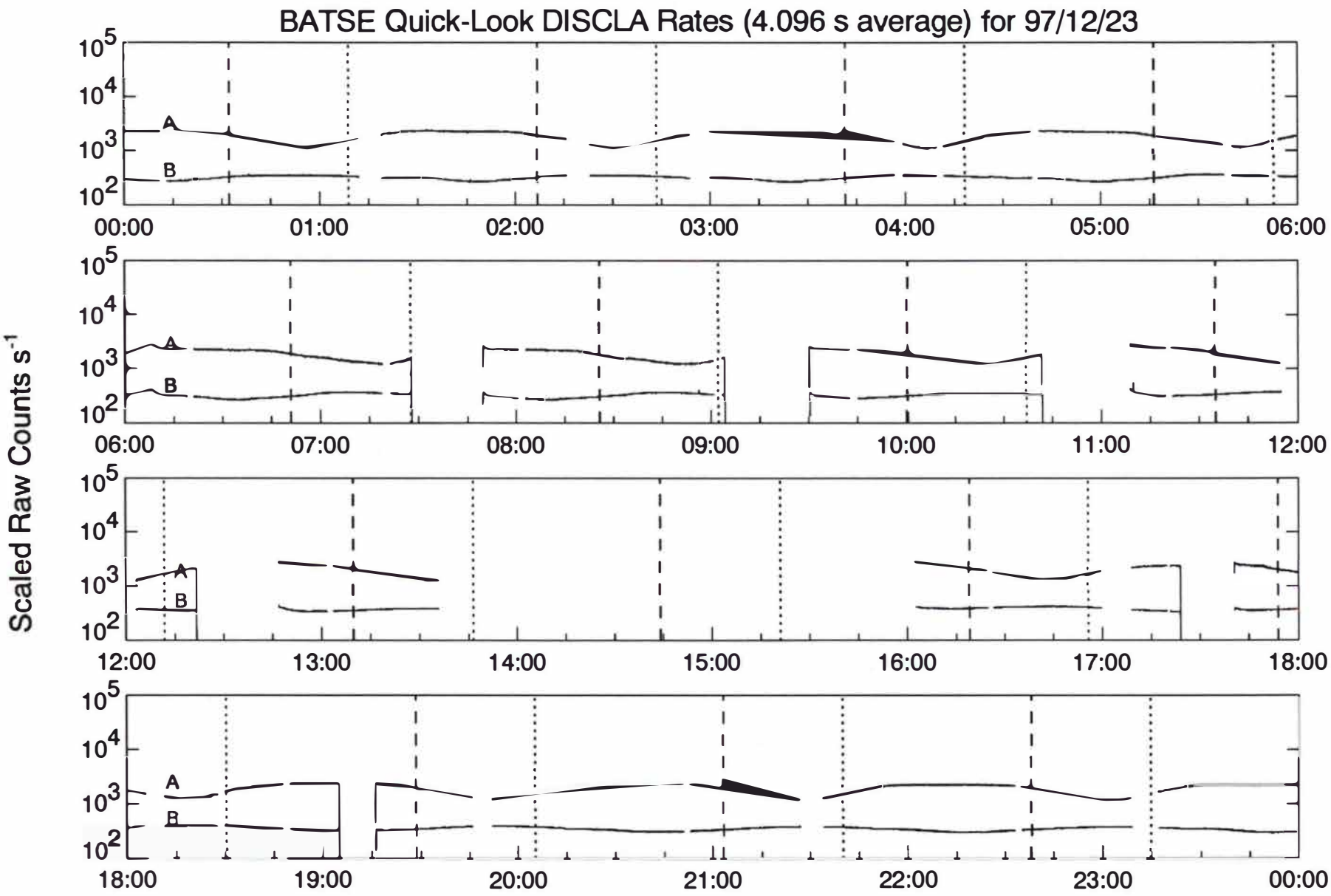
INTERVALS REGROUPED BY 7

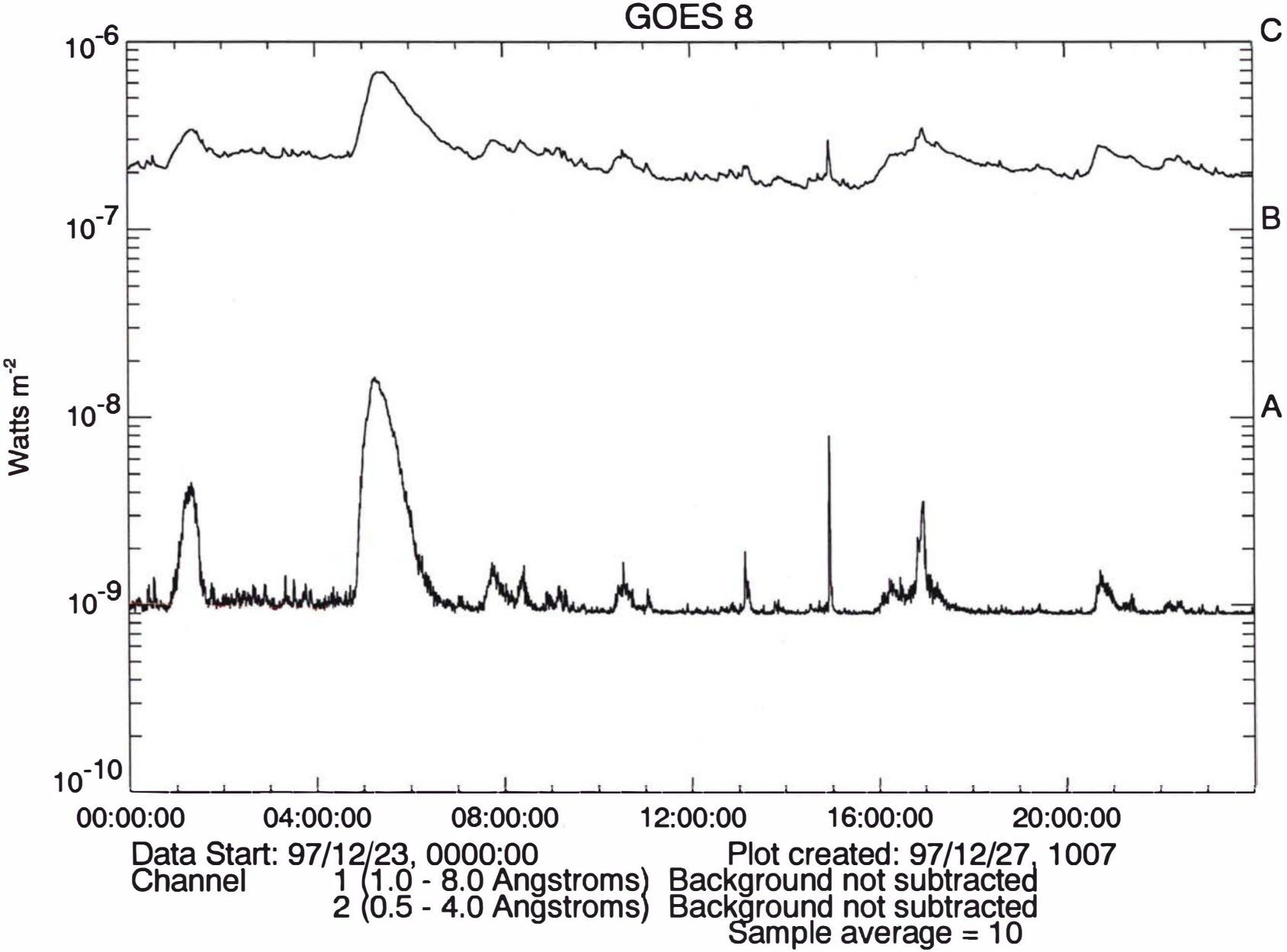
22- 148 keV



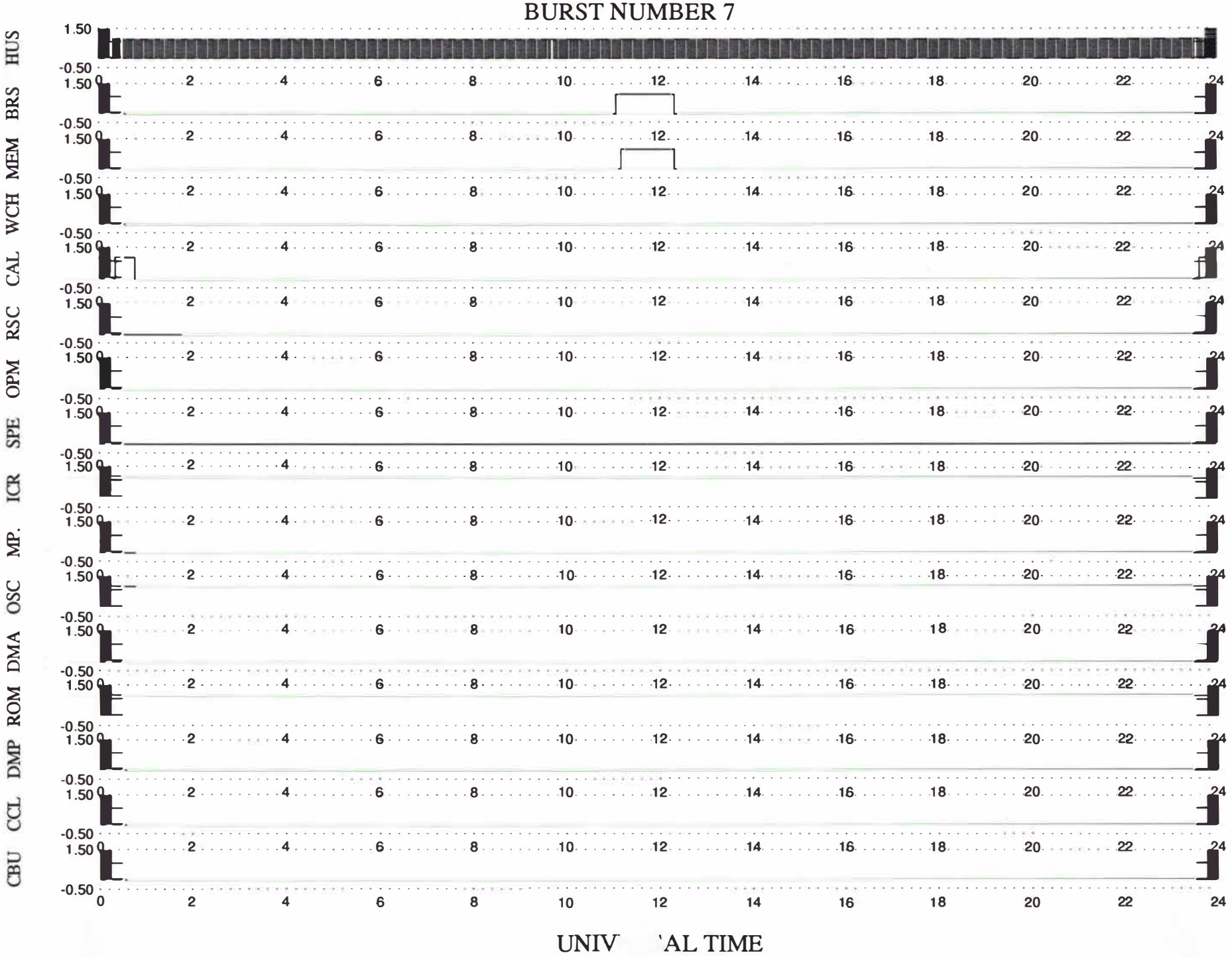

DETECTOR 2 - N. ECLIPTIC
30/03/07
KONUS
10- 50 keV 50- 200 keV 200- 750 keV
23/12/97 34709.219
COUNTS/2.945 S
4400
3400
2400
1400
400
0
500
1000
1500
2000
2500
3000
3500
TIME, SECS


KONUS
23/12/97 34709.219
10- 50 keV
50- 200 keV
200- 750 keV
COUNTS/2.945 S
0
500
1500
2500
3500
TIME, SECS
0
500
1000
1500
2000
2500
3000
3500
DETECTOR 1 - S. ECLIPTIC
30/03/04


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/23
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/27, 1009 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

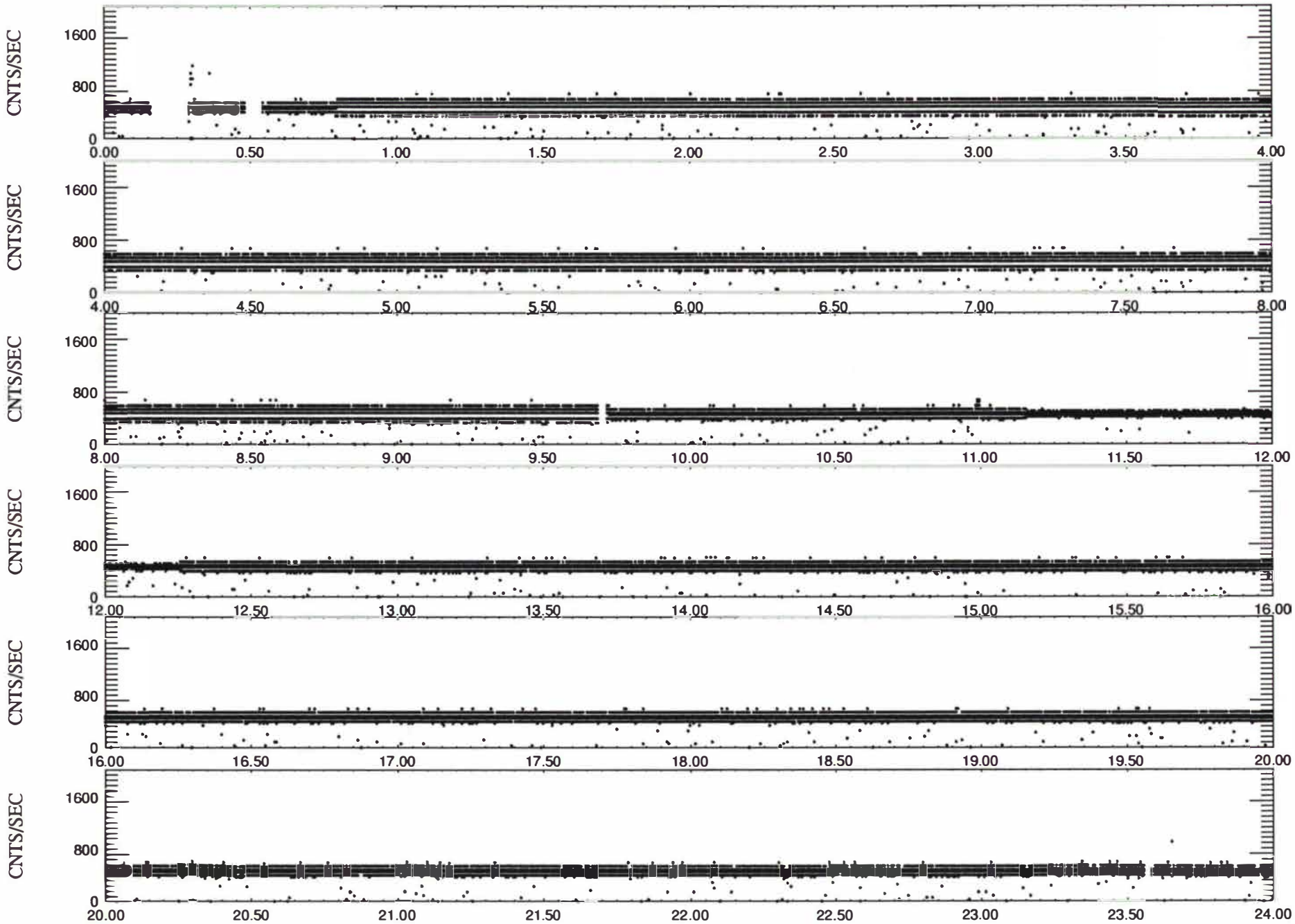

GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/23, 0000:00
Plot created: 97/12/27, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 357, year 1997 to day 357, year 1997 3/12/98



HUS 2A, MODE 1, NOT AVERAGED EDR day 357, year 1997 to day 357, year 1997 3/12/98

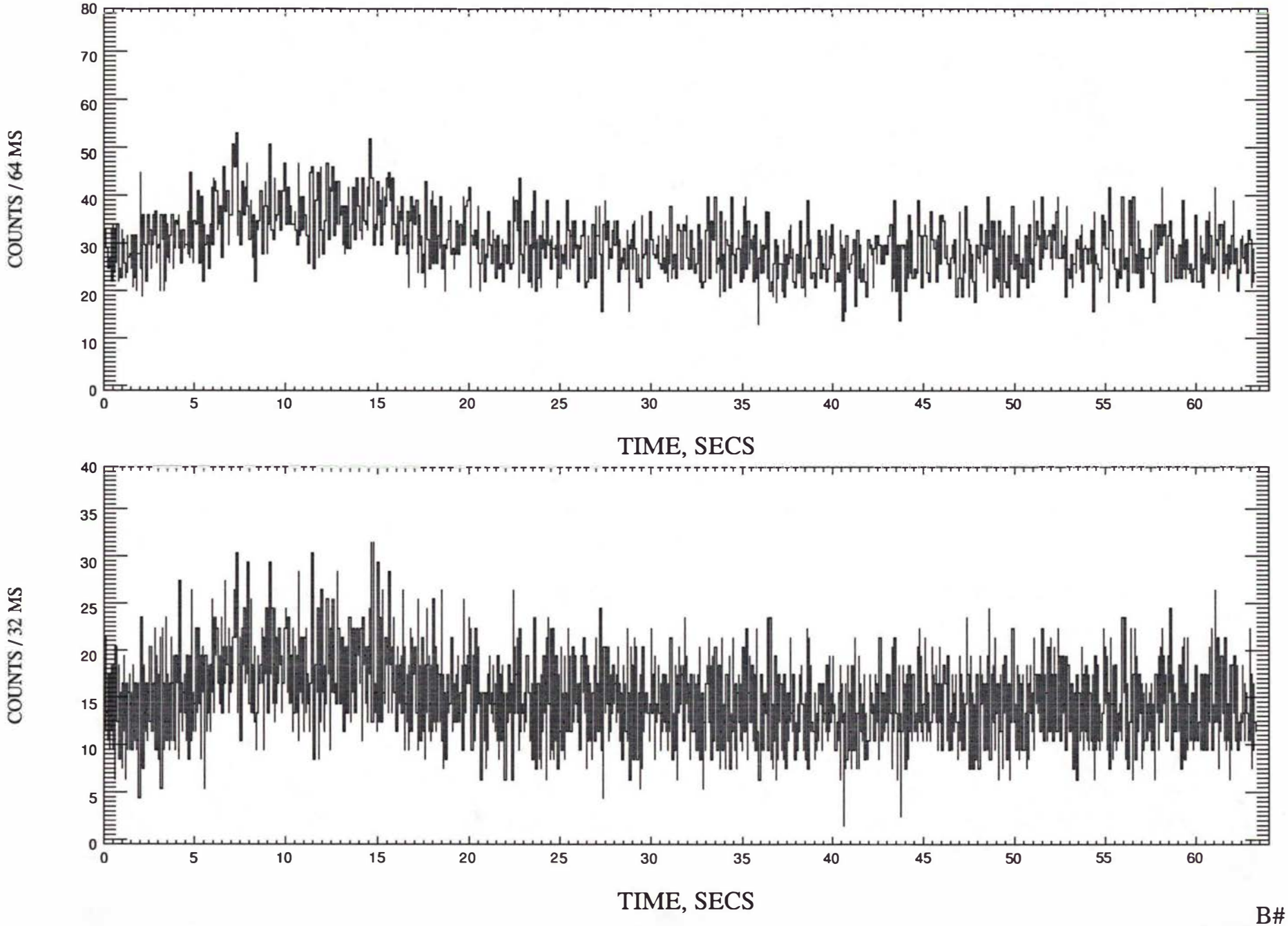
CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2A TRIGGERED DATA EDR day 357, year 1997 3/11/98

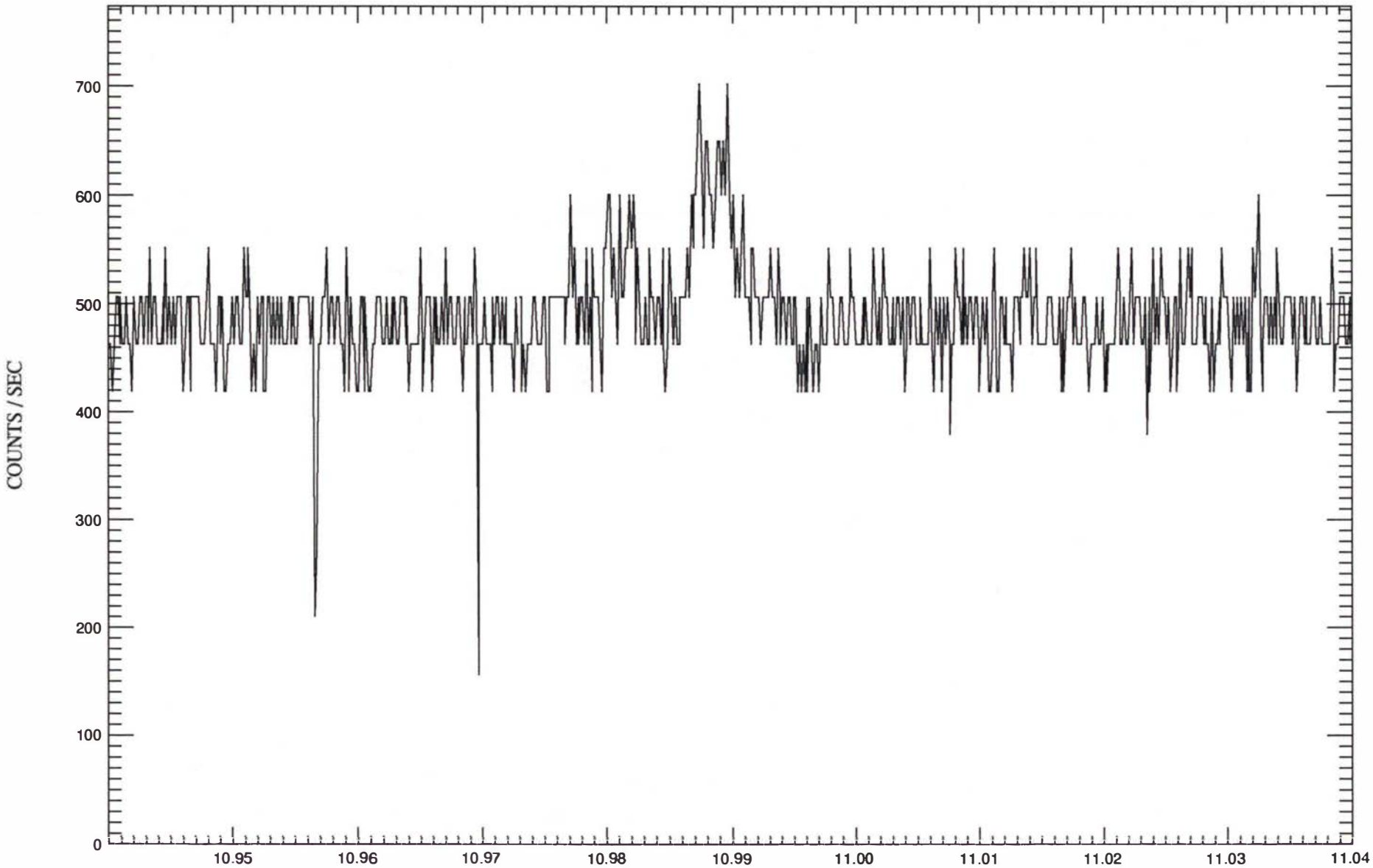
Burst Counter 7 at UT=10.987514110141 h=39555.051 s 10:59:15.051



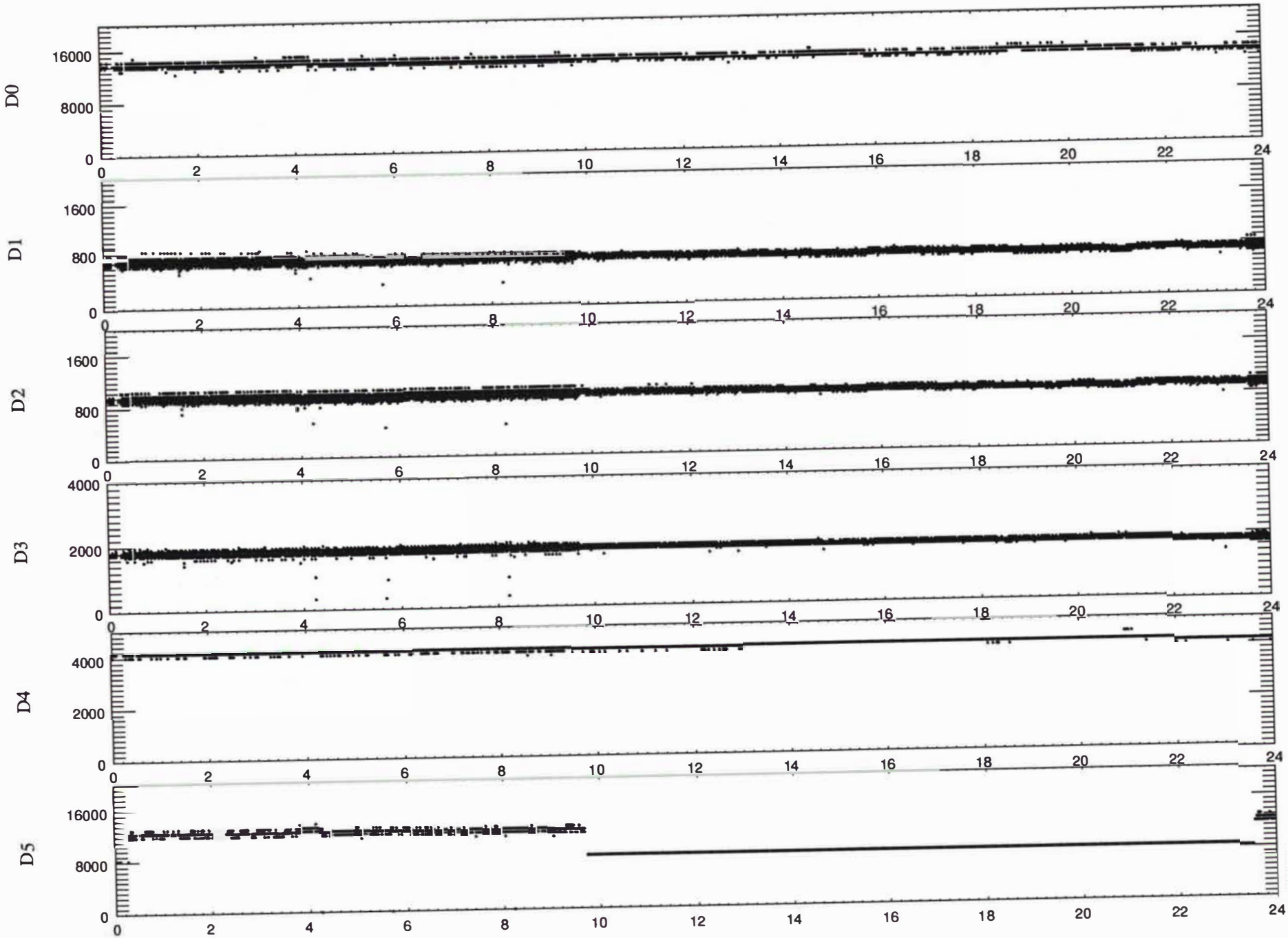

B# 1

HUS 2A, MODE 1, NOT AVERAGED EDR day 357, year 1997 to day 357, year 1997 3/11/98

CALIBRATION DATA INCLUDED



HUS 2B COUNTS / SEC EDR day 357, year 1997 to day 357, year 1997 3/12/98



From kraken@rosserv.gsfc.nasa.gov Fri May 8 09:08 PDT 1998
X-Sender: kraken@kangaroo.gsfc.nasa.gov (Unverified)
Mime-Version: 1.0
D : Fri, 8 May 1998 12:08:43 -0500
khurley@sunspot.ssl.berkeley.edu
From: Peter Kurczynski <kraken@rosserv.gsfc.nasa.gov>
Subject: TGRS/Ulysses bursts
Cc: TEEGARDEN@tgrs2.gsfc.nasa.gov

Hi Kevin,

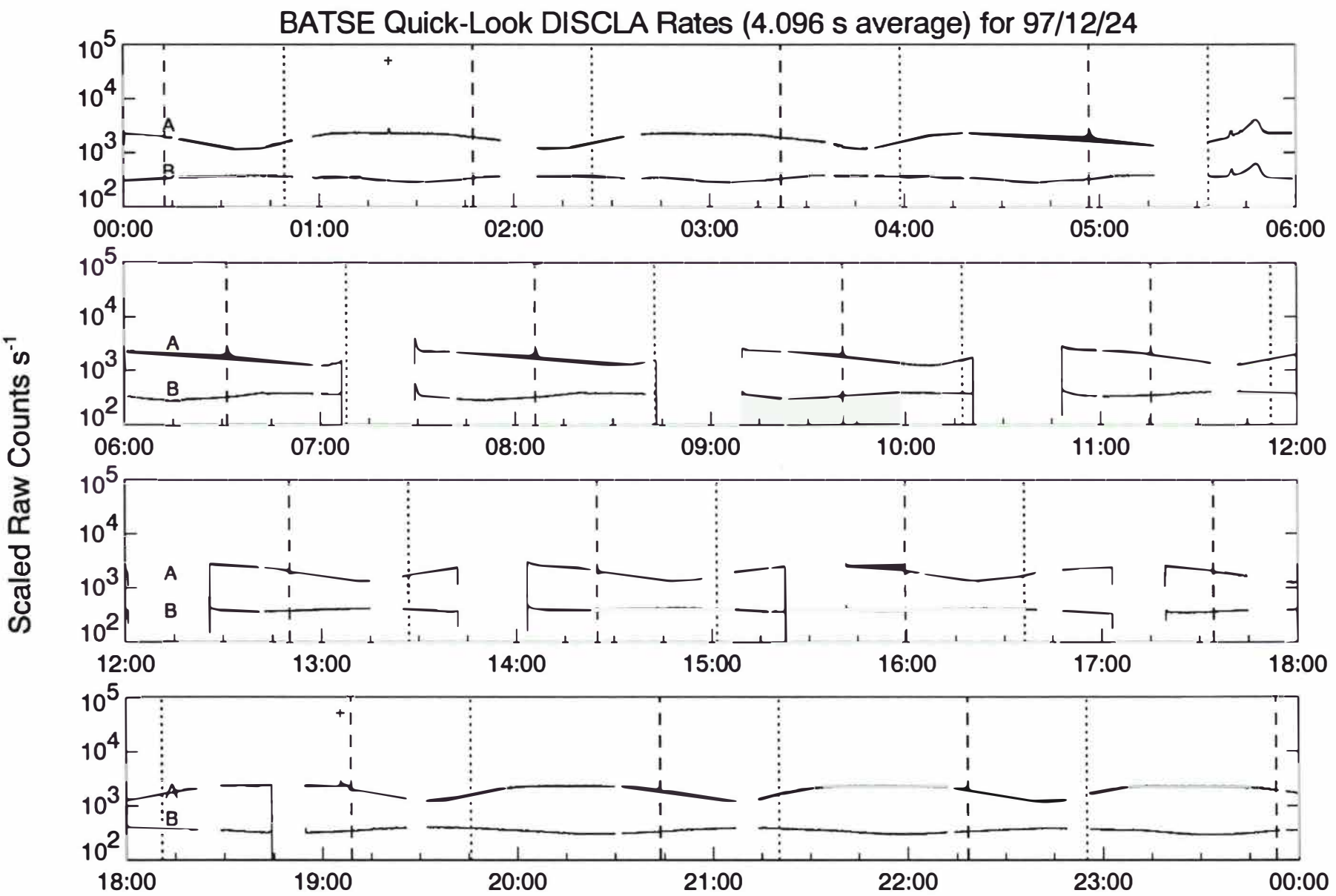
Here's the results of a search through TGRS data for recent
Ulysses bursts not seen by BATSE.

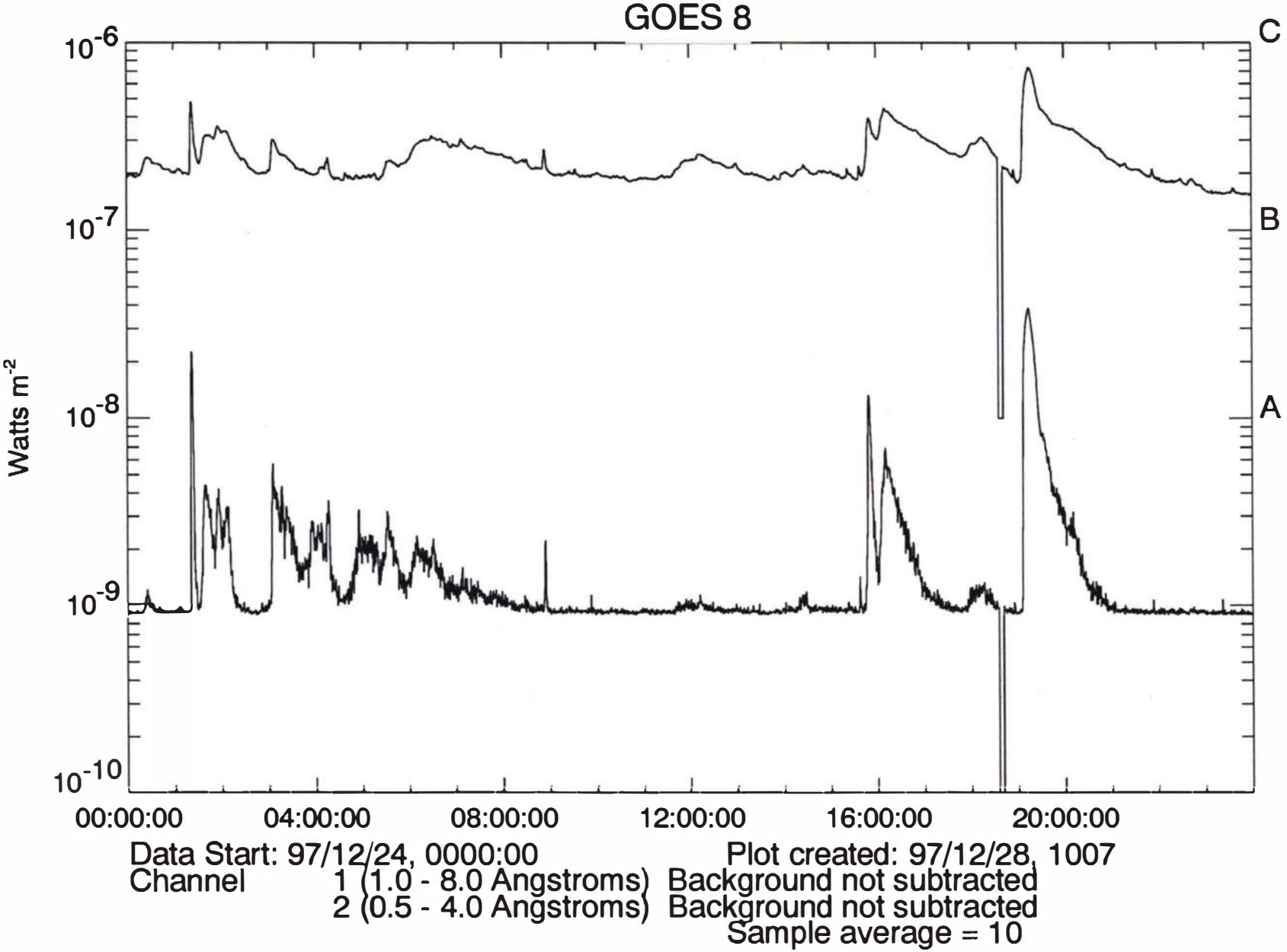
December 23 1997 10:59 Ulysses time; moderate burst, 15 s long

corresponds to TGRS 661
occurred at 38209s on December 23, 1997
100-300 keV range:
Peak Flux 131 cts/s
T90: 62 s
T50: 12 s

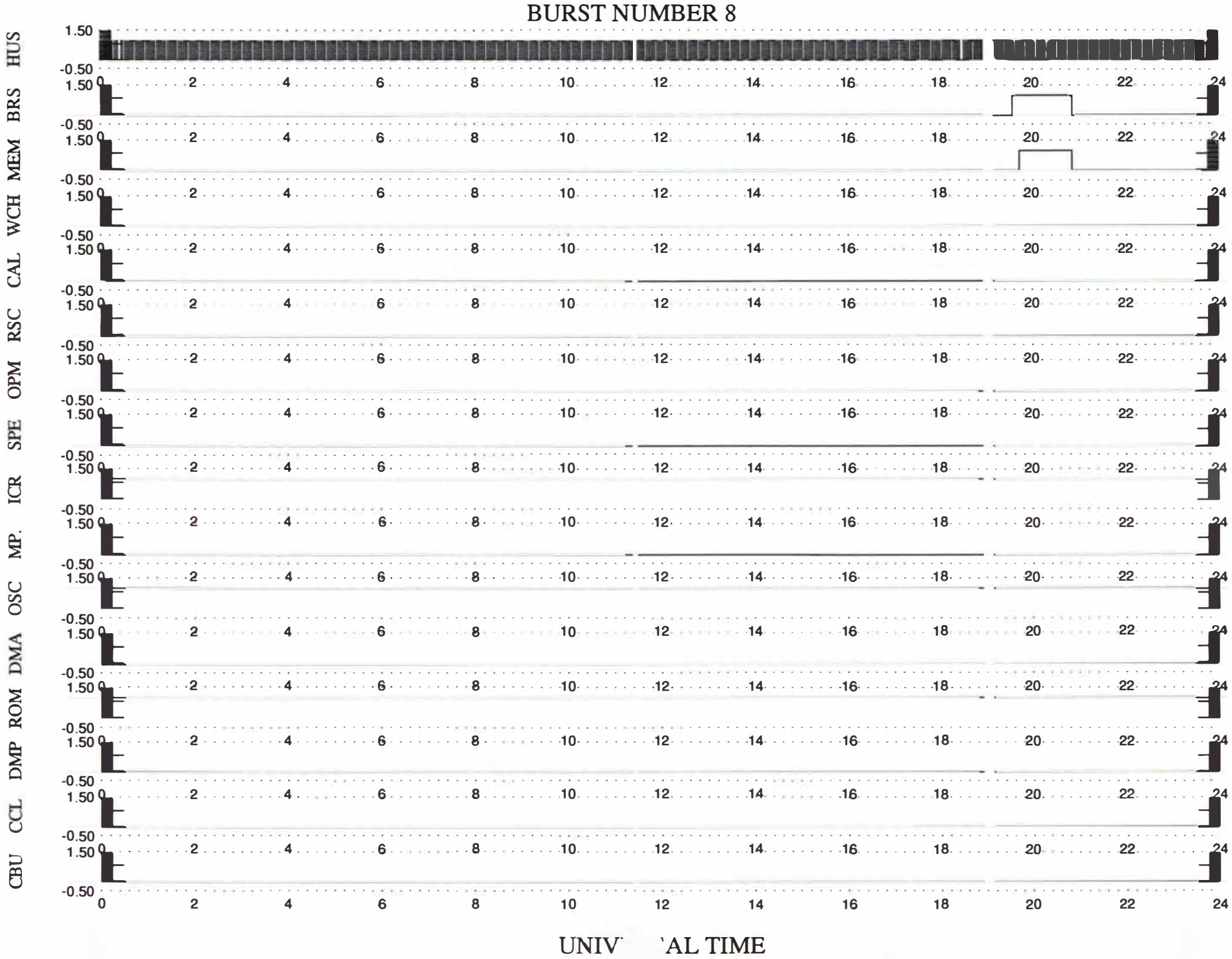
THESE BURSTS WERE NOT SEEN BY TGRS

December 24 1997 19:29 Ulysses time; weak burst, 64 ms long
pril 5 1998 14:48 Ulysses time; weak burst, 64 ms long
il 6 1998 07:45 Ulysses time; weak burst, 64 ms long
April 7 1998 15:44 Ulysses time; weak burst, 64 ms long
April 8 1998 02:51 Ulysses time; weak burst, 64 ms long
April 09 1998 07:03 Ulysses time; weak burst, 64 ms long
April 09 1998 19:19 Ulysses time; weak burst, 32 ms long
April 15 1998 12:23 Ulysses time; weak burst, 32 ms long


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/24
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/28, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

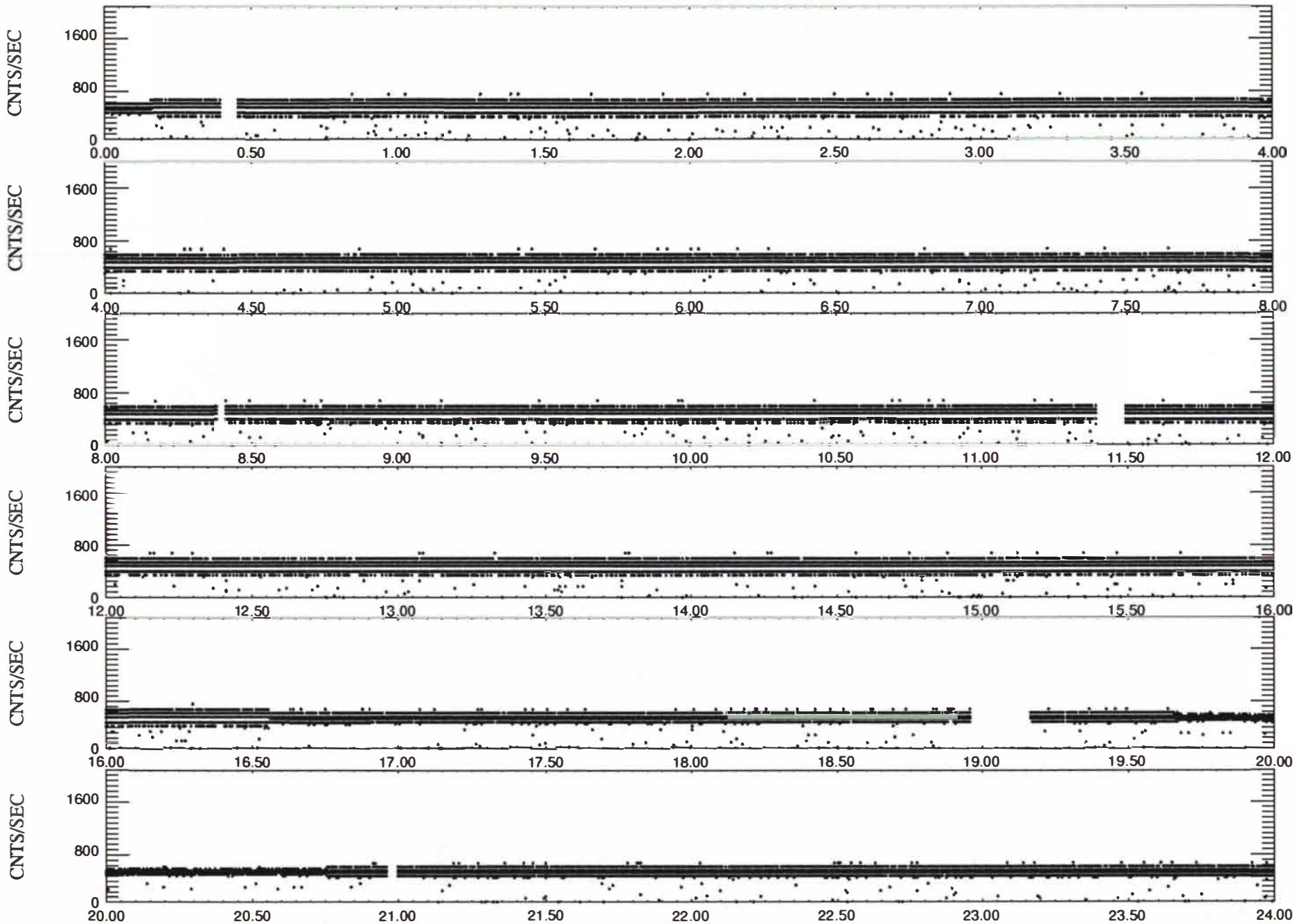

GOES 8
C
B
A
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/24, 0000:00
Plot created: 97/12/28, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 358, year 1997 to day 358, year 1997 3/12/98



HUS 2A, MODE 1, NOT AVERAGED EDR day 358, year 1997 to day 358, year 1997 3/12/98

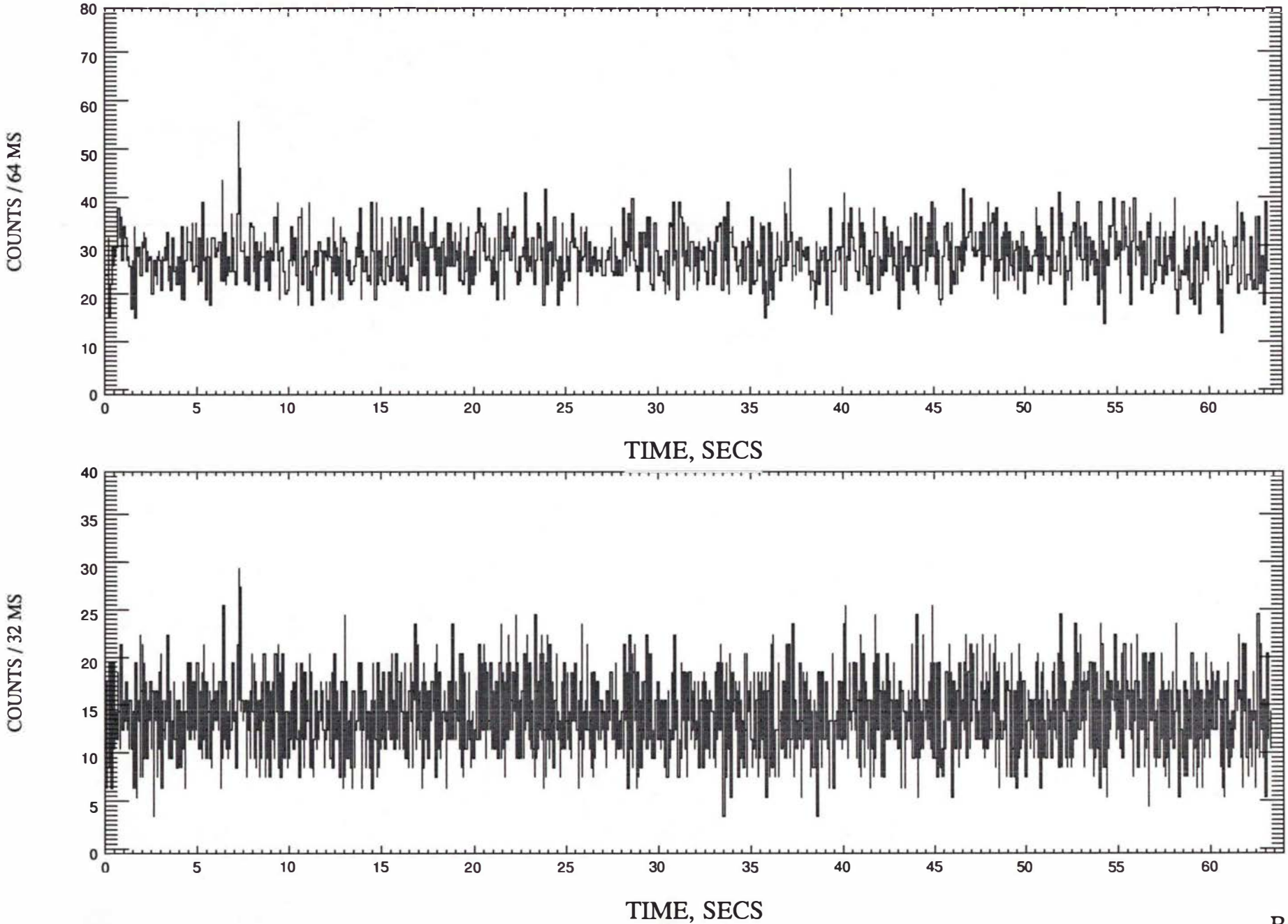
CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2A TRIGGERED DATA EDR day 358, year 1997 3/11/98

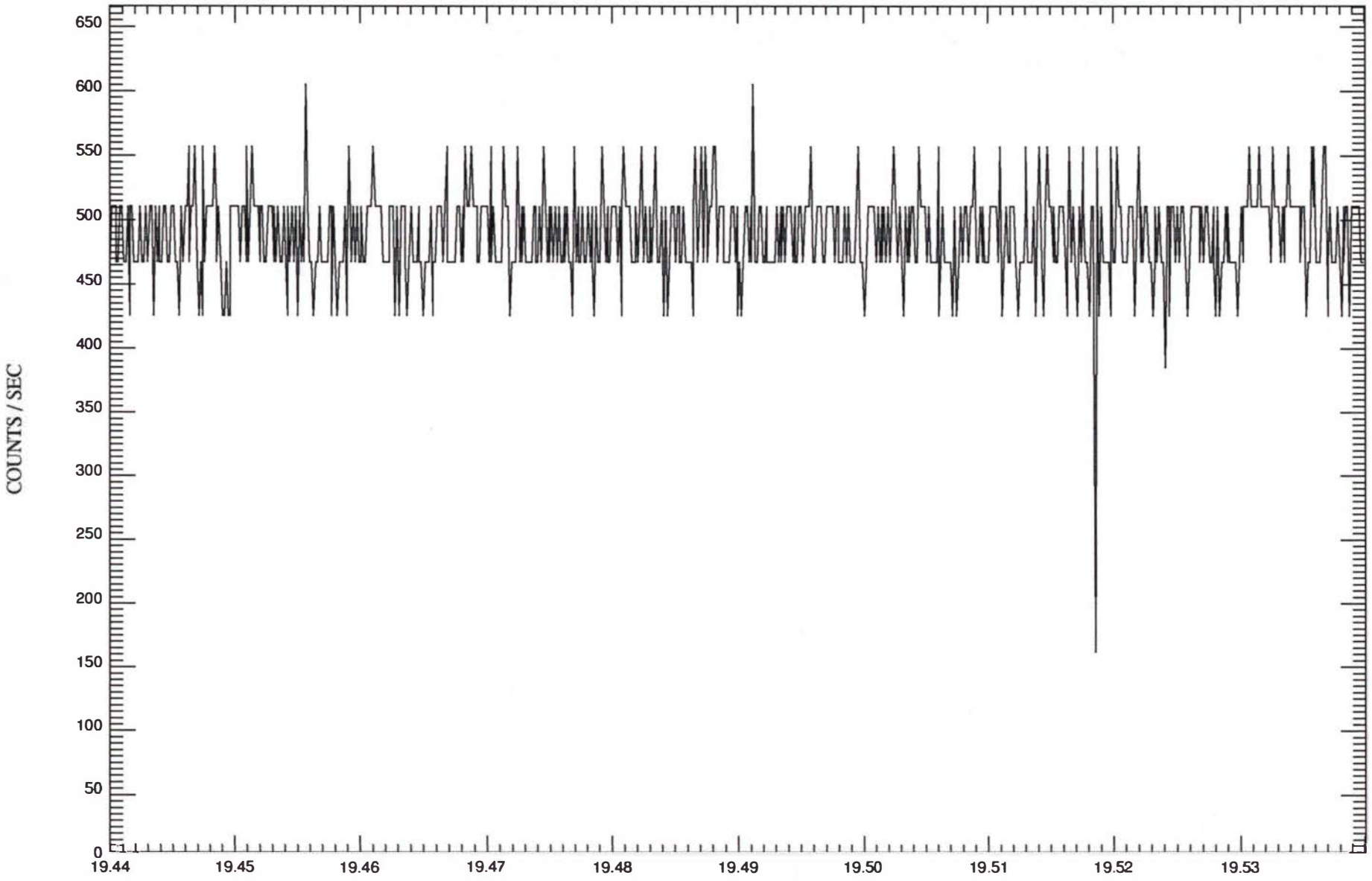
Burst Counter 8 at UT=19.491421161228 h=70169.116 s 19:29:29.116



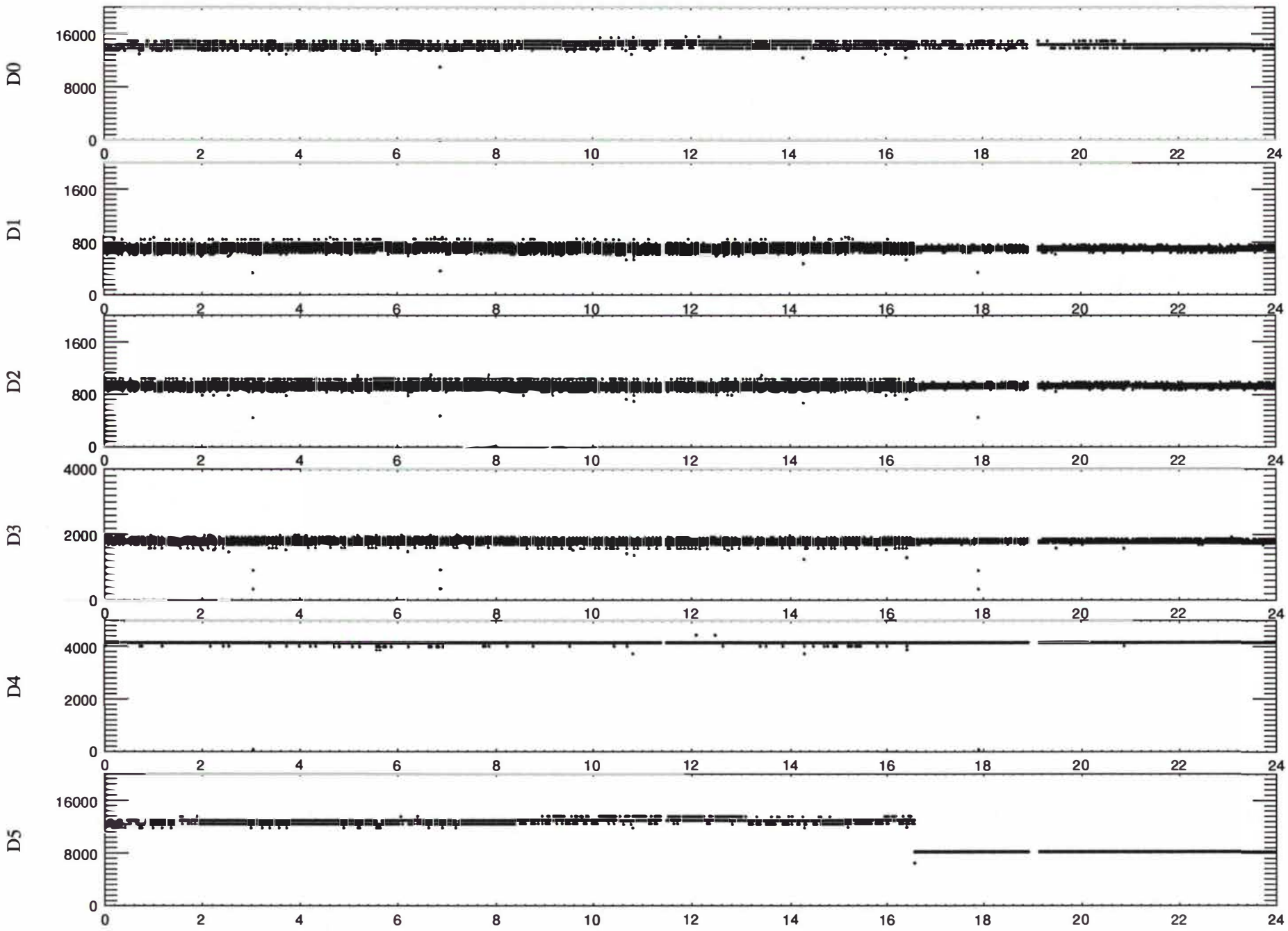

B# 1

HUS 2A, MODE 1, NOT AVERAGED EDR day 358, year 1997 to day 358, year 1997 3/11/98

CALIBRATION DATA INCLUDED



HUS 2B COUNTS / SEC EDR day 358, year 1997 to day 358, year 1997 3/12/98



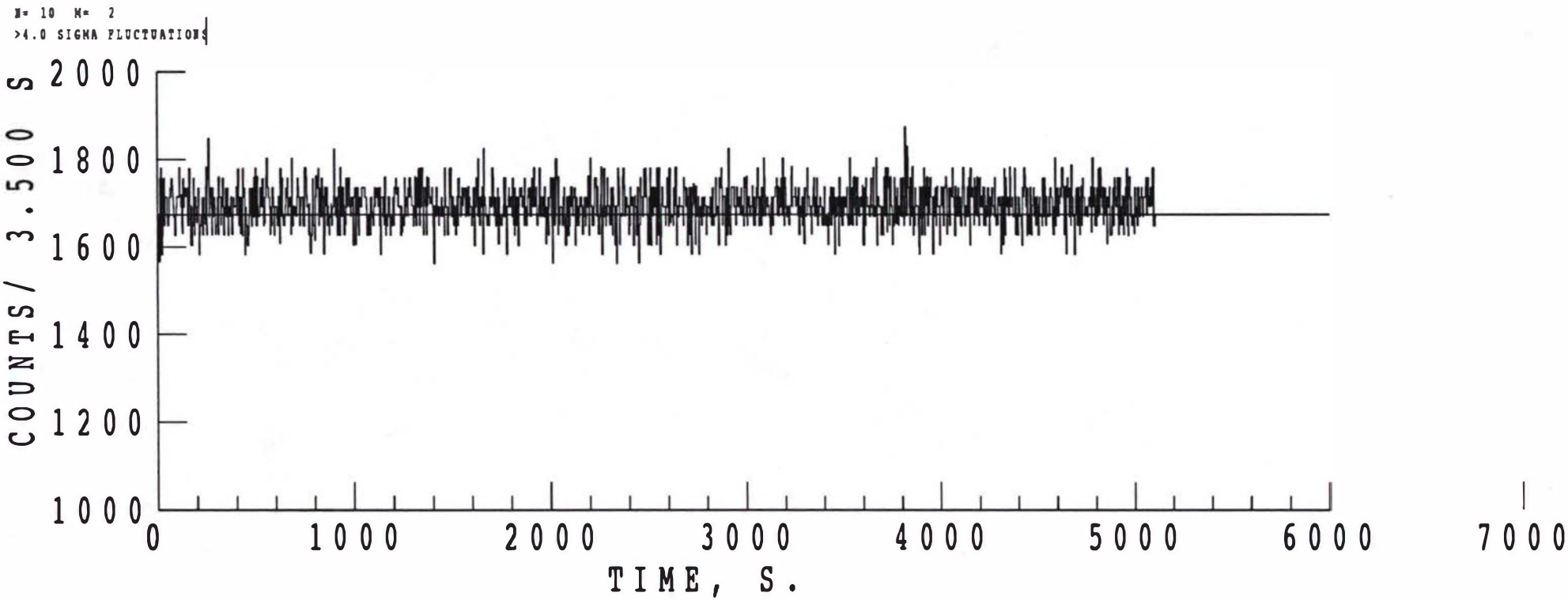
KONUS

ULYSSES RT 07/02/00

25/12/97 33156.297 s

0.500 S INTERVALS REGROUPED BY 7

0- 0 keV



---

ember 17 1997 02:08  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

November 18 1997 11:22  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

November 29 1997 20:25  Ulysses time; weak burst, 100 ms long

This event was not detected by Konus.

---

December 7 1997 11:24  Ulysses time; weak burst, 64 ms long

This event was not detected by Konus.

---

December 11 1997 20:22  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.

---

December 14 1997 08:44  Ulysses time; weak burst, 32 ms long

This event was not detected by Konus.

---

December 19 1997 21:33  Ulysses time; moderate burst, 15 s long

Konus triggered at 22:12:54.241 in the North-facing detector.  The event consisted of a single broad soft peak lasting 10 seconds, with a 50-200 keV spike 4 seconds after the trigger and lasting 0.5 seconds.

---

ember 25 1997 17:23  Ulysses time; weak burst, 32 ms long

Konus waiting-mode data records a couple of events during the period of interest.  There was a weak to moderate North-facing detector soft event lasting 60 seconds, with a peak at 18:00:35.  A single 3-second timebin

From David.M.Palmer.1@gsfc.nasa.gov Mon Jan 5 12:18 PST 1998
X-Sender: palmer@lheapop.gsfc.nasa.gov
Mime-Version: 1.0
Date: Mon, 5 Jan 1998 15:20:17 -0500
    khurley@sunspot.ssl.berkeley.edu (Kevin Hurley)
From: David Palmer <David.M.Palmer.1@gsfc.nasa.gov>
Subject: No TGRS events for 971219 nor 971225

TGRS saw neither of these, with neither trigger nor rate increase.

>December 19 1997 21:33  Ulysses time; moderate burst, 15 s long
>
>December 25 1997 17:23  Ulysses time; weak burst, 32 ms long

It did see a burst at 971225_54409 (= 15:06:49)

David Palmer
palmer@lheamail.gsfc.nasa.gov
USA (301) 286-2739 Voice
USA (301) 286-1684 Fax

Date: Jan 11 2012

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

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

## 2. For Konus events

☑ Konus ecliptic latitude used with latest calibration?

## 2. For Odyssey events

☐ Was CHECKMO run to eliminate data gaps?

☐ Did the Odyssey ephemeris correspond to the event time? (When there is data in the database, the ephemeris is for the start of record, usually ~1320 s prior to the request time; when there is no data in the database, the ephemeris is for the request time in the e-mail, so the request time in mosearch should be equal to the GRB time. Note that the time in the return e-mail will be ~1320 s prior to the time requested, in the line "no HEND data…")

☐ Was Mars-blocking used?

☐ For cruise phase data (April – October 2001), was the updated data used? (Old data has timing errors)

☐ GRS database searched for triggered data? Database data between August 2005 and January 2006 should be re-extracted, due to timing errors. (E-mailed data should be OK).

☐ GRS and HEND data cross-correlated to check timing?

## 2. For 3 or More Spacecraft events

☐ $\Sigma$ 3$\Delta$t's calculated, and/or BMAPSUM executed?

## 3. For INTEGRAL events

☐ INTEGRAL SPI-ACS website checked for bursts that weren't transmitted automatically?

☐ 125 ms added to INTEGRAL SPI-ACS time for bursts prior to April 2 2004 11:00 UT?

☐ Updated ephemeris used for bursts prior to September 30, 2003?

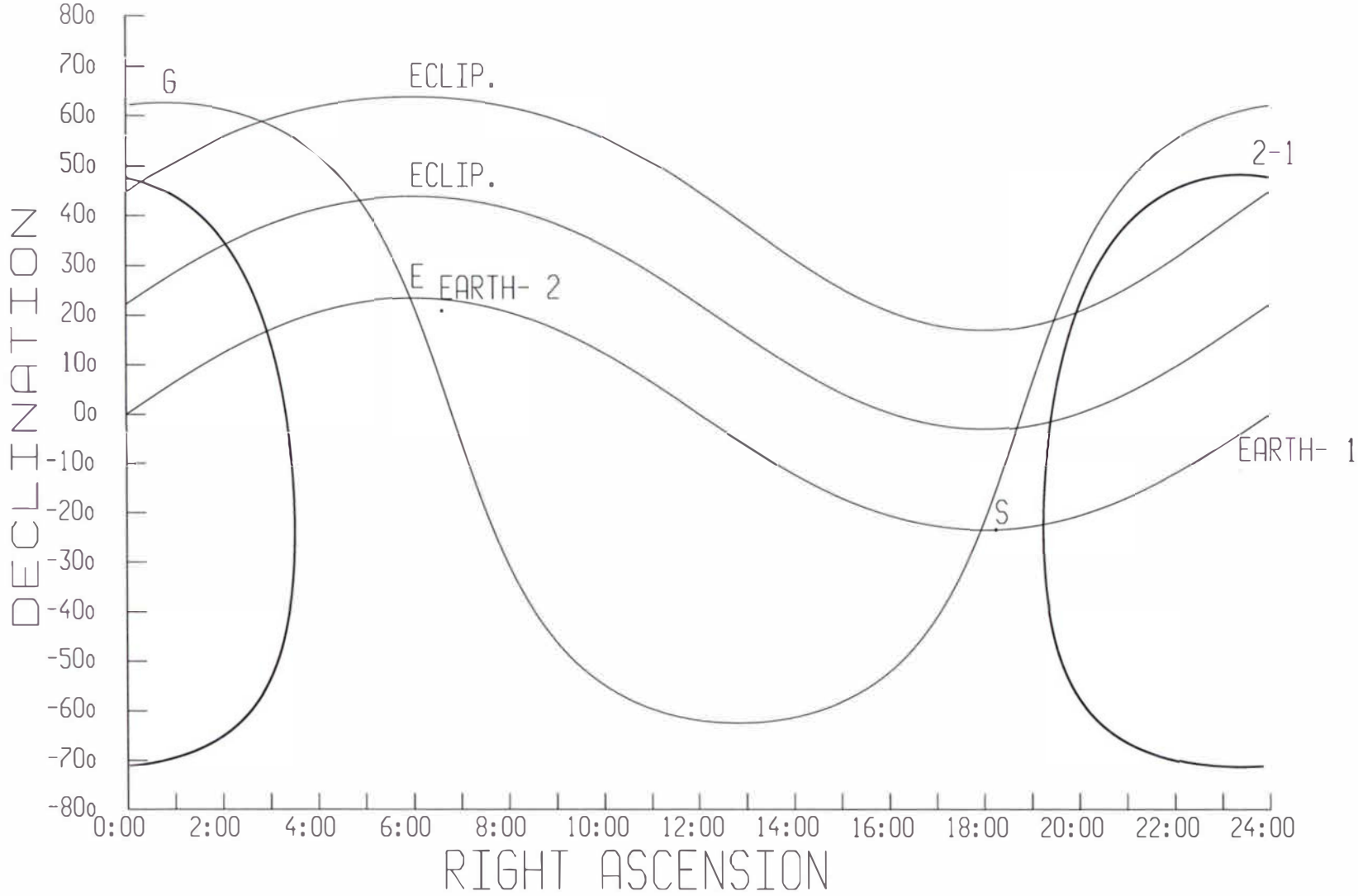
---

☑ ACCESS and MBL4 databases updated with identical times?

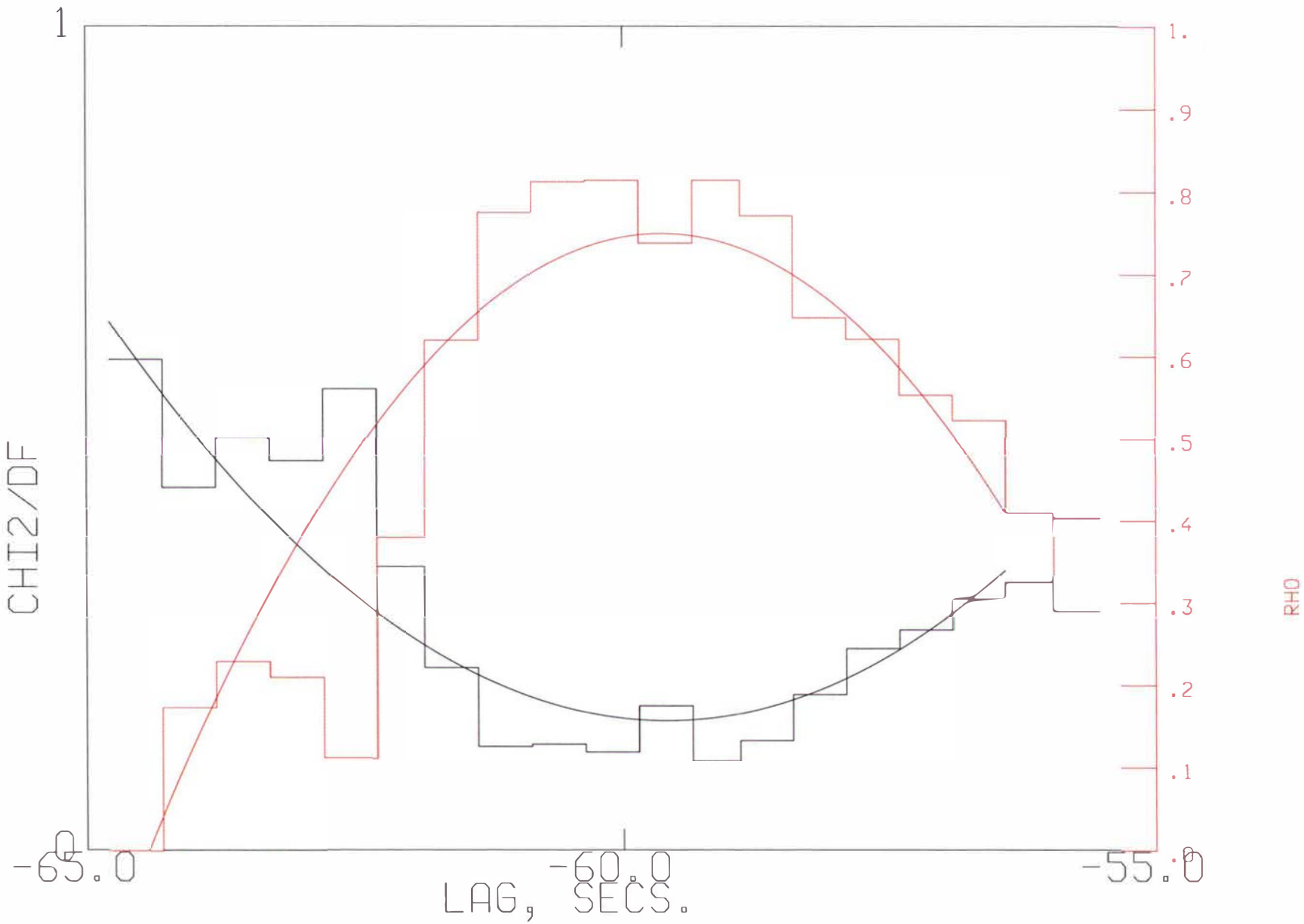
# EVENT OF DEC 25, 1997 10:15

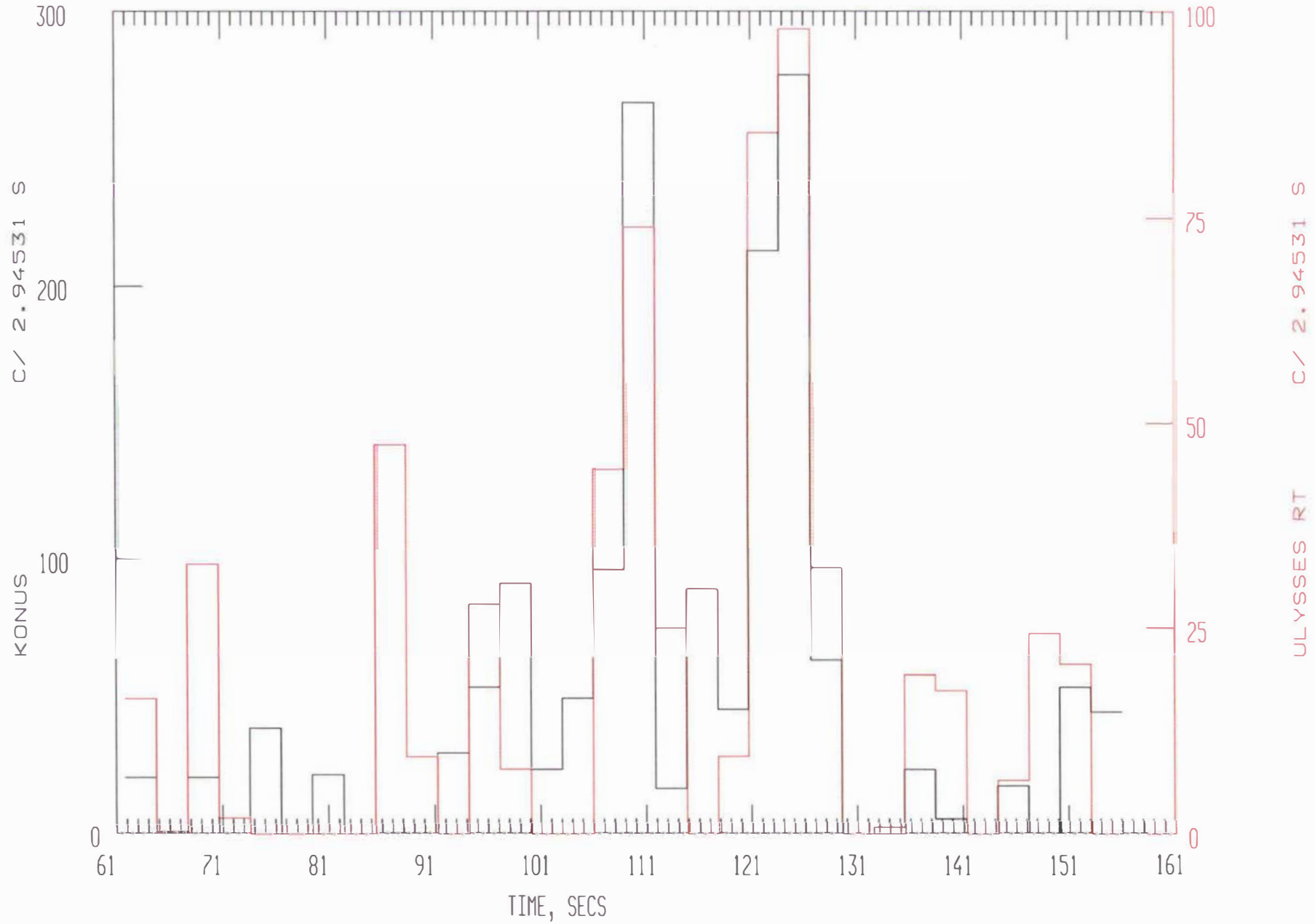
11/01/2012

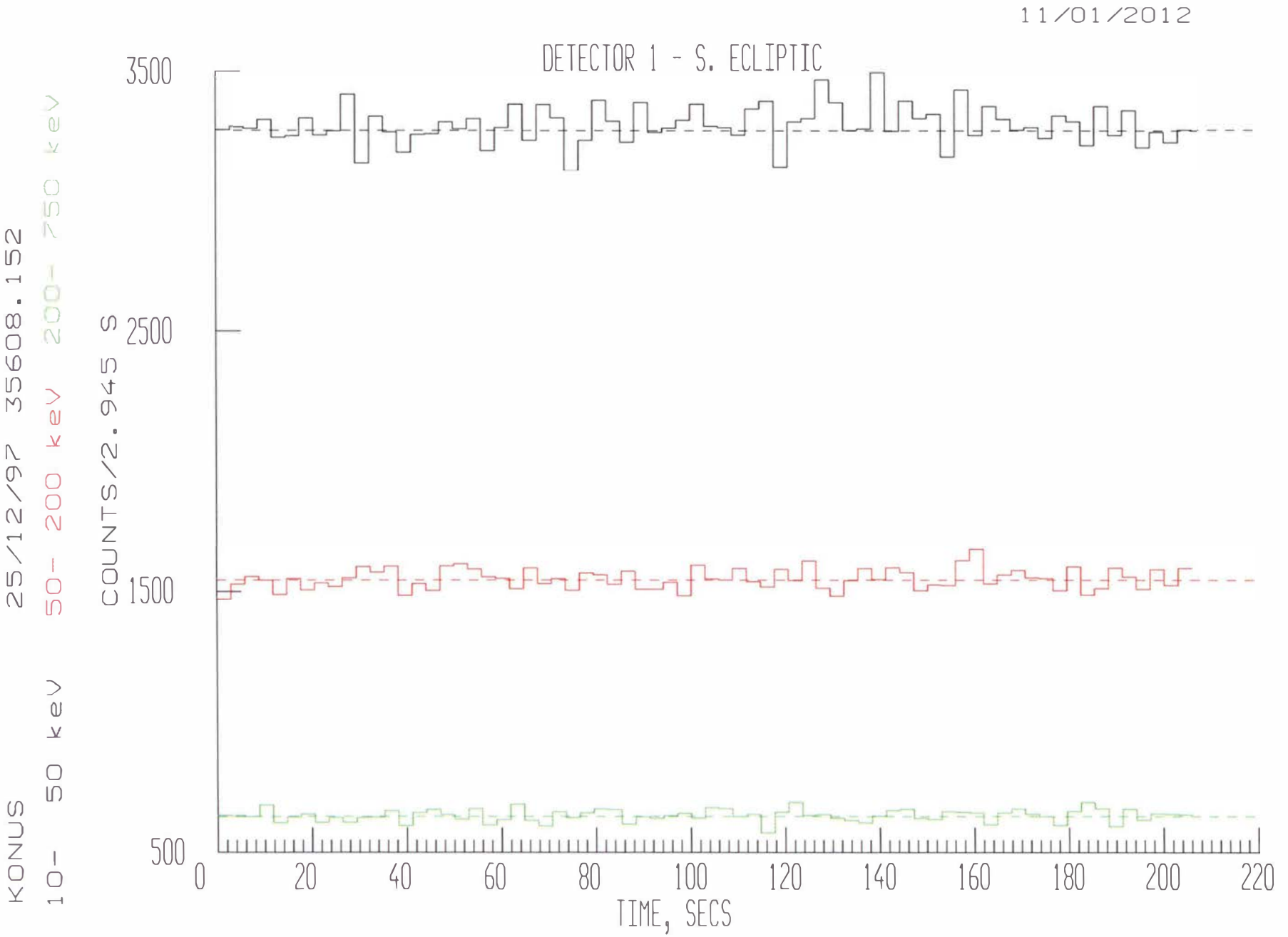
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 KONUS

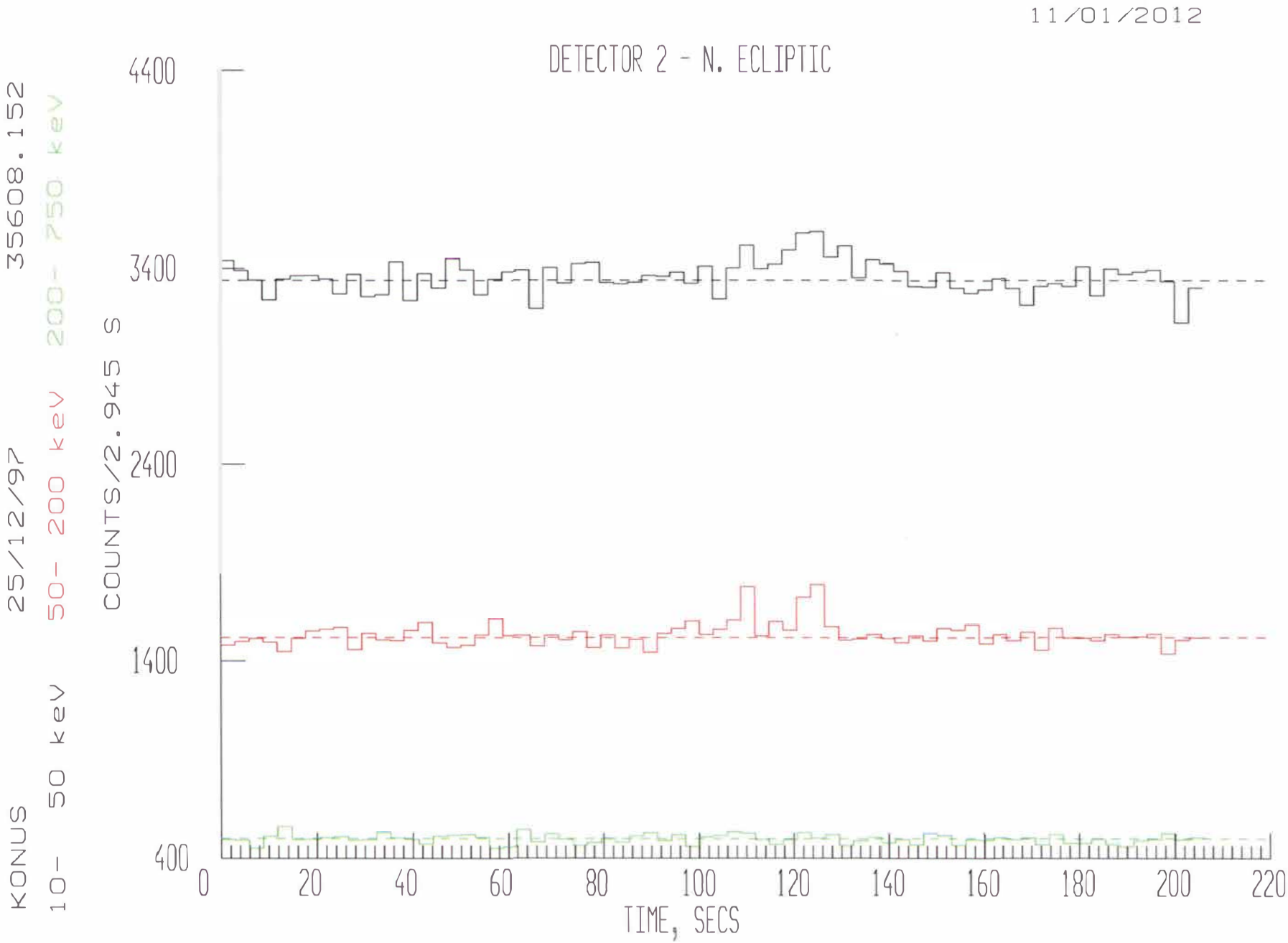


KONUS -ULYSSES RT CORRELATION 25/12/97 35608.152




300
200
100
0
KONUS
C/ 2.94531 S
100
75
50
25
0
ULYSSES RT
C/ 2.94531 S
61
71
81
91
101
111
121
131
141
151
161
TIME, SECS


11/01/2012
DETECTOR 1 - S. ECLIPTIC
KONUS 25/12/97 35608.152
10- 50 keV 50- 200 keV 200- 750 keV
COUNTS/2.945 S
3500
2500
1500
500
0
20
40
60
80
100
120
140
160
180
200
220
TIME, SECS


11/01/2012
DETECTOR 2 - N. ECLIPTIC
KONUS
25/12/97
35608.152
10- 50 keV
50- 200 keV
200- 750 keV
COUNTS/2.945 S
4400
3400
2400
1400
400
0
20
40
60
80
100
120
140
160
180
200
220
TIME, SECS

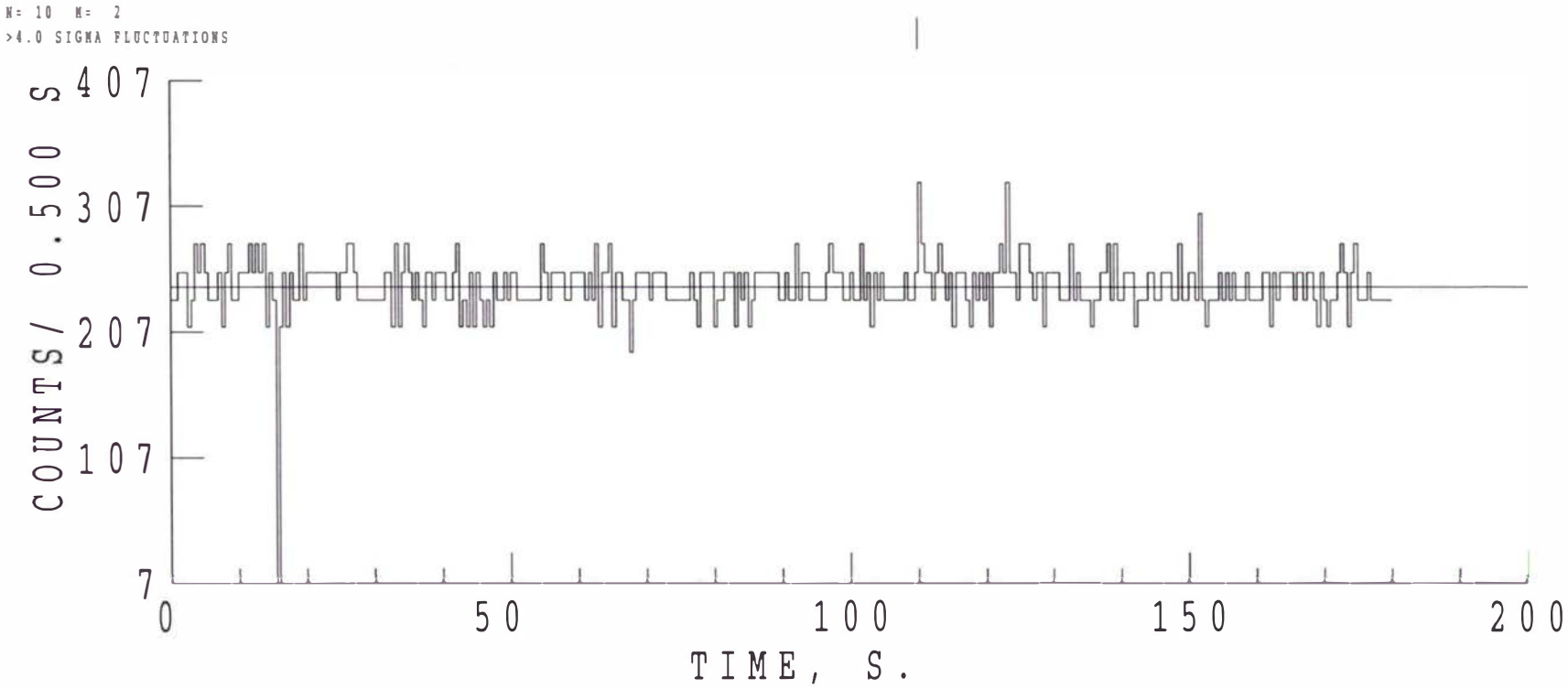
KONUS 19971225 36956

ULYSSES RT

09/01/12

25/12/97 36864.344 s

0- 0 keV

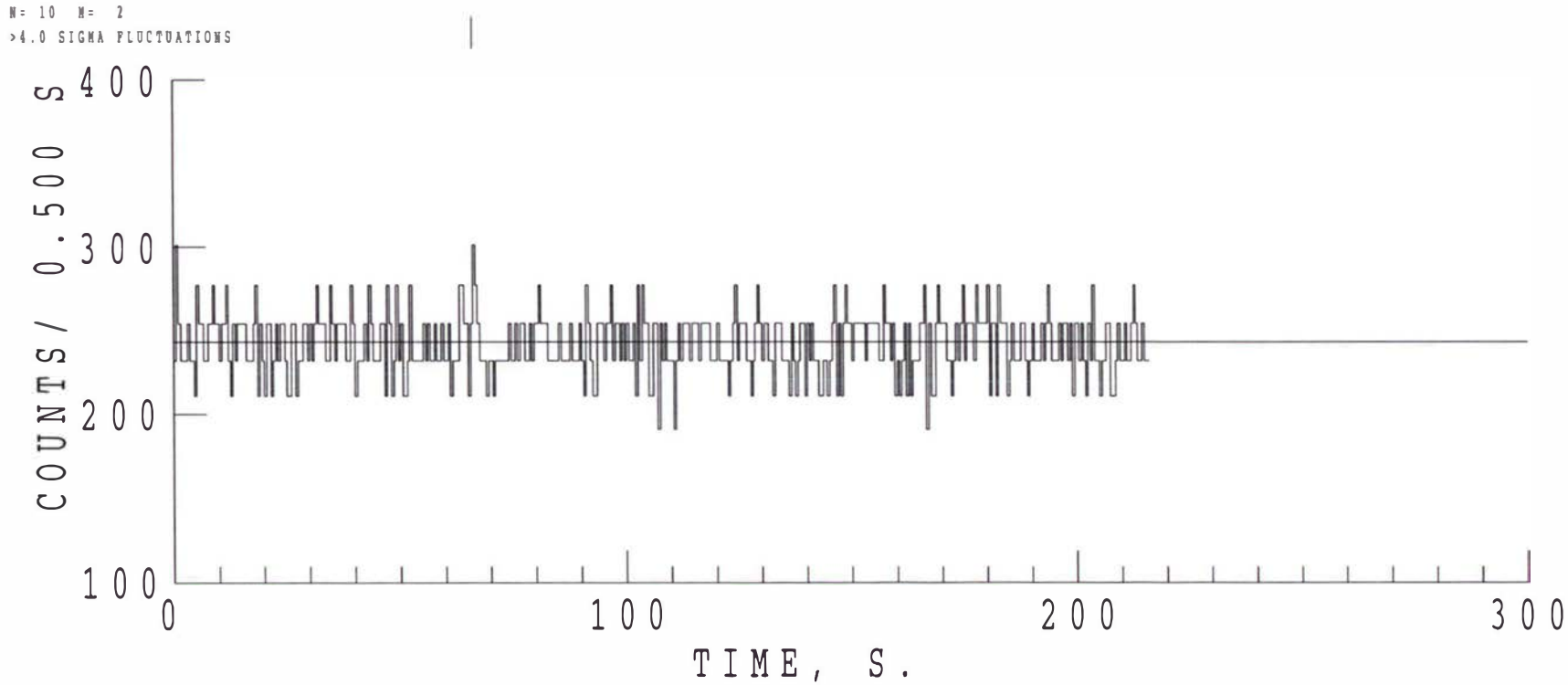


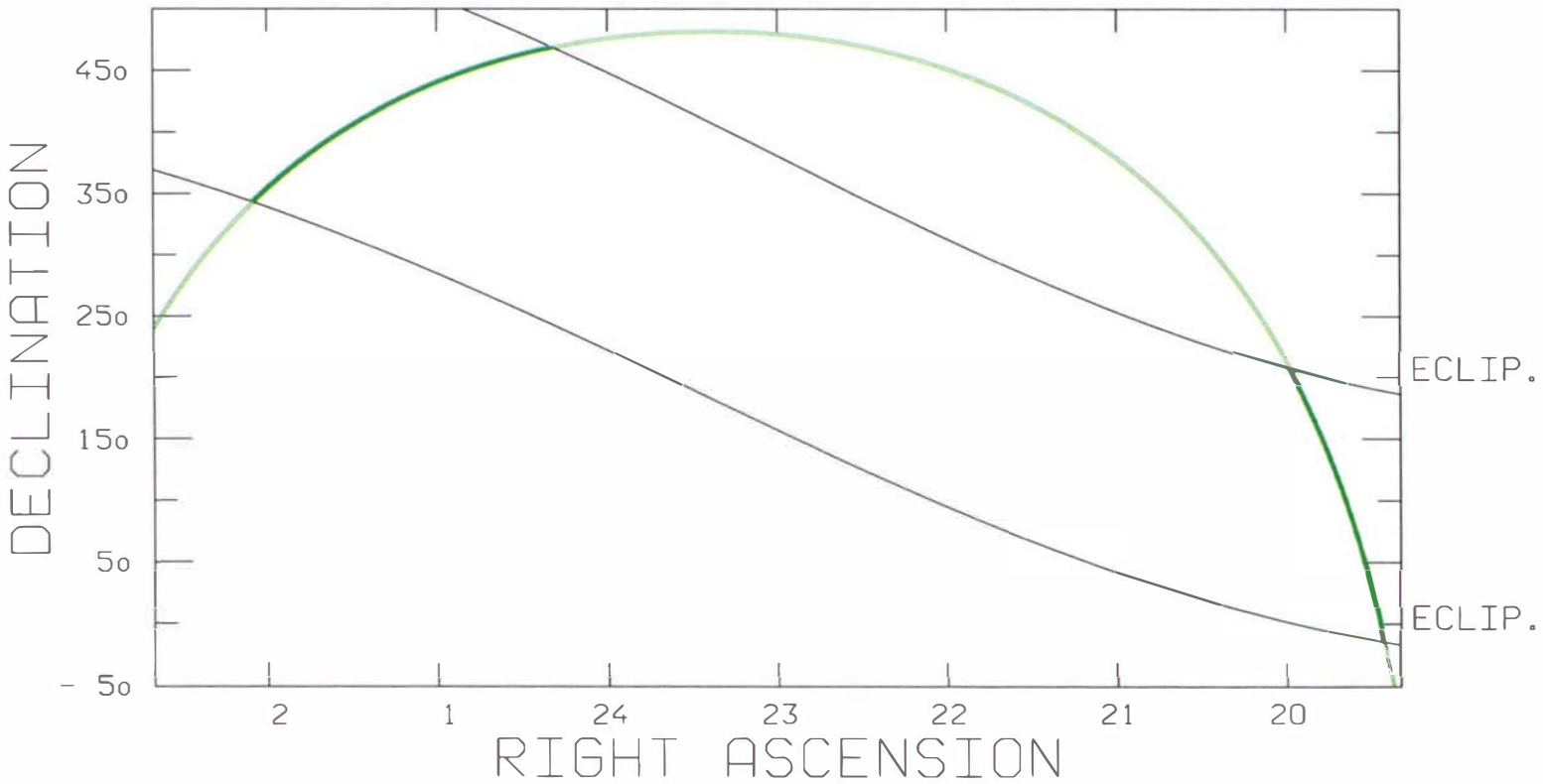
KONUS 19971225 35456

ULYSSES RT 09/01/12

25/12/97 35352.324 s

0- 0 keV




DECLINATION
45o
35o
25o
15o
5o
- 5o
2
1
24
23
22
21
20
RIGHT ASCENSION
ECLIP.
ECLIP.

From SAHI@fender.msfc.nasa.gov Tue Dec 30 11:30:51 1997
Return-Path: <SAHI@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA18582; Tue, 30 Dec 1997 11:30:46 -0800
From: SAHI@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA15909; Tue, 30 Dec 1997 11:30:44 -0800
Date: Tue, 30 Dec 1997 13:30:35 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971230133035.224595ab@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6545
Content-Length: 1135
X-Lines: 26

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

BATSE BURST # 6545
EVENT OF 1997 DEC 25 DAY OF YEAR=359
EVENT CROSSING TIME AT BATSE : 64834. S. OR 18:00:34.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 265.000 65.000
BATSE PEAK COUNTING RATE: 5000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 25/12/ 97 IS:
RA= 170.171 DEC= 11.846 DIST= 4.985 AU
BATSE-ULYSSES DISTANCE = 745827212. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 98.70 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -376.20 SECS.
CROSSING TIME AT ULYSSES IS 64458. S. OR 17:54:17 +/- 471.24 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 25/12/ 97 IS:
RA= 307.938 DEC= -20.113 DIST= 2.114 AU
MARS-BATSE DISTANCE = 316217568. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 88.79 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 22.29 SECS.
CROSSING TIME AT MARS IS 64856. S. OR 18:00:56 +/- 183.43 SECONDS

BATSE BURST TRIGGER

NO.: 6545

TIME: TJD=0807 SECONDS=64834

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=128.8 AZIMUTH=42.2 ERROR=1.83 DEGREES

COMMENTS:
BURST, SINGLE PULSE WITH SUBSTRUCTURE, DUR.~30 SECS. NOT VISIBLE ABOVE
300 KEV. POSSIBLE PRECURSOR AT APPROX. T-150, AND AT T-50 SECS. CRAB SET AT
T-60 SECS; CYGX-1 RISE AT T+150 SECS.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6545 | 971225 | 10807 | 64834 | 5000 | 265 | +65 | 30 |

Helio corr removed Feb 9 00

Date: May 5 '98

**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? N/A

☑ 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

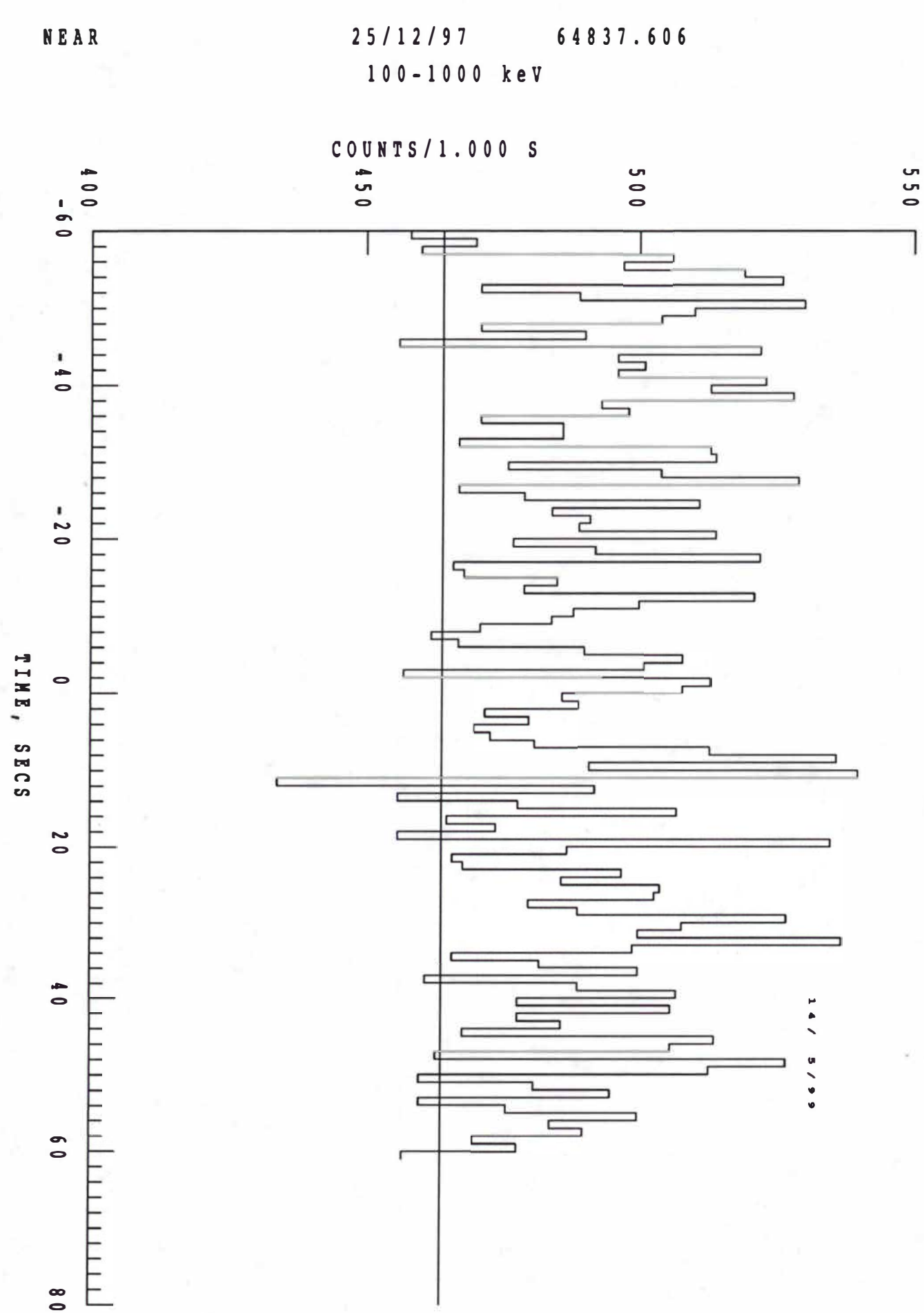
3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

☐ Geocentric time used?

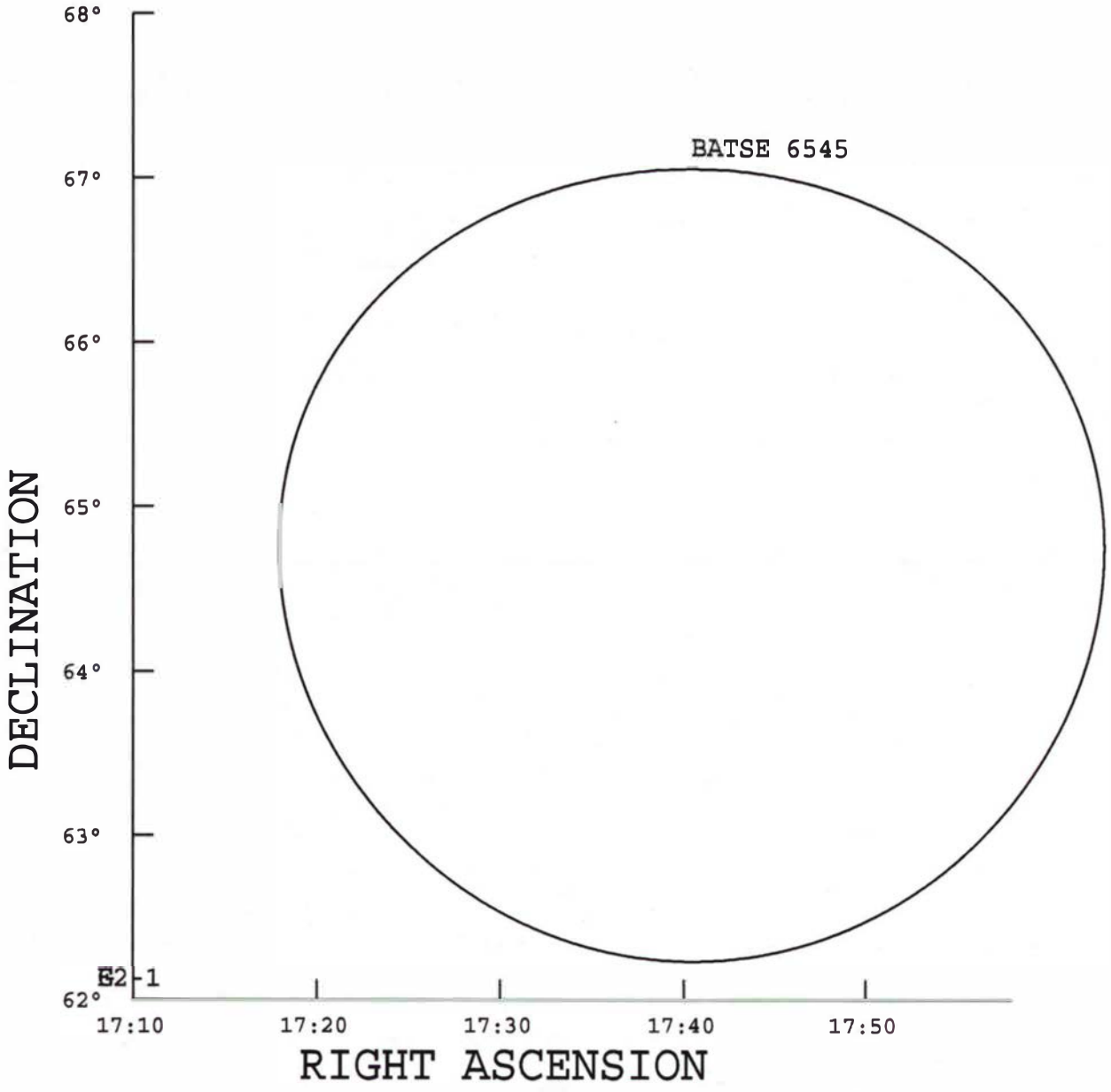
☑ ACCESS database updated?

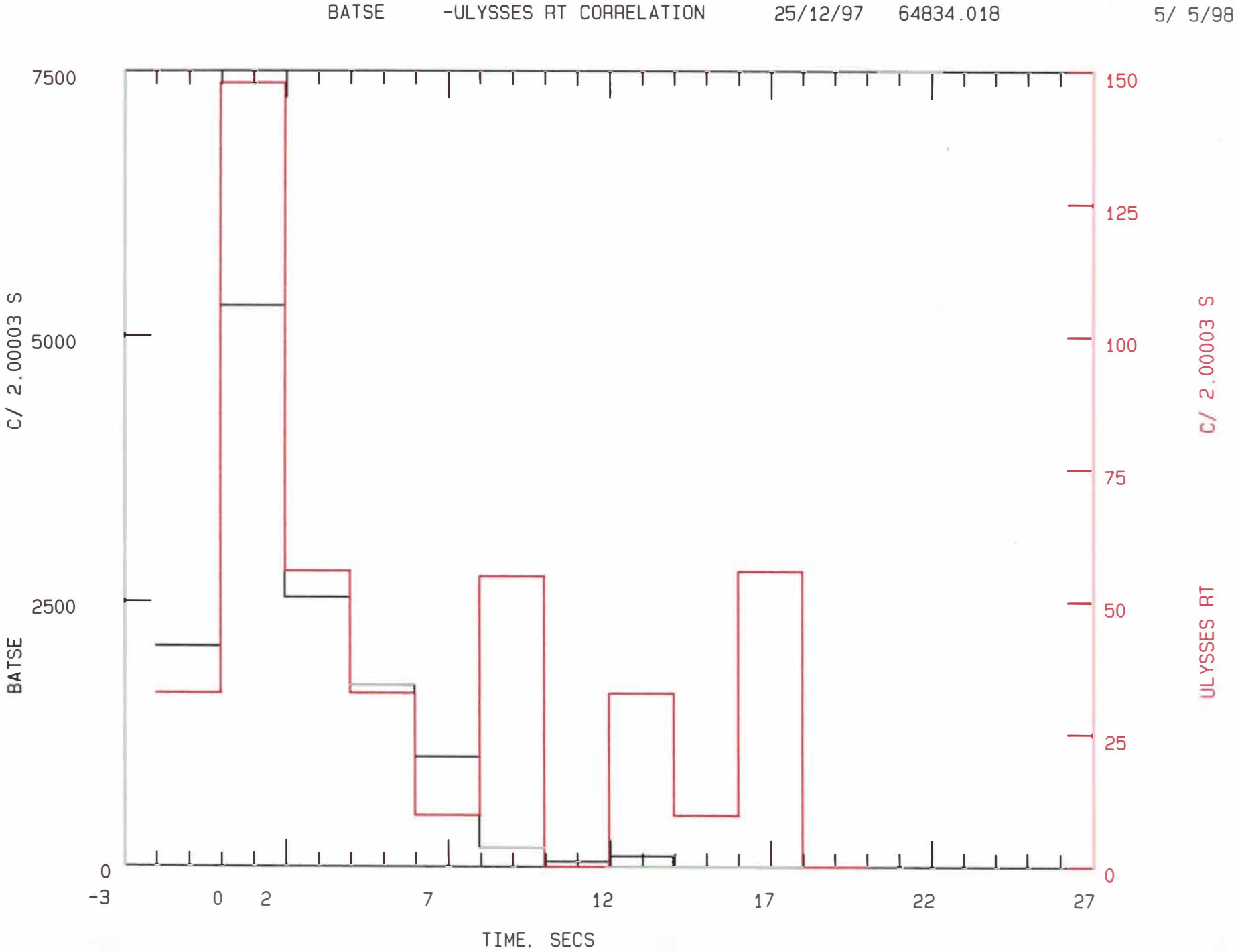

NEAR
25/12/97
64837.606
100-1000 keV
COUNTS/1.000 S
400
450
500
550
-60
-40
-20
0
20
40
60
80
TIME, SECS
14/ 5/99

# EVENT OF DEC 25, 1997 17:50

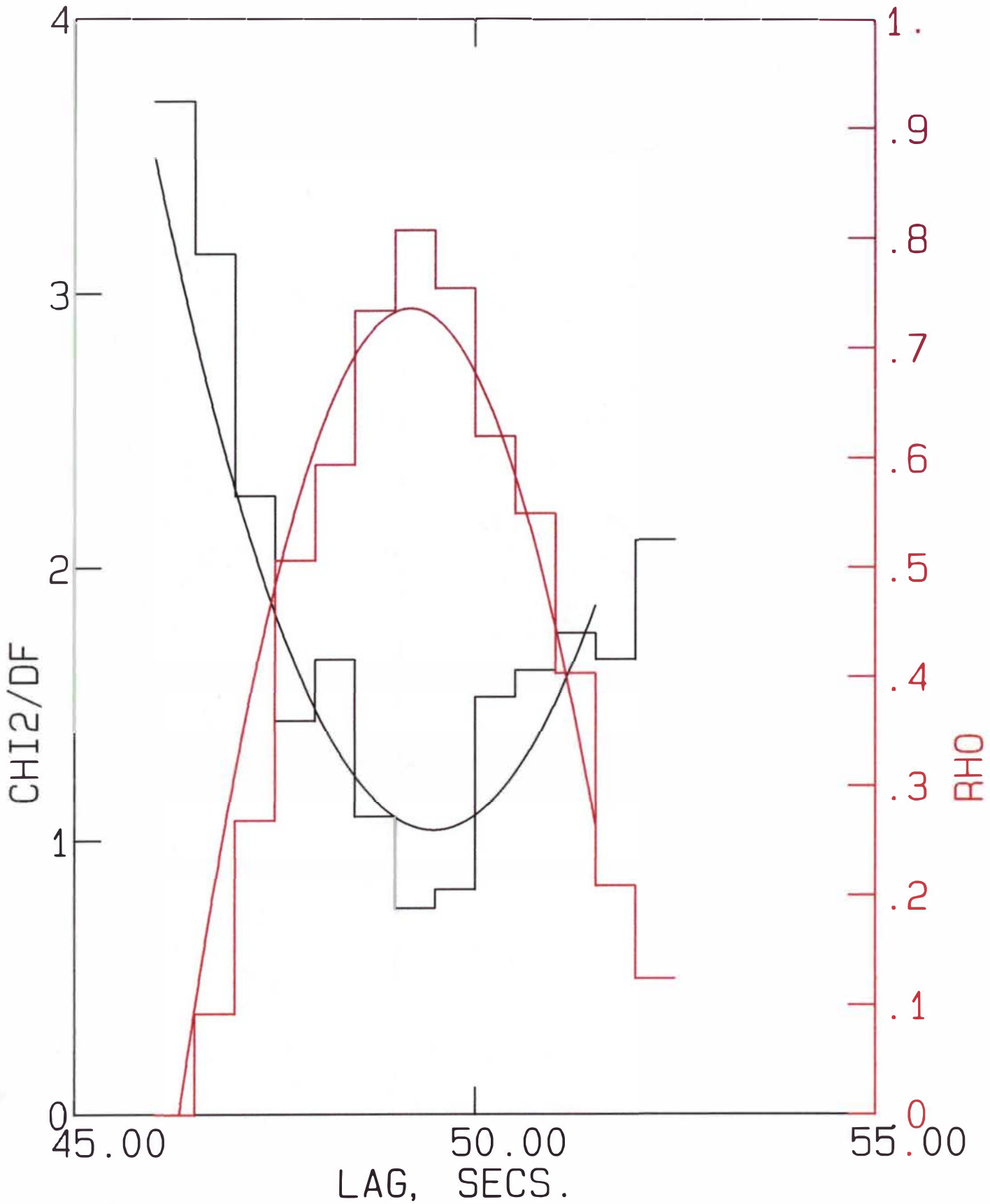
9/ 2/ 0

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




BATSE -ULYSSES RT CORRELATION 25/12/97 64834.018 5/ 5/98
7500
5000
2500
0
C/ 2.00003 S
BATSE
150
125
100
75
50
25
0
C/ 2.00003 S
ULYSSES RT
-3
0
2
7
12
17
22
27
TIME, SECS

BATSE -ULYSSES RT CORRELATION 25/12/97 64834.018

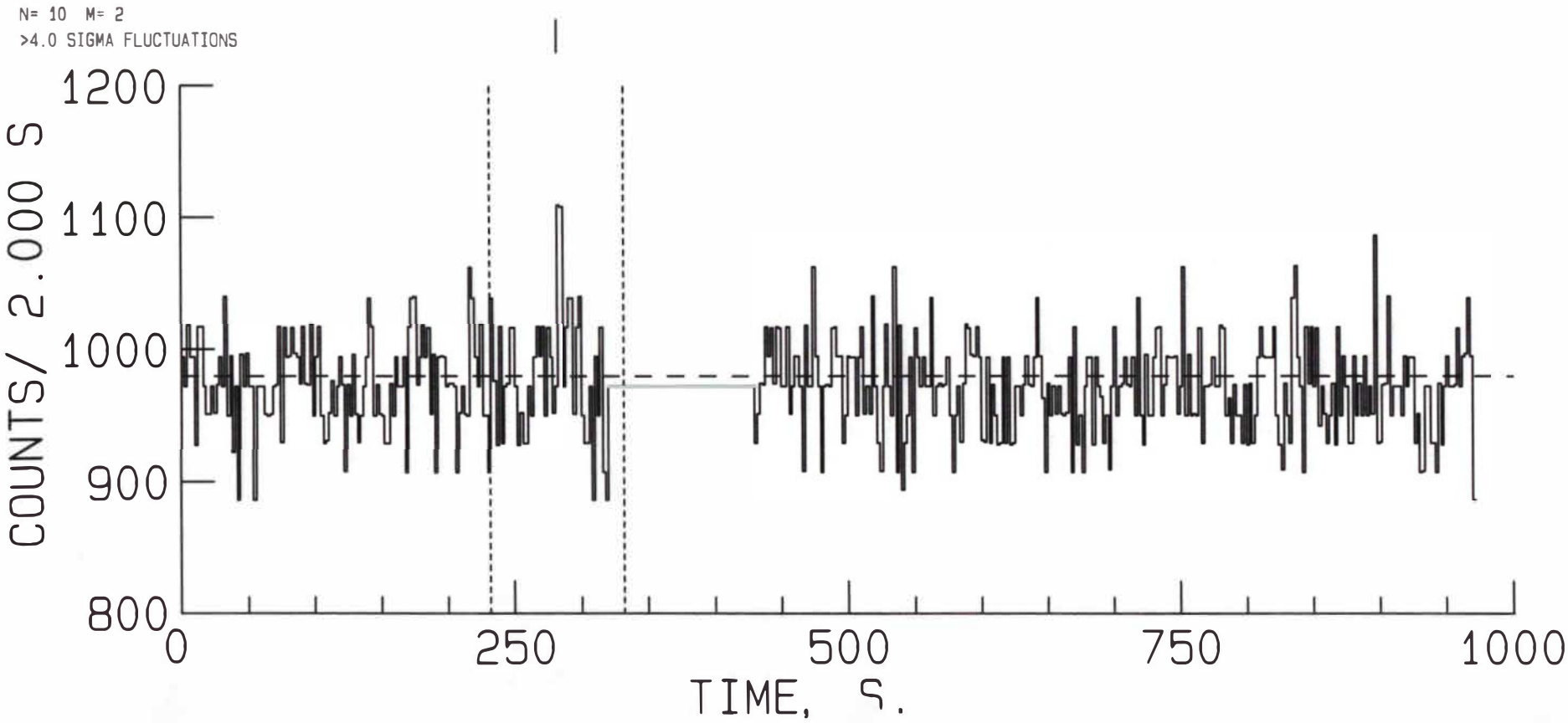


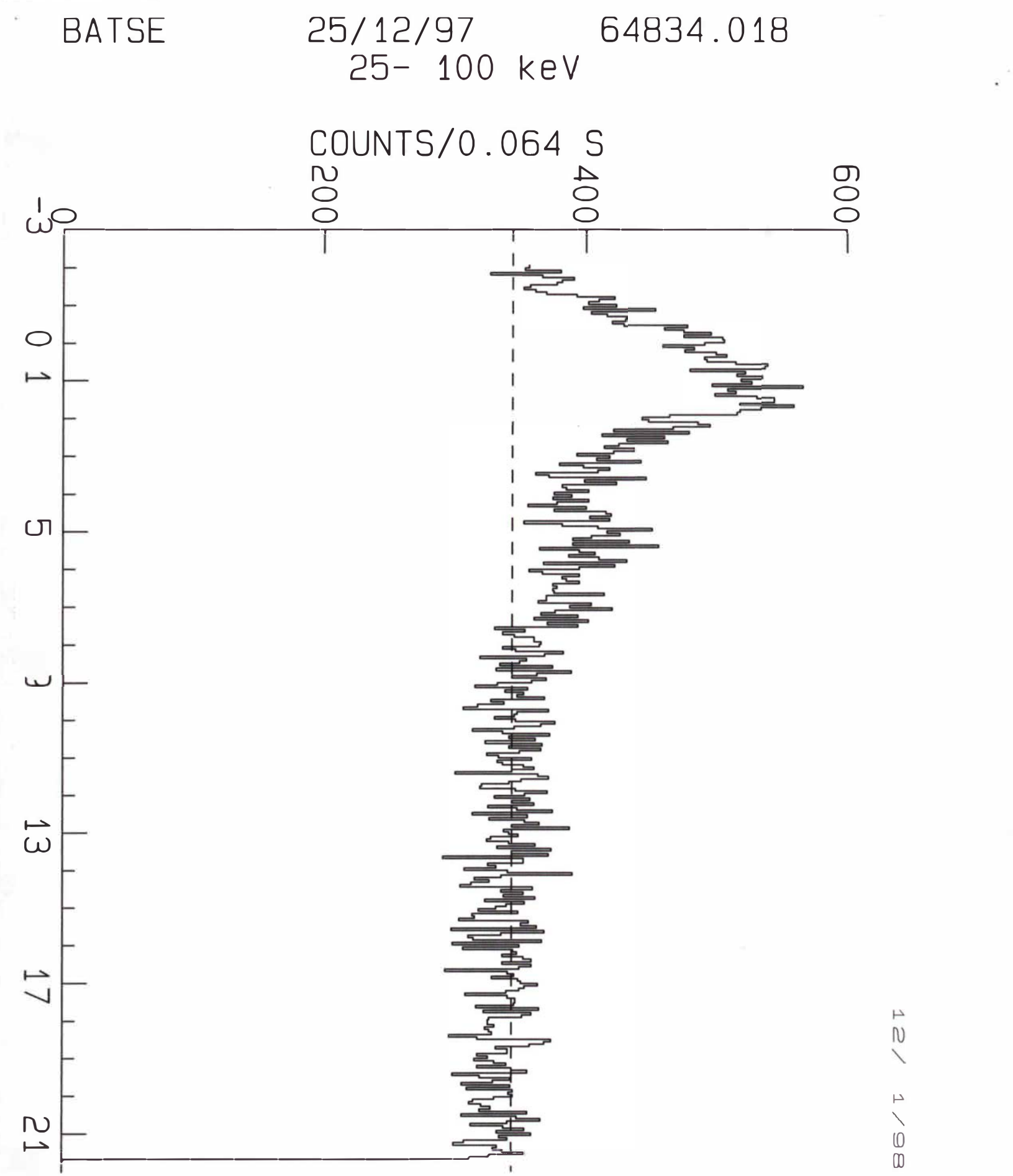
ULYSSES RT 5/ 5/98

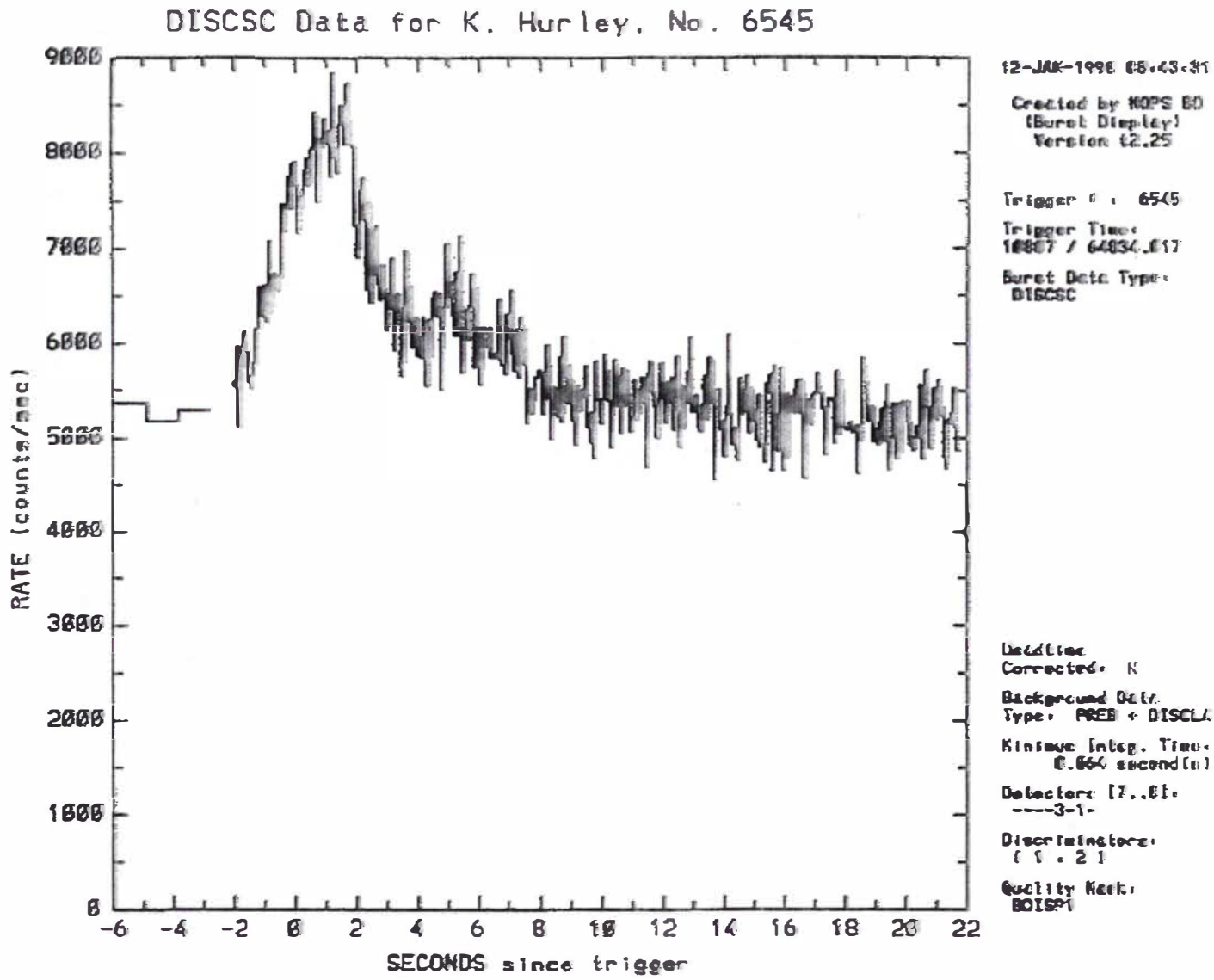
25/12/97 63972.143 s

0.500 S INTERVALS REGROUPED BY 4

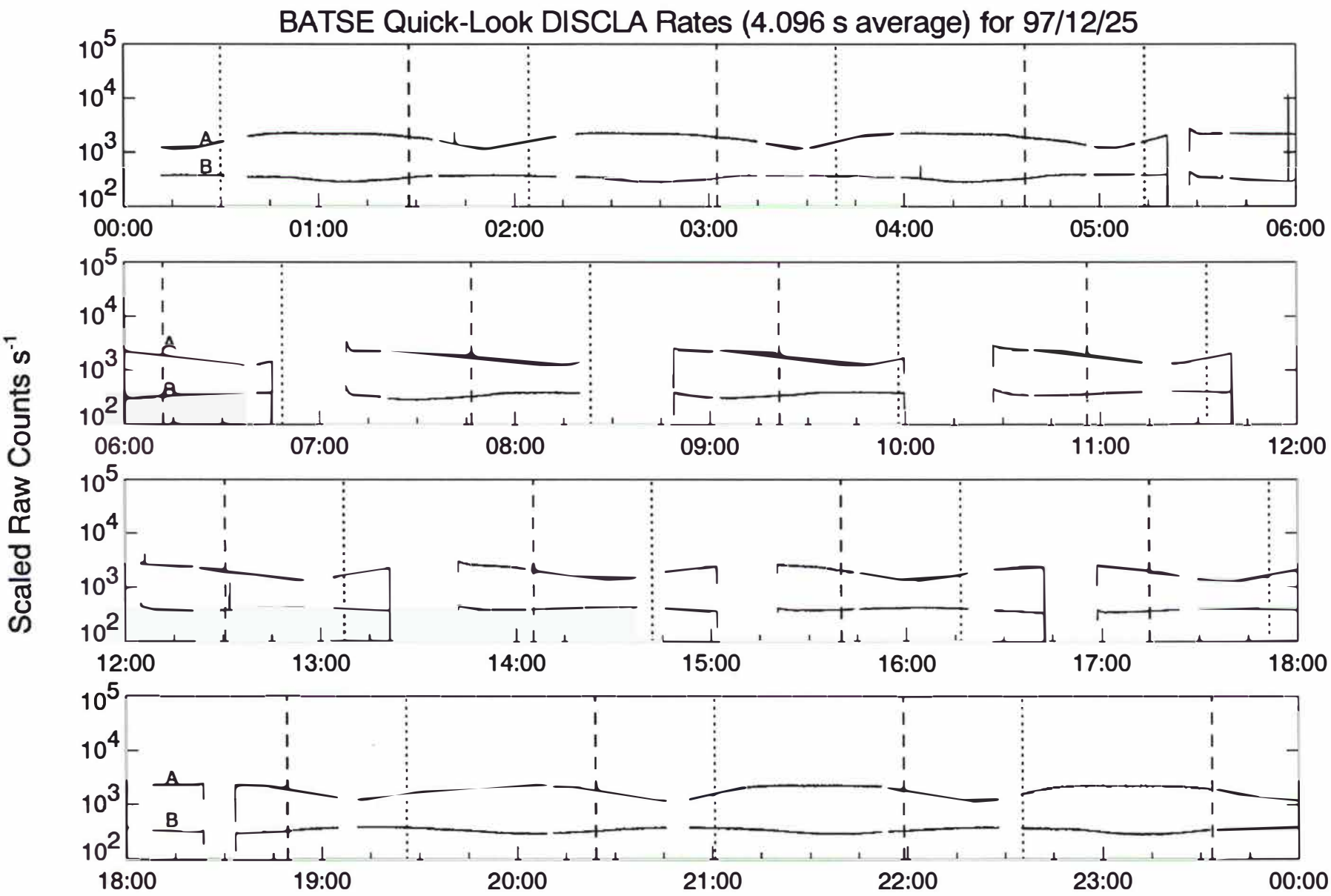
22- 149 keV




BATSE 25/12/97 64834.018
25- 100 keV
COUNTS/0.064 S
200
400
600
-3
0
1
5
3
13
17
21
12/ 1/98


DISCSC Data for K. Hurley. No. 6545
RATE (counts/sec)
SECONDS since trigger
12-JAN-1998 08:43:31
Created by MOPS BD
(Burst Display)
Version 12.25
Trigger # : 6545
Trigger Time:
10807 / 64834.017
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
----3-1-
Discriminators:
[ 1 , 2 ]
Quality Mask:
BDISP1

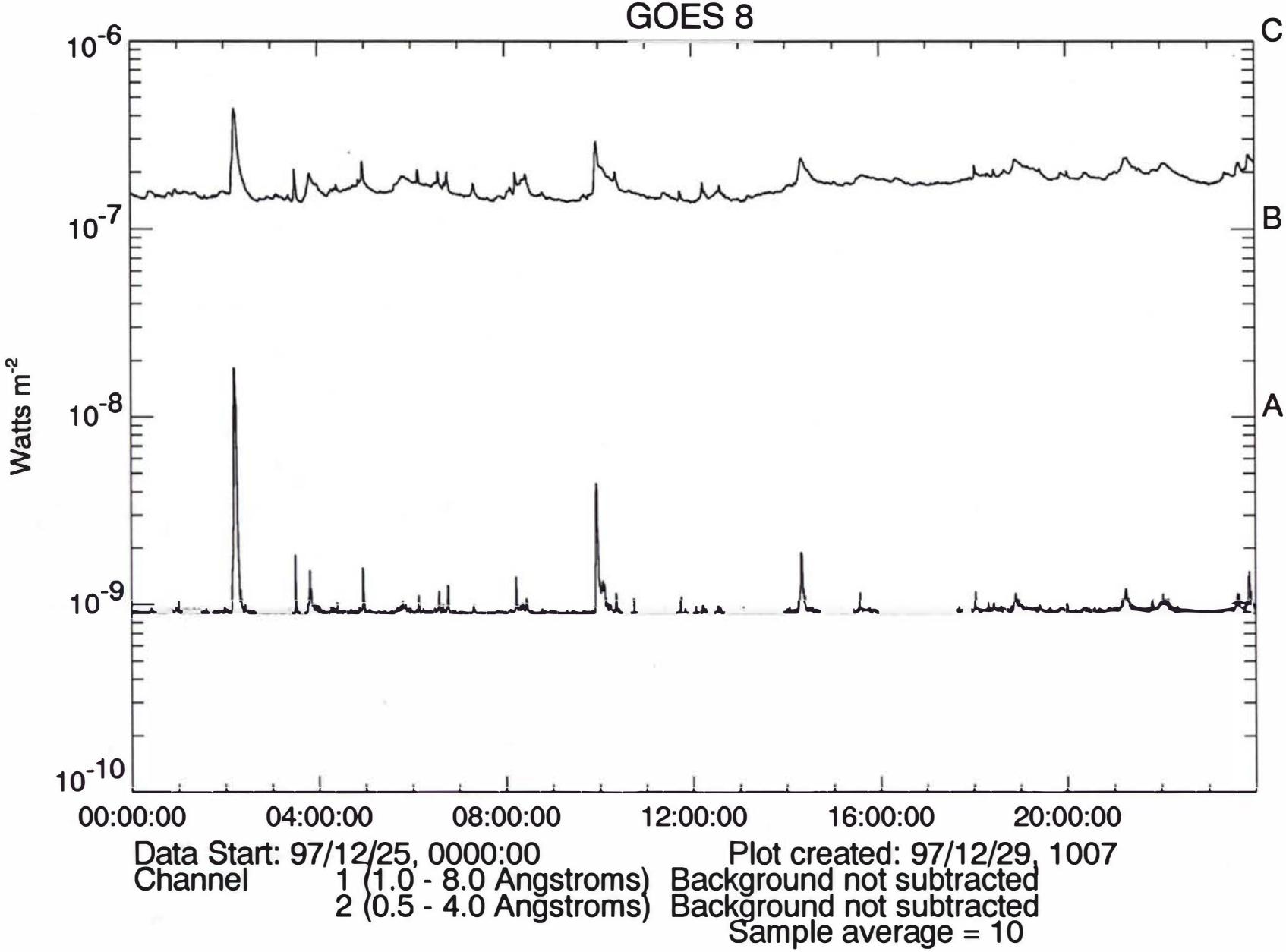
R=95%




Current Time: 97/12/29, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05

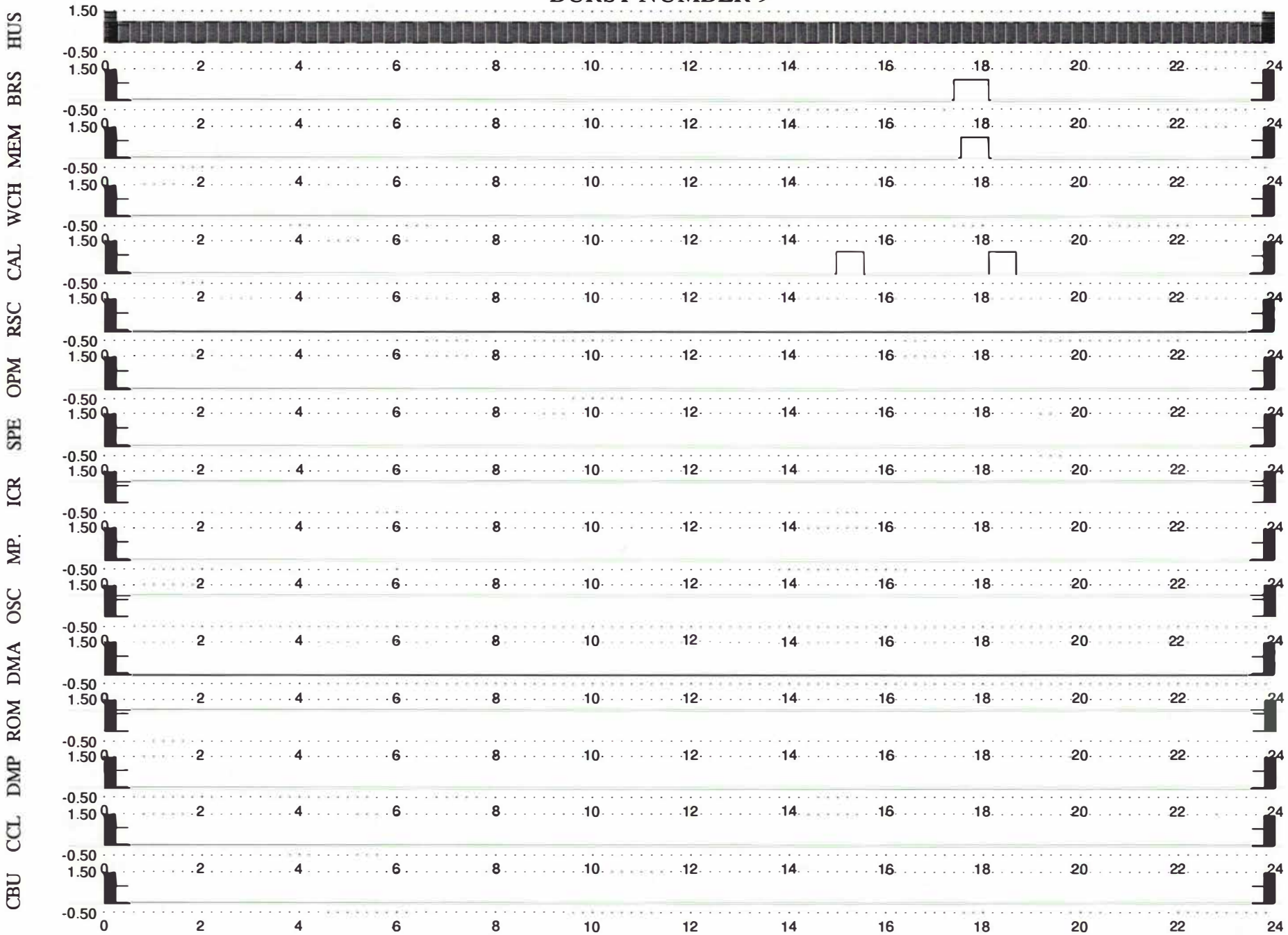
Dotted line: Day entry
Dashed line: Night entry

* Solar Burst Trigger
\+ Solar Flare


GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/25, 0000:00
Plot created: 97/12/29, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 359, year 1997 to day 359, year 1997 3/12/98

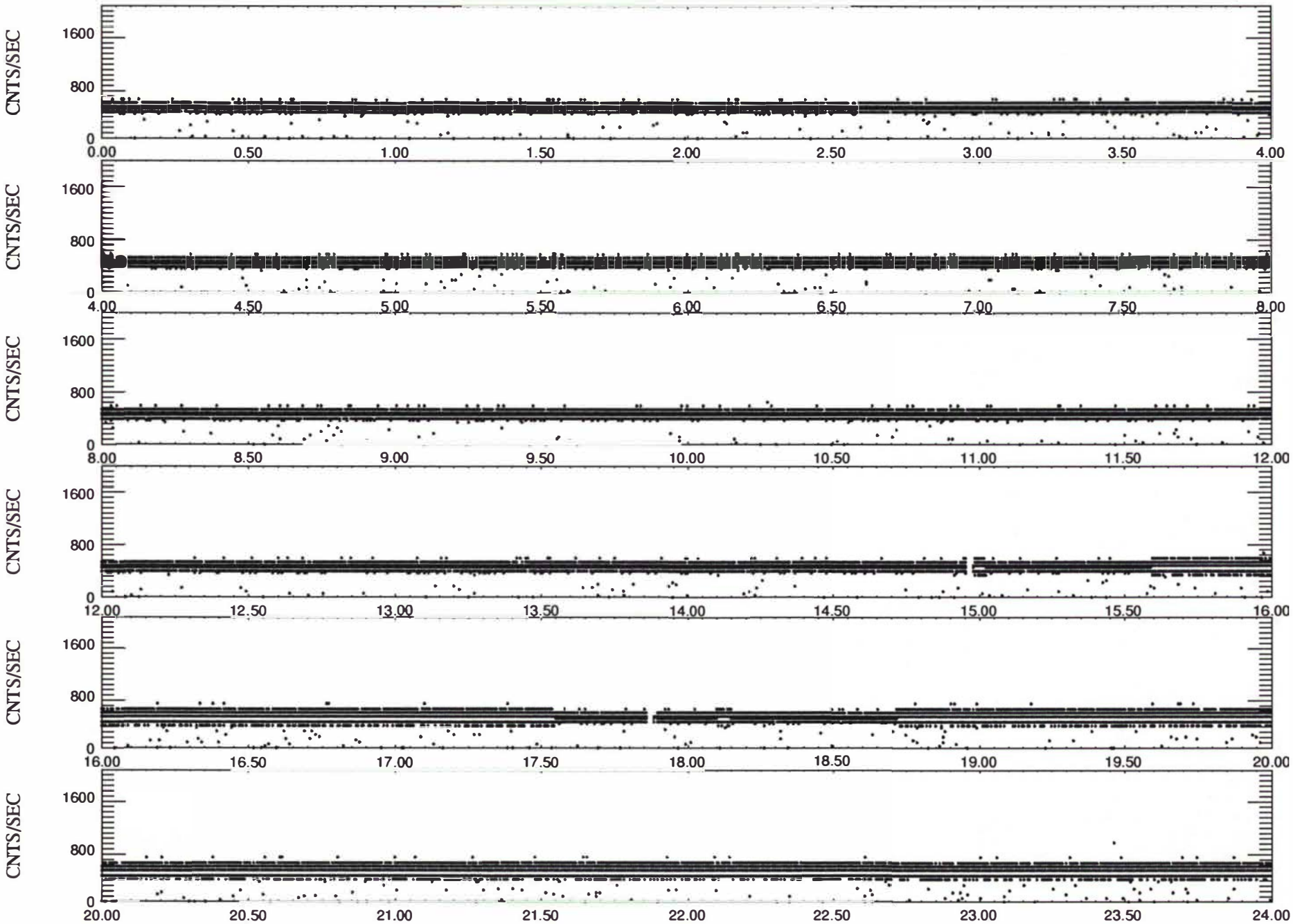
BURST NUMBER 9




UNIV 'AL TIME

HUS 2A, MODE 1, NOT AVERAGED EDR day 359, year 1997 to day 359, year 1997 3/12/98

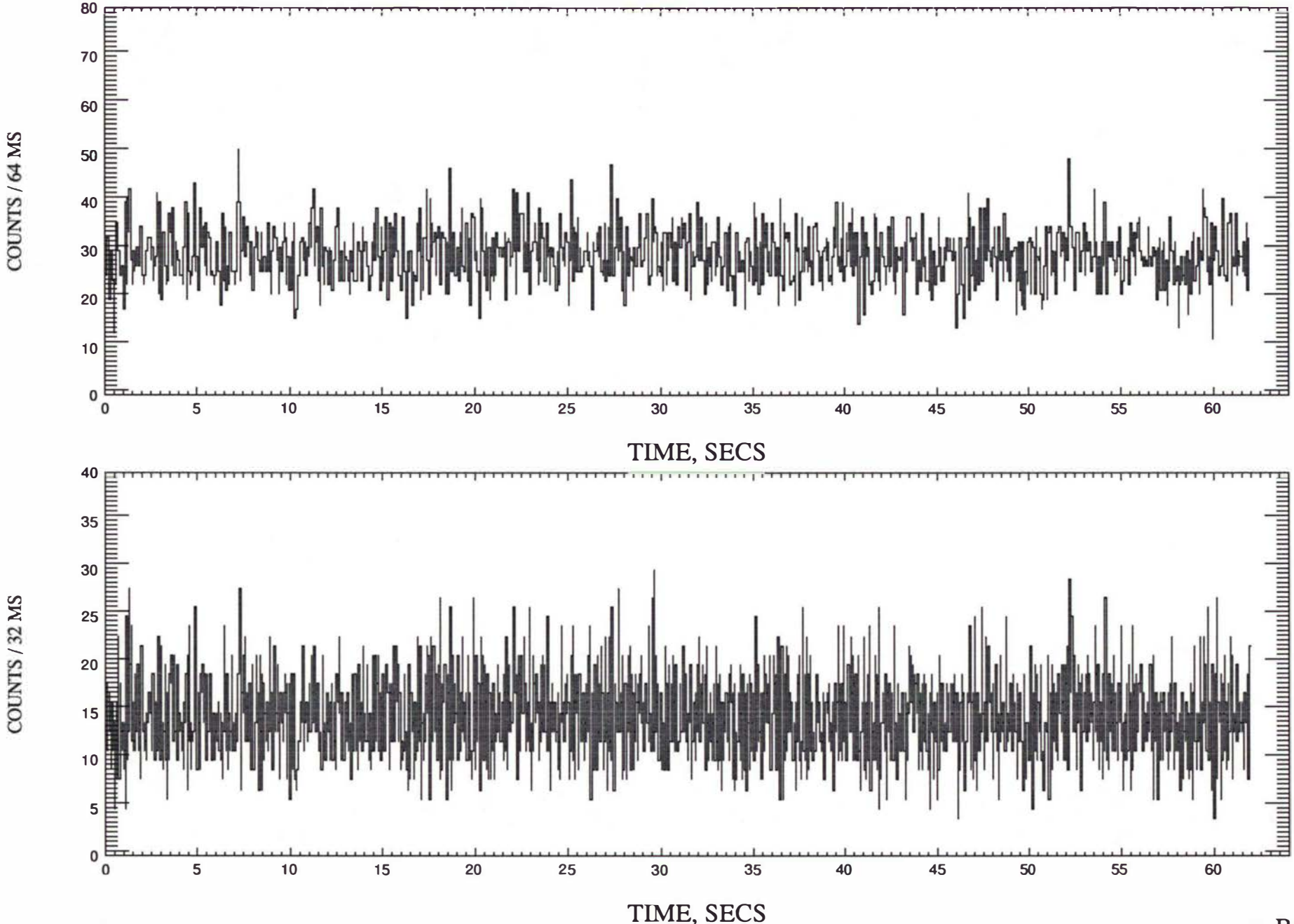
CALIBRATION DATA INCLUDED




UNIV[illegible]AL TIME

HUS 2A TRIGGERED DATA EDR day 359, year 1997 3/11/98

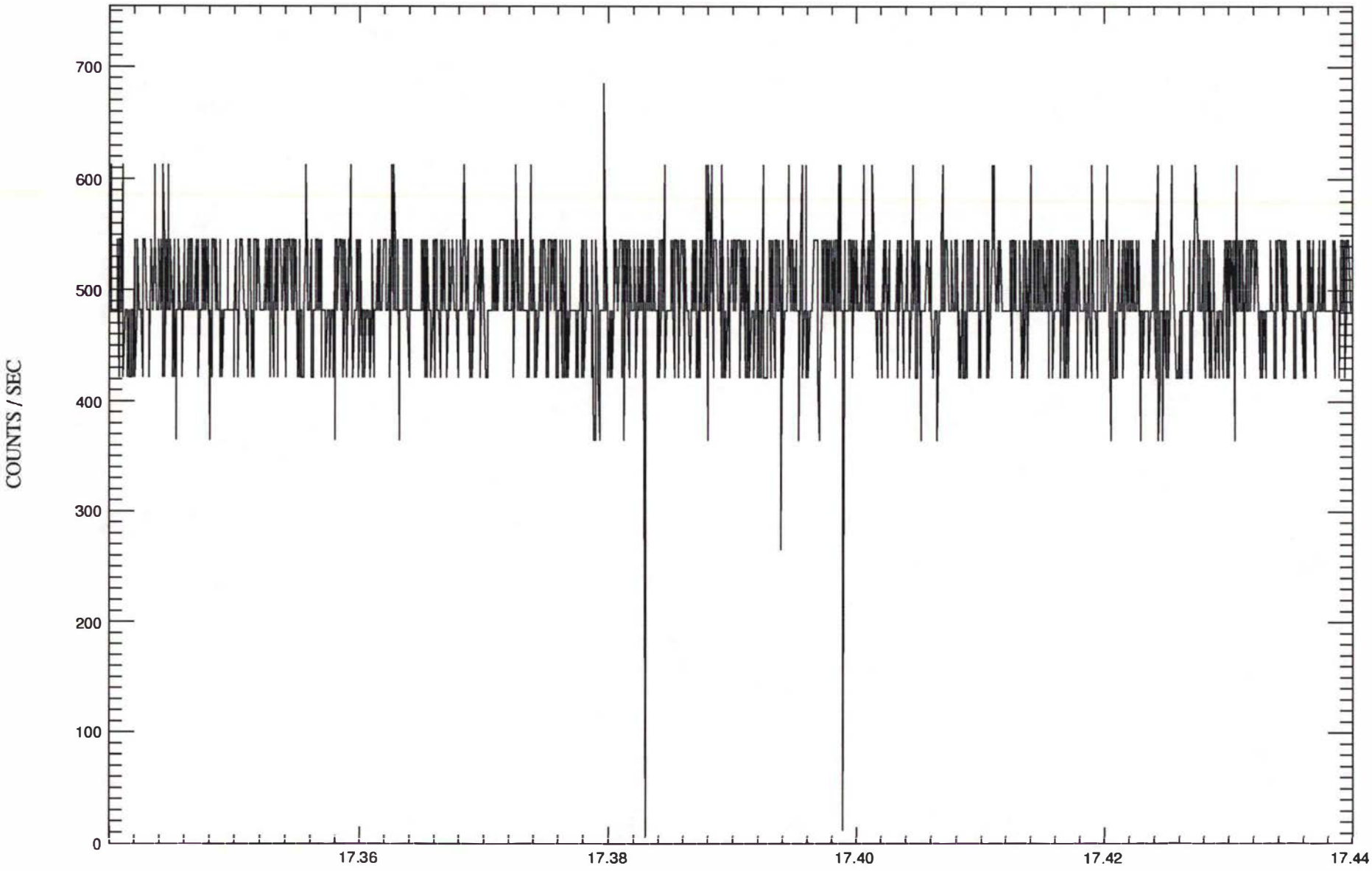
Burst Counter 9 at UT=17.394581620958 h=62620.494 s 17:23:40.494



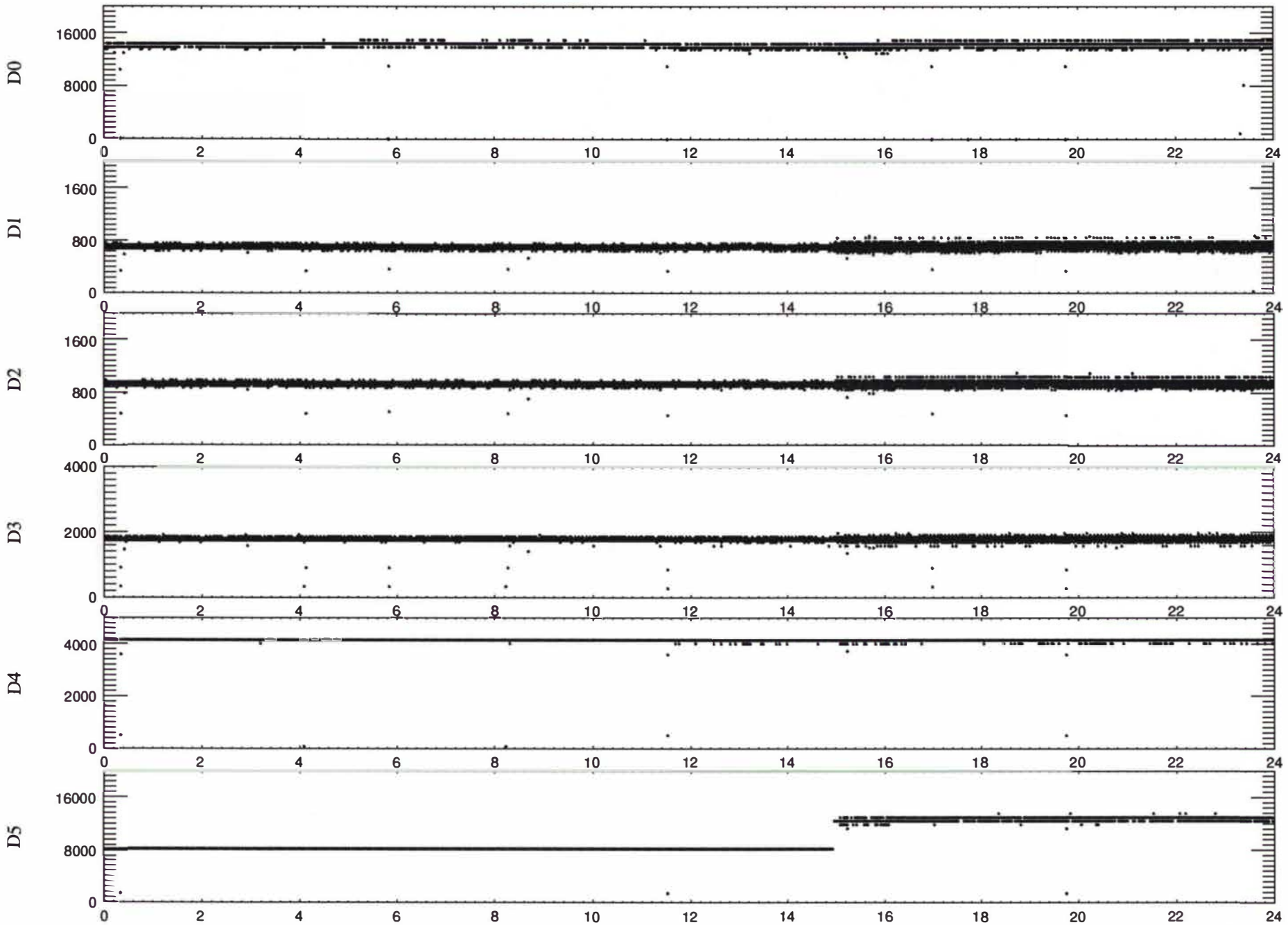

B# 1

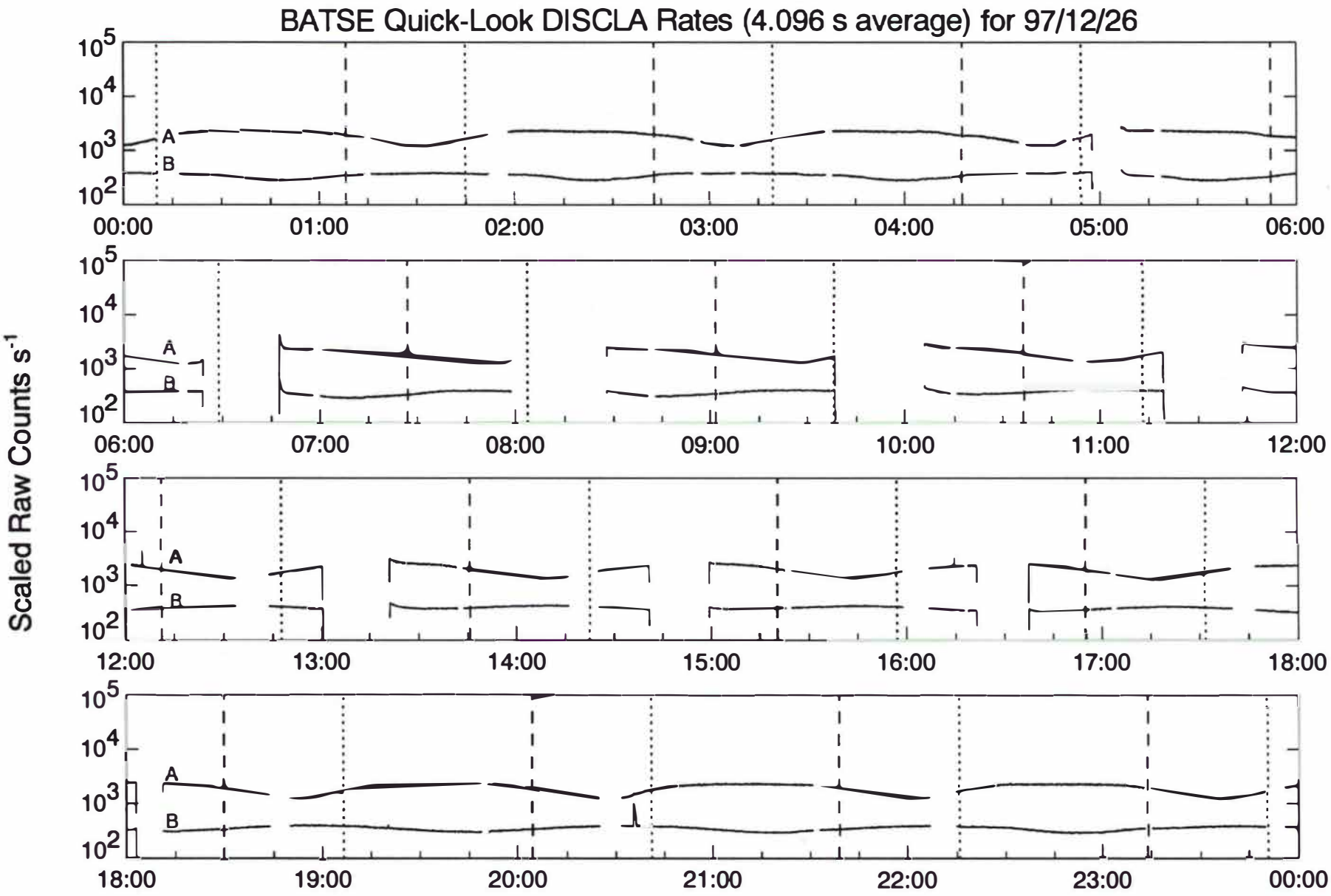
HUS 2A, MODE 1, NOT AVERAGED EDR day 359, year 1997 to day 359, year 1997 3/11/98

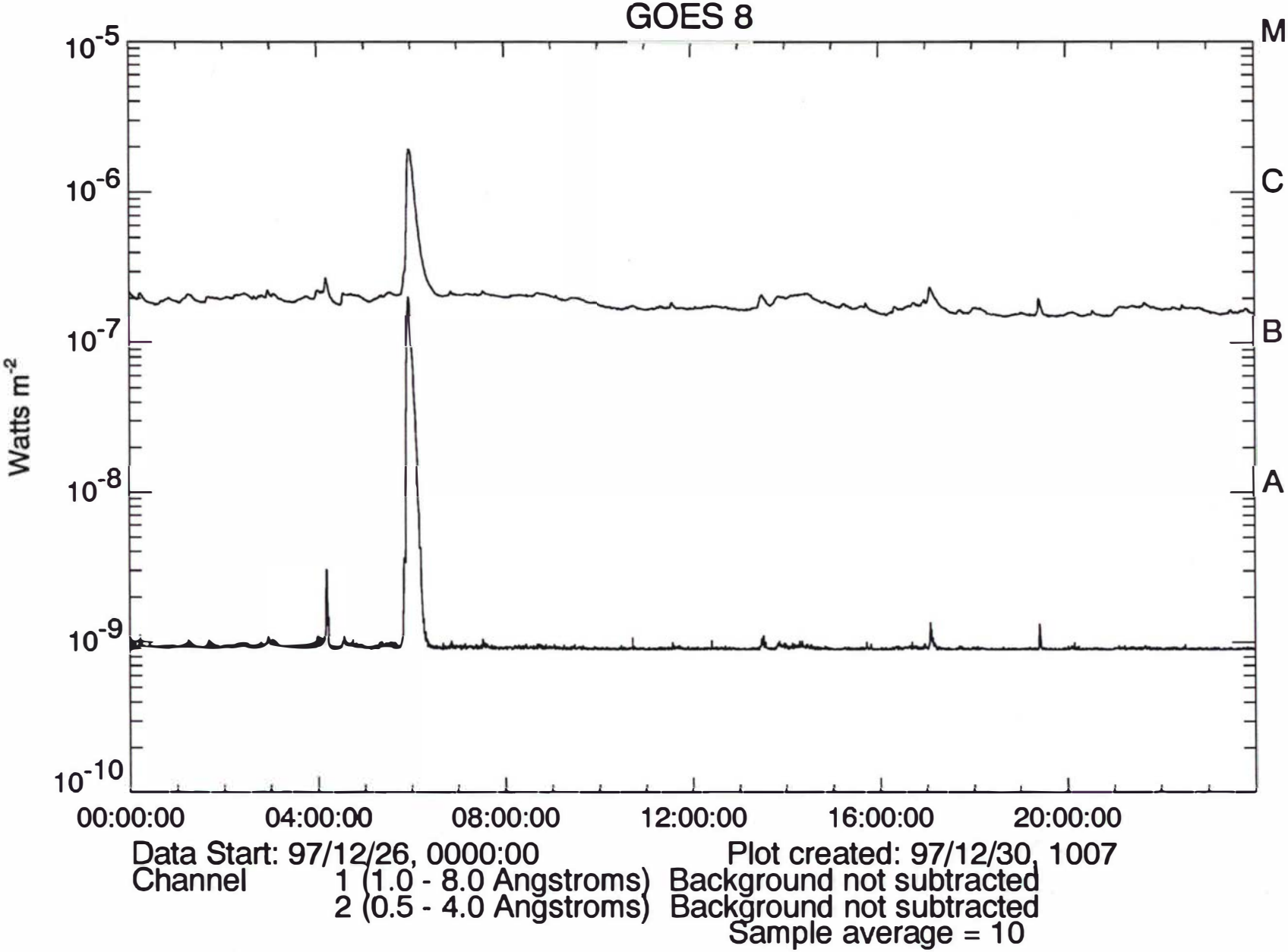
CALIBRATION DATA INCLUDED



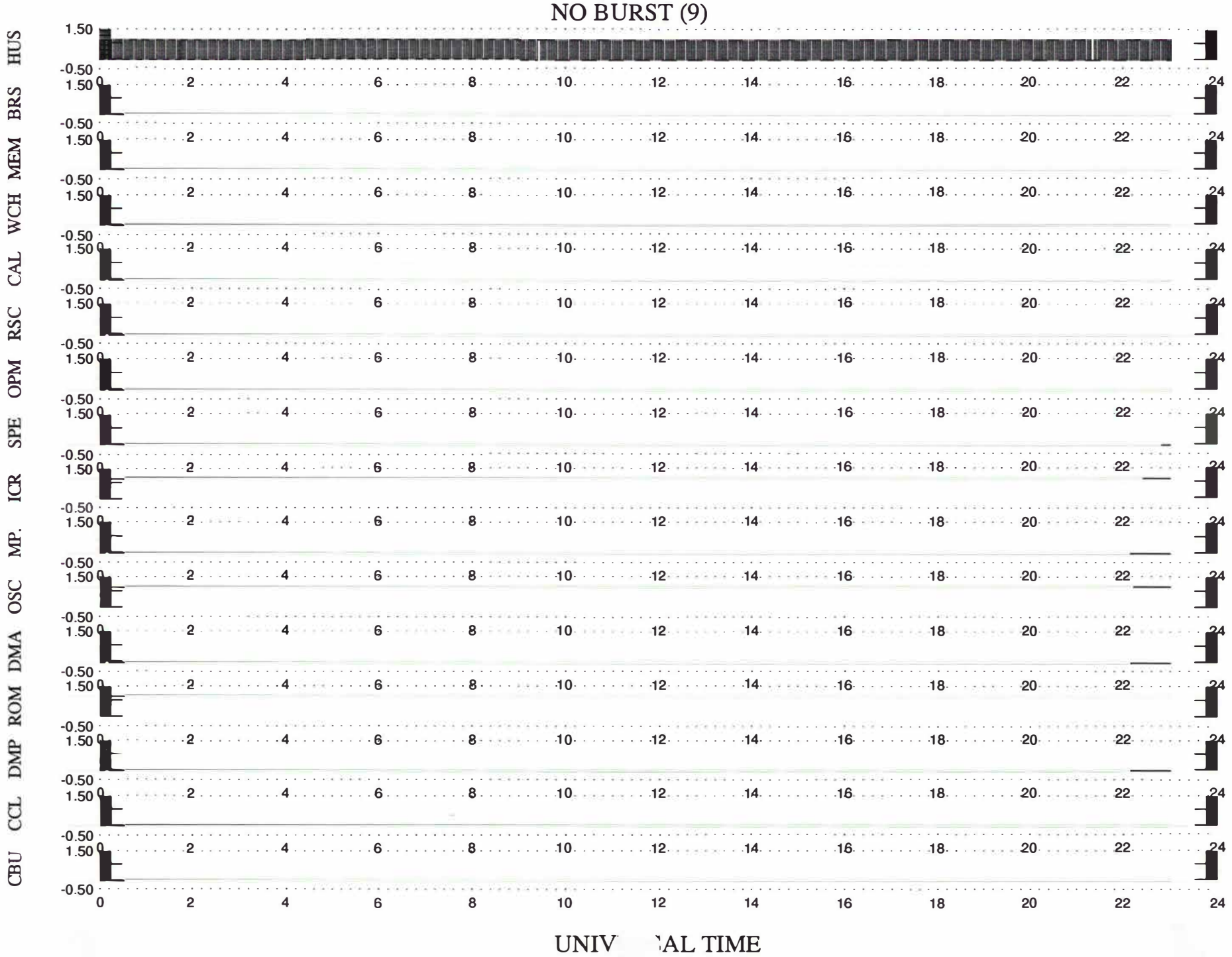
HUS 2B COUNTS / SEC EDR day 359, year 1997 to day 359, year 1997 3/12/98




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/26
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 97/12/30, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

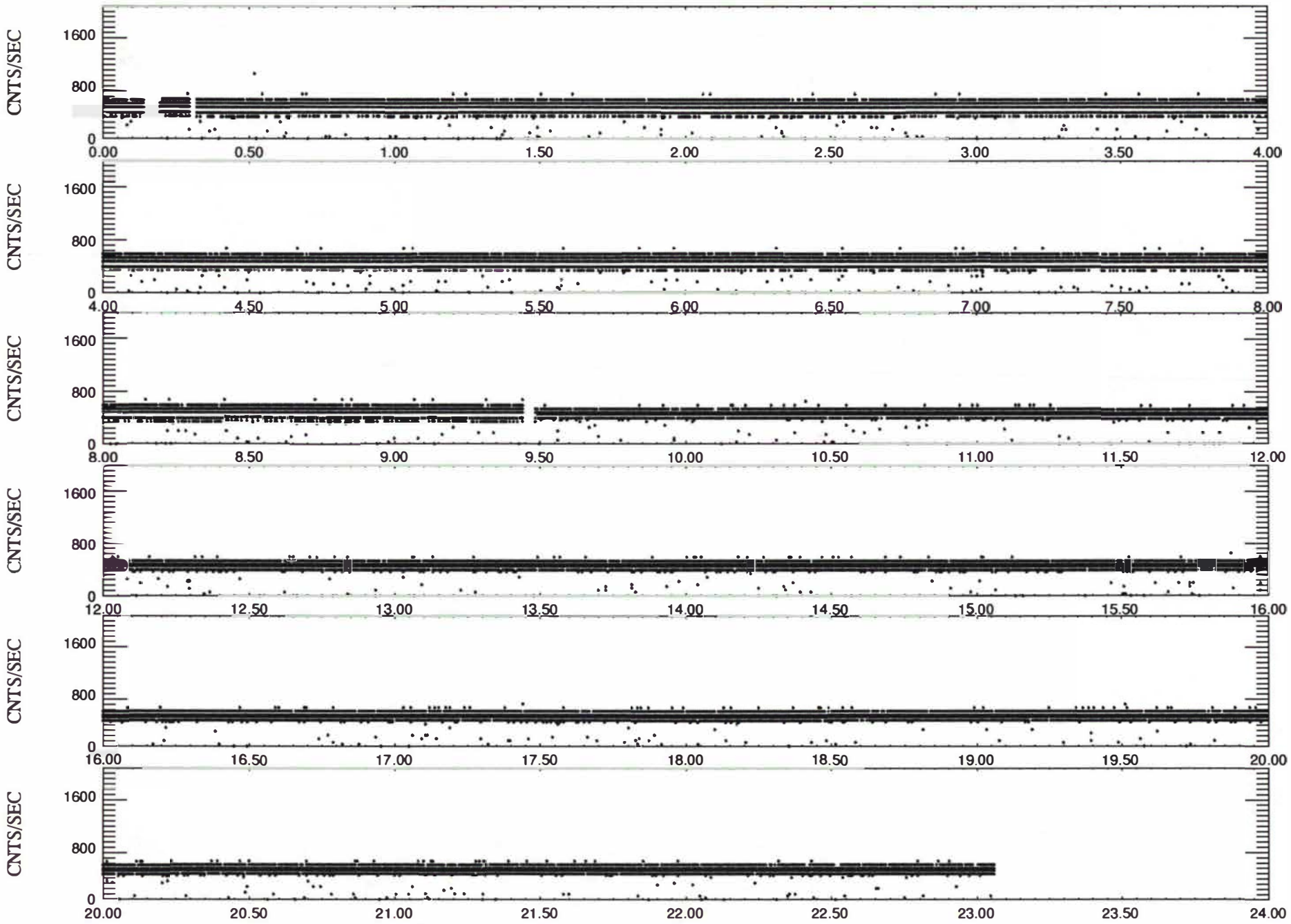

GOES 8
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/26, 0000:00
Plot created: 97/12/30, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 360, year 1997 to day 360, year 1997 3/12/98



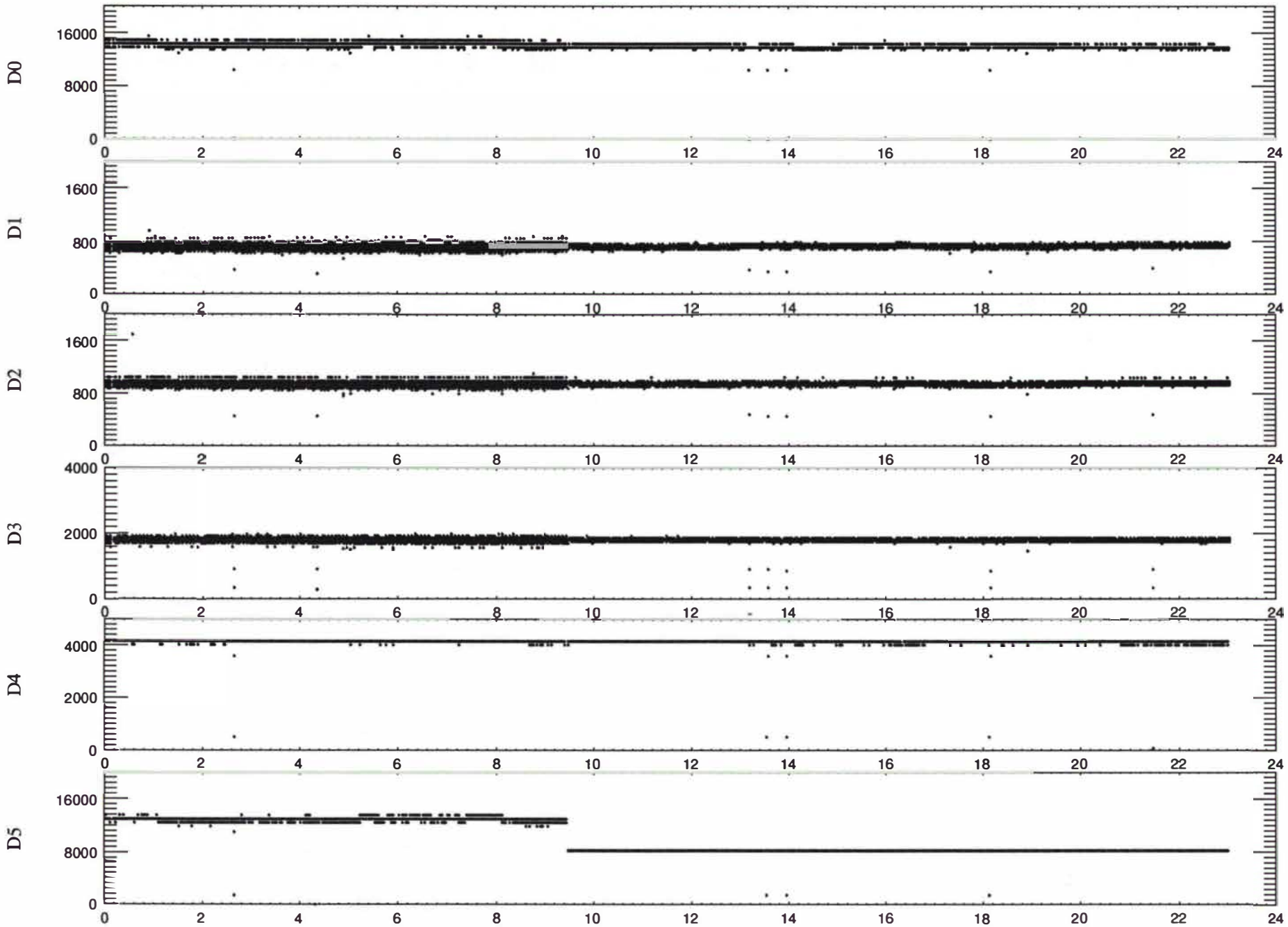
HUS 2A, MODE 1, NOT AVERAGED EDR day 360, year 1997 to day 360, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2B COUNTS / SEC EDR day 360, year 1997 to day 360, year 1997 3/12/98



From SAHI@fender.msfc.nasa.gov Mon Dec 29 12:25:23 1997
Return-Path: <SAHI@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA12034; Mon, 29 Dec 1997 12:25:22 -0800
From: SAHI@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id MAA11568; Mon, 29 Dec 1997 12:25:20 -0800
Date: Mon, 29 Dec 1997 14:24:56 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971229142456.2245c26f@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6546
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6546
EVENT OF 1997 DEC 27 DAY OF YEAR=361
EVENT CROSSING TIME AT BATSE : 30186. S. OR 08:23:06.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 190.000 54.000
BATSE PEAK COUNTING RATE: 12500 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 27/12/ 97 IS:
RA= 170.065 DEC= 11.838 DIST= 4.960 AU
BATSE-ULYSSES DISTANCE = 742084130. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=134.97 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1749.50 SECS.
CROSSING TIME AT ULYSSES IS 28436. S. OR 07:53:56 +/- 327.46 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 27/12/ 97 IS:
RA= 309.552 DEC= -19.715 DIST= 2.120 AU
MARS-BATSE DISTANCE = 317199904. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 56.92 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 577.52 SECS.
CROSSING TIME AT MARS IS 30764. S. OR 08:32:43 +/- 162.69 SECONDS

BATSE BURST TRIGGER

NO.: 6546

TIME: TJD=0809 SECONDS=30186

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=117 AZIMUTH=84.5 ERROR=1.66 DEGREES

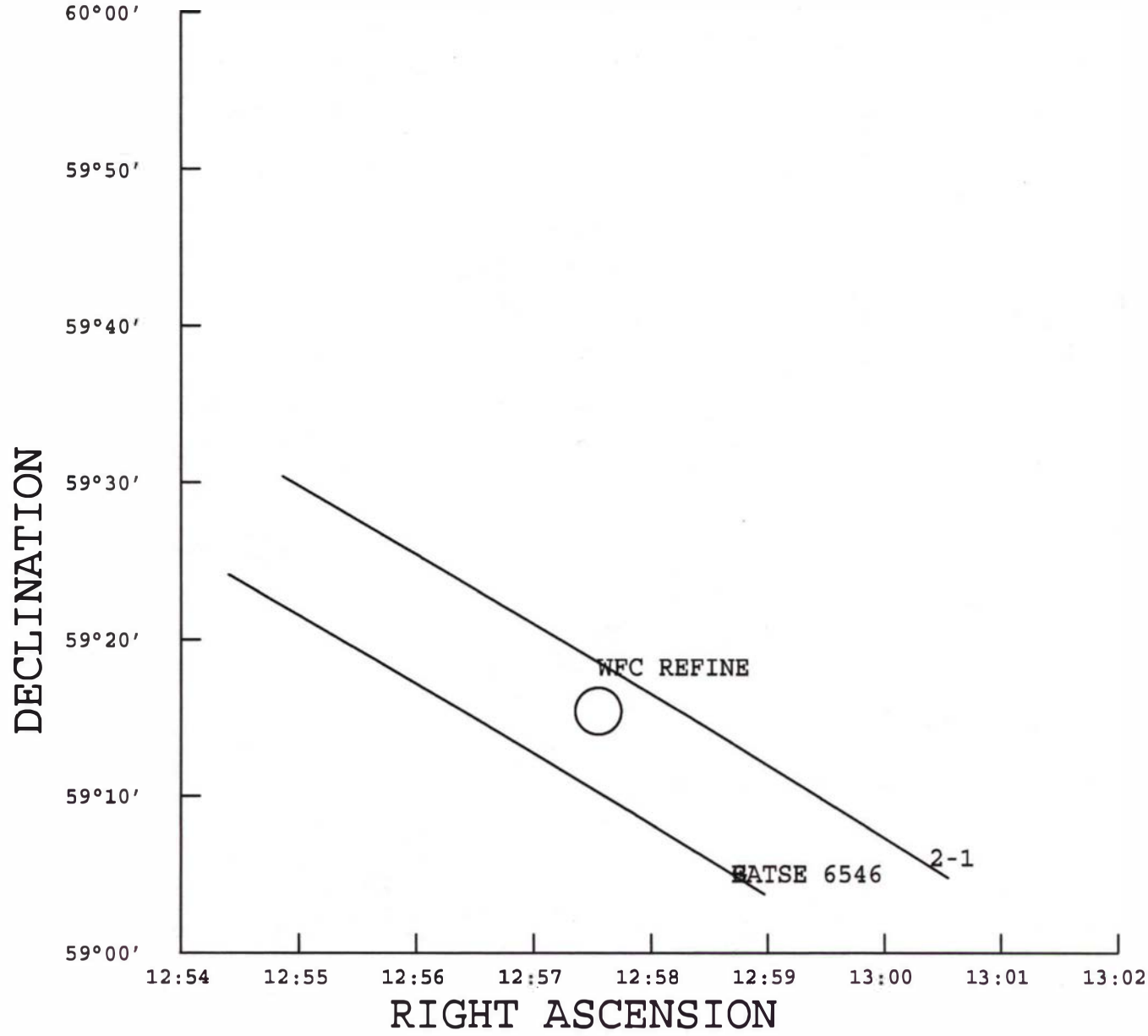
COMMENTS:
BURST, DOUBLE PULSE, DUR. APPROX. 7 SECS, STARTS AT APPROX. T-3.5 SECS,
MAX. AT APPROX. T+0.7 SECS. NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6546 | 971227 | 10809 | 30186 | 12500 | 190 | +54 | 7 |

# EVENT OF DEC 27, 1997 7:56

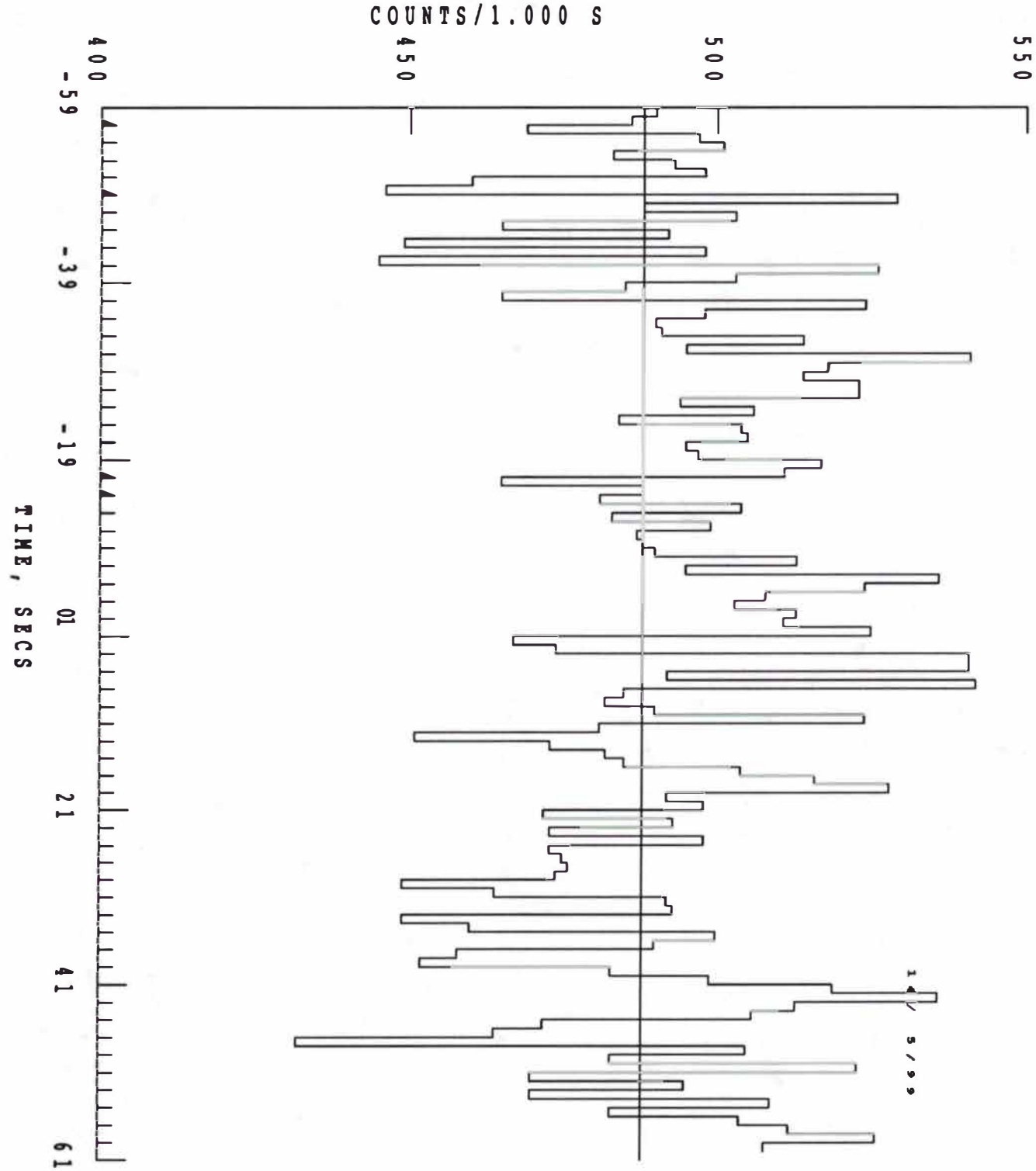
9/ 2/ 0

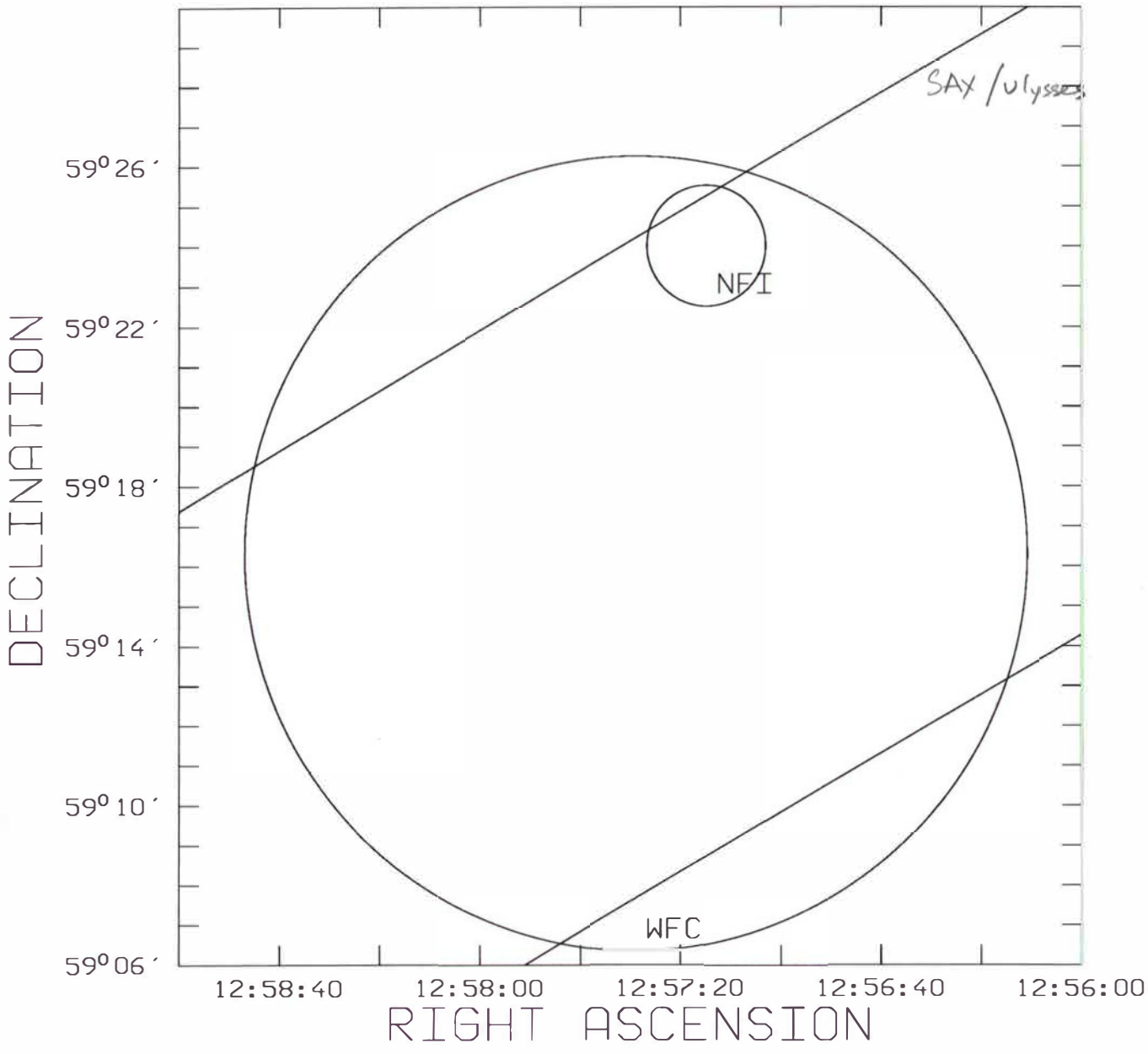
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE

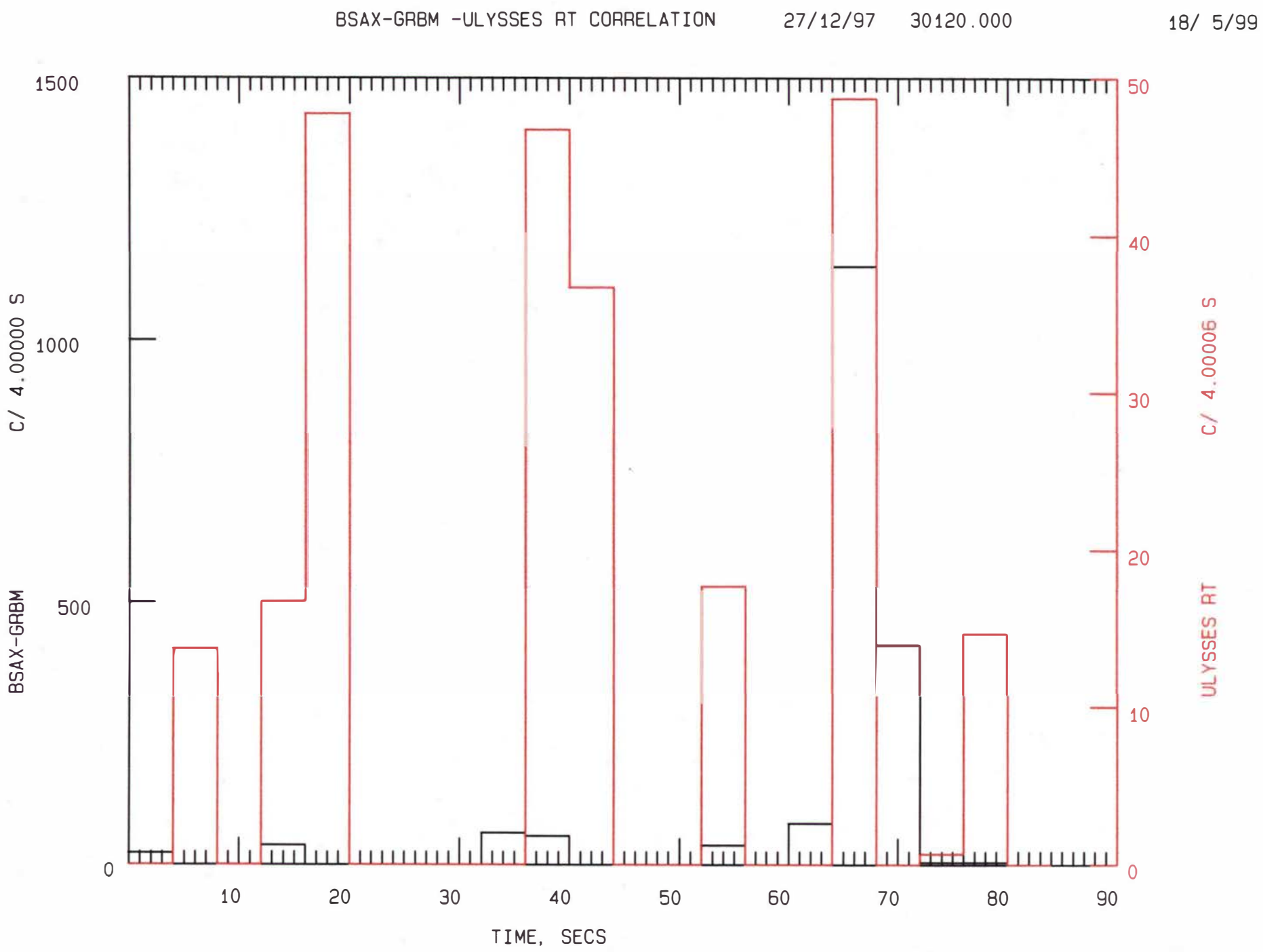


NEAR 27/12/97 30178.579

100-1000 keV

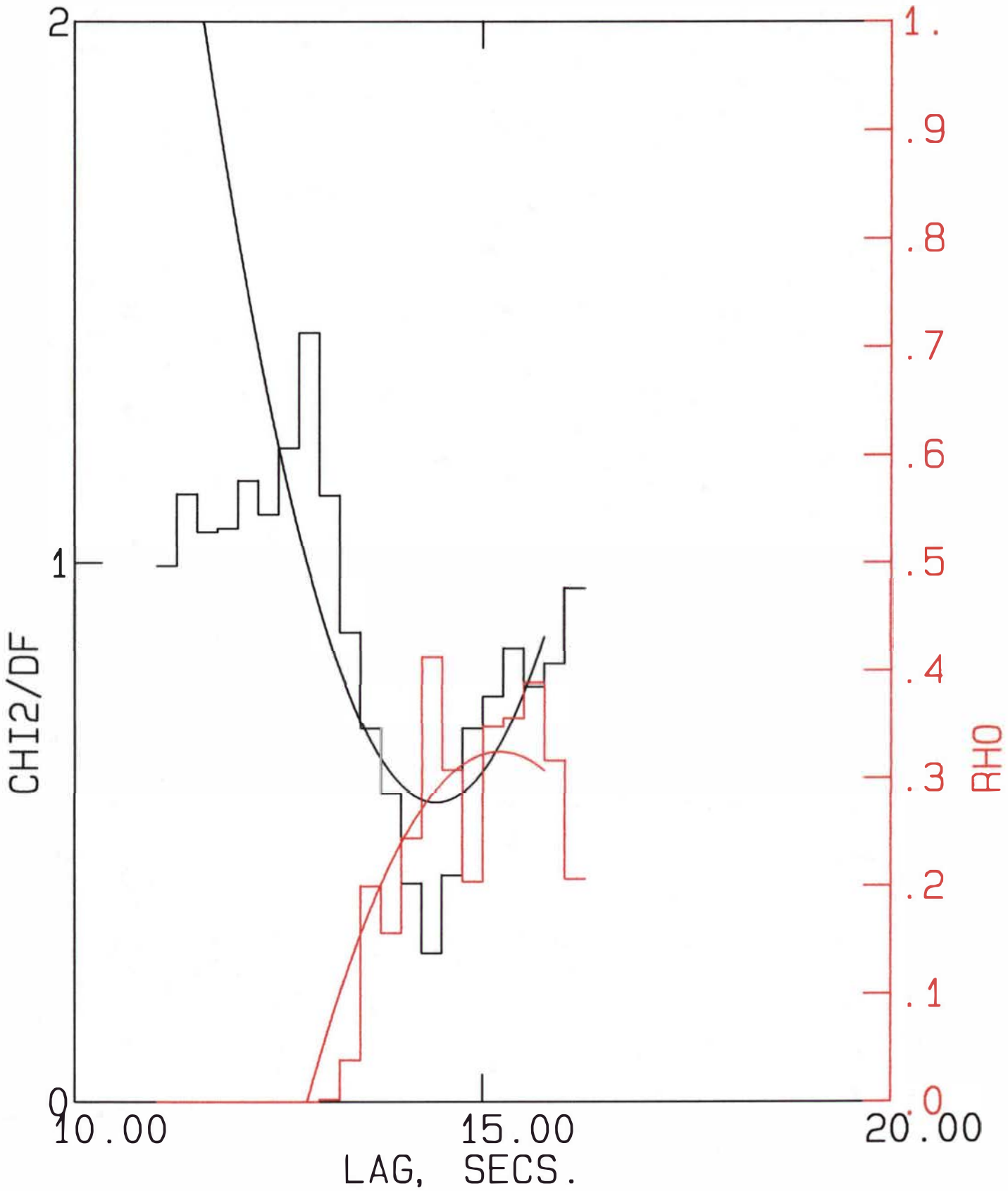



SAX / Ulysses
NFI
WFC
59° 26′
59° 22′
59° 18′
59° 14′
59° 10′
59° 06′
DECLINATION
12:58:40
12:58:00
12:57:20
12:56:40
12:56:00
RIGHT ASCENSION


BSAX-GRBM -ULYSSES RT CORRELATION 27/12/97 30120.000 18/ 5/99
1500
1000
500
0
C/ 4.00000 S
BSAX-GRBM
50
40
30
20
10
0
C/ 4.00006 S
ULYSSES RT
10
20
30
40
50
60
70
80
90
TIME, SECS

18/ 5/99

BSAX-GRBM -ULYSSES RT CORRELATION 27/12/97 30120.000



Helio corr removed from U-B triangulation Feb 9 - still applied to U-S

Date: May 5 '98

**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? N/A

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

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

## 2. BATSE Data

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

☑ BATSE ephemeris for $T_0$?

☑ Error circle position and radius from public catalog used?

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

## 3. PVO Data

☐ Ephemeris of PVO used (not Venus)?

☐ 2000 coordinates used?

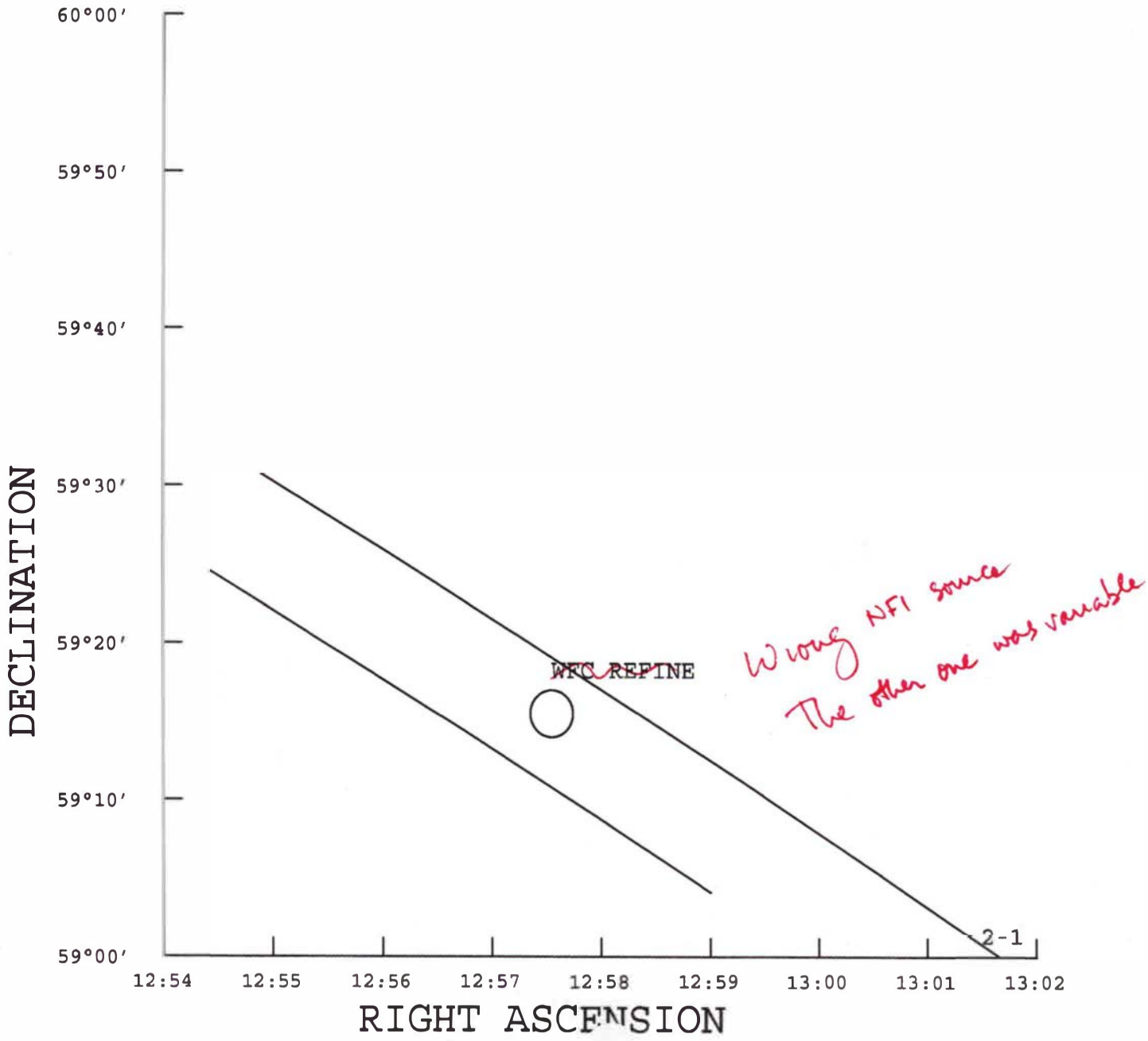
☐ Geocentric time used?

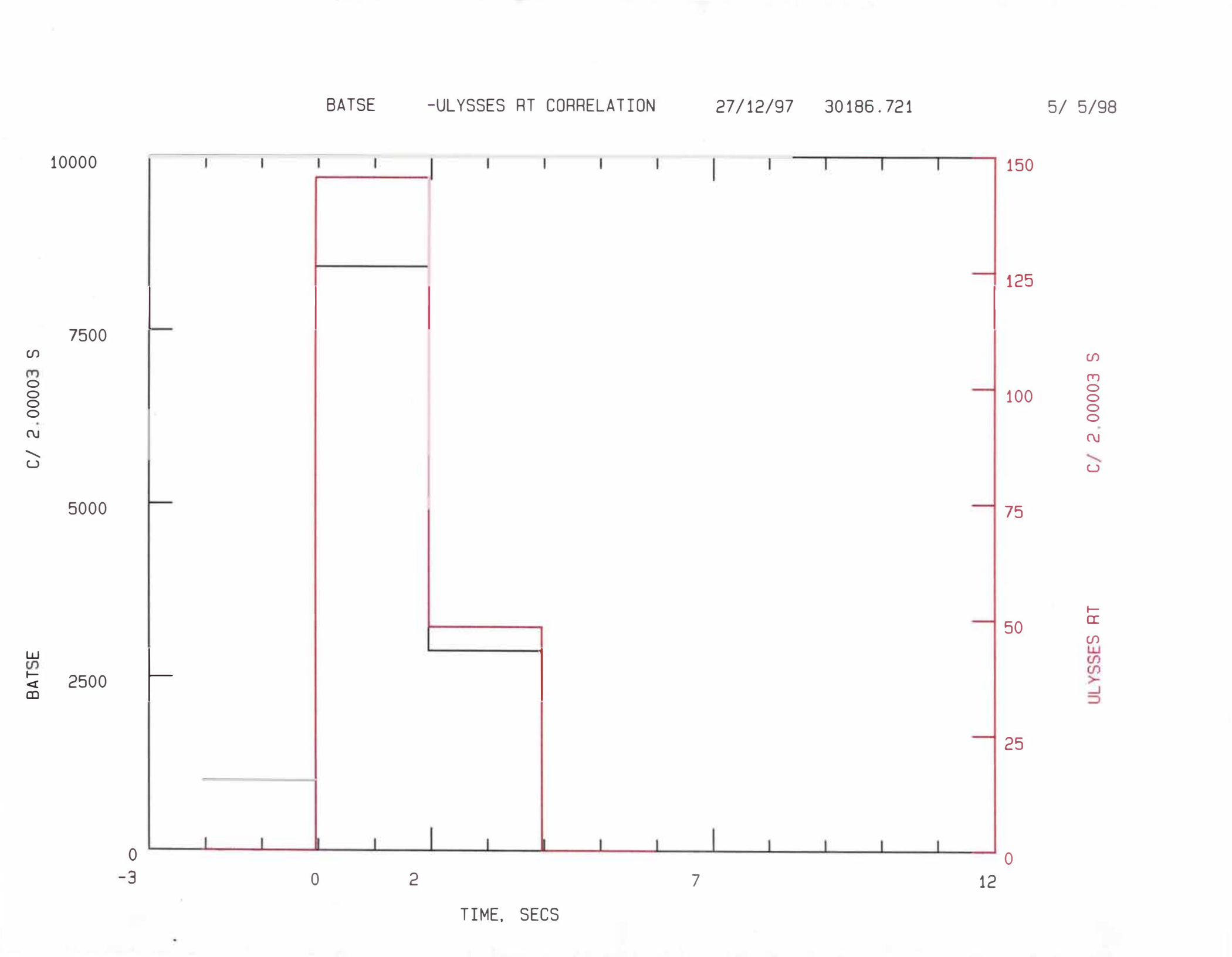
☑ ACCESS database updated?

# EVENT OF DEC 27, 1997 7:56

5/ 5/98

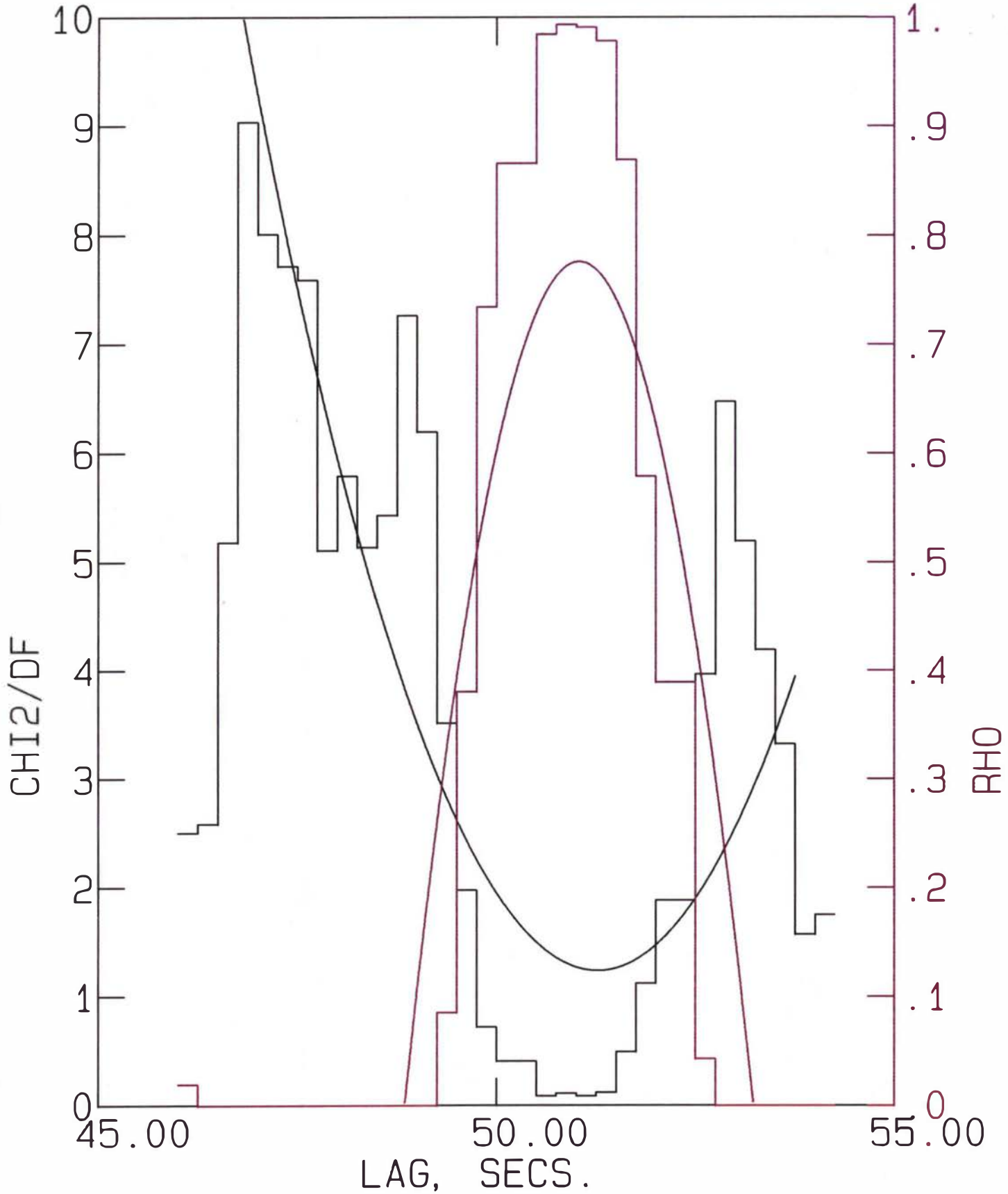
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 ULYSSES 2 BATSE




BATSE -ULYSSES RT CORRELATION 27/12/97 30186.721 5/ 5/98
10000
7500
5000
2500
0
C/ 2.00003 S
BATSE
150
125
100
75
50
25
0
C/ 2.00003 S
ULYSSES RT
-3
0
2
7
12
TIME, SECS

5/ 5/98

BATSE -ULYSSES RT CORRELATION 27/12/97 30186.721

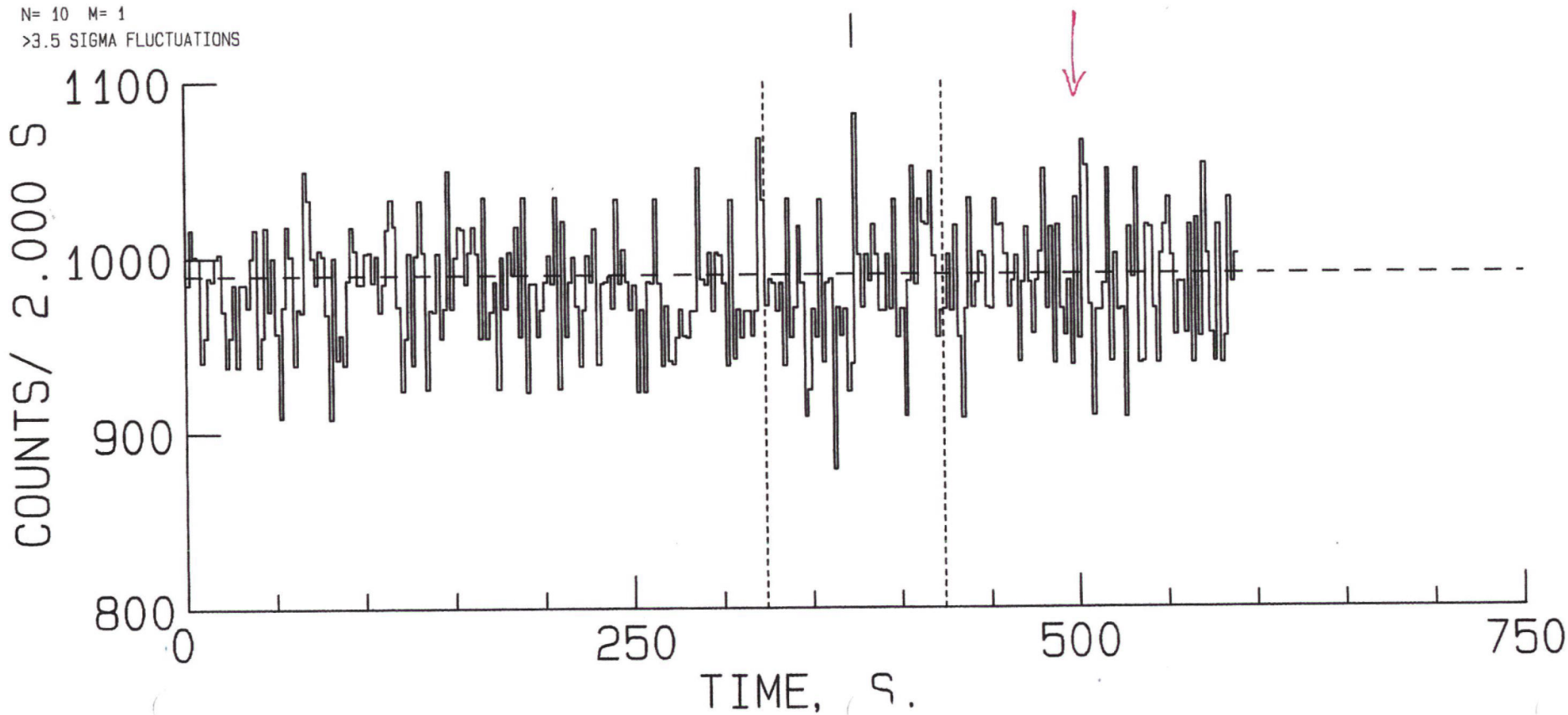


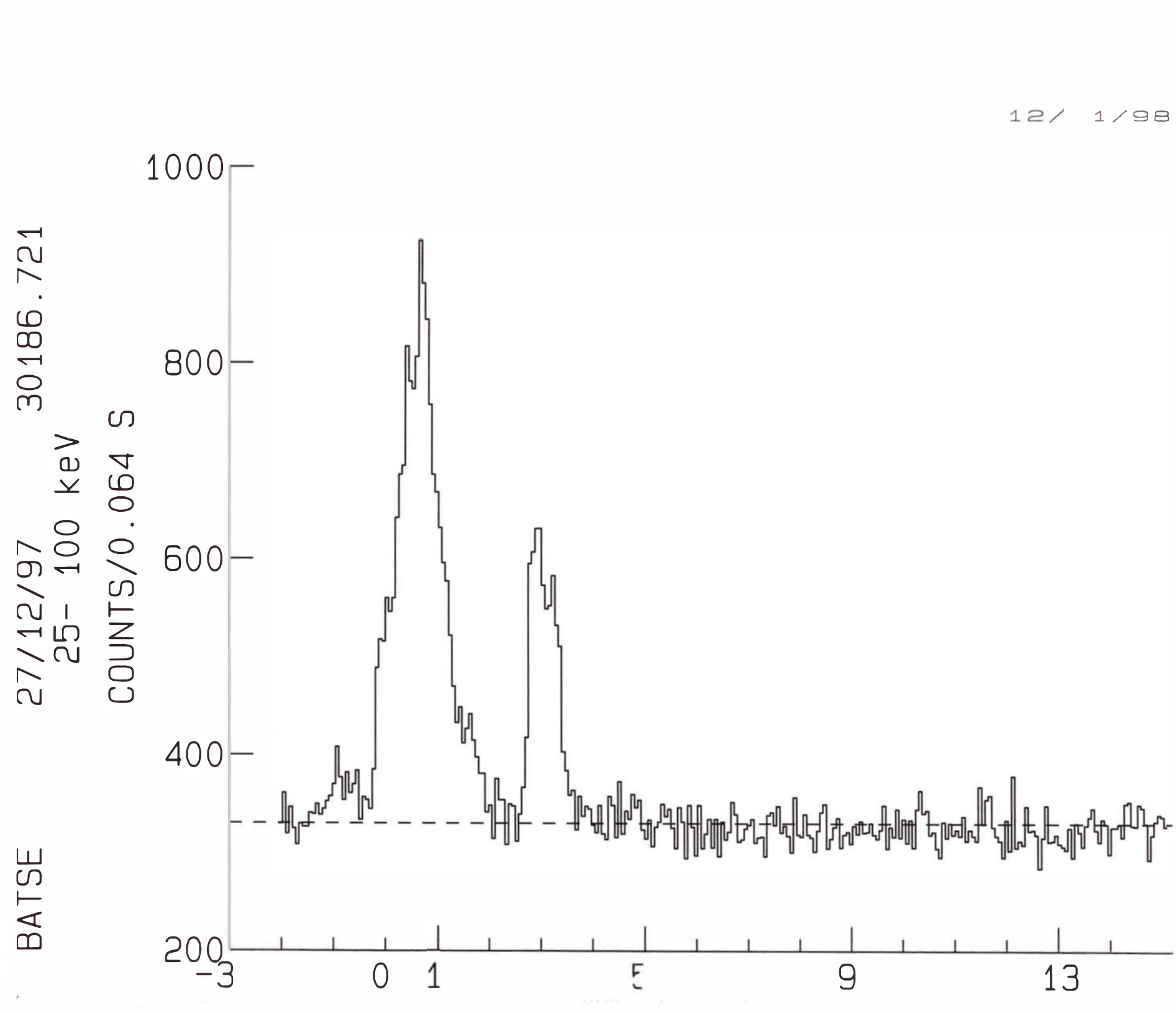
ULYSSES RT 5/ 5/98

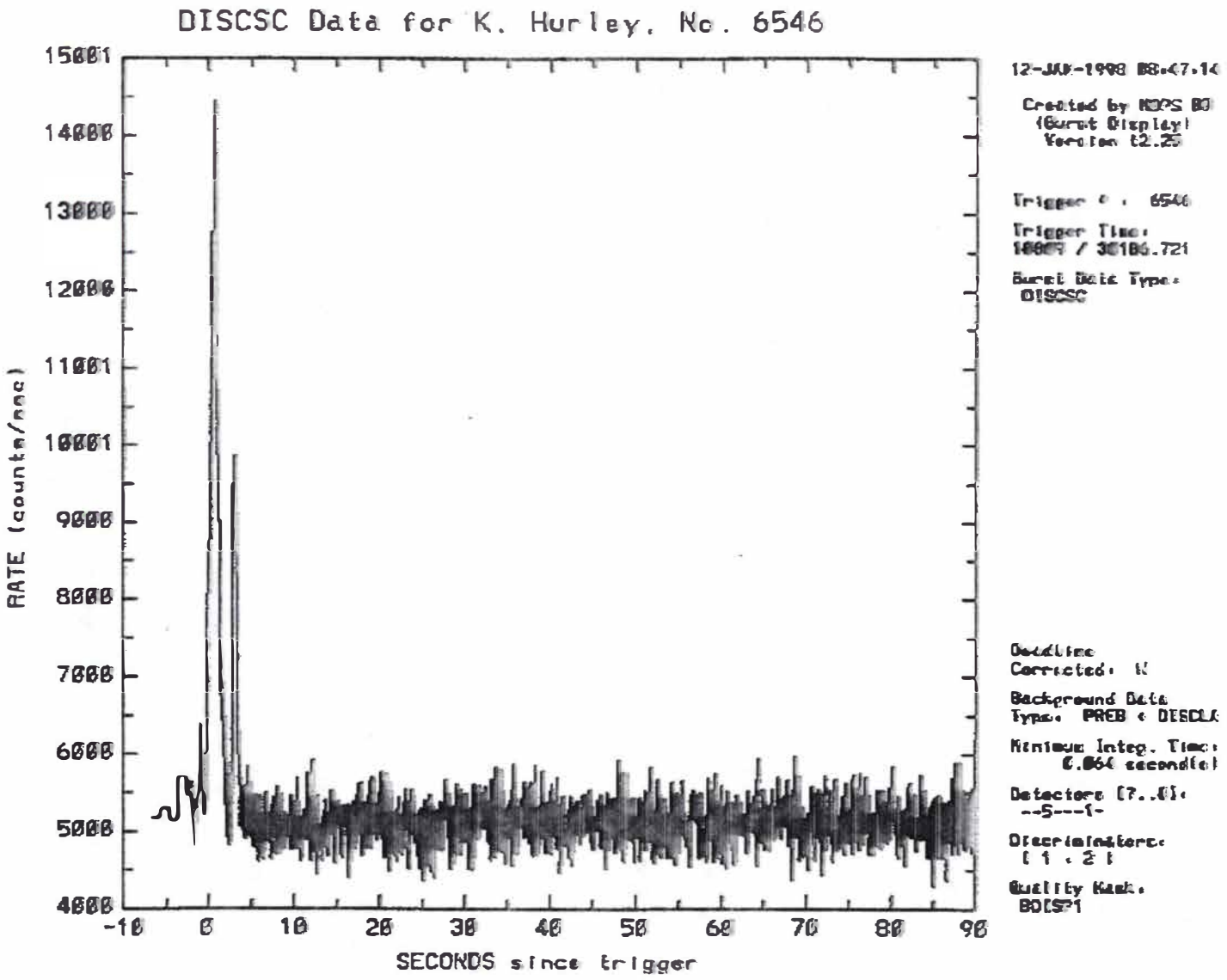
27/12/97 28116.168 s

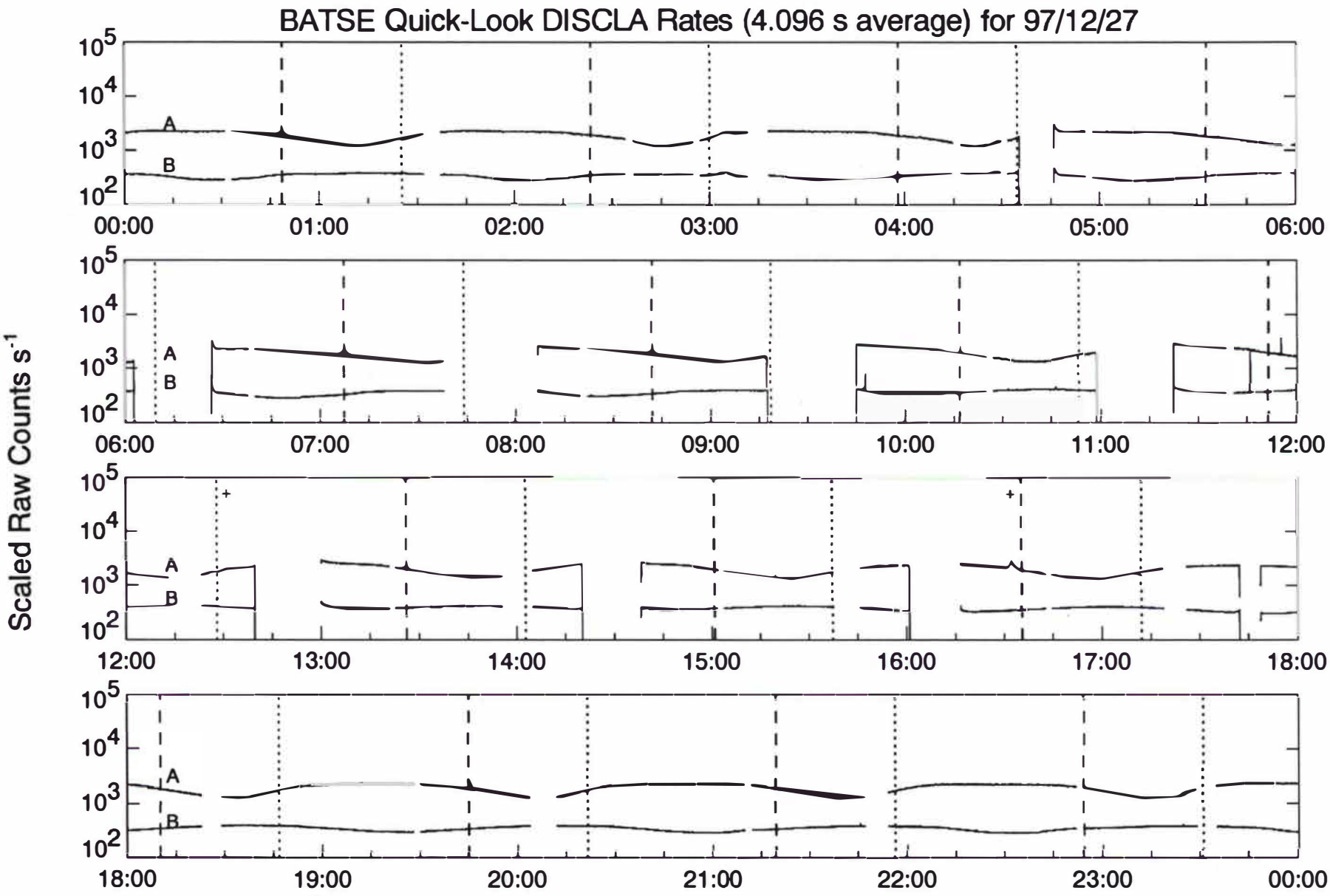
0.250 S INTERVALS REGROUPED BY 8

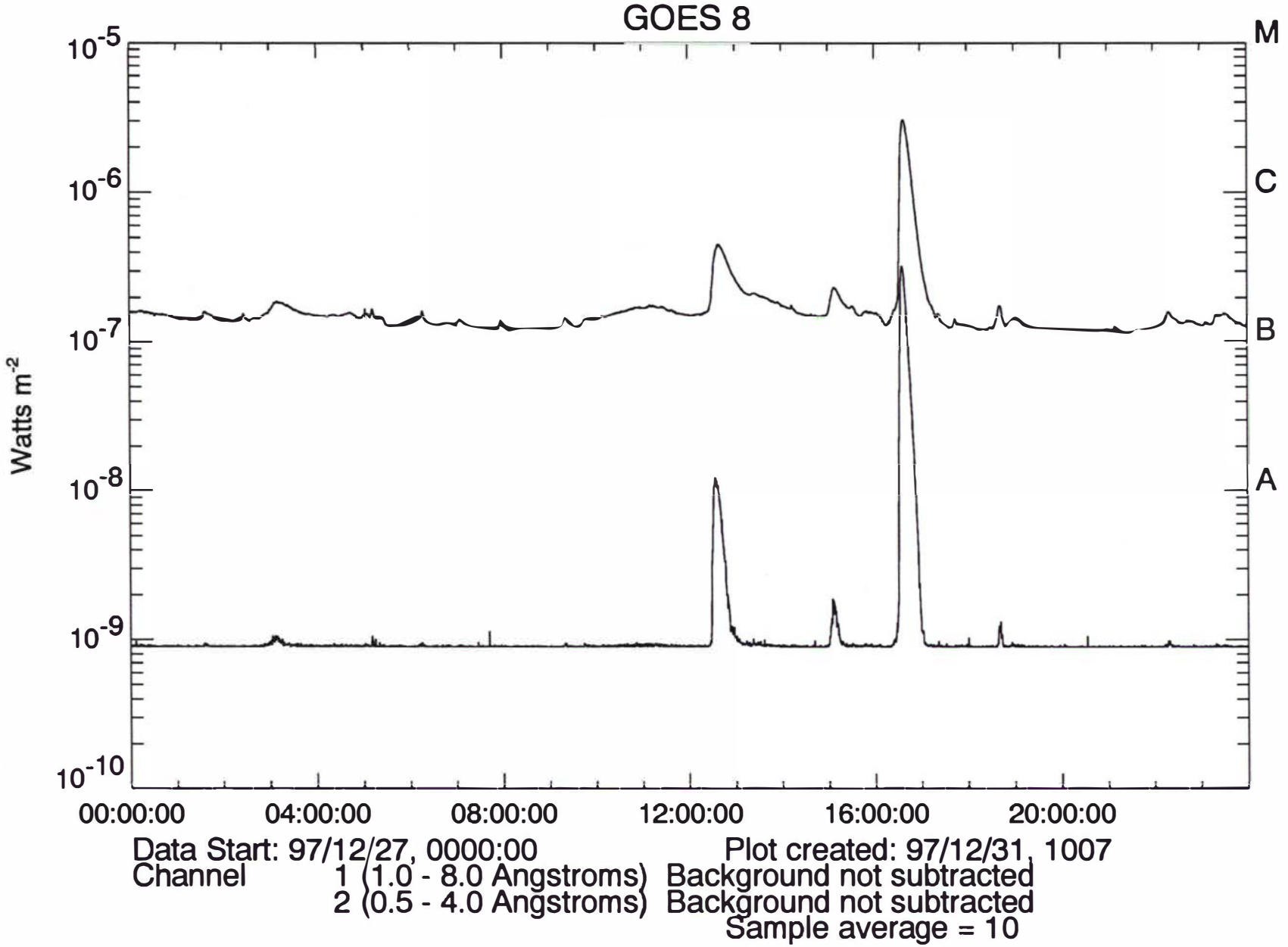
22- 148 keV



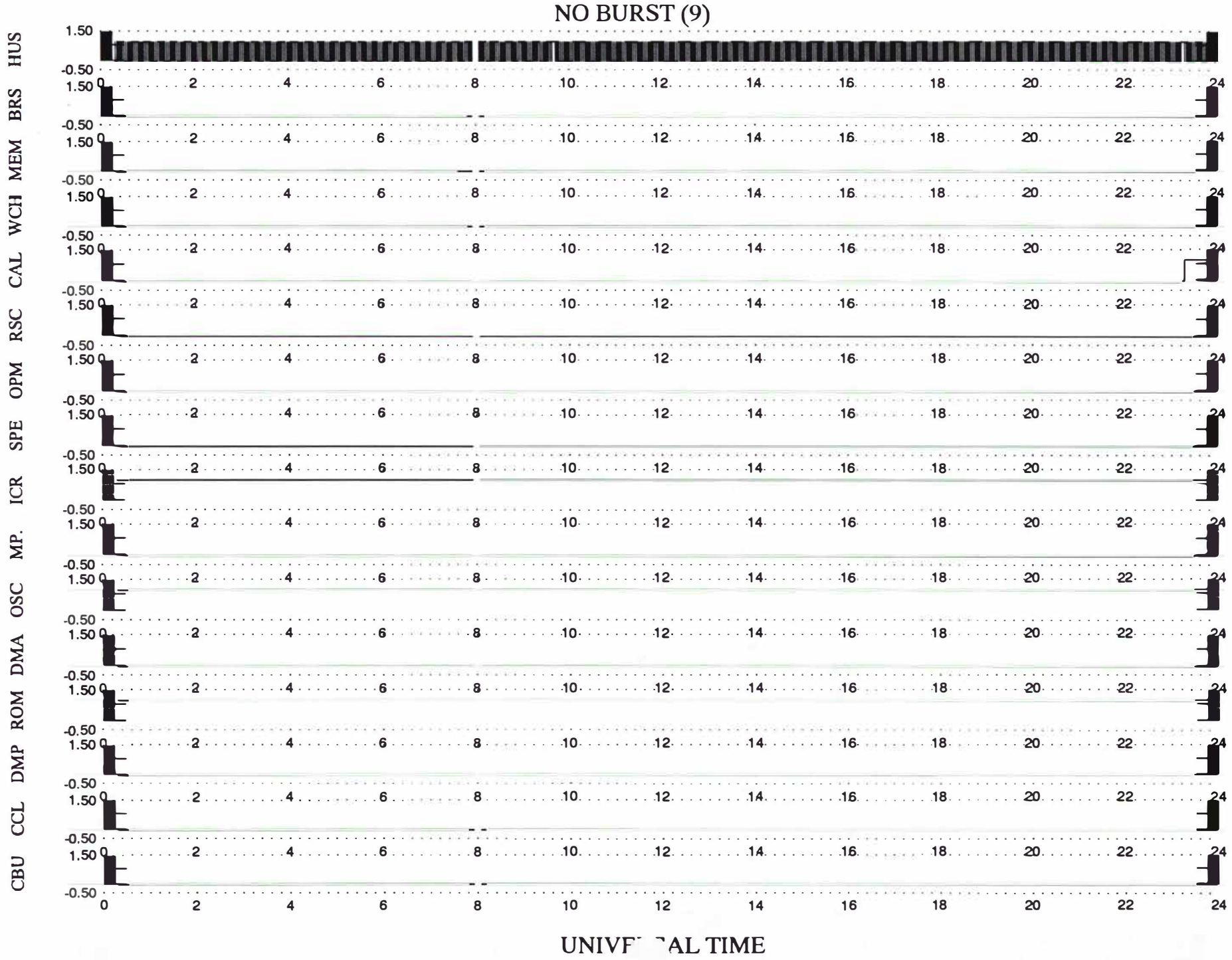

12/ 1/98
BATSE 27/12/97 30186.721
25- 100 keV
COUNTS/0.064 S
1000
800
600
400
200
-3
0
1
5
9
13


DISCSC Data for K. Hurley, No. 6546
RATE (counts/sec)
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
-10
0
10
20
30
40
50
60
70
80
90
SECONDS since trigger
12-JAN-1998 08:47:14
Created by NRAO BO
(Burst Display)
Version t2.25
Trigger # : 6546
Trigger Time:
10007 / 30186.721
Burst Data Type:
DISCSC
Deadtime
Corrected: N
Background Data
Type: PREB + DISCLA
Minimum Integ. Time:
0.064 second(s)
Detectors [7..0]:
--5---1-
Discriminators:
[ 1 , 2 ]
Quality Mask:
BDISP1


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/27
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
+
Current Time: 97/12/31, 1008 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

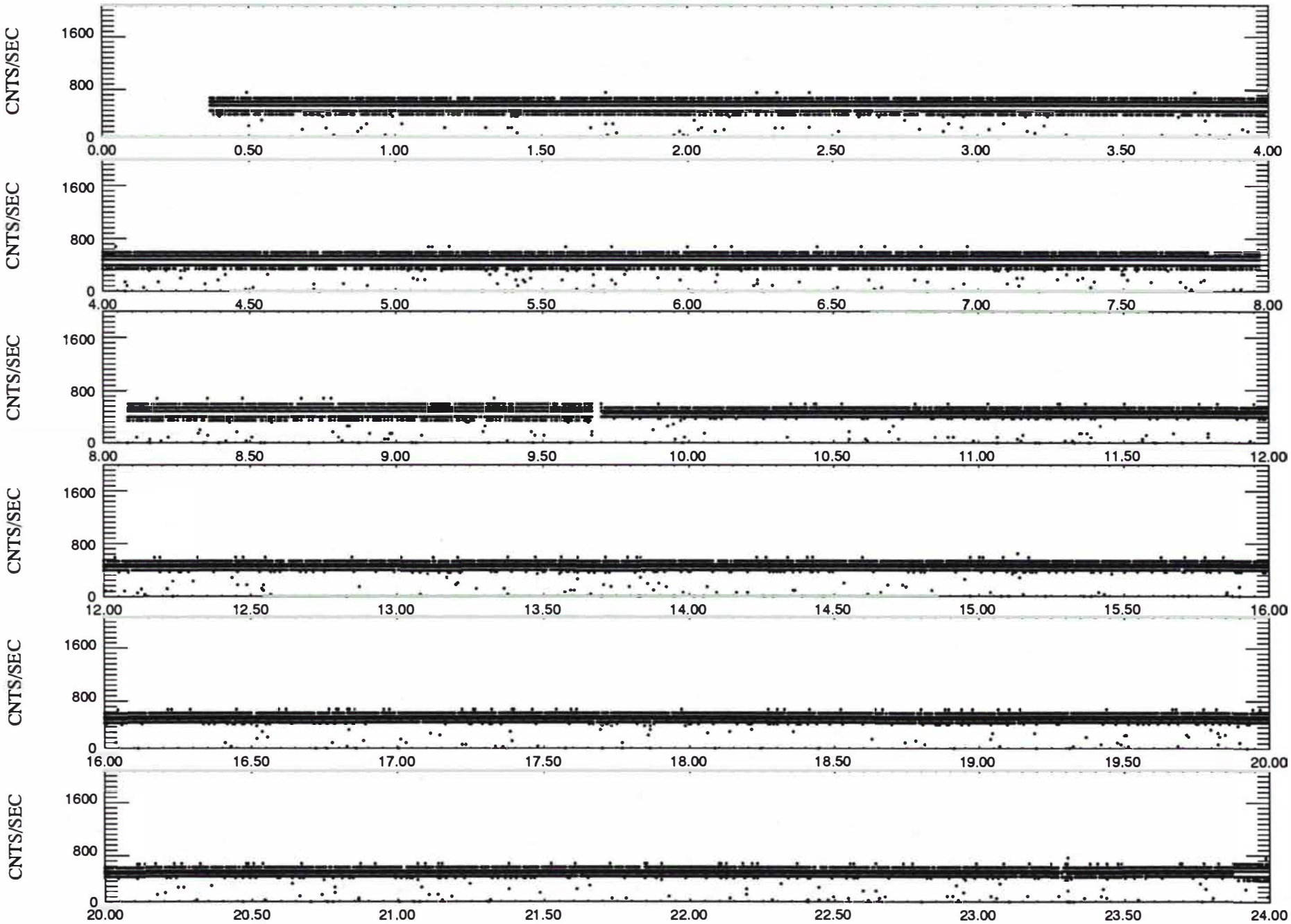

GOES 8
M
C
B
A
Watts m-2
10-5
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/27, 0000:00
Plot created: 97/12/31, 1007
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 361, year 1997 to day 361, year 1997 3/12/98



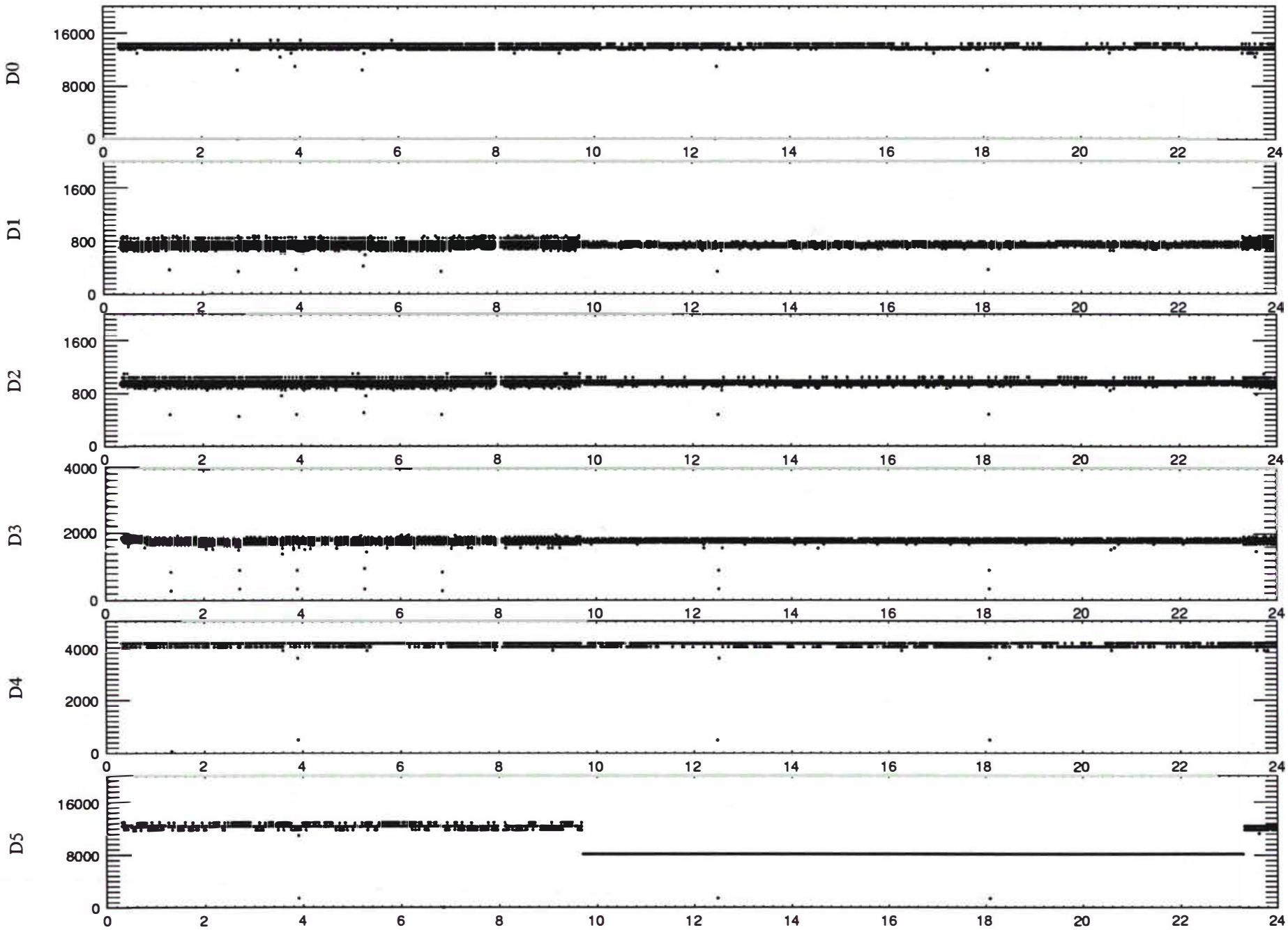
HUS 2A, MODE 1, NOT AVERAGED EDR day 361, year 1997 to day 361, year 1997 3/12/98

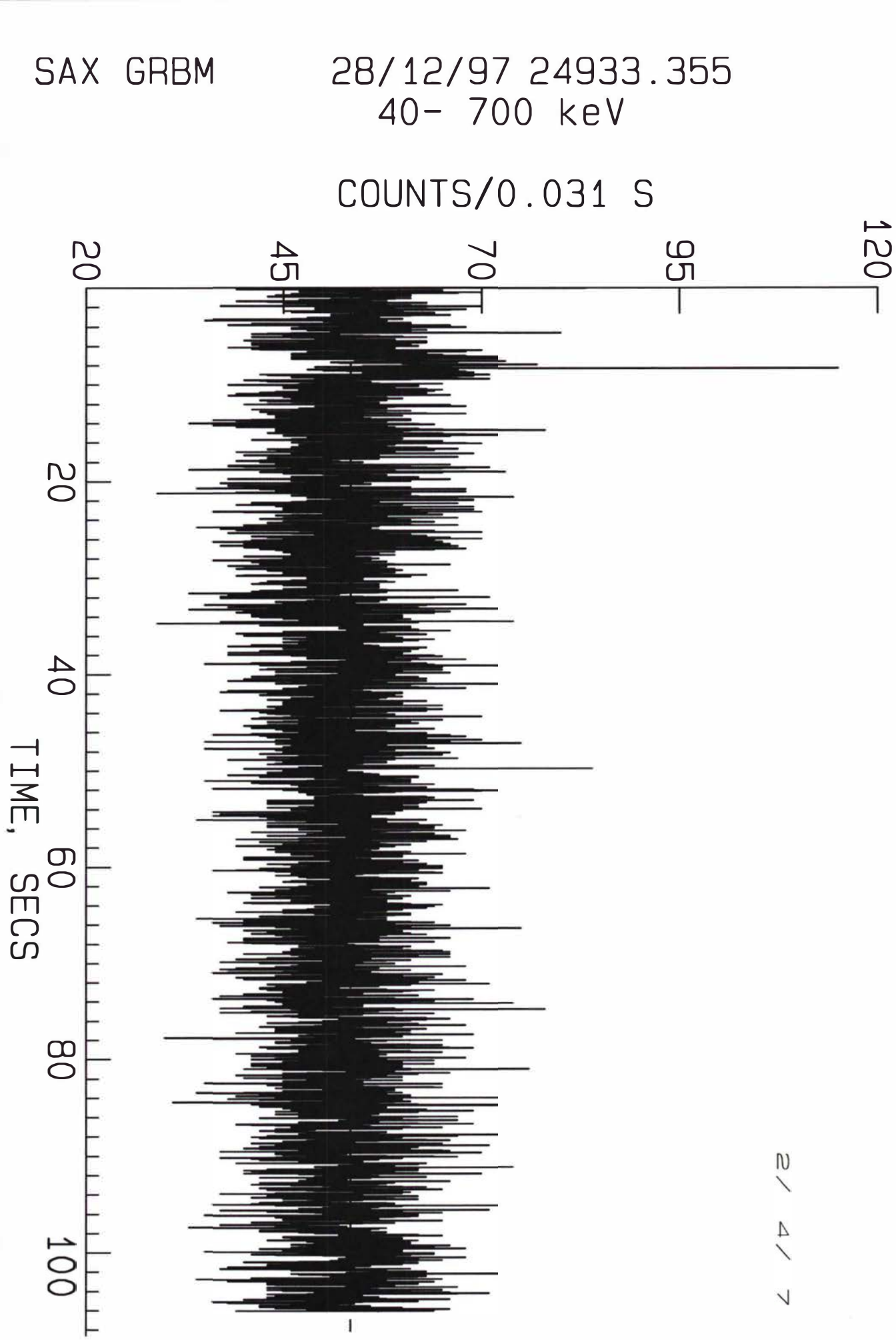
CALIBRATION DATA INCLUDED




UNIVERSAL TIME

HUS 2B COUNTS / SEC EDR day 361, year 1997 to day 361, year 1997 3/12/98




SAX GRBM
28/12/97 24933.355
40- 700 keV
COUNTS/0.031 S
20
45
70
95
120
20
40
60
80
100
TIME, SECS
2/ 4/ 7

SAX

HUS DATA

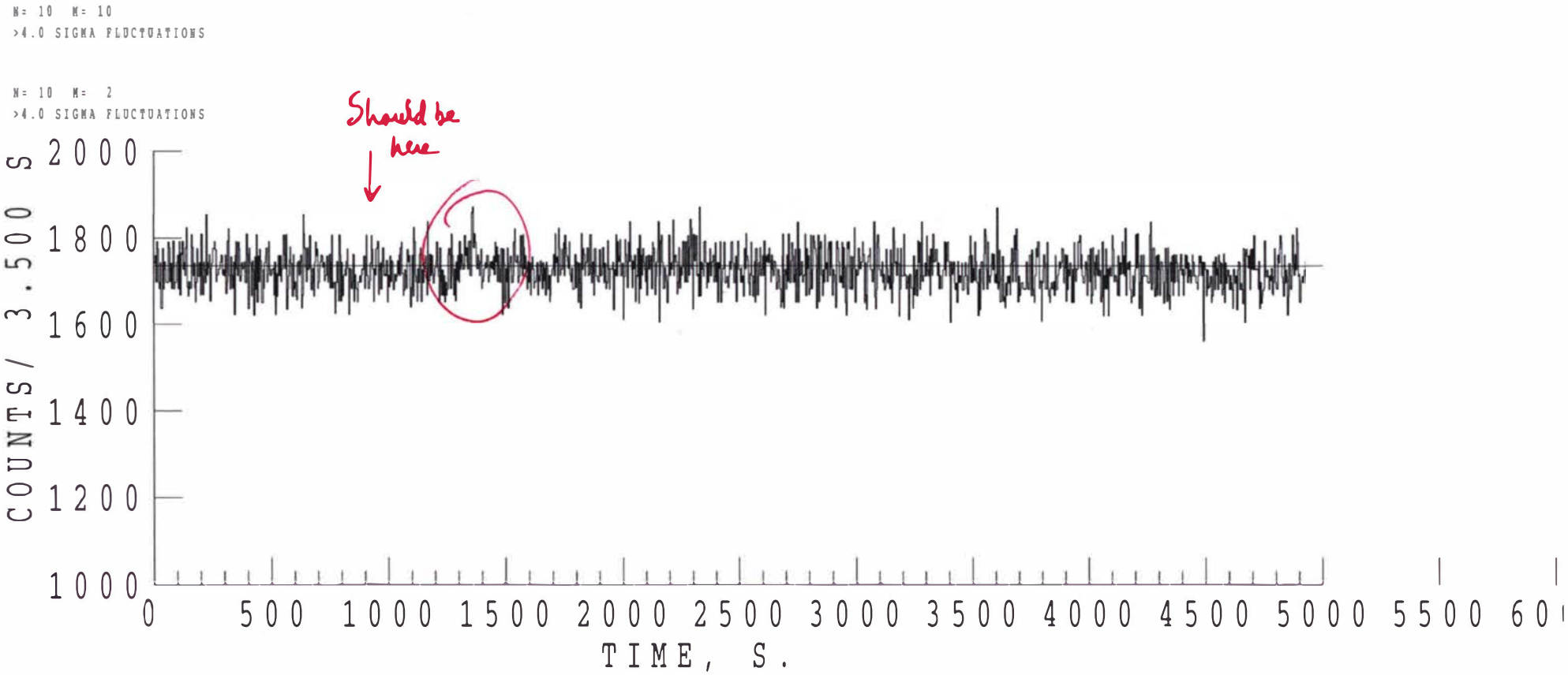
19/07/05

ULYSSES RT

28/12/97 22464.068 s

0.250 S INTERVALS REGROUPED BY 14

0- 0 keV



From HENZE@fender.msfc.nasa.gov Tue Dec 30 11:08:19 1997
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA18270; Tue, 30 Dec 1997 11:08:18 -0800
From: HENZE@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA15748; Tue, 30 Dec 1997 11:08:16 -0800
Date: Tue, 30 Dec 1997 13:08:06 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971230130806.2244aa45@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6547
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6547
EVENT OF 1997 DEC 28 DAY OF YEAR=362
EVENT CROSSING TIME AT BATSE : 29484. S. OR 08:11:24.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 155.000 62.000
BATSE PEAK COUNTING RATE: 5100 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 28/12/ 97 IS:
RA= 169.994 DEC= 11.835 DIST= 4.945 AU
BATSE-ULYSSES DISTANCE = 739782369. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=128.68 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1542.11 SECS.
CROSSING TIME AT ULYSSES IS 27942. S. OR 07:45:41 +/- 361.04 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 28/12/ 97 IS:
RA= 310.357 DEC= -19.510 DIST= 2.124 AU
MARS-BATSE DISTANCE = 317689504. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 45.81 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 738.71 SECS.
CROSSING TIME AT MARS IS 30223. S. OR 08:23:42 +/- 143.13 SECONDS

BATSE BURST TRIGGER
NO.: 6547

TIME: TJD=0810 SECONDS=29484

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

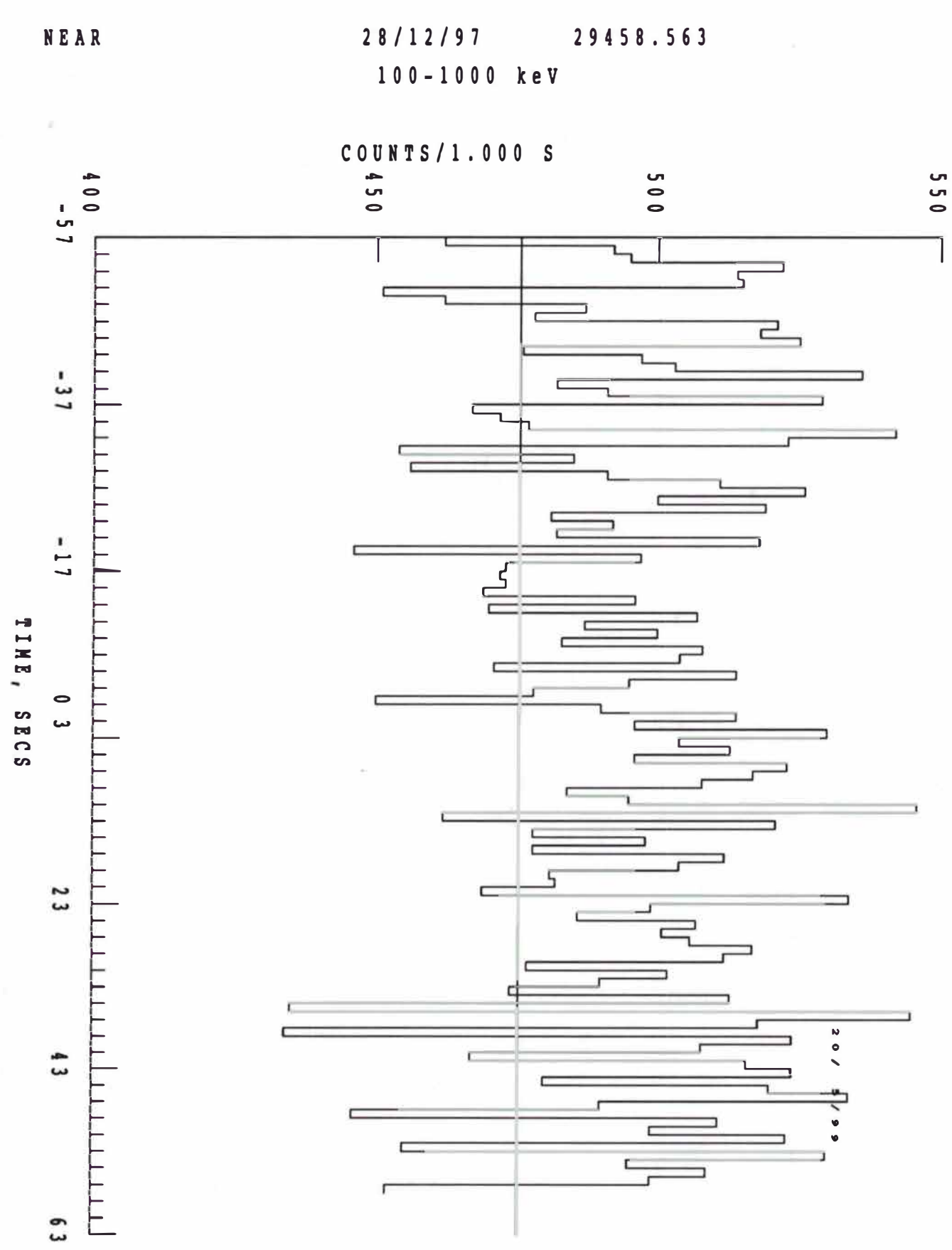
SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=132.3 AZIMUTH= 99.7 ERROR= 13.6 DEGREES

COMMENTS:
SINGLE PULSE, DUR. ~0.04 S. MARGINALLY OR NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6547 | 971228 | 10810 | 29484 | 5100 | 155 | +62 | .04 |


NEAR
28/12/97
29458.563
100-1000 keV
COUNTS/1.000 S
400
450
500
550
-57
-37
-17
03
23
43
63
TIME, SECS

BATSE BURST# 6547

ULYSSES RT 30/12/97

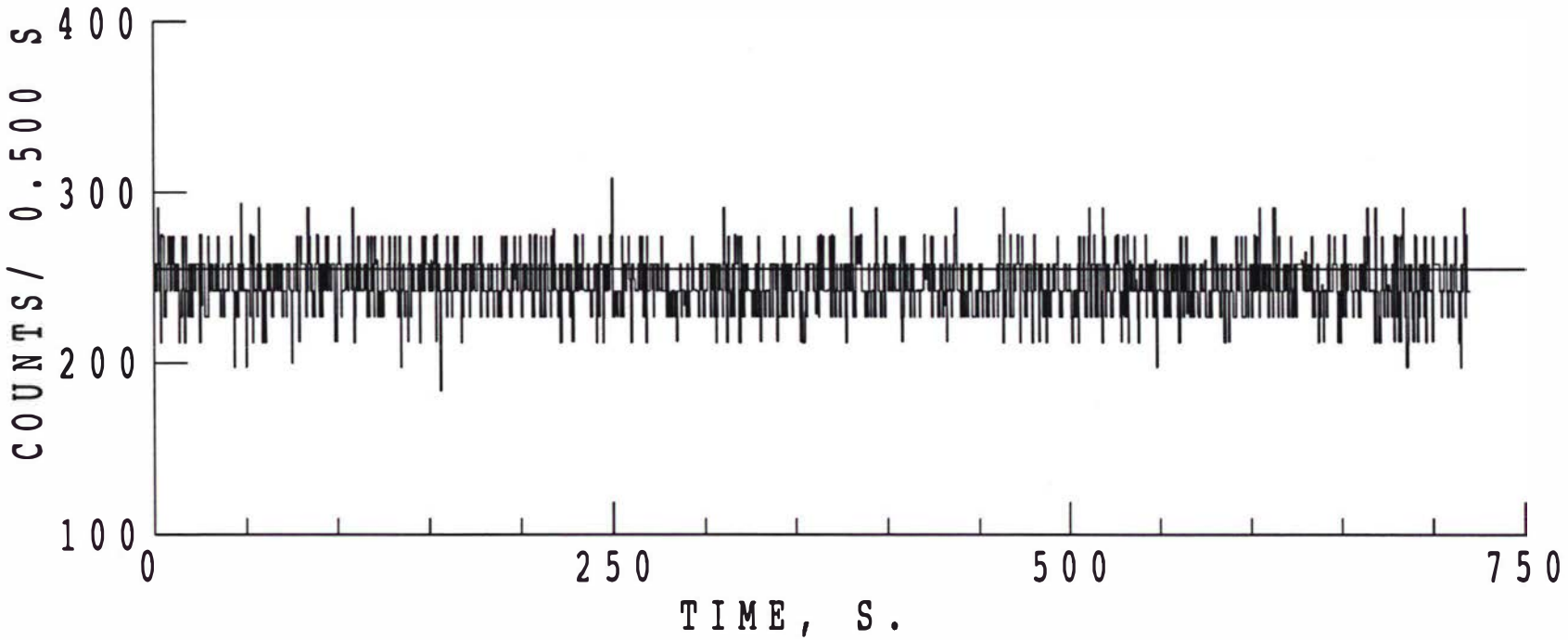
28/12/97 27576.236 s

0.250 S INTERVALS REGROUPED BY 2

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From HENZE@fender.msfc.nasa.gov Tue Dec 30 09:52:36 1997
Date: Tue, 30 Dec 1997 11:52:10 -0600 (CST)
From: Bill Henze (205-544-7616) <HENZE@fender.msfc.nasa.gov>
To: burst@comptel.sr.unh.edu, grobad@estsa2.estec.esa.nl,
cline@lheavx.gsfc.nasa.gov, barthelmy@lheavx.gsfc.nasa.gov,
bacodine@lheawww.gsfc.nasa.gov, scott@circe.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, band@cass09.ucsd.edu,
gruber@cass09.ucsd.edu, matteson@cass09.ucsd.edu,
PACIESAS@fender.msfc.nasa.gov, HORACK@fender.msfc.nasa.gov,
khurley@sunspot.ssl.berkeley.edu, park@kabul.llnl.gov
Subject: Burst Trigger Message

BATSE BURST TRIGGER

NO.: 6548

TIME: TJD=0810 SECONDS=50104

TYPE: CYG X-1 SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
FLUCTUATION FOLLOWING CYG X-1 RISE.

KONUS, GRB#, Stern

07/02/00

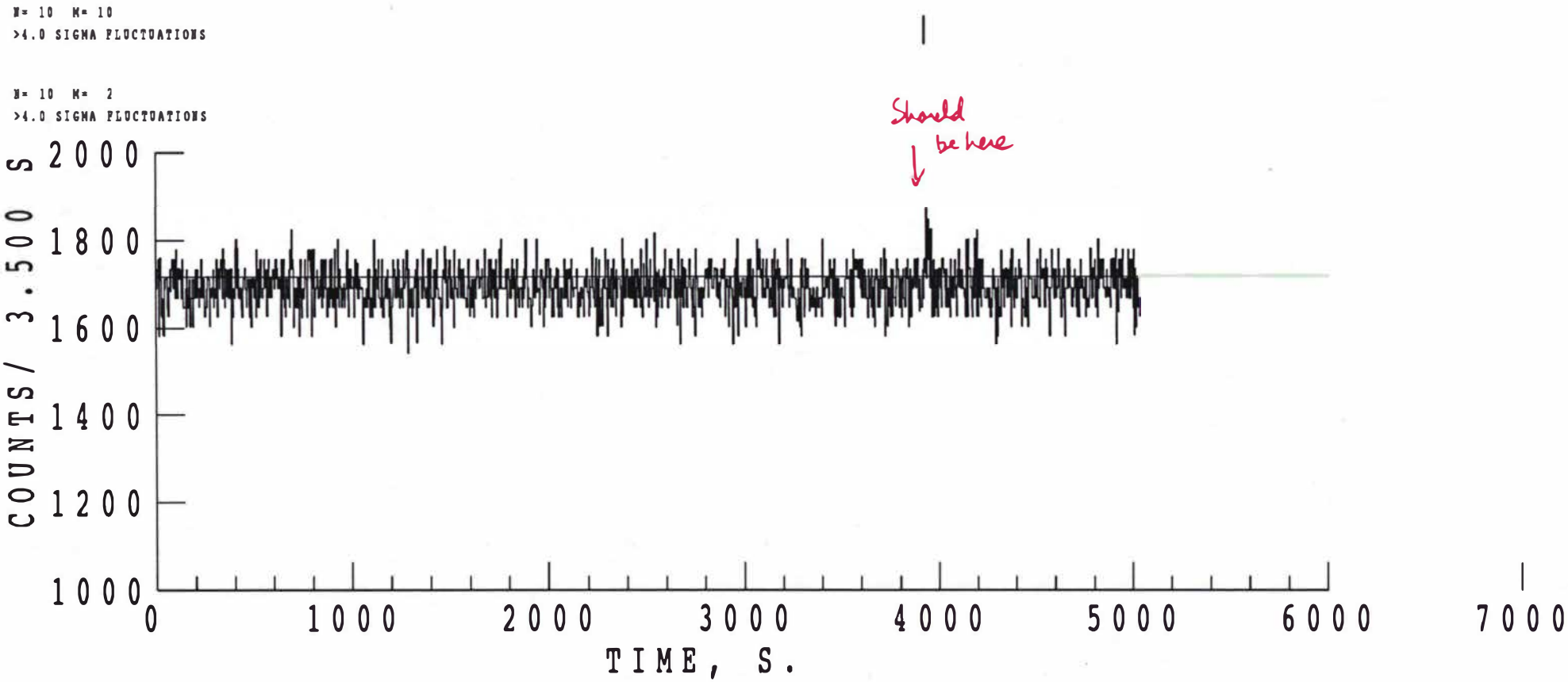
Too weak to Δ

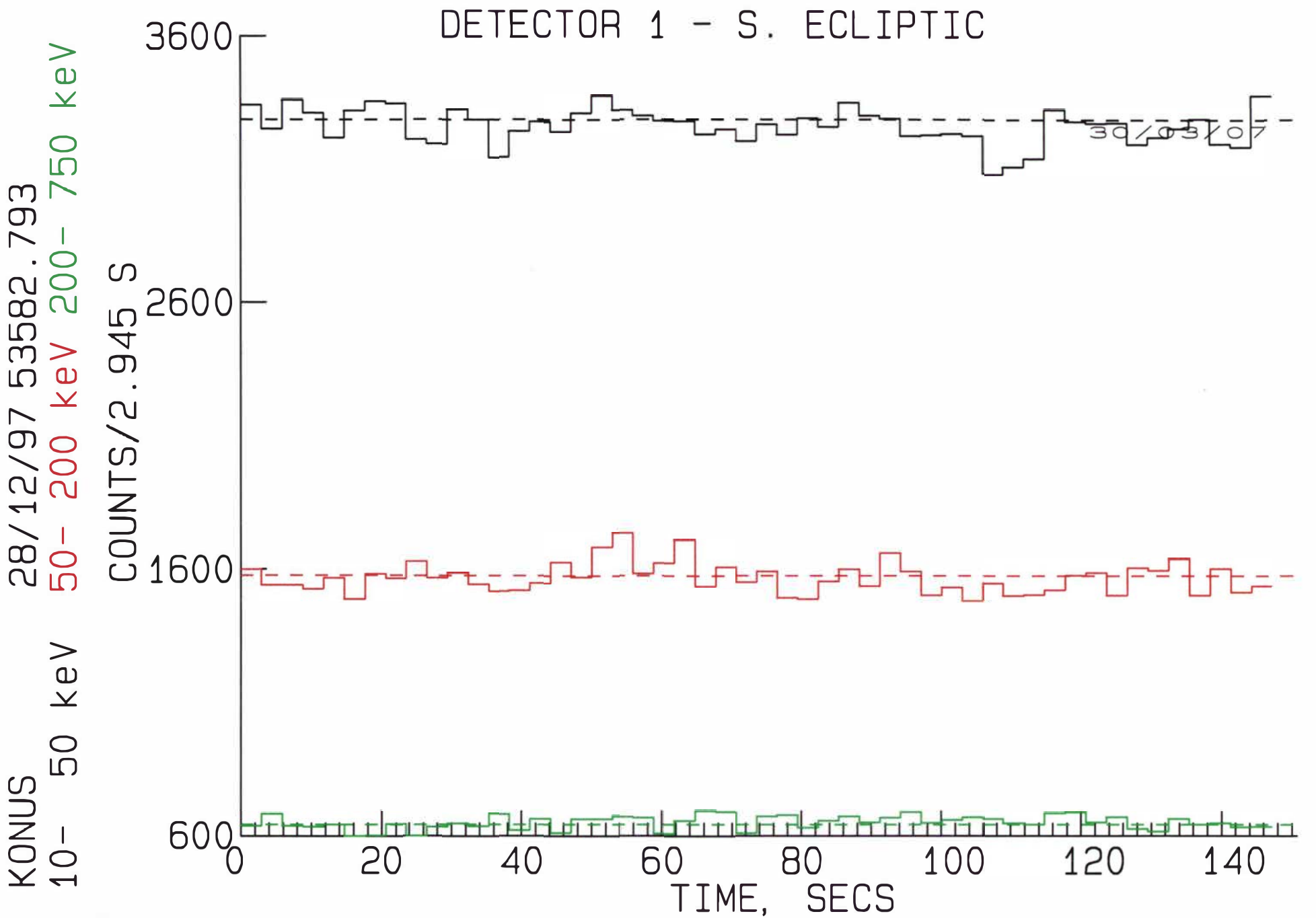
ULYSSES RT

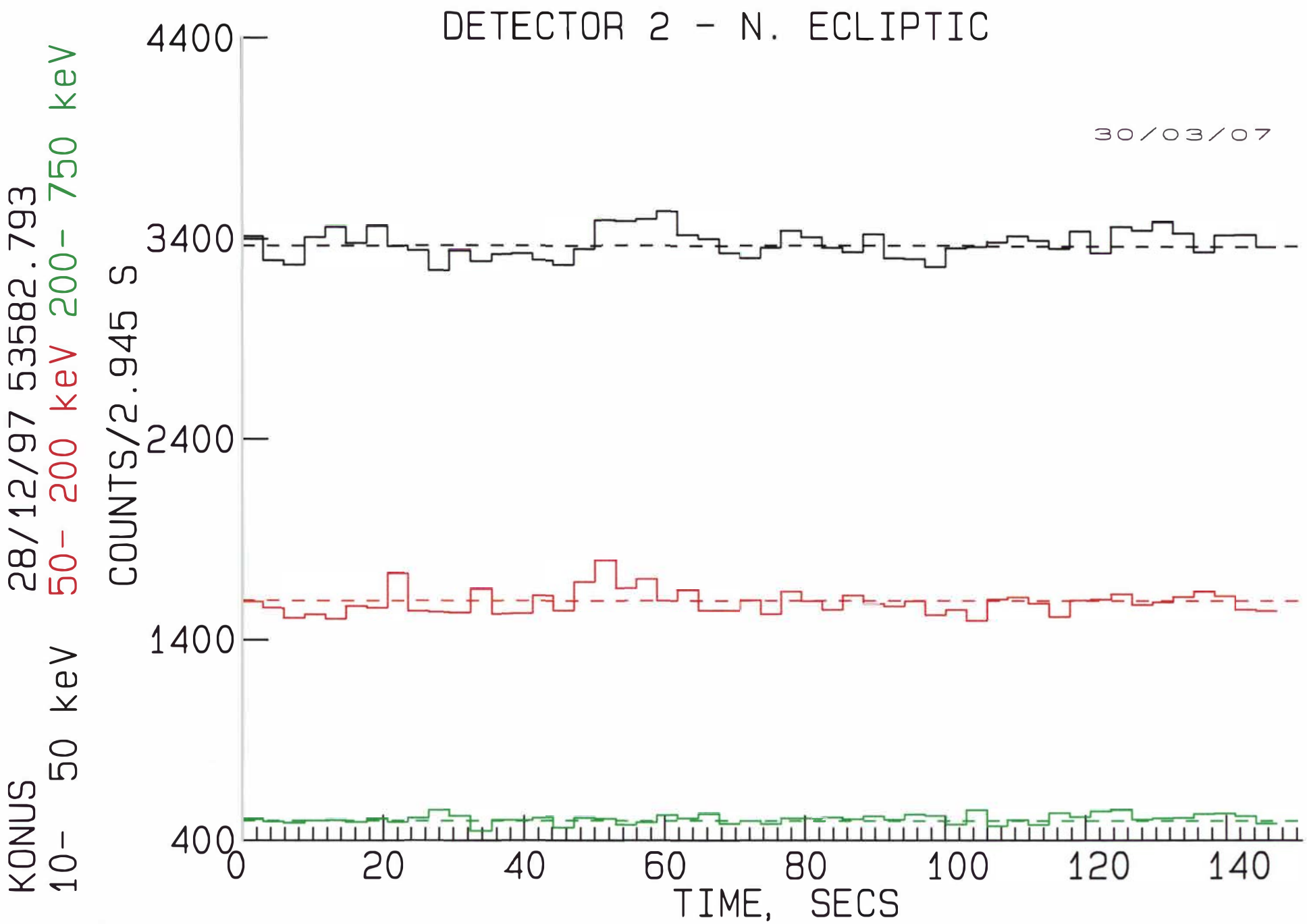
28/12/97 51120.383 s

0.500 S INTERVALS REGROUPED BY 7

0- 0 keV




DETECTOR 1 - S. ECLIPTIC
KONUS
10- 50 keV
50- 200 keV
200- 750 keV
28/12/97 53582.793
COUNTS/2.945 S
3600
2600
1600
600
0
20
40
60
80
100
120
140
TIME, SECS


DETECTOR 2 - N. ECLIPTIC
30/03/07
KONUS
28/12/97 53582.793
10- 50 keV
50- 200 keV
200- 750 keV
COUNTS/2.945 S
4400
3400
2400
1400
400
0
20
40
60
80
100
120
140
TIME, SECS

From HENZE@fender.msfc.nasa.gov Mon Dec 29 13:35:21 1997
Date: Mon, 29 Dec 1997 15:34:10 -0600 (CST)
From: Bill Henze (205-544-7616) <HENZE@fender.msfc.nasa.gov>
To: burst@comptel.sr.unh.edu, grobad@estsa2.estec.esa.nl,
cline@lheavx.gsfc.nasa.gov, barthelmy@lheavx.gsfc.nasa.gov,
bacodine@lheawww.gsfc.nasa.gov, scott@circe.gsfc.nasa.gov,
butterworth@lheavx.gsfc.nasa.gov, band@cass09.ucsd.edu,
gruber@cass09.ucsd.edu, matteson@cass09.ucsd.edu,
PACIESAS@fender.msfc.nasa.gov, HORACK@fender.msfc.nasa.gov,
khurley@sunspot.ssl.berkeley.edu, park@kabul.llnl.gov
Subject: Burst Trigger Message

BATSE BURST TRIGGER

NO.: 6549

TIME: TJD=0810 SECONDS=78282

TYPE: PARTICL SOLAR FLARE TRIGGER SIGNAL:Y

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH= AZIMUTH= ERROR= DEGREES

COMMENTS:
PARTICLE EVENT, OVER AUSTRALIA.

BATSE time corrected 10/02

Date: Jul 11 2002

**BURST TRIANGULATION CHECKLIST**

| 1. Ulysses Data |
|---|

☑ Jim Schmidling's stat file correction applied?

☑ Final ephemeris used?

☑ Final, CDROM data used?

Too weak

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

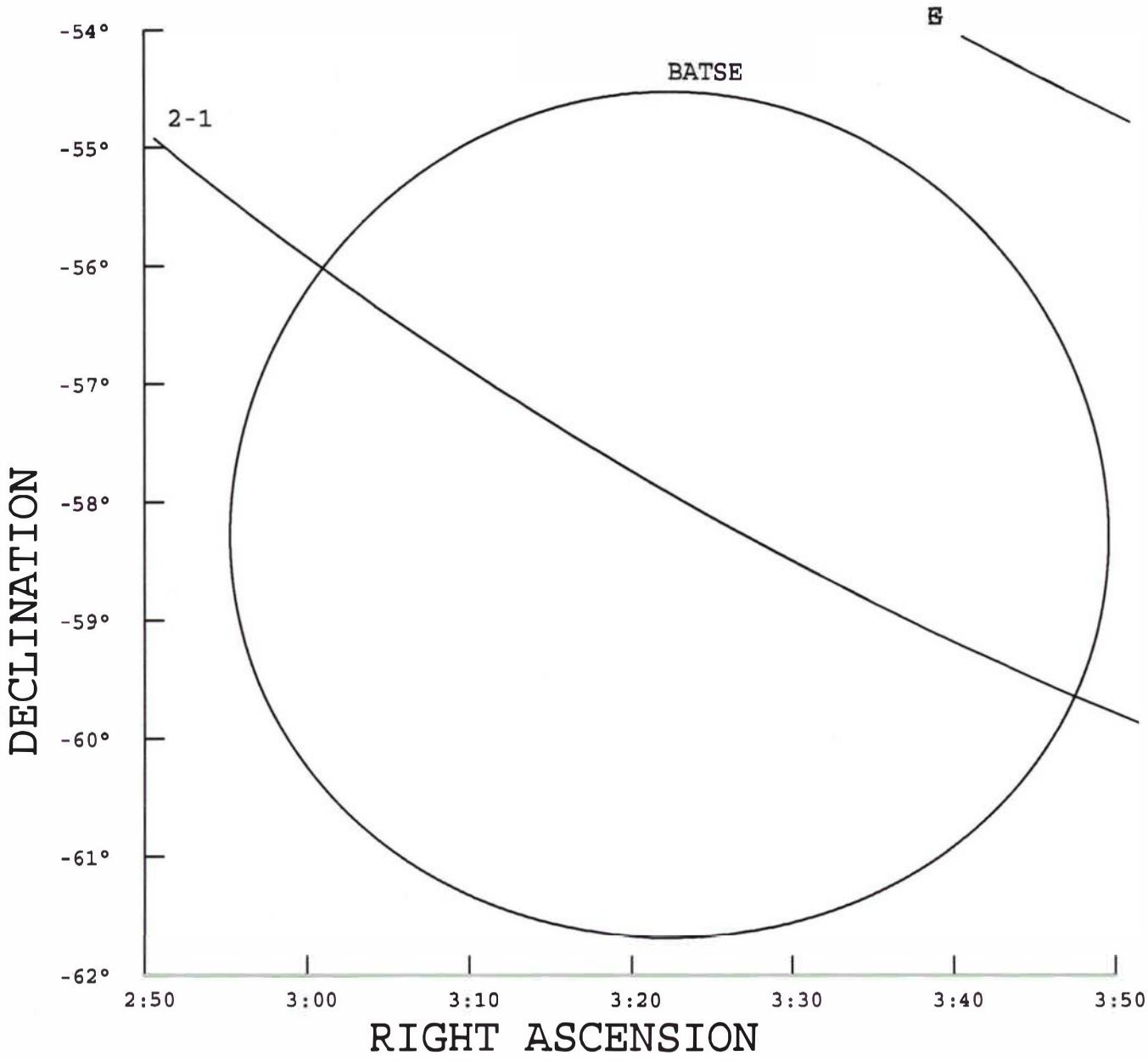
☐ BATSE >100 keV data used for NEAR correlation? No

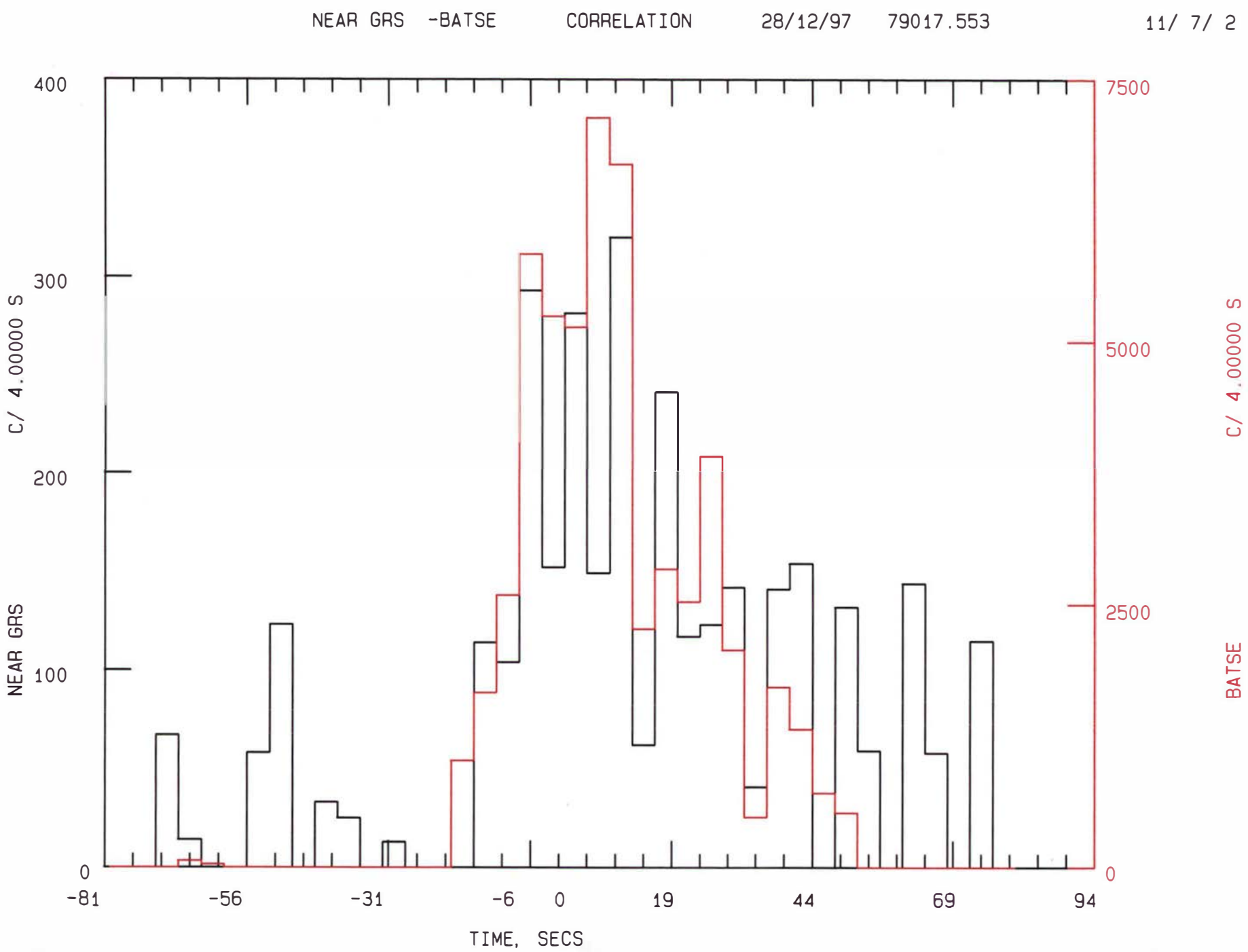
☑ ACCESS database updated?

# EVENT OF DEC 28, 1997 21:56

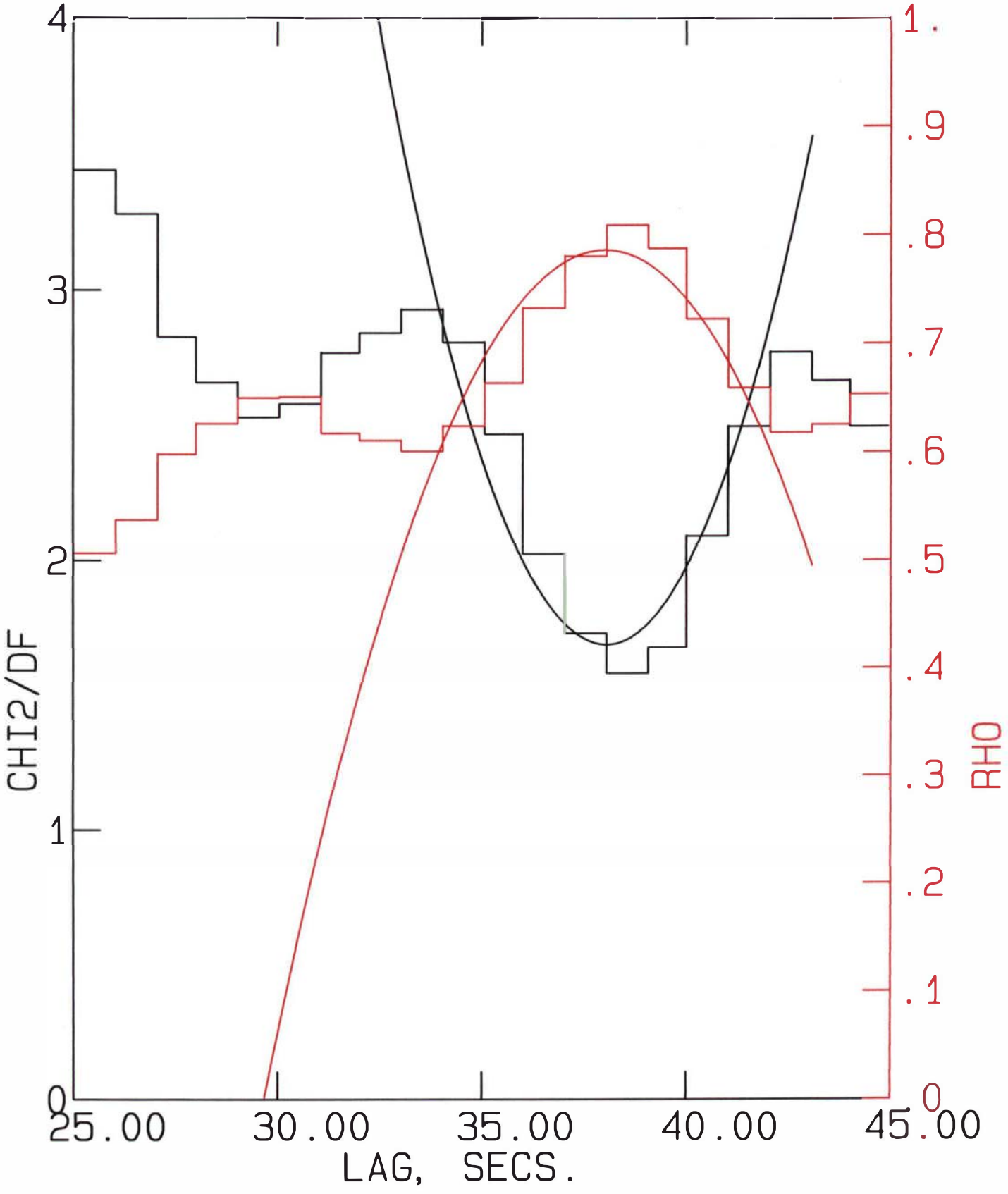
11/ 7/ 2

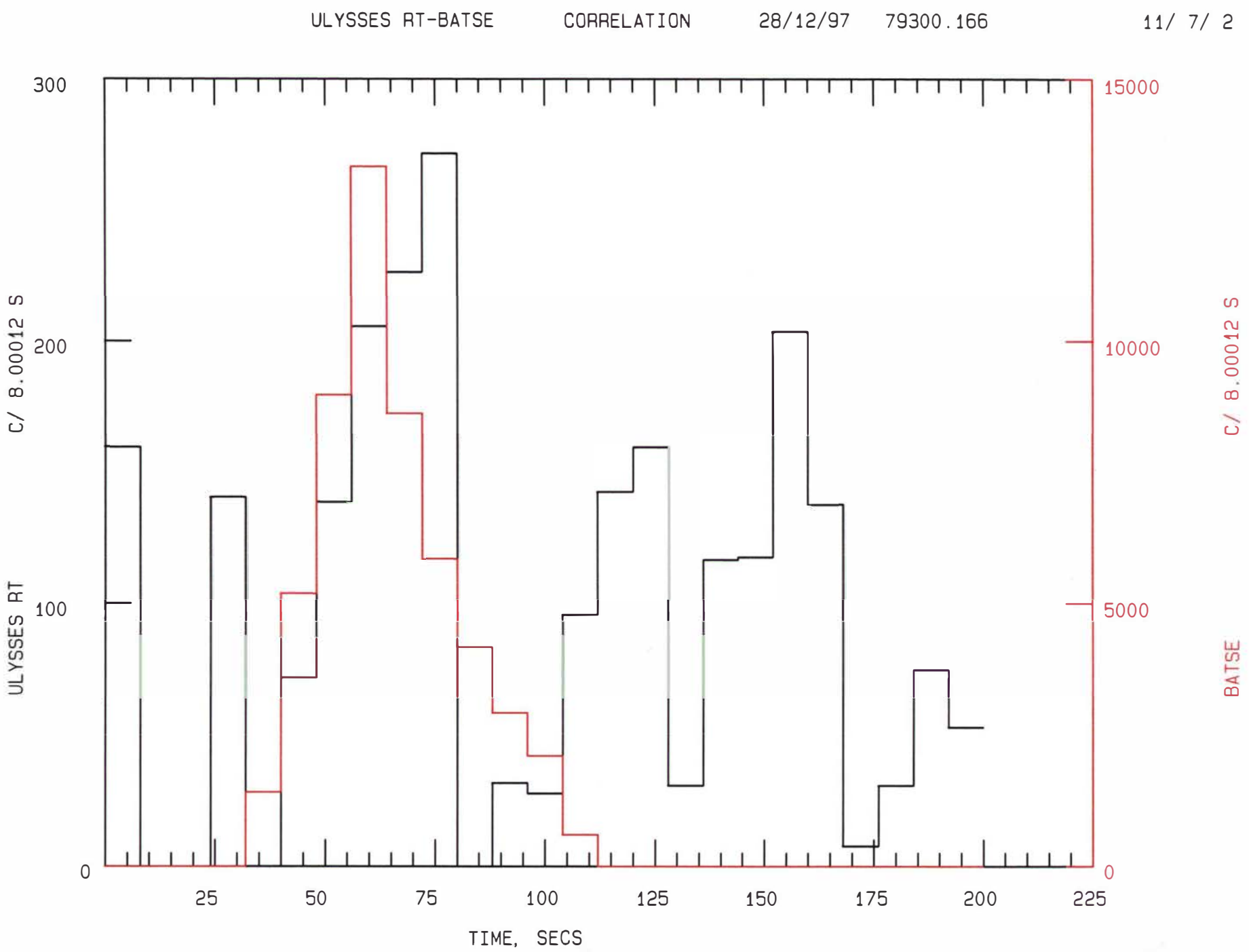
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 BATSE 2 NEAR



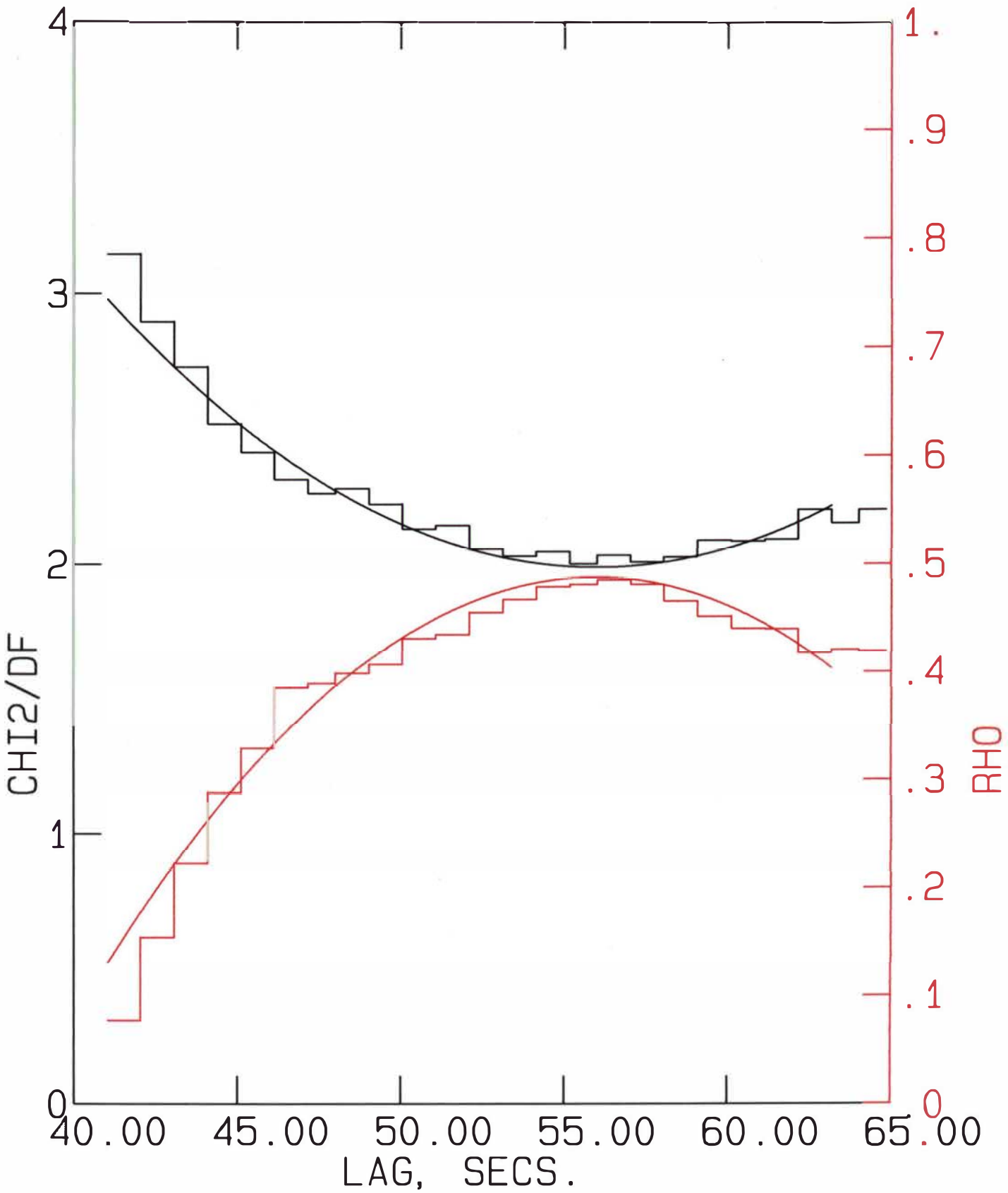

NEAR GRS -BATSE CORRELATION 28/12/97 79017.553
11/ 7/ 2
400
300
200
100
0
C/ 4.00000 S
NEAR GRS
7500
5000
2500
0
C/ 4.00000 S
BATSE
-81
-56
-31
-6
0
19
44
69
94
TIME, SECS

NEAR GRS -BATSE CORRELATION 28/12/97 79017.553




ULYSSES RT-BATSE CORRELATION 28/12/97 79300.166 11/ 7/ 2
300
200
100
0
ULYSSES RT
C/ 8.00012 S
15000
10000
5000
0
BATSE
C/ 8.00012 S
25
50
75
100
125
150
175
200
225
TIME, SECS

ULYSSES RT-BATSE CORRELATION 28/12/97 79300.166



NEAR

ULYSSES RT

24/11/98

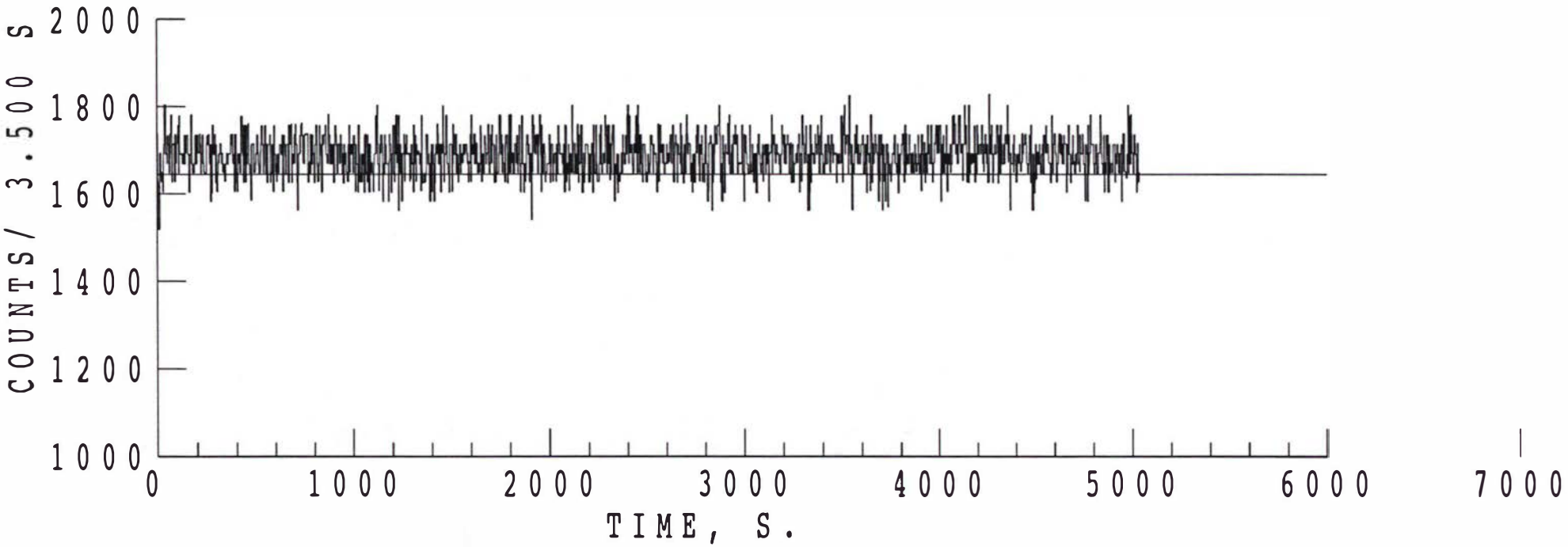
28/12/97 76500.172 s

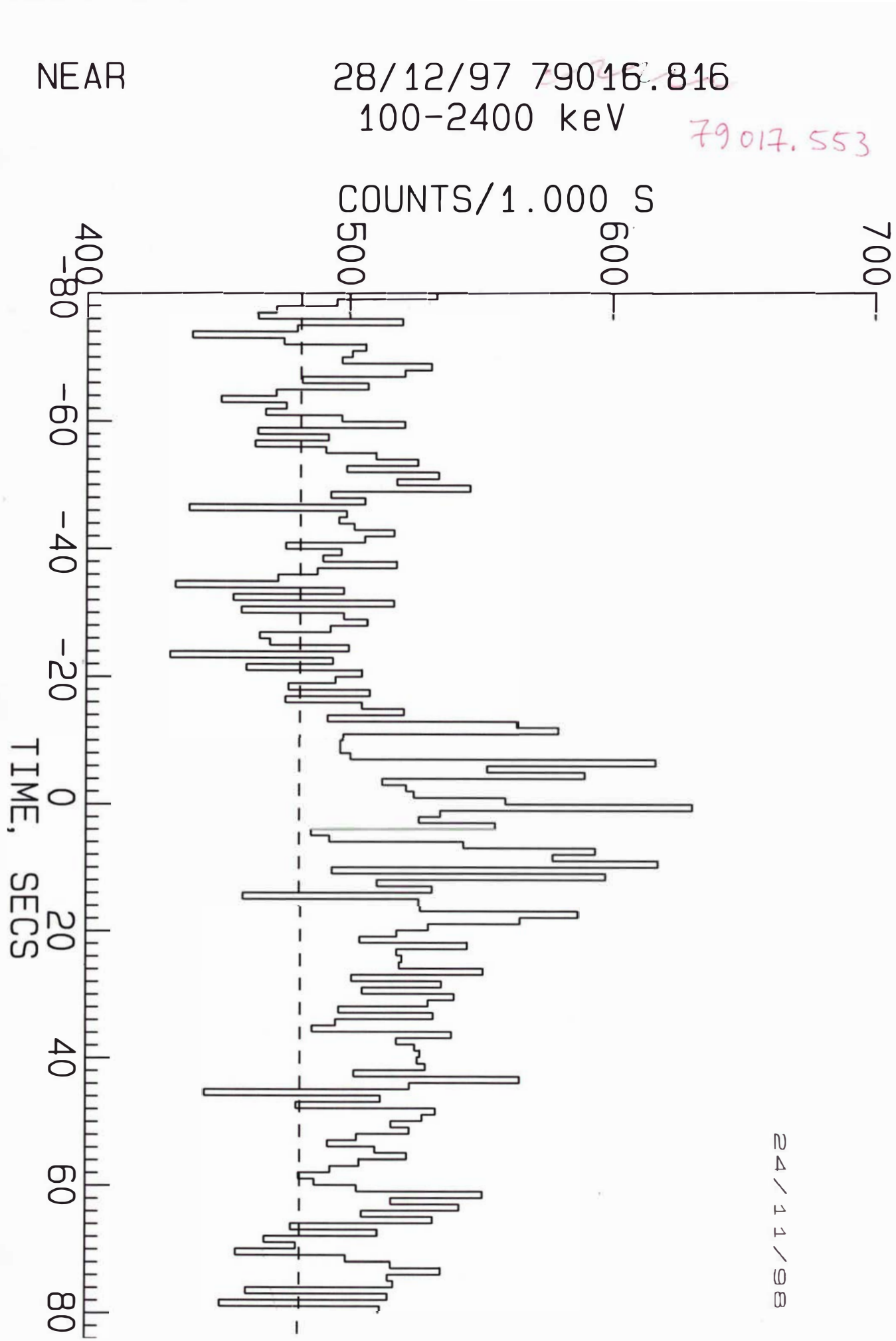
0.500 S INTERVALS REGROUPED BY 7

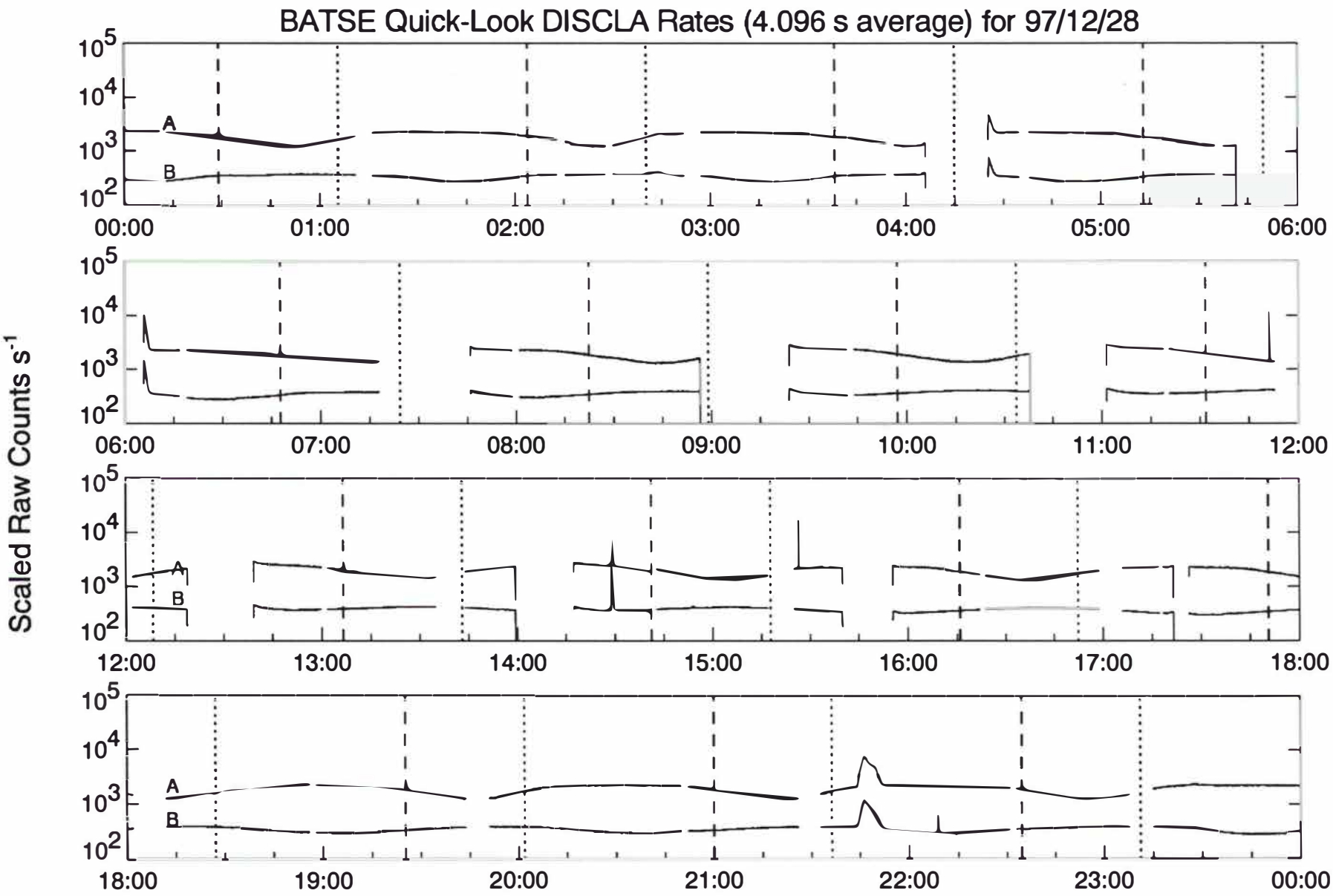
0- 0 keV

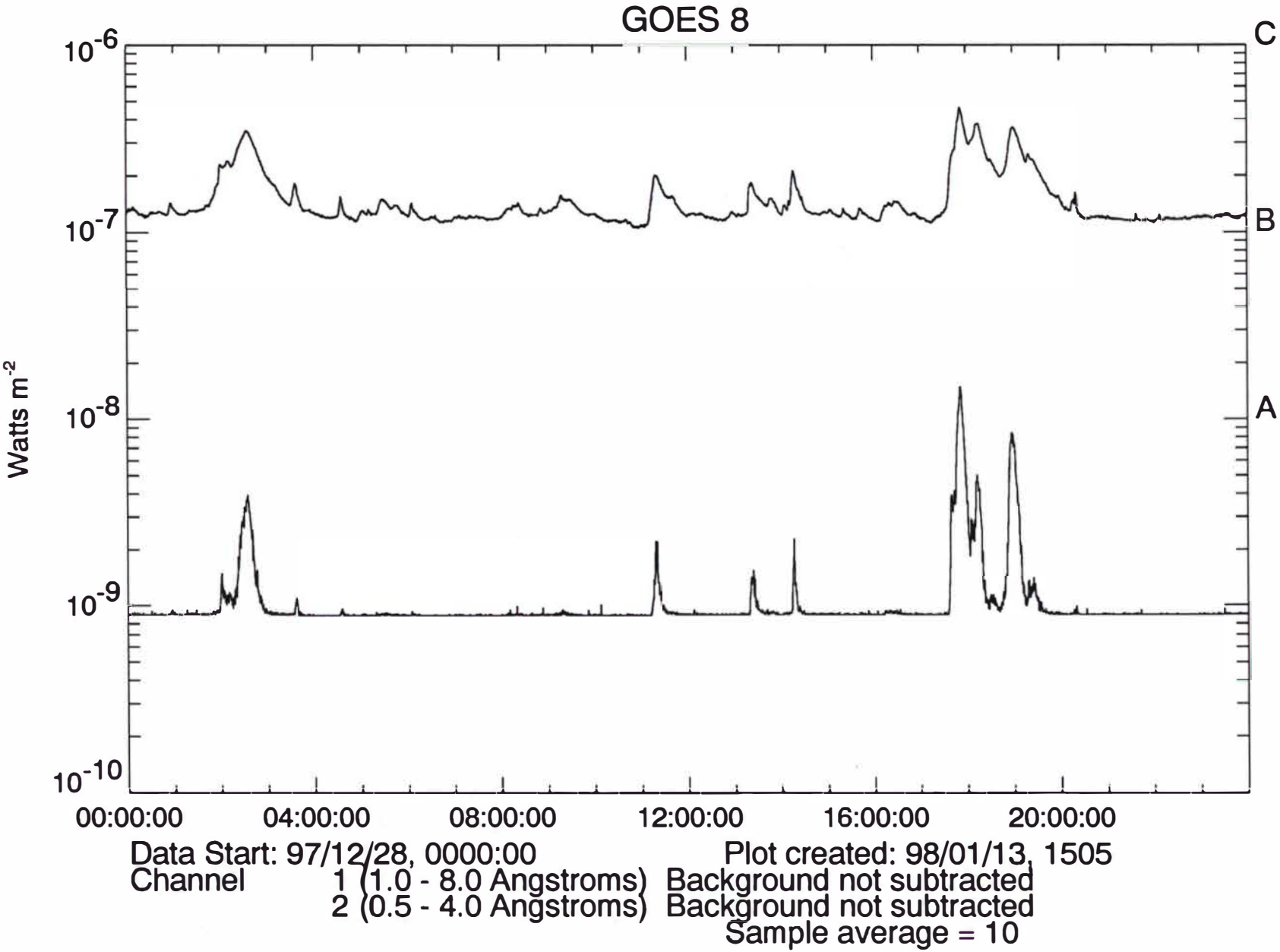
N= 10 M= 10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

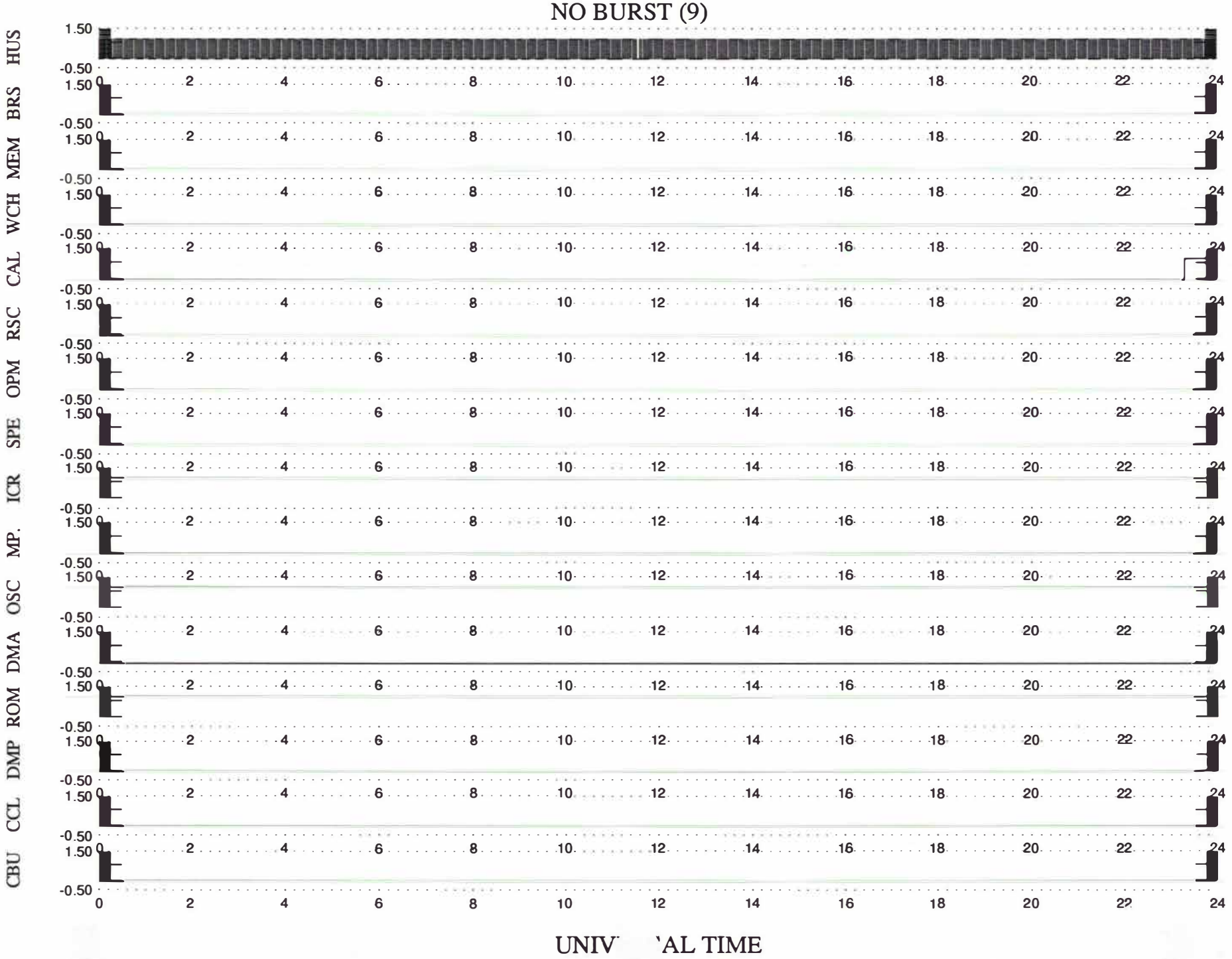



NEAR
28/12/97 79016.816
100-2400 keV
79017.553
COUNTS/1.000 S
400
500
600
700
-80
-60
-40
-20
0
20
40
60
80
TIME, SECS
24/11/98


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/28
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 98/01/13, 1506 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

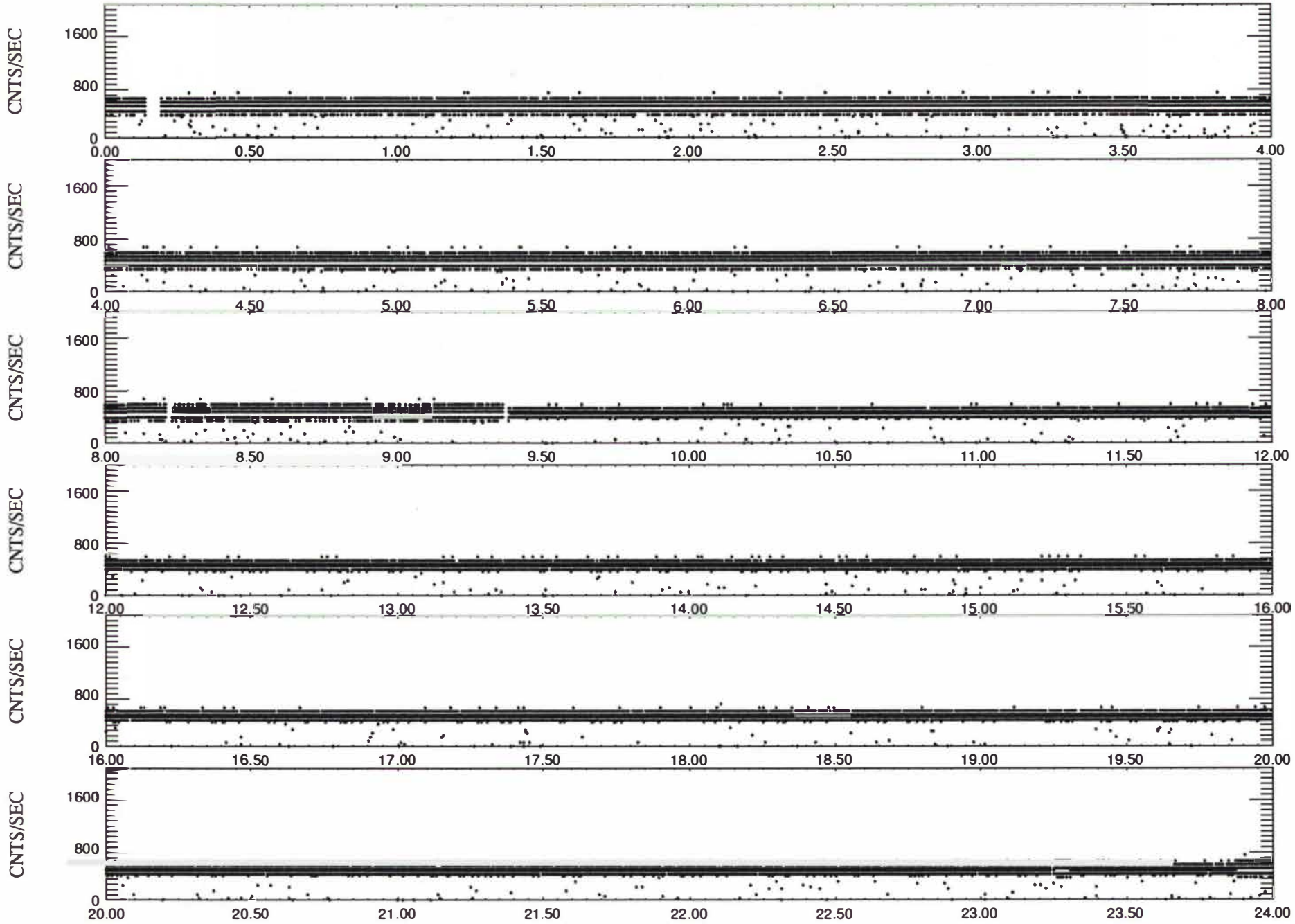

GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/28, 0000:00
Plot created: 98/01/13, 1505
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 362, year 1997 to day 362, year 1997 3/12/98



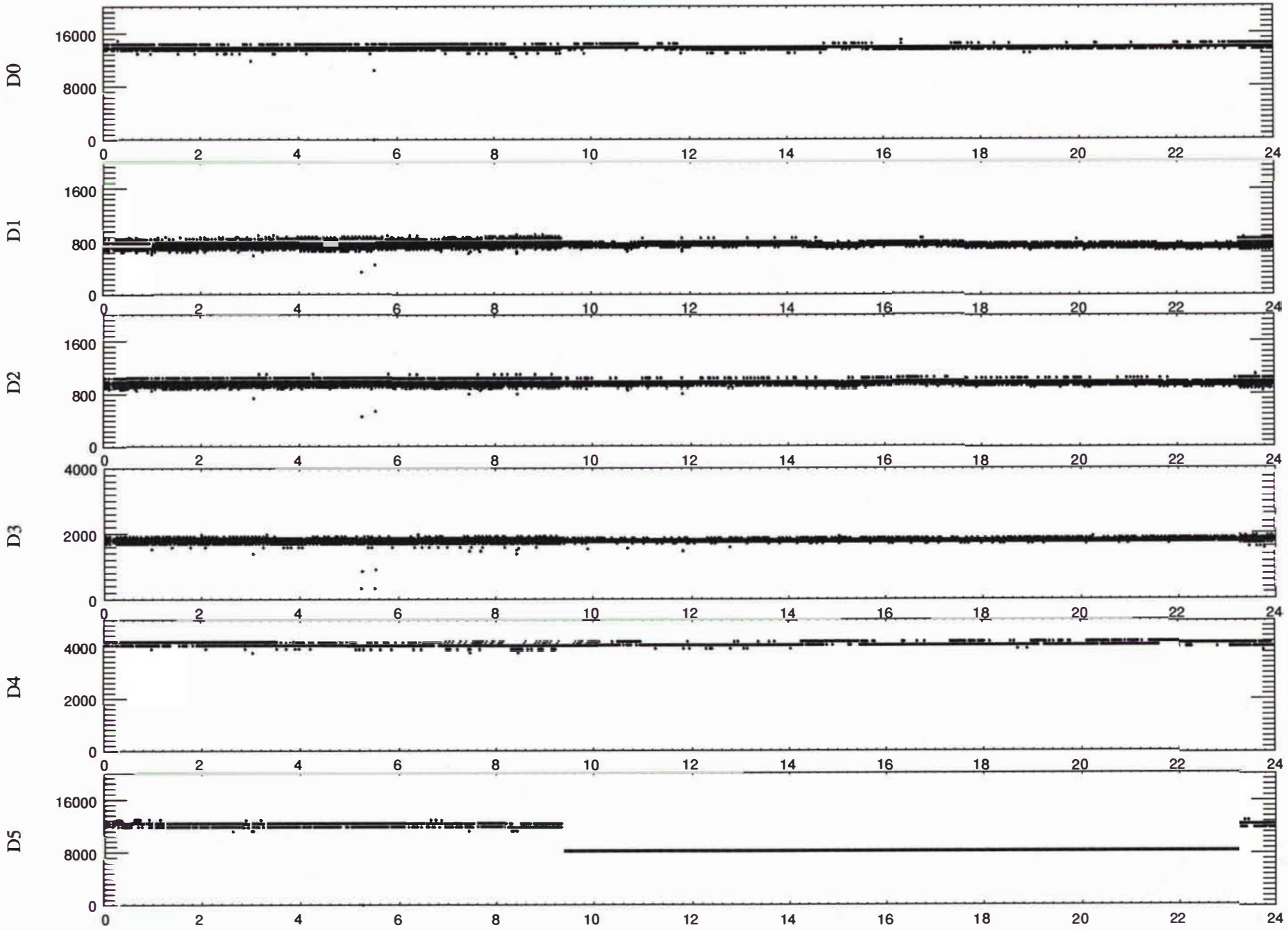
HUS 2A, MODE 1, NOT AVERAGED EDR day 362, year 1997 to day 362, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV `AL TIME

HUS 2B COUNTS / SEC EDR day 362, year 1997 to day 362, year 1997 3/12/98



From SAHI@fender.msfc.nasa.gov Tue Dec 30 11:33:31 1997
Return-Path: <SAHI@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA18662; Tue, 30 Dec 1997 11:33:30 -0800
From: SAHI@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA15948; Tue, 30 Dec 1997 11:33:28 -0800
Date: Tue, 30 Dec 1997 13:33:19 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <971230133319.224595ab@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6550
Content-Length: 1135
X-Lines: 26
Status: RO

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

BATSE BURST # 6550
EVENT OF 1997 DEC 29 DAY OF YEAR=363
EVENT CROSSING TIME AT BATSE : 36693. S. OR 10:11:33.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 340.000 -68.000
BATSE PEAK COUNTING RATE: 5000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 29/12/ 97 IS:
RA= 169.912 DEC= 11.832 DIST= 4.928 AU
BATSE-ULYSSES DISTANCE = 737284223. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 56.54 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1355.80 SECS.
CROSSING TIME AT ULYSSES IS 38049. S. OR 10:34:08 +/- 426.82 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 29/12/ 97 IS:
RA= 311.160 DEC= -19.302 DIST= 2.127 AU
MARS-BATSE DISTANCE = 318178080. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=128.04 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= -653.97 SECS.
CROSSING TIME AT MARS IS 36039. S. OR 10:00:39 +/- 135.20 SECONDS

BATSE BURST TRIGGER

NO.: 6550

TIME: TJD=0811 SECONDS=36693

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

LOCATION: ZENITH=44.3 AZIMUTH=272 ERROR=3.6 DEGREES

COMMENTS:
BURST, SINGLE PULSE WITH SUBSTRUCTURE, DUR. APPROX. 20 SECS, MAX. AT APPROX.
T+6 SECS. NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6550 | 971229 | 10811 | 36693 | 5000 | 340 | -68 | 20 |

BATSE BURST# 6550

ULYSSES RT 30/12/97

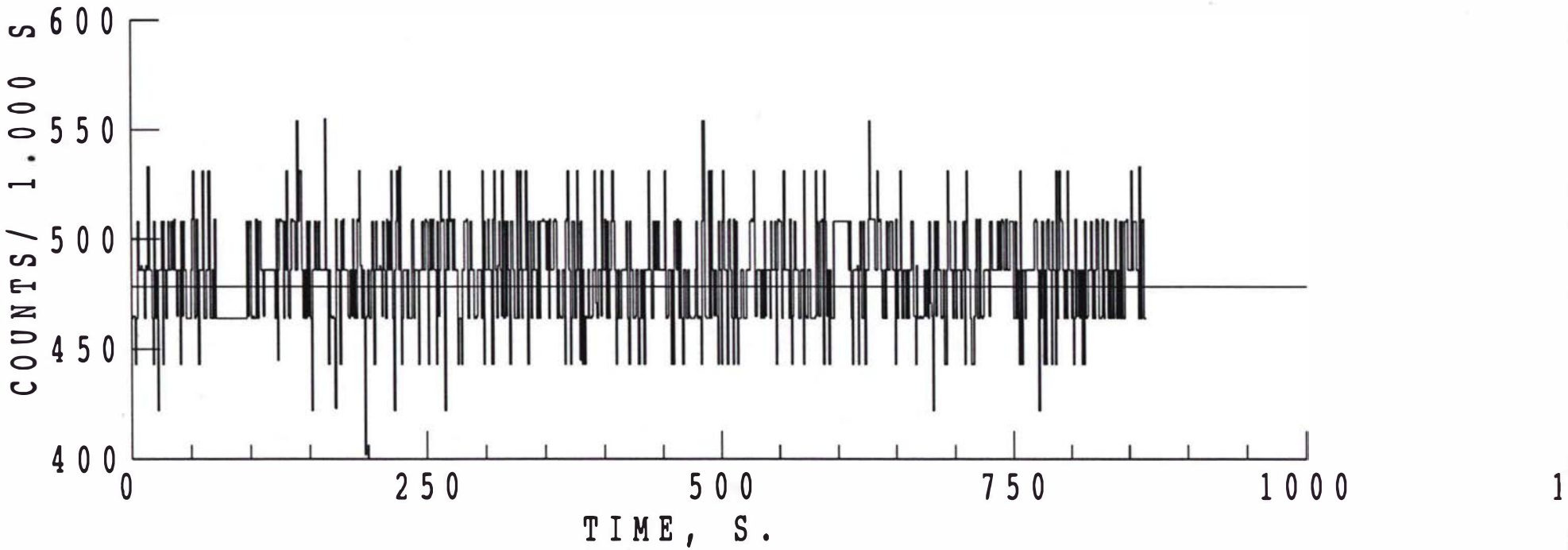
29/12/97 37620.180 s

0.500 S INTERVALS REGROUPED BY 2

0- 0 keV

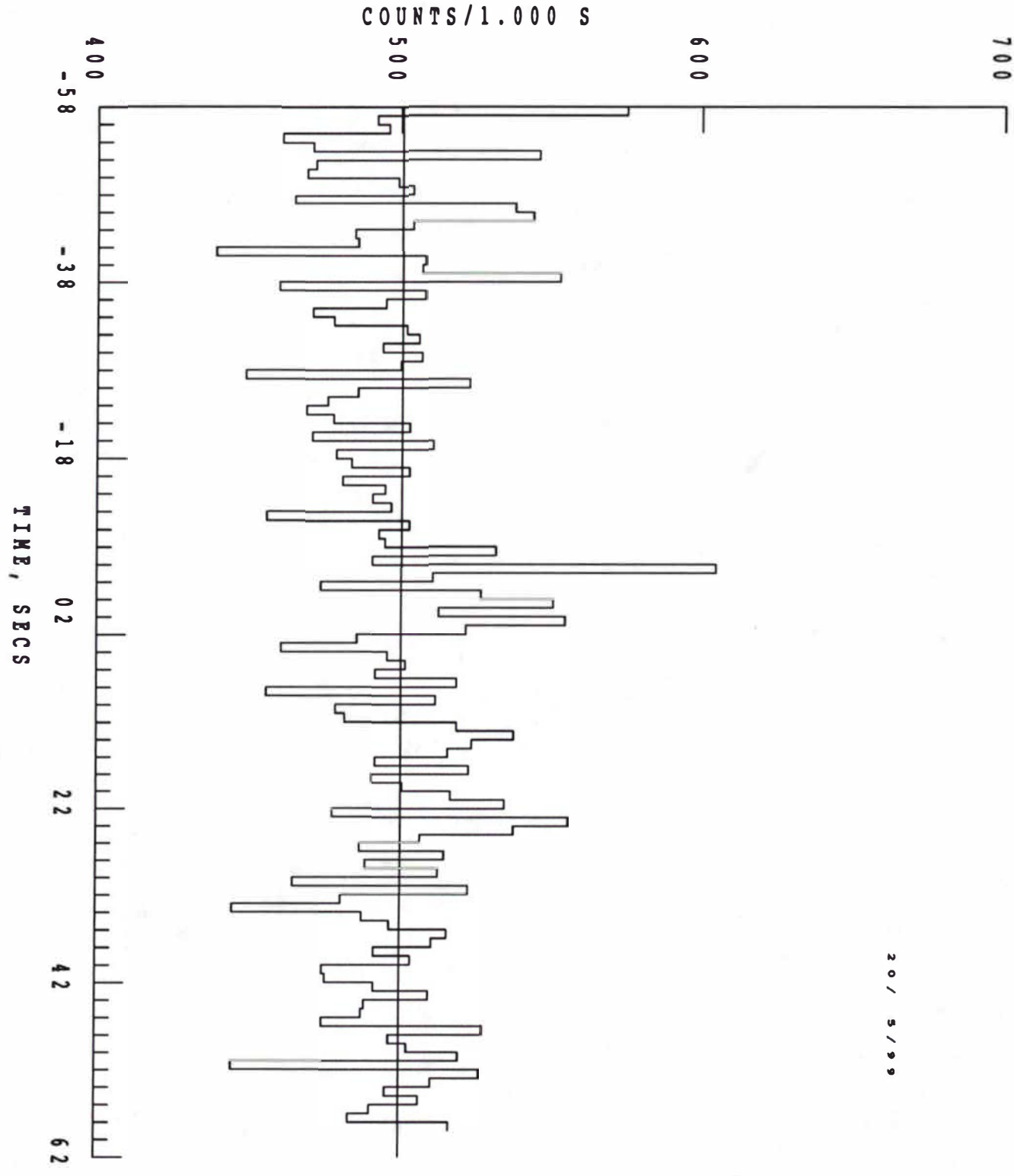
N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS

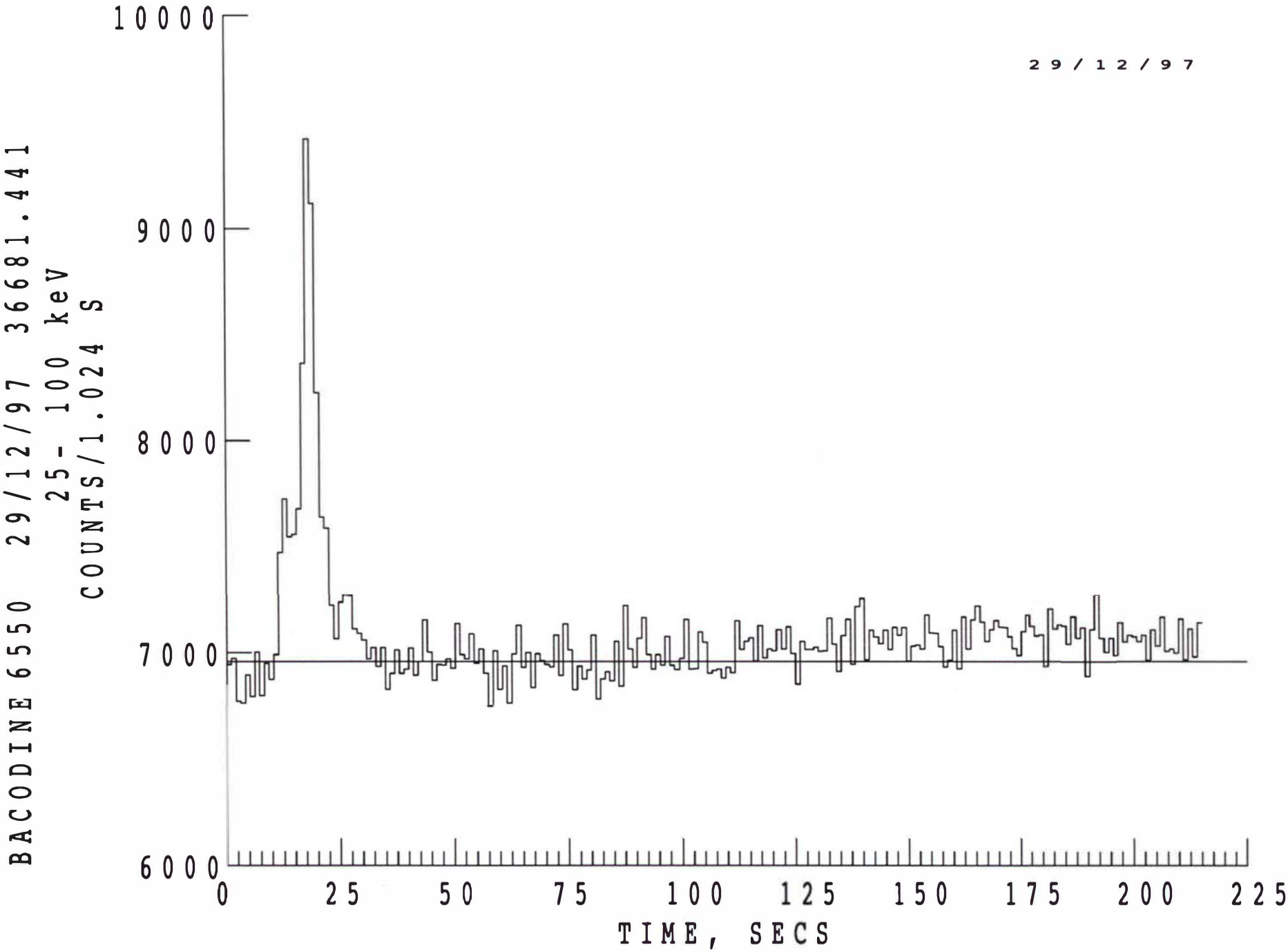


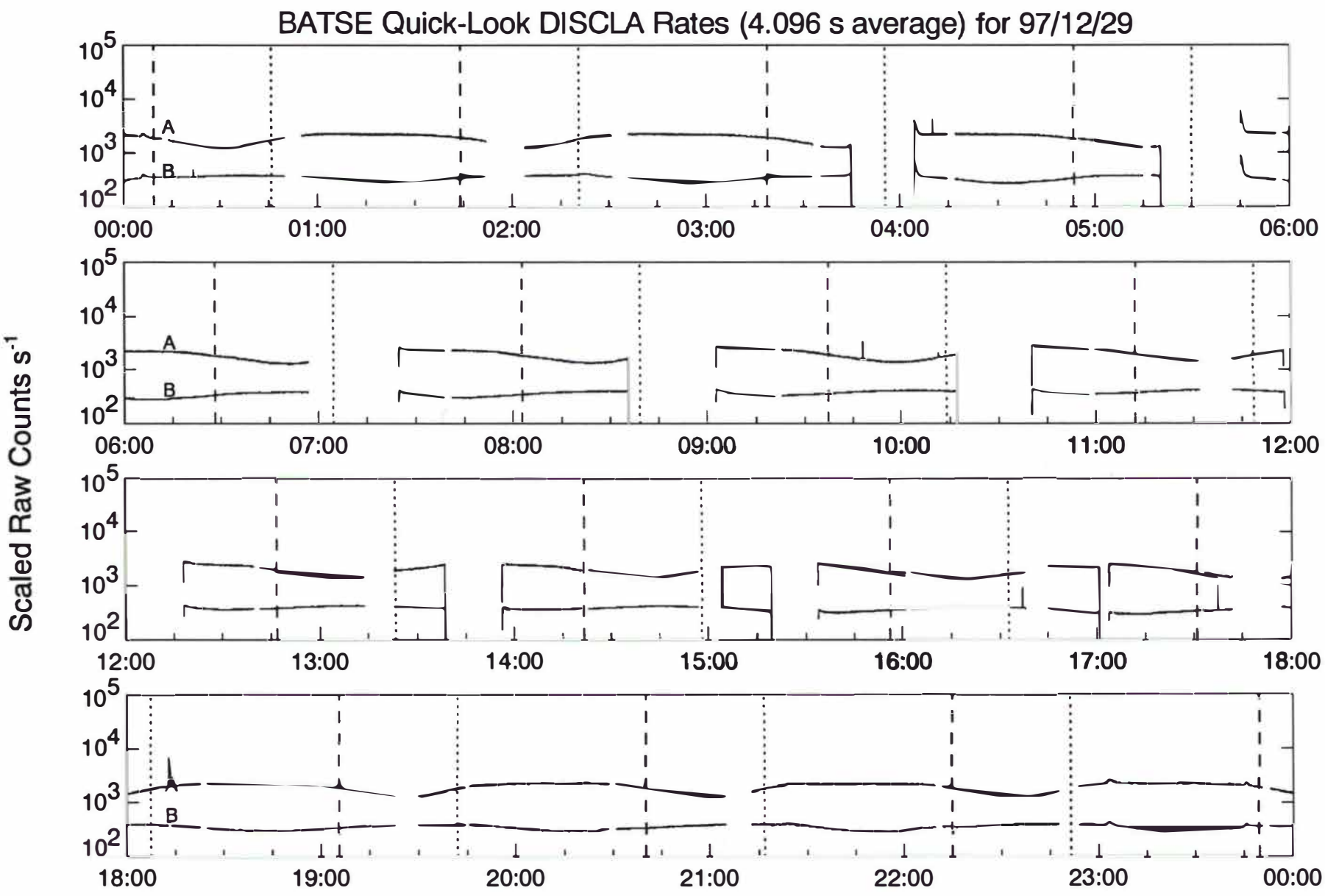
NEAR 29/12/97 36713.545

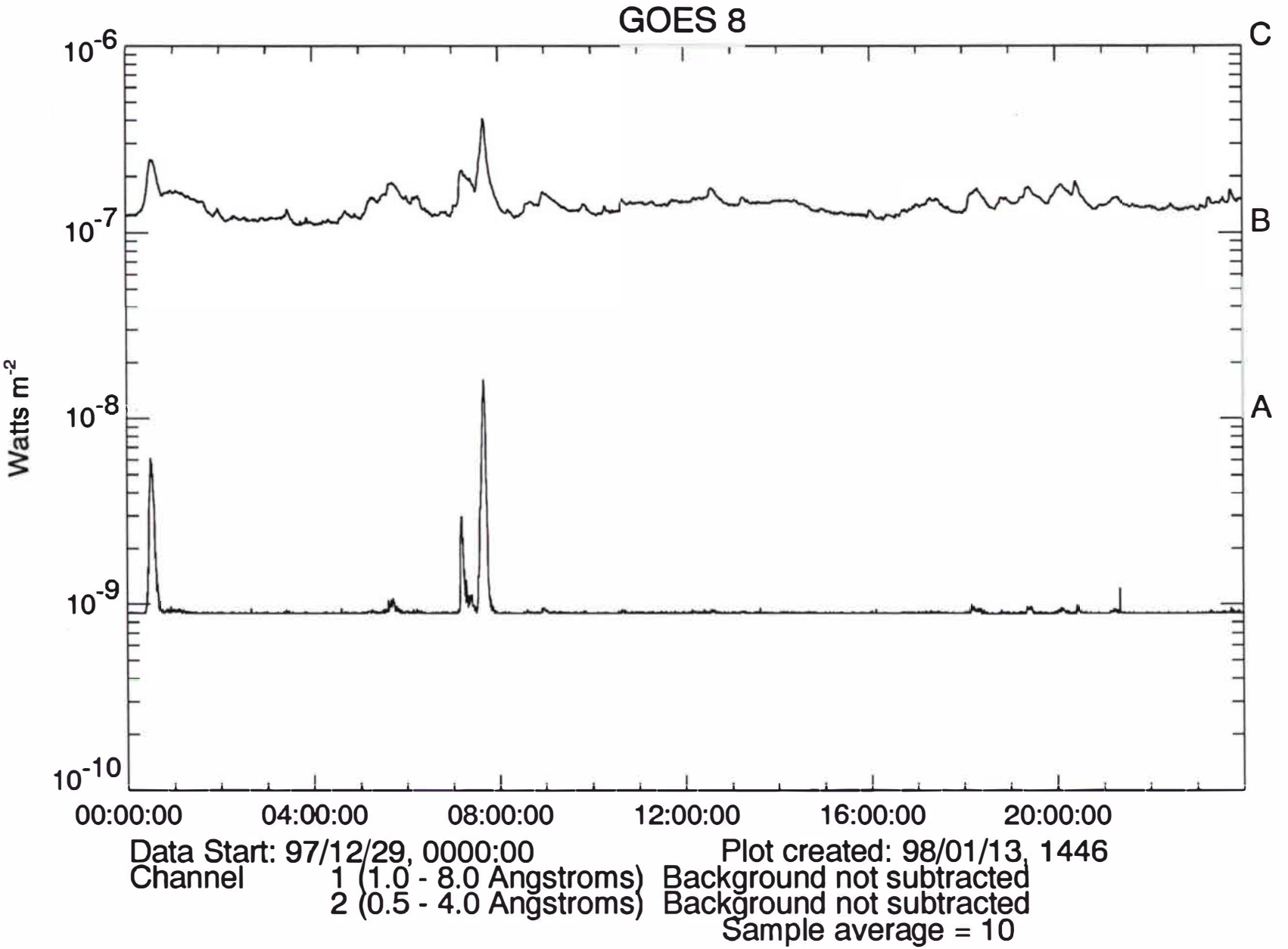
100-1000 keV



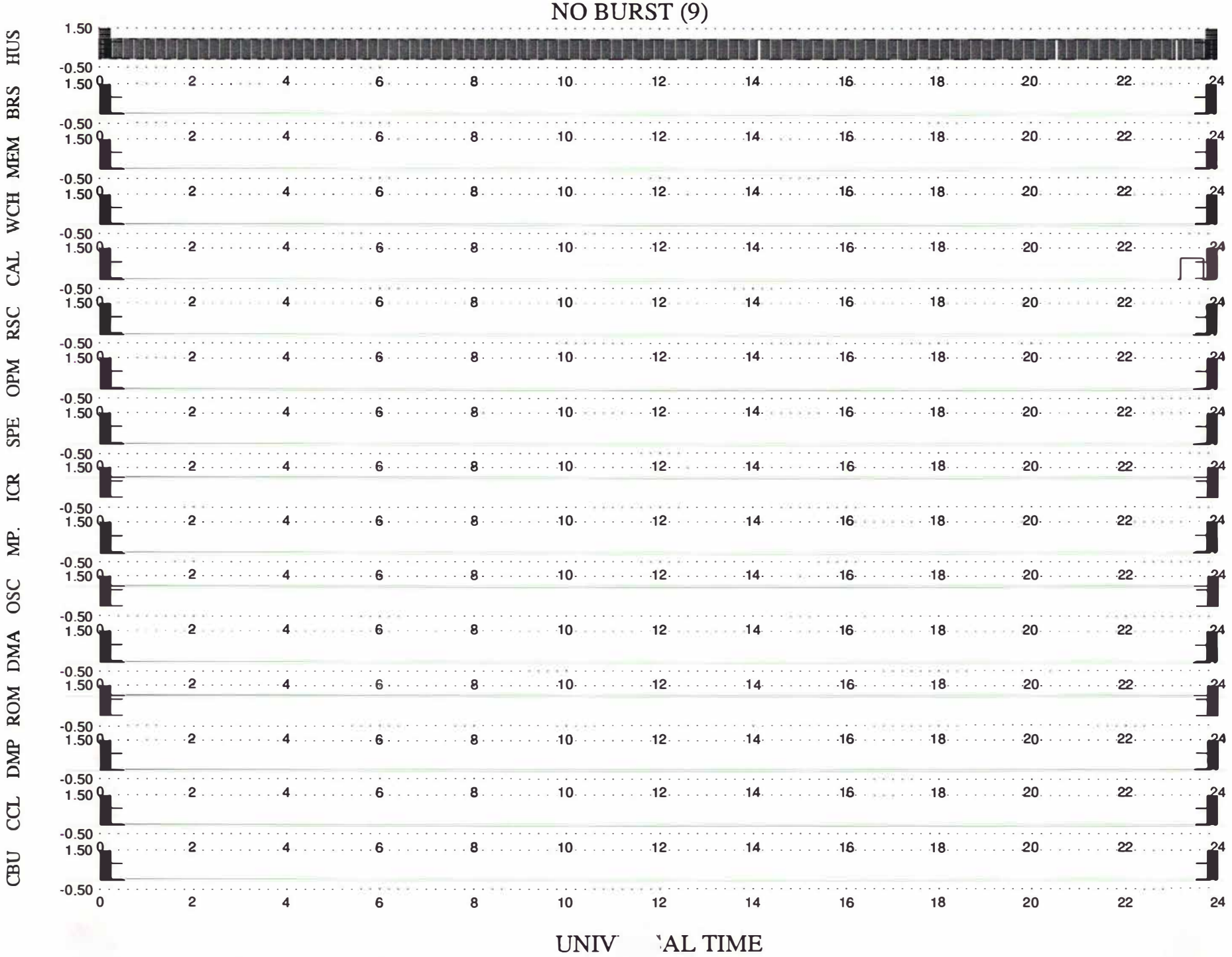

20/ 5/99


BACODINE 6550 29/12/97 36681.441
25- 100 keV
COUNTS/1.024 S
29/12/97
10000
9000
8000
7000
6000
0
25
50
75
100
125
150
175
200
225
TIME, SECS


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/29
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 98/01/13, 1447 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

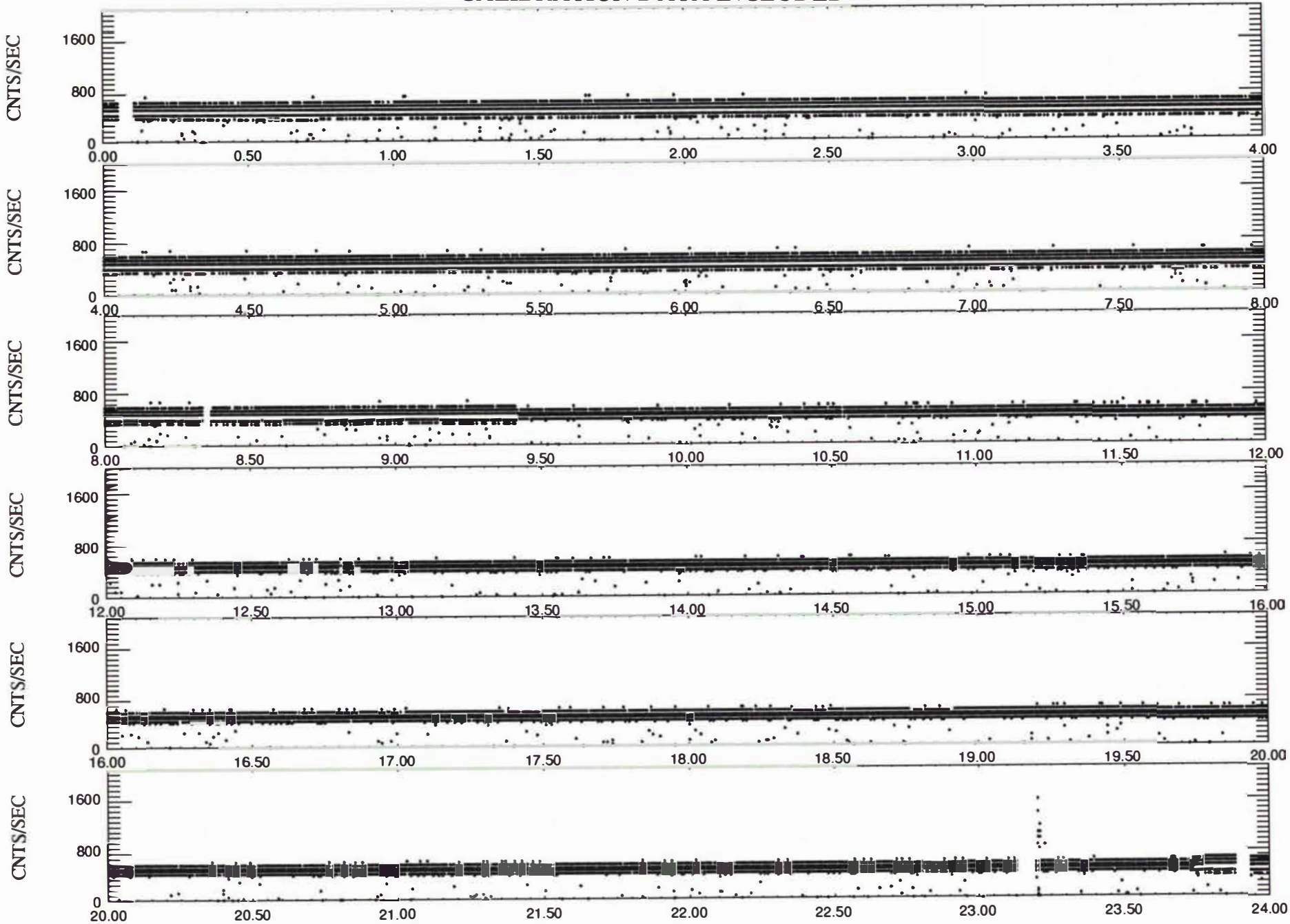

GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/29, 0000:00
Plot created: 98/01/13, 1446
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 363, year 1997 to day 363, year 1997 3/12/98



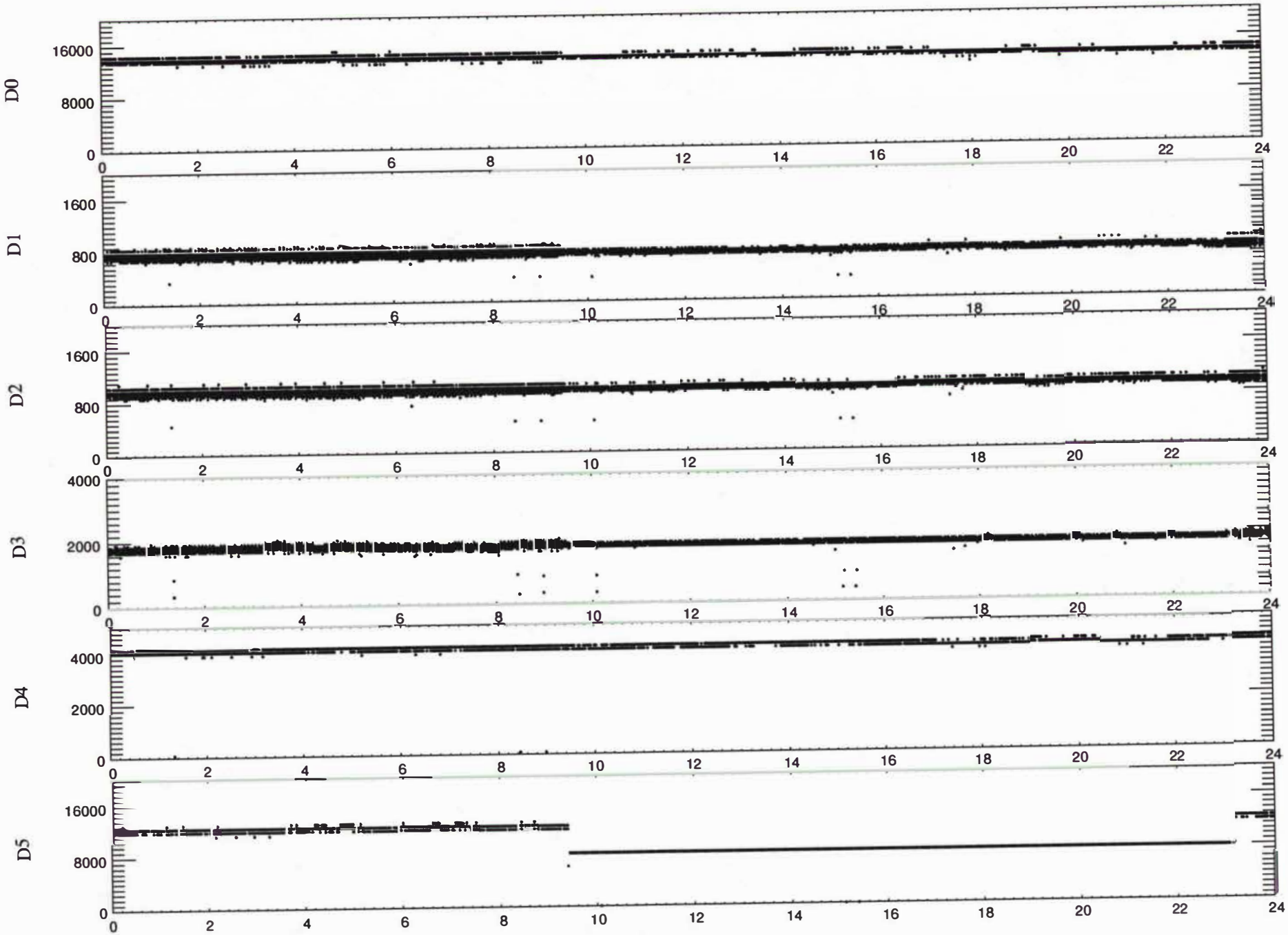
HUS 2A, MODE 1, NOT AVERAGED EDR day 363, year 1997 to day 363, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV AL TIME

HUS 2B COUNTS / SEC EDR day 363, year 1997 to day 363, year 1997 3/12/98



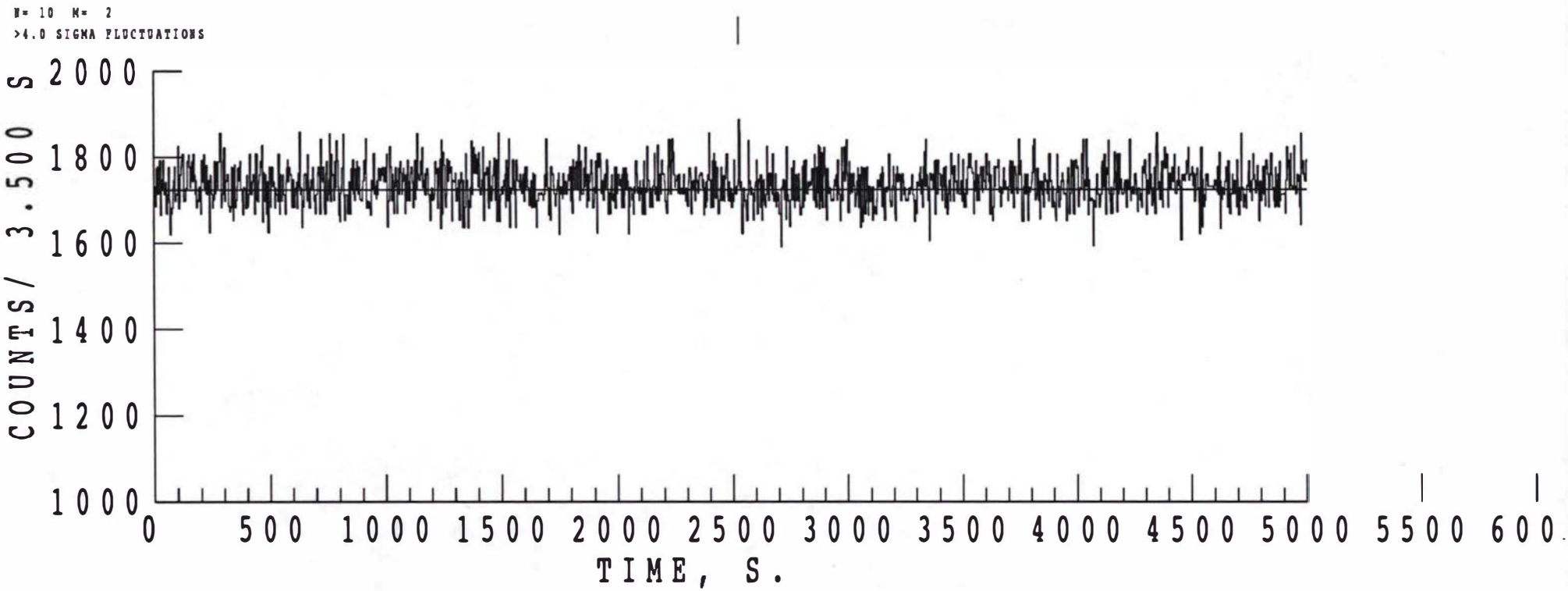
KONUS

ULYSSES RT 07/02/00

30/12/97 22032.197 s

0.250 S INTERVALS REGROUPED BY 14

0- 0 keV



From HENZE@fender.msfc.nasa.gov Fri Jan 2 11:31:13 1998
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA05683; Fri, 2 Jan 1998 11:31:12 -0800
From: HENZE@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA28733; Fri, 2 Jan 1998 11:31:11 -0800
Date: Fri, 2 Jan 1998 13:30:46 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <980102133046.22460a98@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6551
Content-Length: 1135
X-Lines: 26
Status: O

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

BATSE BURST # 6551
EVENT OF 1997 DEC 30 DAY OF YEAR=364
EVENT CROSSING TIME AT BATSE : 32652. S. OR 09:04:12.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 305.000 -10.000
BATSE PEAK COUNTING RATE: 3000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 30/12/ 97 IS:
RA= 169.837 DEC= 11.831 DIST= 4.914 AU
BATSE-ULYSSES DISTANCE = 735097668. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 44.02 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 1763.26 SECS.
CROSSING TIME AT ULYSSES IS 34415. S. OR 09:33:35 +/- 372.60 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 30/12/ 97 IS:
RA= 311.962 DEC= -19.090 DIST= 2.130 AU
MARS-BATSE DISTANCE = 318665536. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION=168.69 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1042.31 SECS.
CROSSING TIME AT MARS IS 31610. S. OR 08:46:49 +/- 20.37 SECONDS

BATSE BURST TRIGGER

NO.: 6551

TIME: TJD=0812 SECONDS=32652

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

SIGNIFICANCE: SIGMA

INTENSITY: COUNTS/CM2

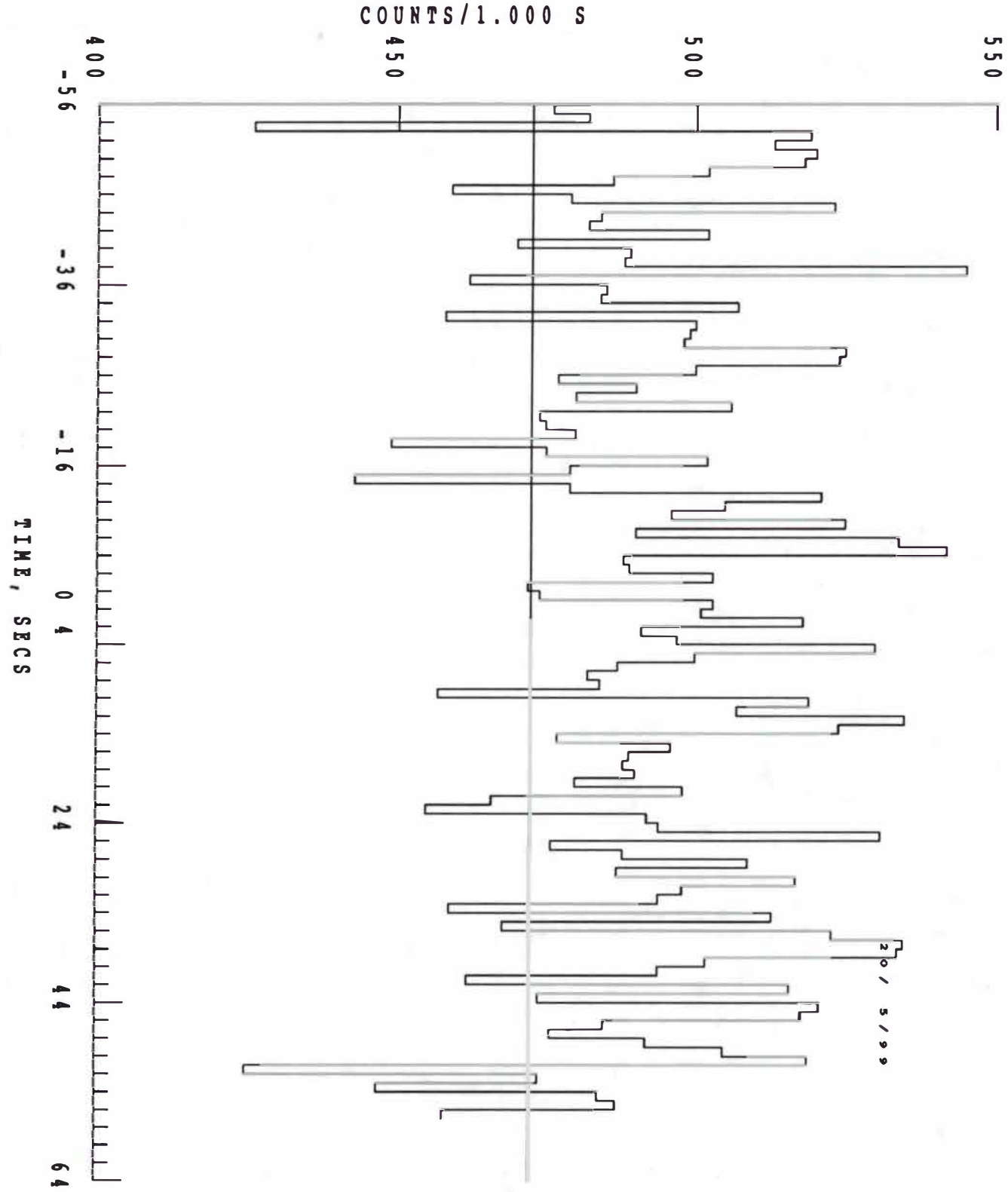
LOCATION: ZENITH= 78.5 AZIMUTH=335.2 ERROR= 5.7 DEGREES

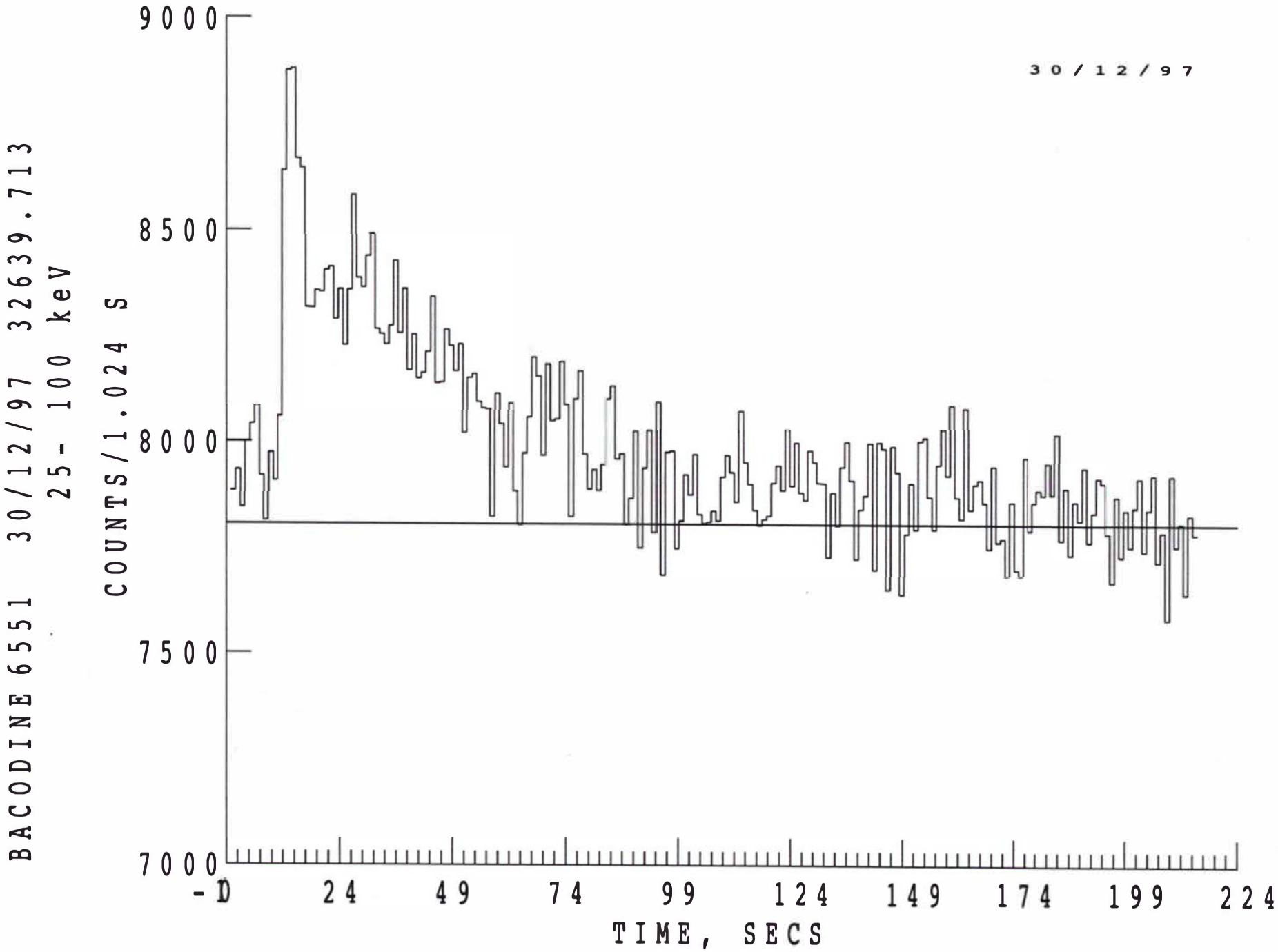
COMMENTS:
SINGLE PULSE WITH STRUCTURE, DUR. APPROX. 80 S.
NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6551 | 971230 | 10812 | 32652 | 3000 | 305 | -10 | 80 |

NEAR 30/12/97 32687.529

100-1000 keV




BACODINE 6551 30/12/97 32639.713
25- 100 keV
COUNTS/1.024 S
9000
8500
8000
7500
7000
30/12/97
-D
24
49
74
99
124
149
174
199
224
TIME, SECS

BATSE BURST# 6551

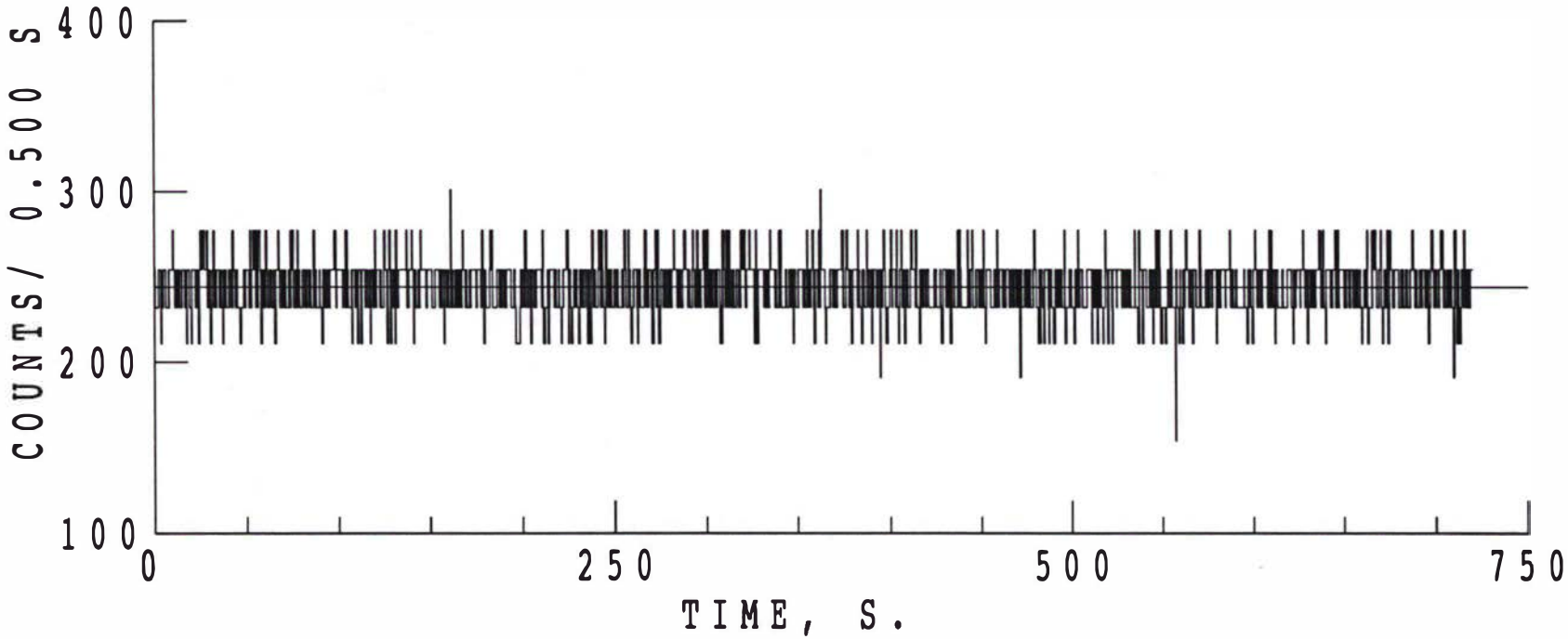
ULYSSES RT 2/ 1/98

30/12/97 34056.078 s

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



From HENZE@fender.msfc.nasa.gov Fri Jan 2 11:33:26 1998
Return-Path: <HENZE@fender.msfc.nasa.gov>
Received: from sunspot.ssl.berkeley.edu by apollo.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA05714; Fri, 2 Jan 1998 11:33:25 -0800
From: HENZE@fender.msfc.nasa.gov
Received: from FENDER.MSFC.NASA.GOV by sunspot.ssl.berkeley.edu (SMI-8.6/SMI-SVR4)
id LAA28757; Fri, 2 Jan 1998 11:33:24 -0800
Date: Fri, 2 Jan 1998 13:33:19 -0600 (CST)
To: khurley@sunspot.ssl.berkeley.edu
Message-Id: <980102133319.22460a98@fender.msfc.nasa.gov>
Subject: Crossing Windows for BATSE Burst 6552
Content-Length: 1135
X-Lines: 26
Status: O

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

BATSE BURST # 6552
EVENT OF 1997 DEC 30 DAY OF YEAR=364
EVENT CROSSING TIME AT BATSE : 40084. S. OR 11:08:04.0
COORDINATES ARE 0.000 0.000 6800. (RA, DEC, DIST.)
BURST ARRIVAL DIRECTION: 148.000 -19.000
BATSE PEAK COUNTING RATE: 4000 C/S

EVENT CROSSING TIME AT ULYSSES WILL BE FOUND
INTERPOLATED POSITION OF ULYSSES ON 30/12/ 97 IS:
RA= 169.830 DEC= 11.831 DIST= 4.912 AU
BATSE-ULYSSES DISTANCE = 734900998. KM.
ANGLE WHICH BATSE-ULYSSES VECTOR MAKES WITH GRB ARRIVAL DIRECTION=142.40 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH=-1942.26 SECS.
CROSSING TIME AT ULYSSES IS 38142. S. OR 10:35:41 +/- 280.16 SECONDS

EVENT CROSSING TIME AT MARS WILL BE FOUND
POSITION OF MARS ON 30/12/ 97 IS:
RA= 311.962 DEC= -19.090 DIST= 2.130 AU
MARS-BATSE DISTANCE = 318665536. KM.
ANGLE WHICH BATSE-MARS VECTOR MAKES WITH GRB ARRIVAL DIRECTION= 41.21 DEG.
LIGHT TRAVEL TIME ALONG PROJECTED PATH= 799.62 SECS.
CROSSING TIME AT MARS IS 40884. S. OR 11:21:23 +/- 133.73 SECONDS

BATSE BURST TRIGGER
NO.: 6552

TIME: TJD=0812 SECONDS=40084

TYPE: BURST SOLAR FLARE TRIGGER SIGNAL:N

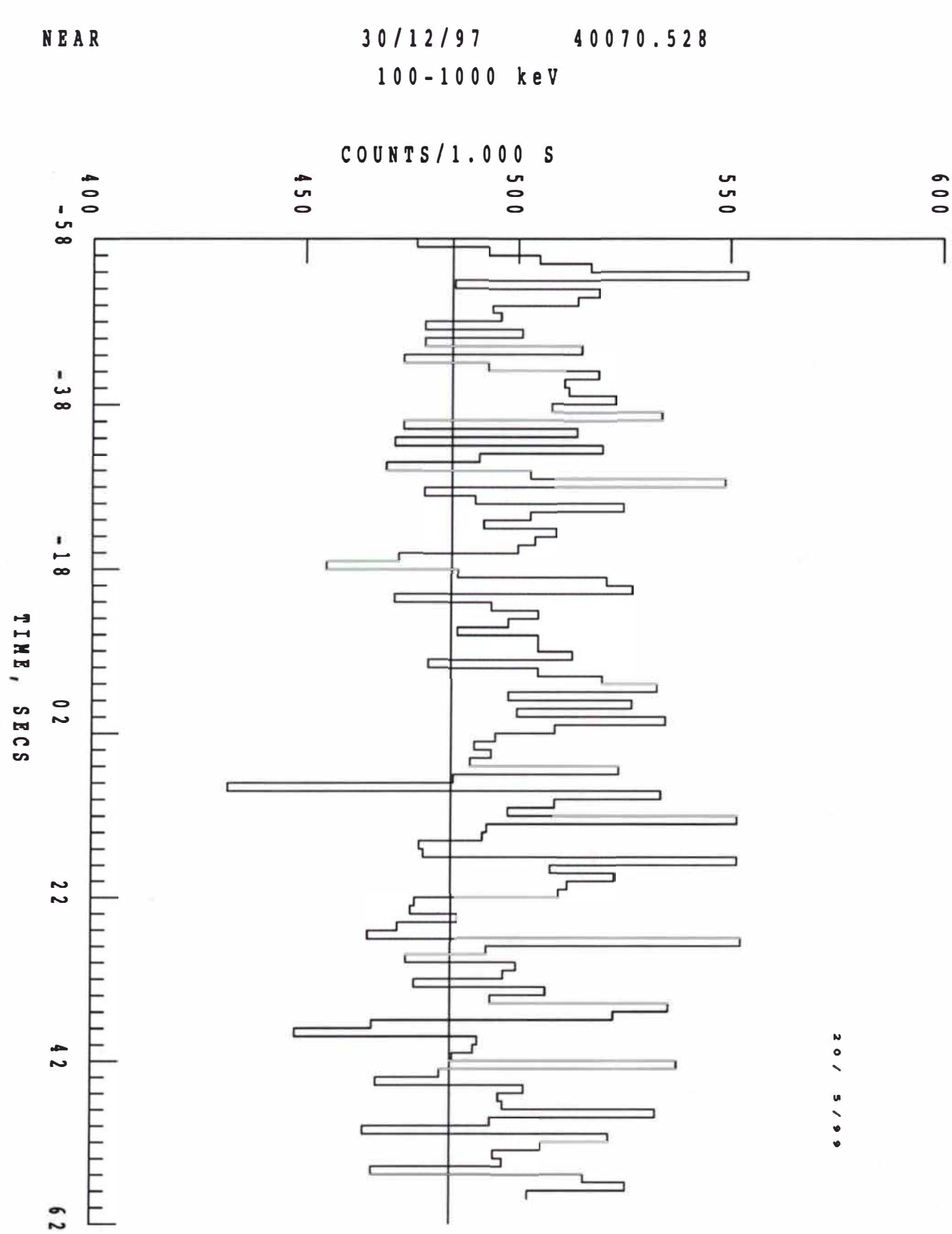
SIGNIFICANCE: SIGMA

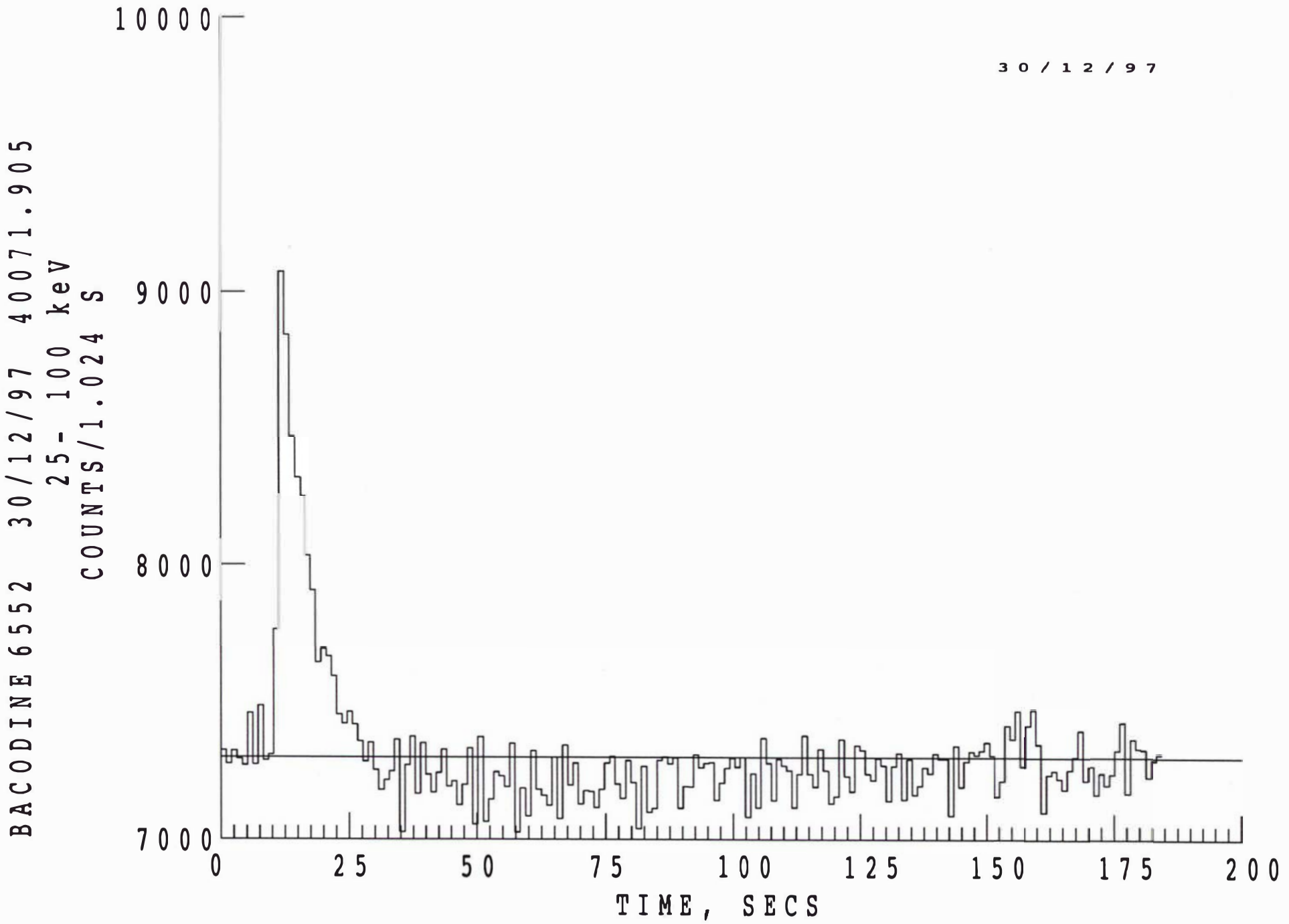
INTENSITY: COUNTS/CM2

LOCATION: ZENITH= 65.5 AZIMUTH=150.6 ERROR= 2.4 DEGREES

COMMENTS:
SINGLE PULSE, DUR. APPROX. 20 S. NOT VISIBLE ABOVE 300 KEV.

| BATSE # | Date | TJD | SoD | Max ct/s | RA | Dec | Dur (s) |
|---|---|---|---|---|---|---|---|
| 6552 | 971230 | 10812 | 40084 | 4000 | 148 | -19 | 20 |


NEAR
30/12/97
40070.528
100-1000 keV
COUNTS/1.000 S
400
450
500
550
600
-58
-38
-18
02
22
42
62
TIME, SECS
20/ 5/99


BACODINE 6552 30/12/97 40071.905
25- 100 keV
COUNTS/1.024 S
10000
9000
8000
7000
30/12/97
0
25
50
75
100
125
150
175
200
TIME, SECS

BATSE BURST# 6552

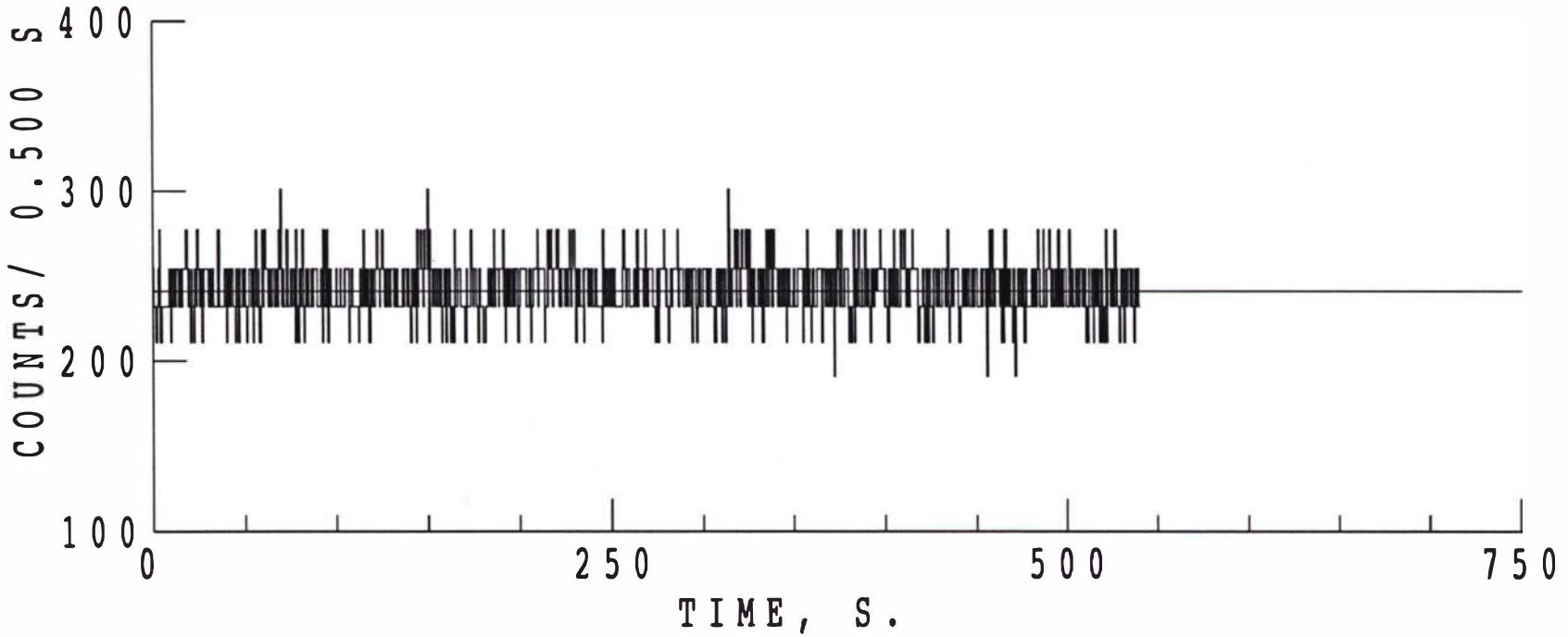
ULYSSES RT 2/ 1/98

30/12/97 37872.121 s

0- 0 keV

N= 10 M=10
>4.0 SIGMA FLUCTUATIONS

N= 10 M= 2
>4.0 SIGMA FLUCTUATIONS



Date: Nov 06 '06

# BURST TRIANGULATION CHECKLIST

## 1. Ulysses Data N/A

☐ Jim Schmidling's stat file correction applied?

☐ Final ephemeris used?

☐ Final, CDROM data used?

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

## 2. For Konus events

☑ Konus ecliptic latitude used with latest calibration?

## 2. For Odyssey events

☐ Was CHECKMO run to eliminate data gaps?

☐ Did the Odyssey ephemeris correspond to the event time? (When there is data in the database, the ephemeris is for the start of record, usually ~1320 s prior to the request time; when there is no data in the database, the ephemeris is for the request time in the e-mail, so the request time in mosearch should be equal to the GRB time. Note that the time in the return e-mail will be ~1320 s prior to the time requested, in the line "no HEND data…")

☐ Was Mars-blocking used?

☐ For cruise phase data (April – October 2001), was the updated data used? (Old data has timing errors)

☐ GRS database searched for triggered data? Database data between August 2005 and January 2006 should be re-extracted, due to timing errors. (E-mailed data should be OK).

☐ GRS and HEND data cross-correlated to check timing?

## 2. For 3 or More Spacecraft events

☐ $\Sigma$ 3$\Delta$t's calculated, and/or BMAPSUM executed?

## 3. For INTEGRAL events

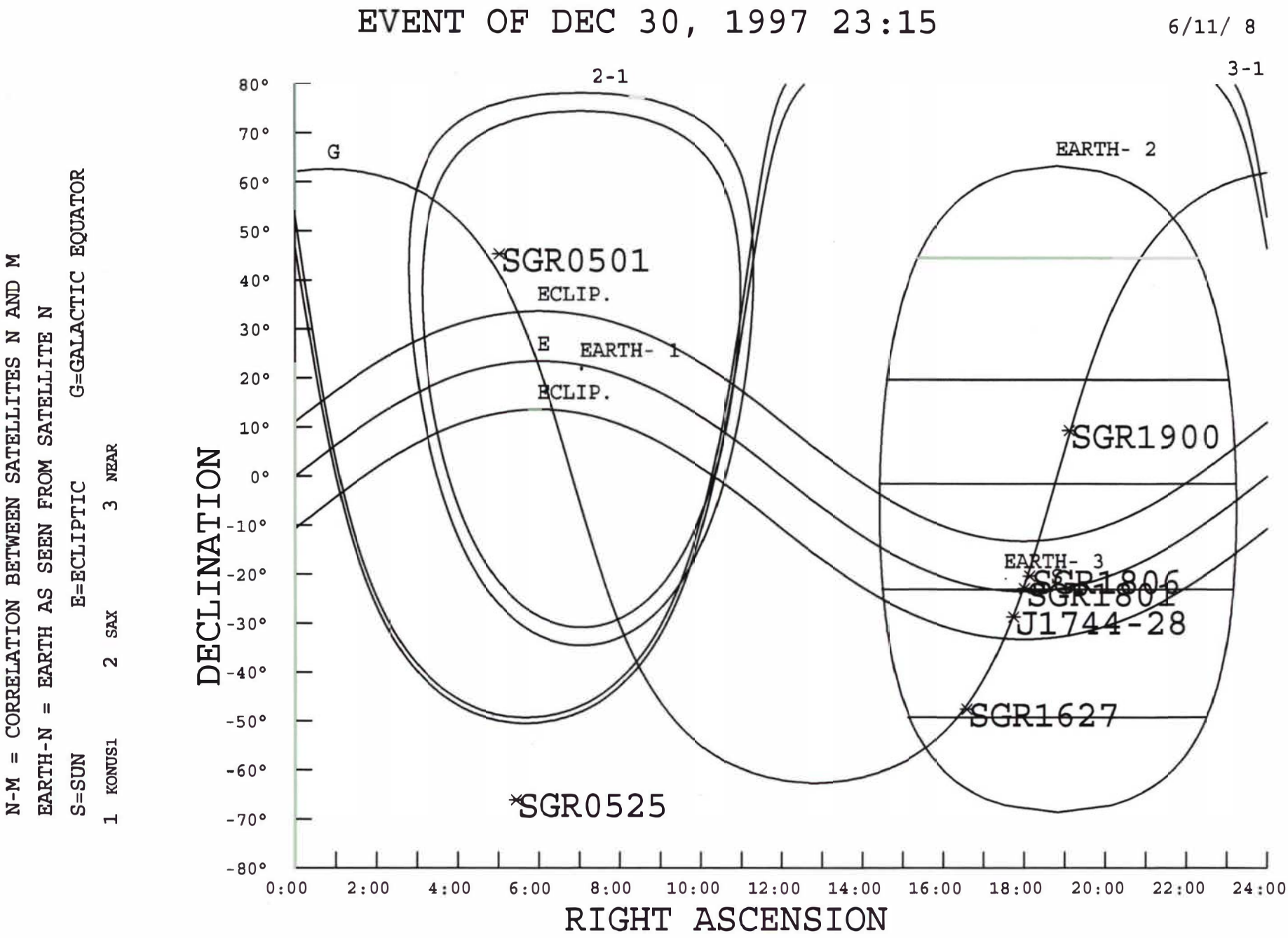
☐ INTEGRAL SPI-ACS website checked for bursts that weren't transmitted automatically?

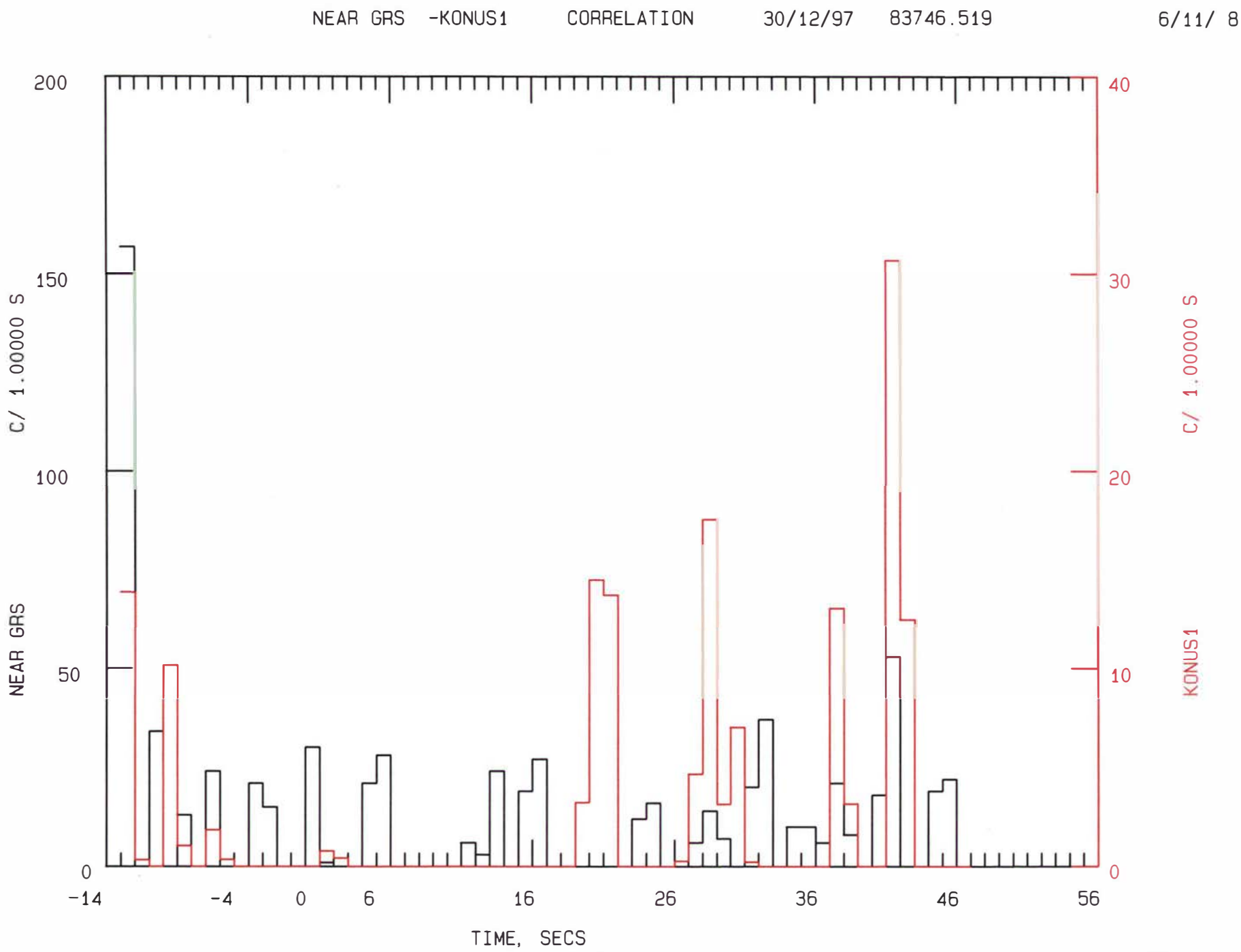
☐ 125 ms added to INTEGRAL SPI-ACS time for bursts prior to April 2 2004 11:00 UT?

☐ Updated ephemeris used for bursts prior to September 30, 2003?

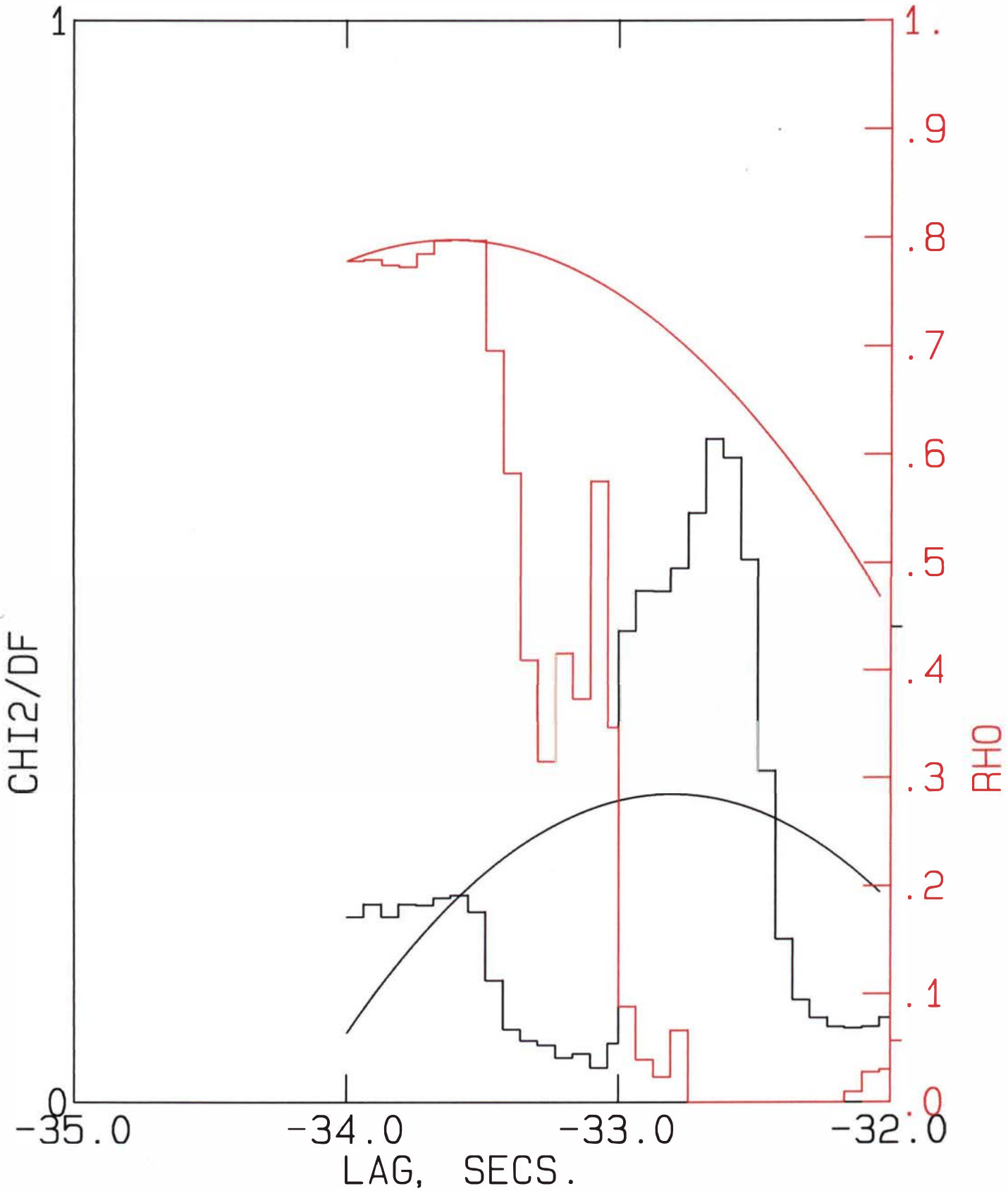
---

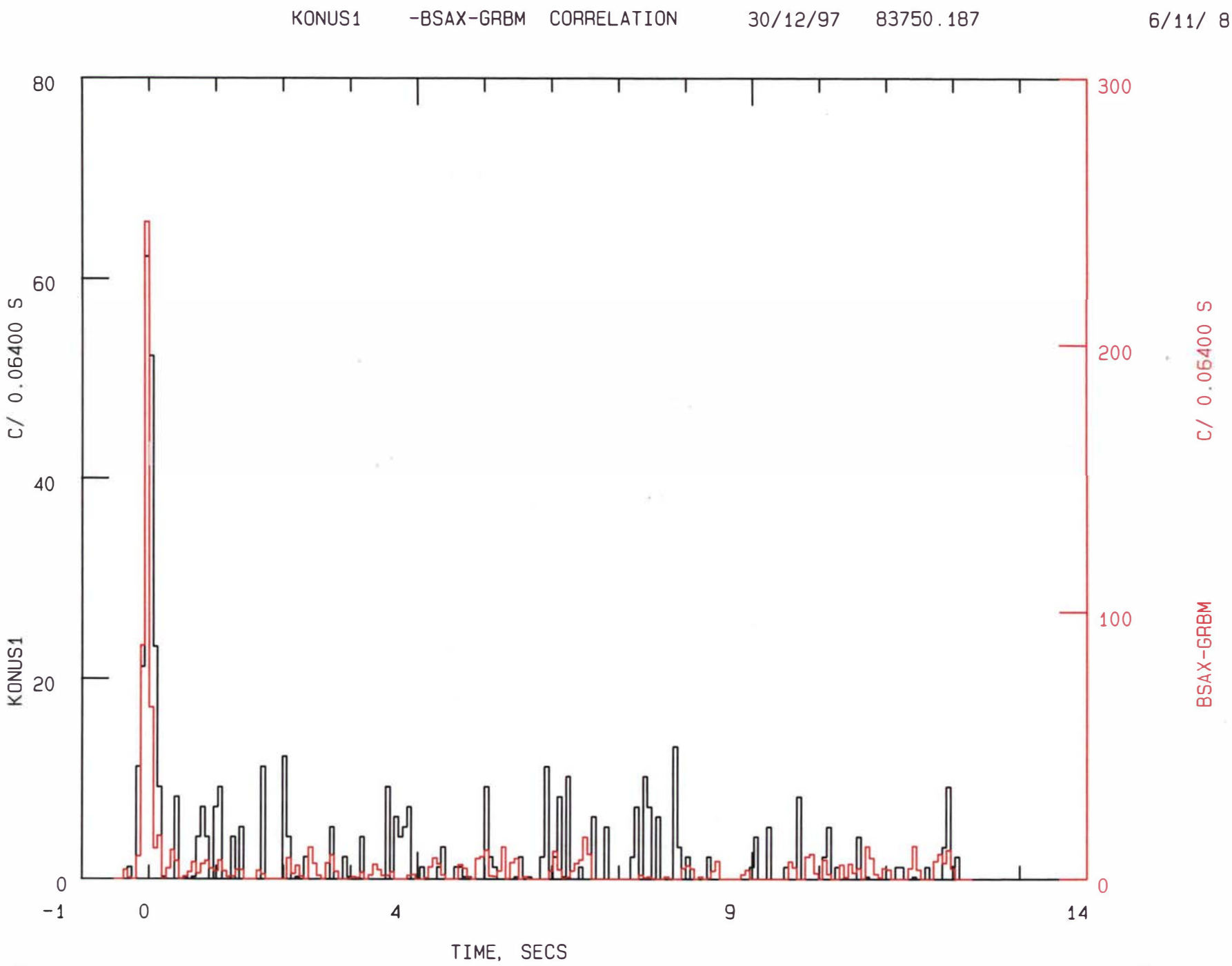
☑ ACCESS and MBL4 databases updated?


EVENT OF DEC 30, 1997 23:15
6/11/ 8
N-M = CORRELATION BETWEEN SATELLITES N AND M
EARTH-N = EARTH AS SEEN FROM SATELLITE N
S=SUN E=ECLIPTIC G=GALACTIC EQUATOR
1 KONUS1 2 SAX 3 NEAR
2-1
3-1
G
EARTH- 2
SGR0501
ECLIP.
E
EARTH- 1
ECLIP.
SGR1900
EARTH- 3
SGR1806
SGR1801
J1744-28
SGR1627
SGR0525
DECLINATION
80°
70°
60°
50°
40°
30°
20°
10°
0°
-10°
-20°
-30°
-40°
-50°
-60°
-70°
-80°
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
RIGHT ASCENSION

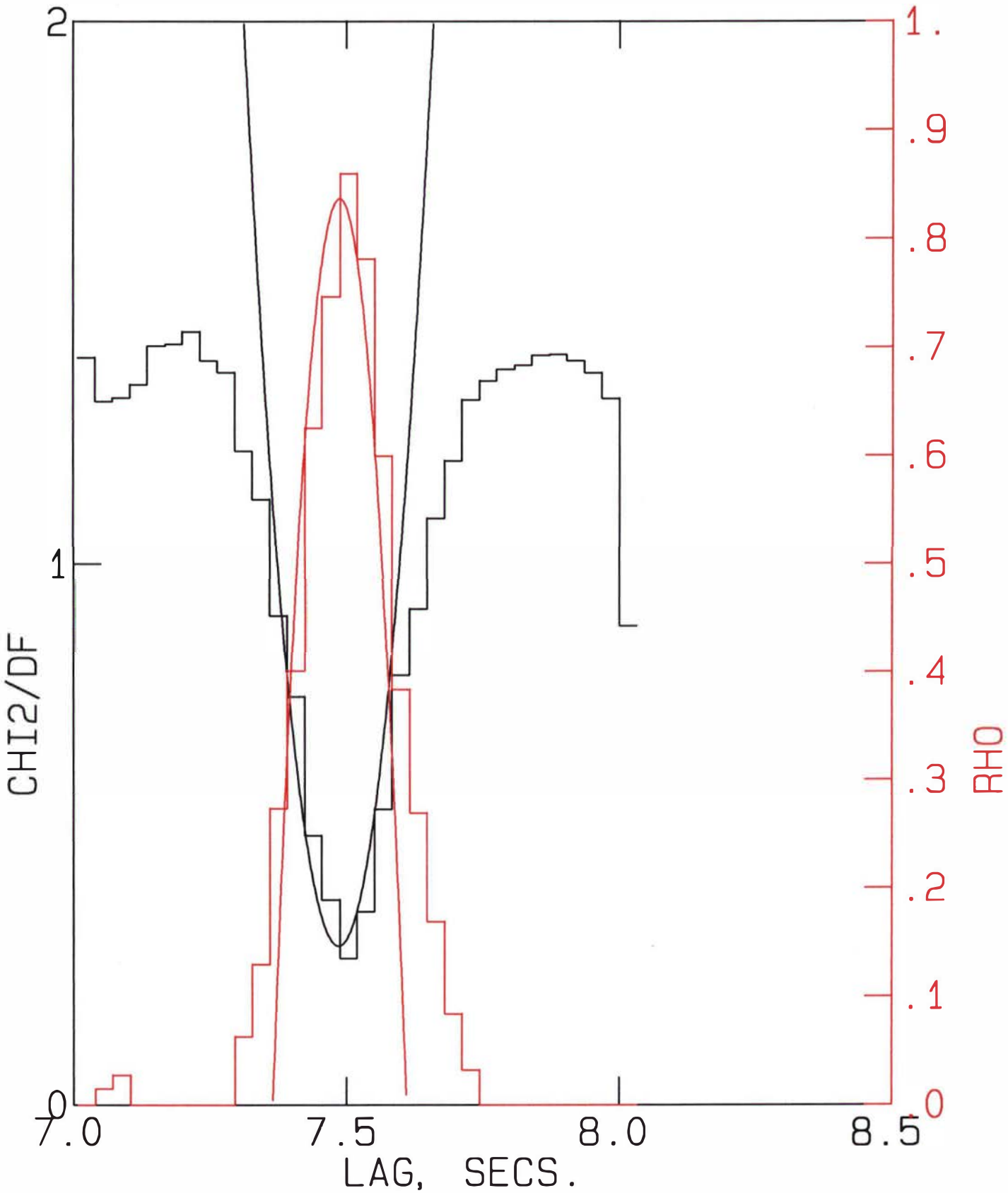

NEAR GRS -KONUS1 CORRELATION 30/12/97 83746.519 6/11/ 8
200
150
100
50
0
C/ 1.00000 S
NEAR GRS
40
30
20
10
0
C/ 1.00000 S
KONUS1
-14
-4
0
6
16
26
36
46
56
TIME, SECS

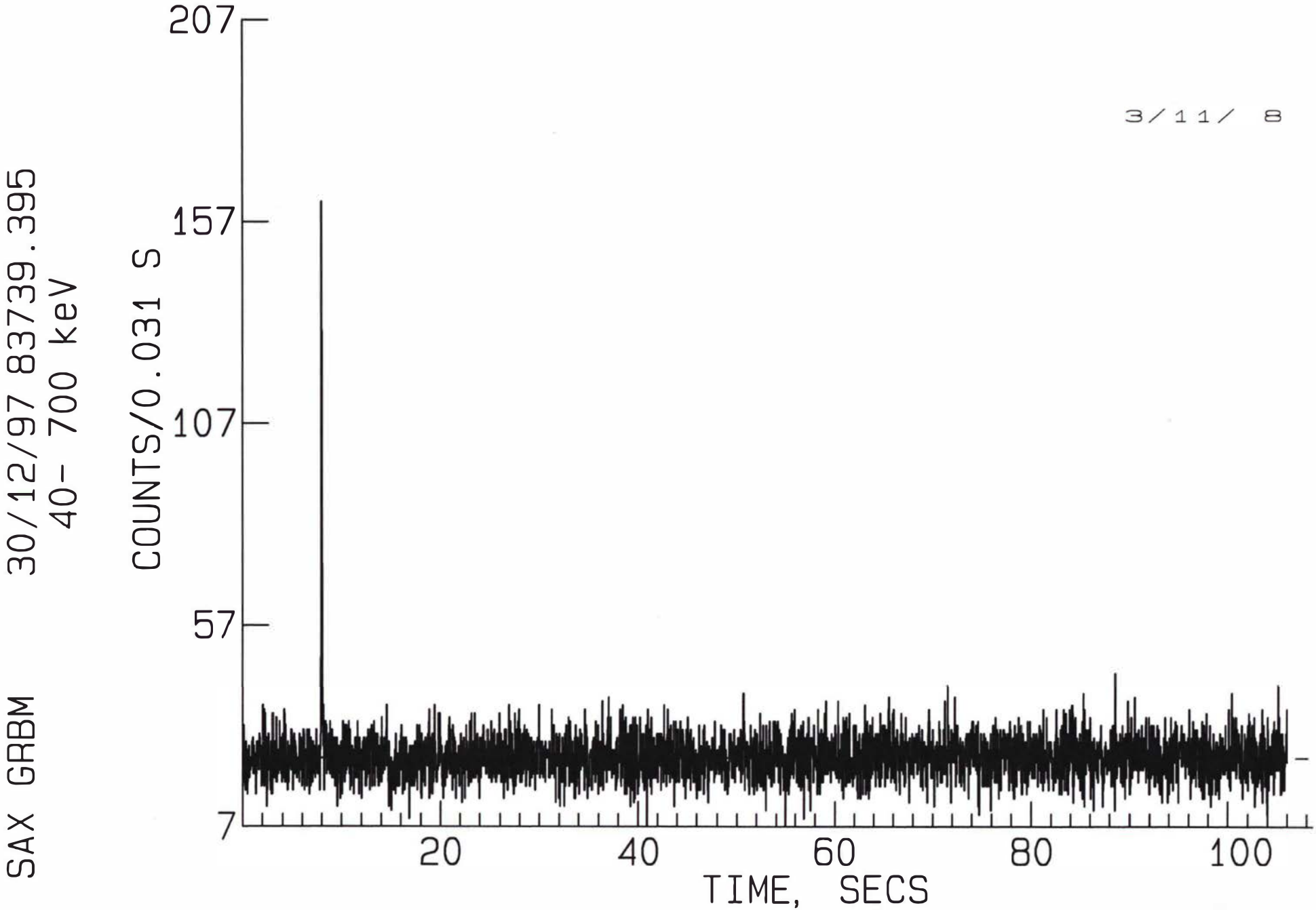
NEAR GRS -KONUS1 CORRELATION 30/12/97 83746.519




KONUS1 -BSAX-GRBM CORRELATION 30/12/97 83750.187 6/11/ 8
80
60
40
20
0
C/ 0.06400 S
KONUS1
300
200
100
0
C/ 0.06400 S
BSAX-GRBM
-1
0
4
9
14
TIME, SECS

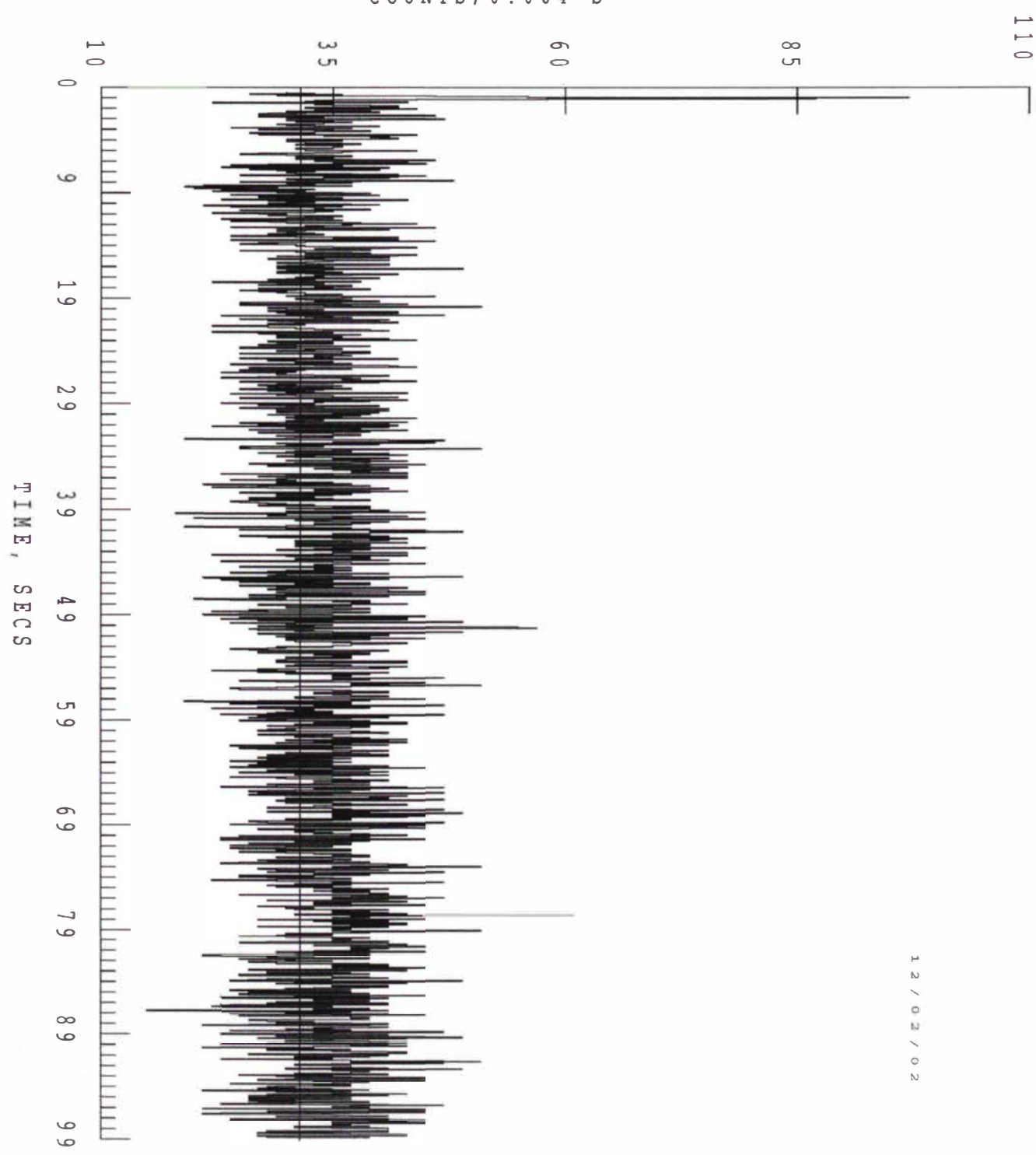
KONUS1 -BSAX-GRBM CORRELATION 30/12/97 83750.187




SAX GRBM
30/12/97 83739.395
40- 700 keV
COUNTS/0.031 S
207
157
107
57
7
20
40
60
80
100
TIME, SECS
3/11/ 8

KONUS1 30/12/97 83750.187

50- 200 keV



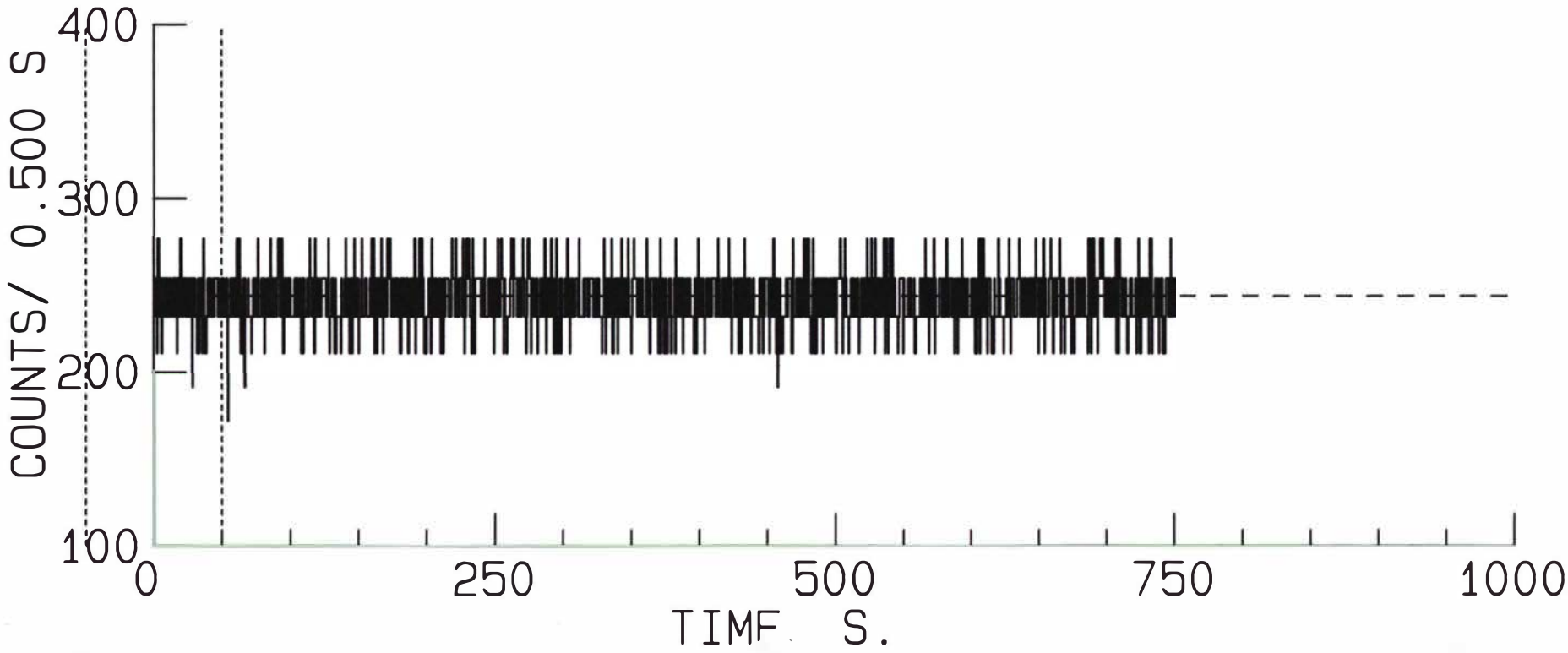
Kanes 0.4s

ULYSSES RT

31/10/ 8

30/12/97 81252.102 s

22- 148 keV

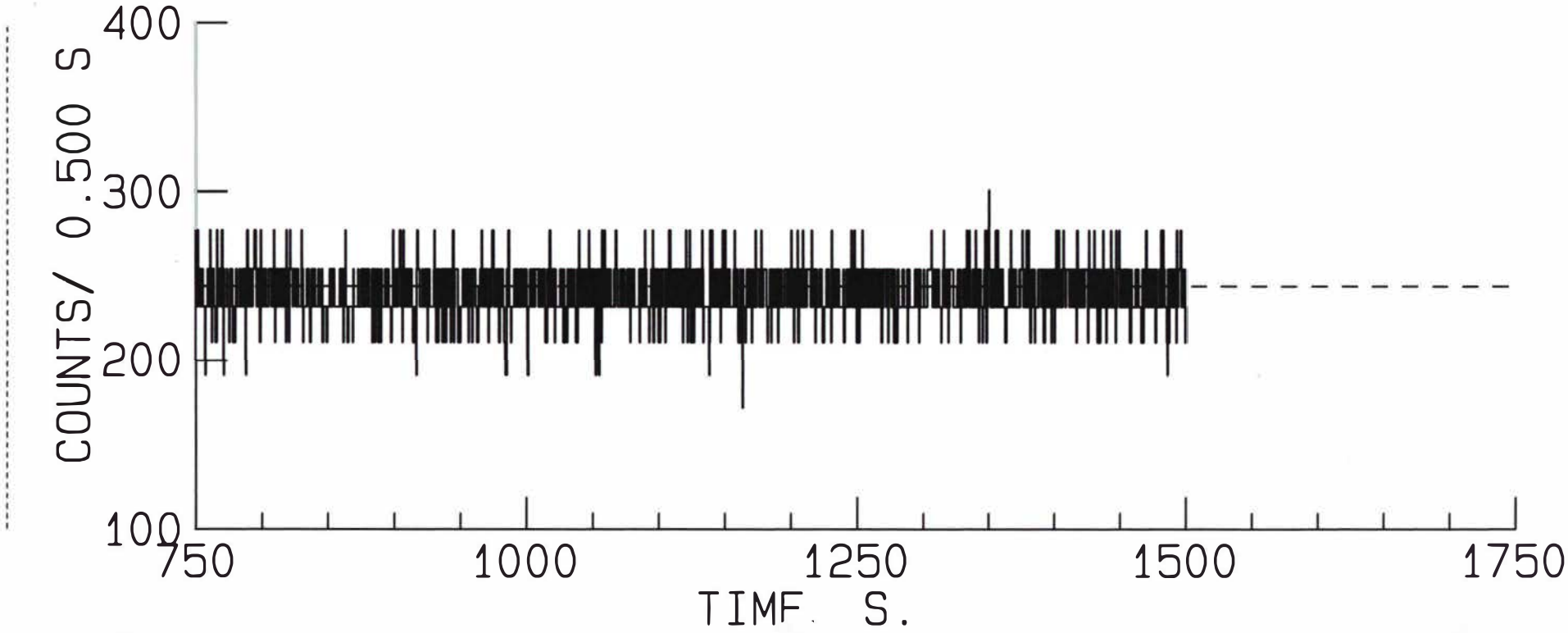


ULYSSES RT

31/10/ 8

30/12/97 81252.102 s

22- 148 keV

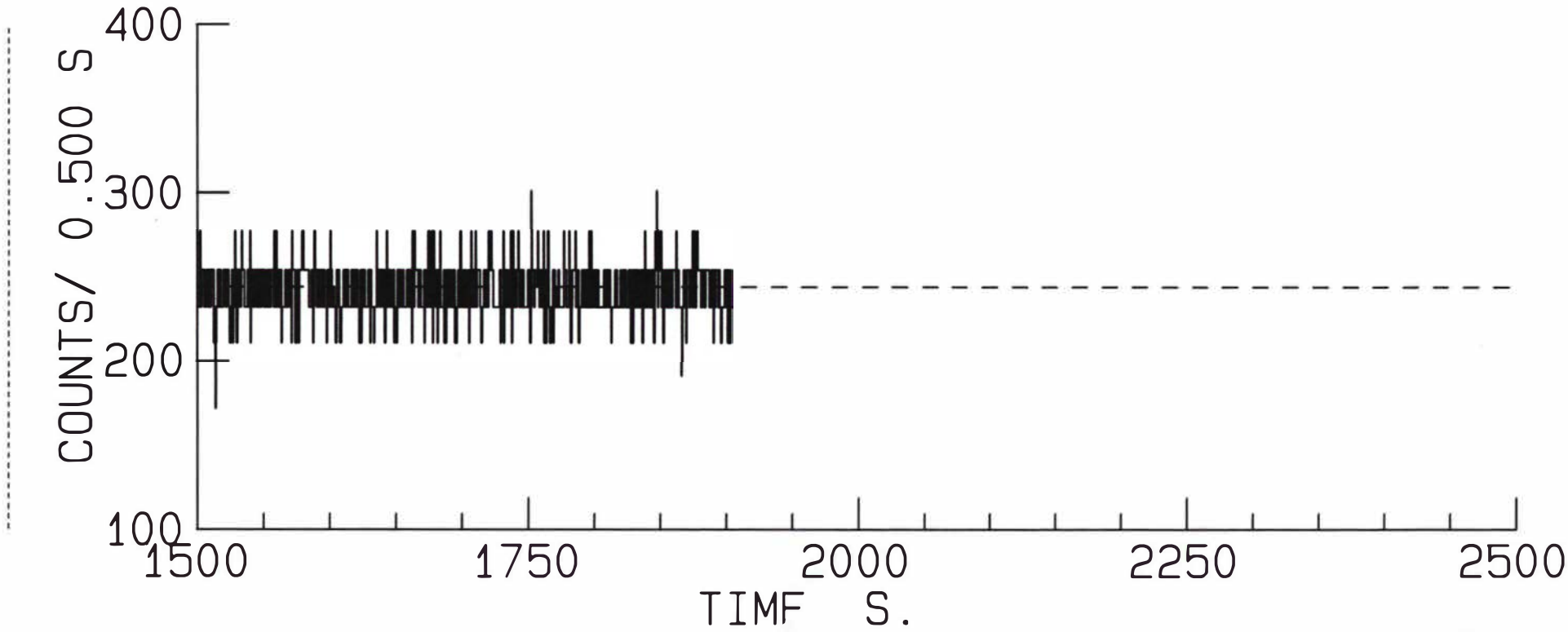


ULYSSES RT

31/10/ 8

30/12/97  81252.102 s

22- 148 keV

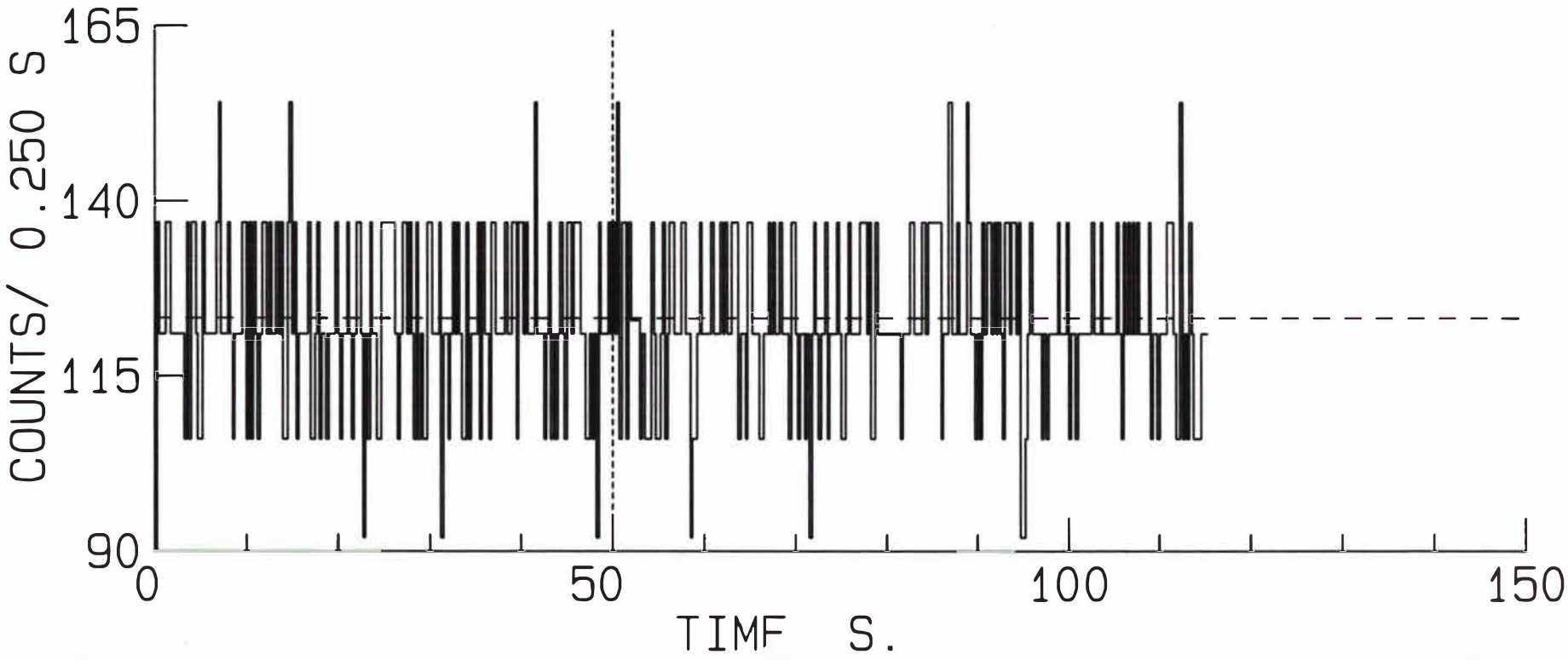


ULYSSES RT

31/10/ 8

30/12/97 83268.883 s

22- 148 keV

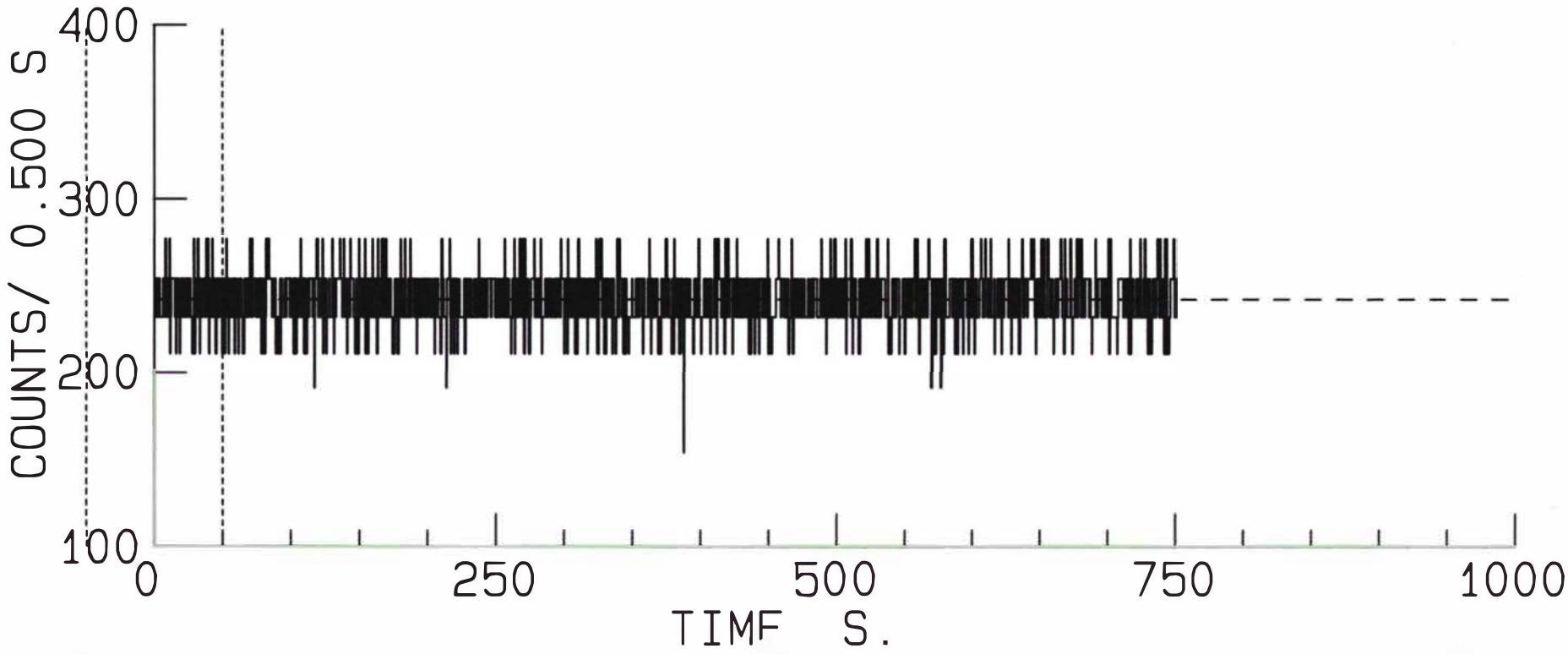


ULYSSES RT

31/10/ 8

30/12/97  83383.633 s

22- 148 keV

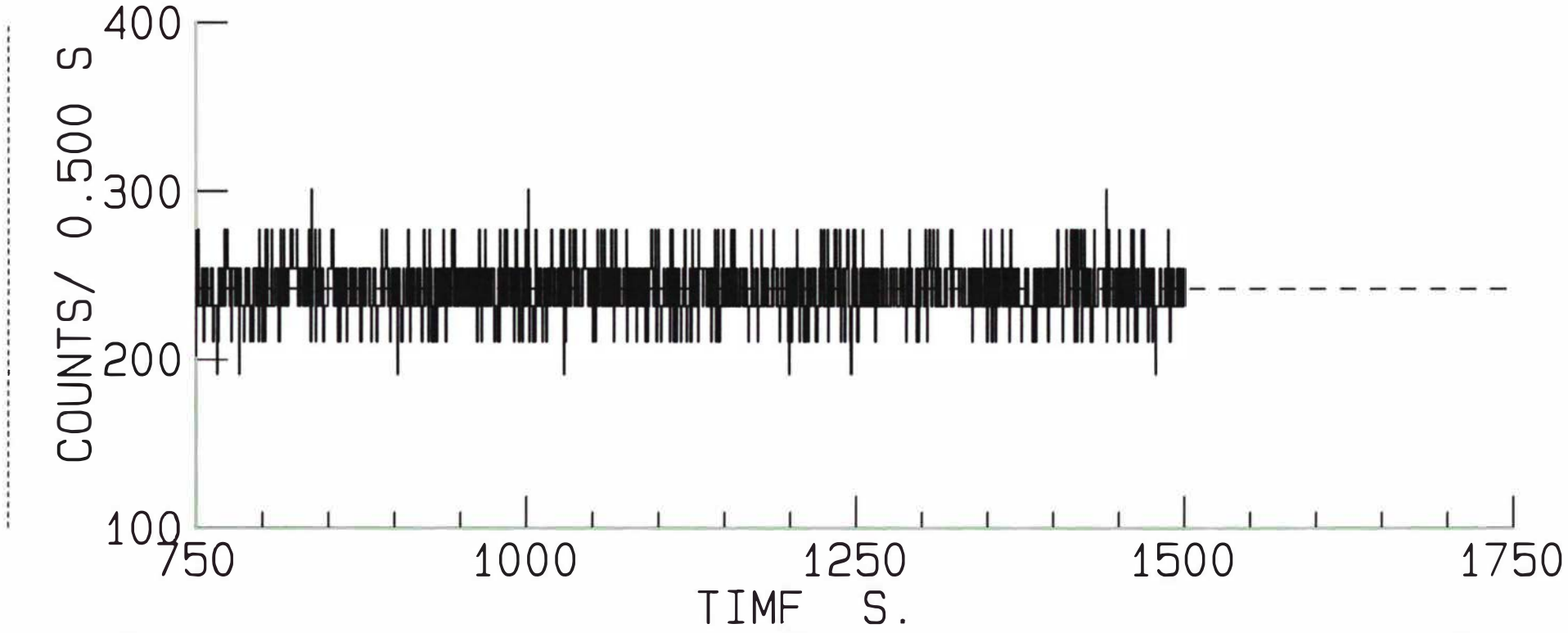


ULYSSES RT

31/10/ 8

30/12/97  83383.633 s

22- 148 keV

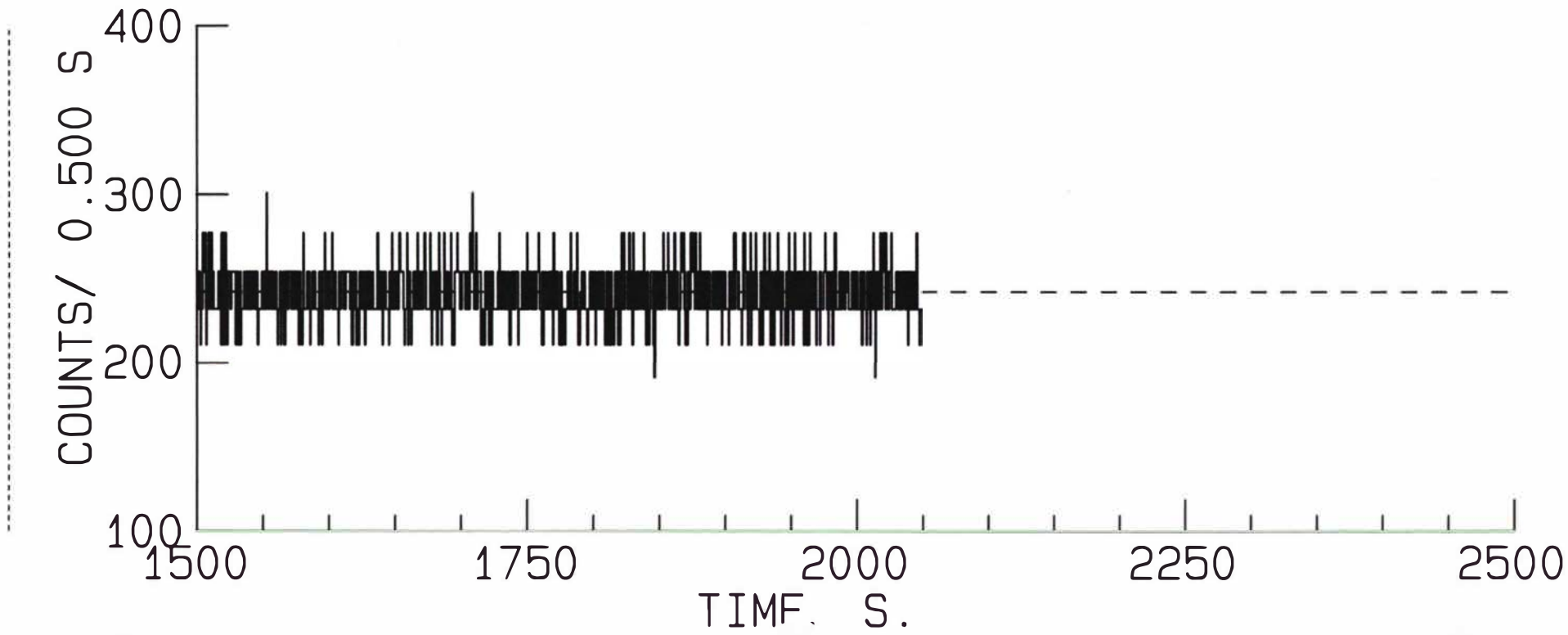


ULYSSES RT

31/10/ 8

30/12/97  83383.633 s

22- 148 keV

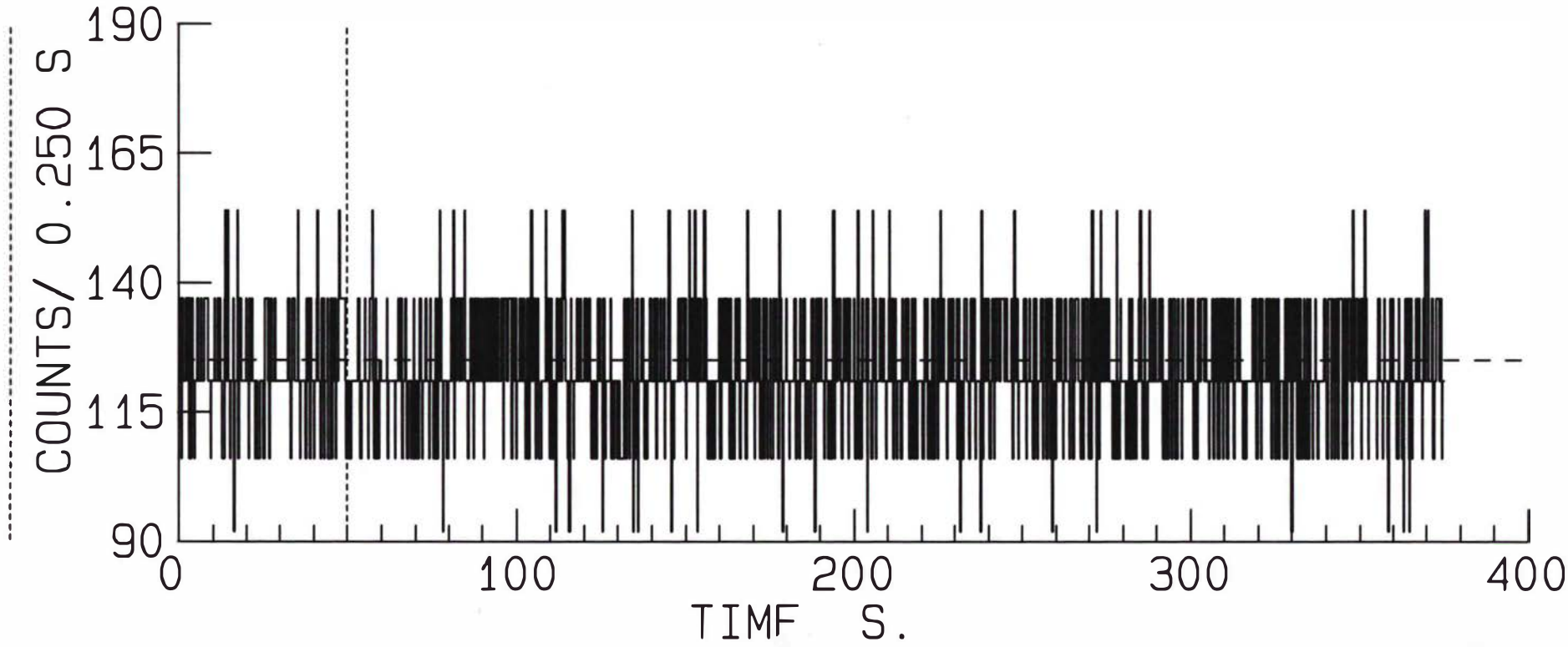


ULYSSES RT

30/12/97  85431.648 s

22- 148 keV

31/10/ 8

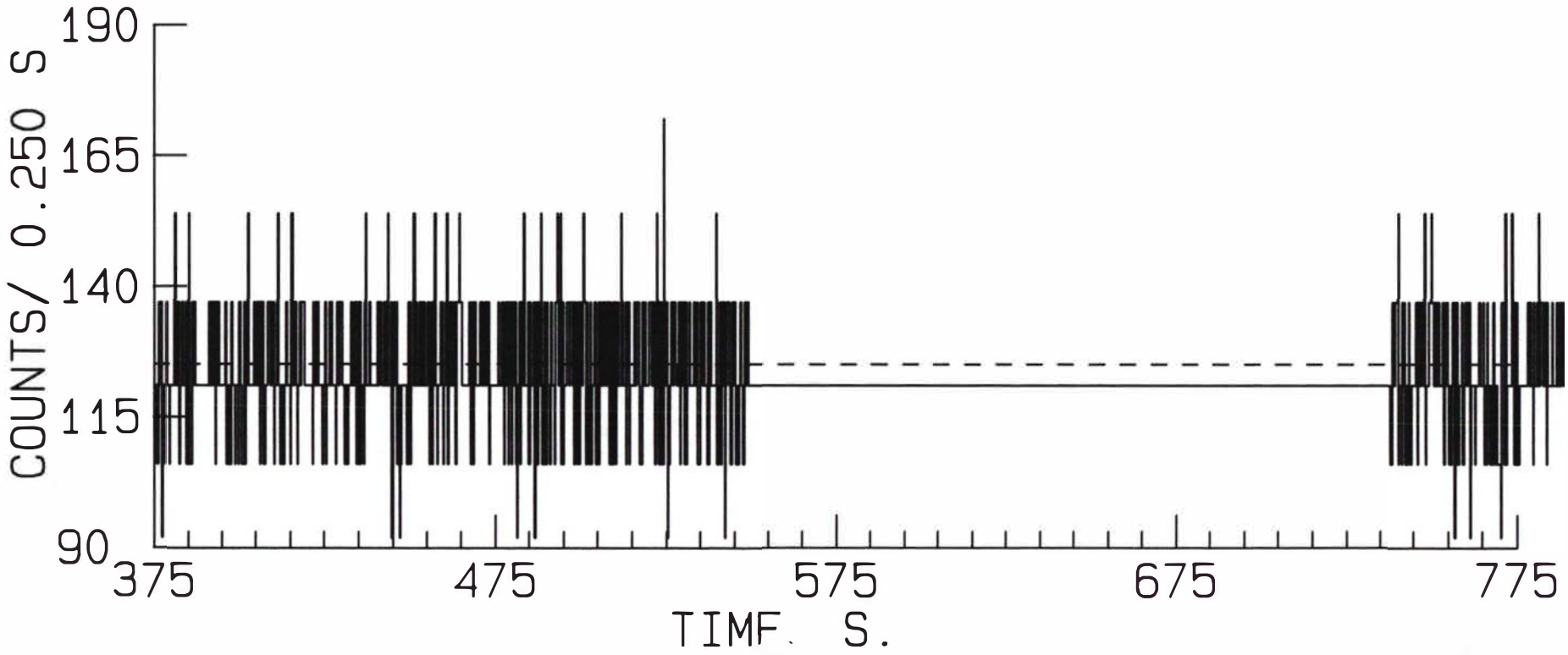


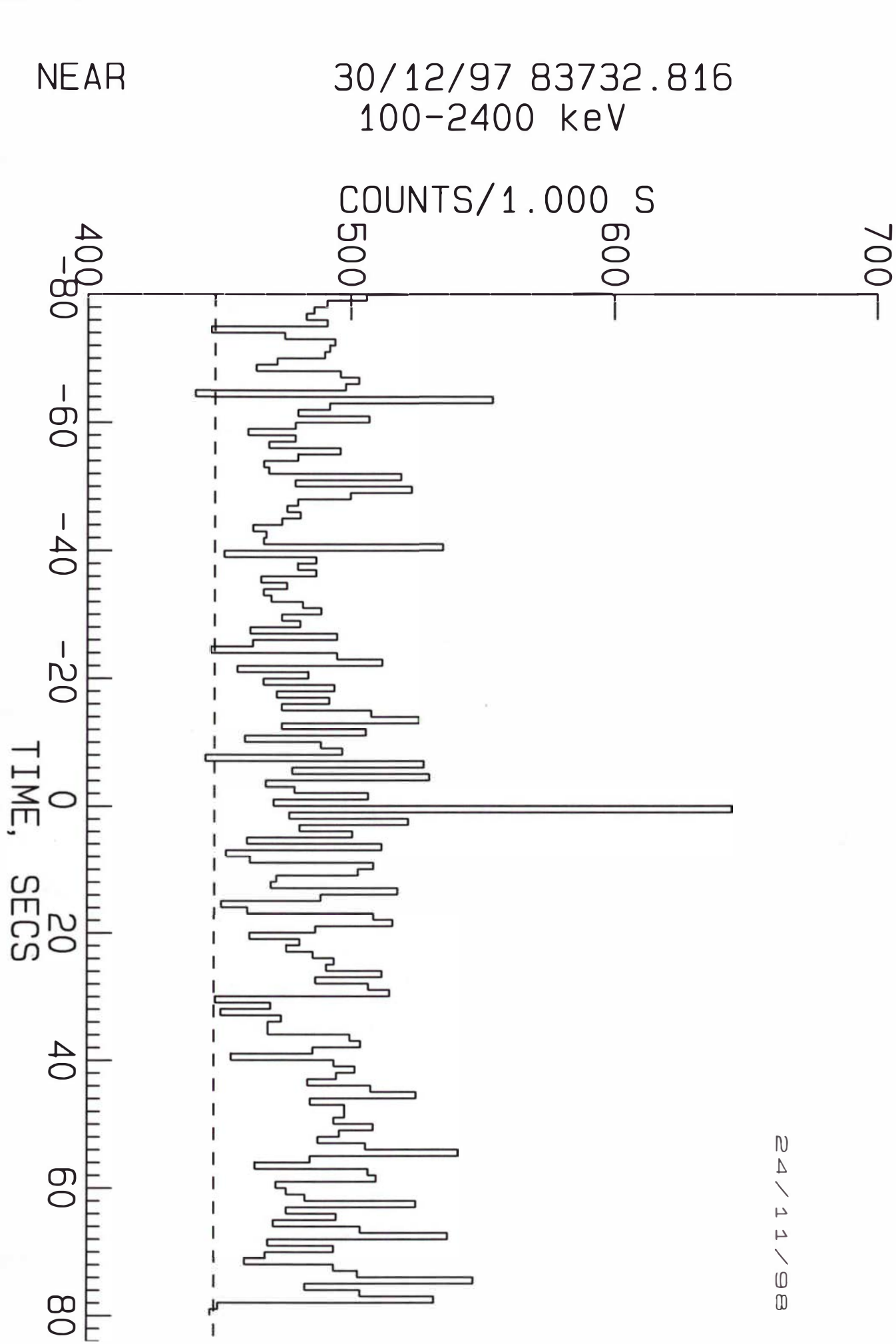
ULYSSES RT

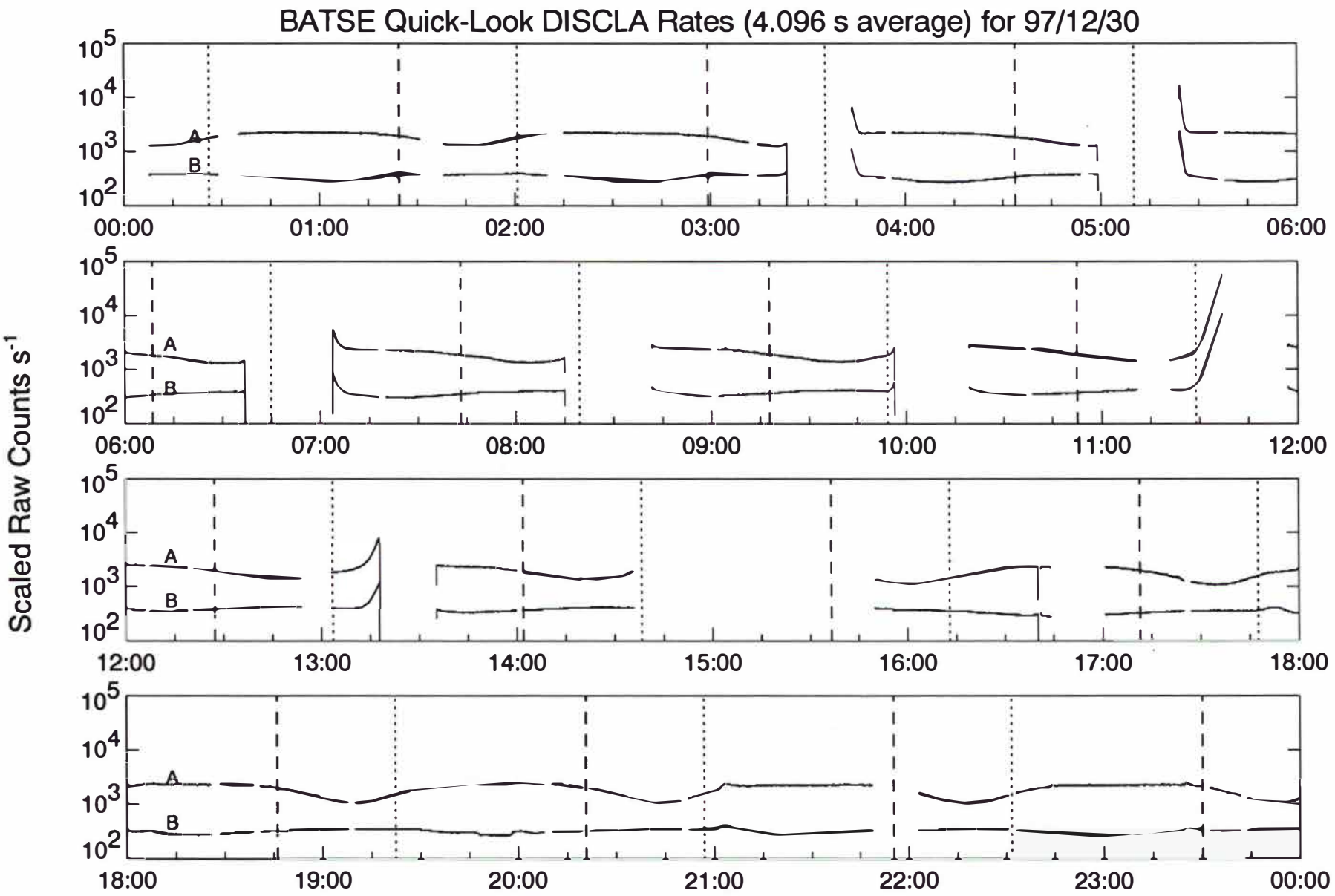
31/10/ 8

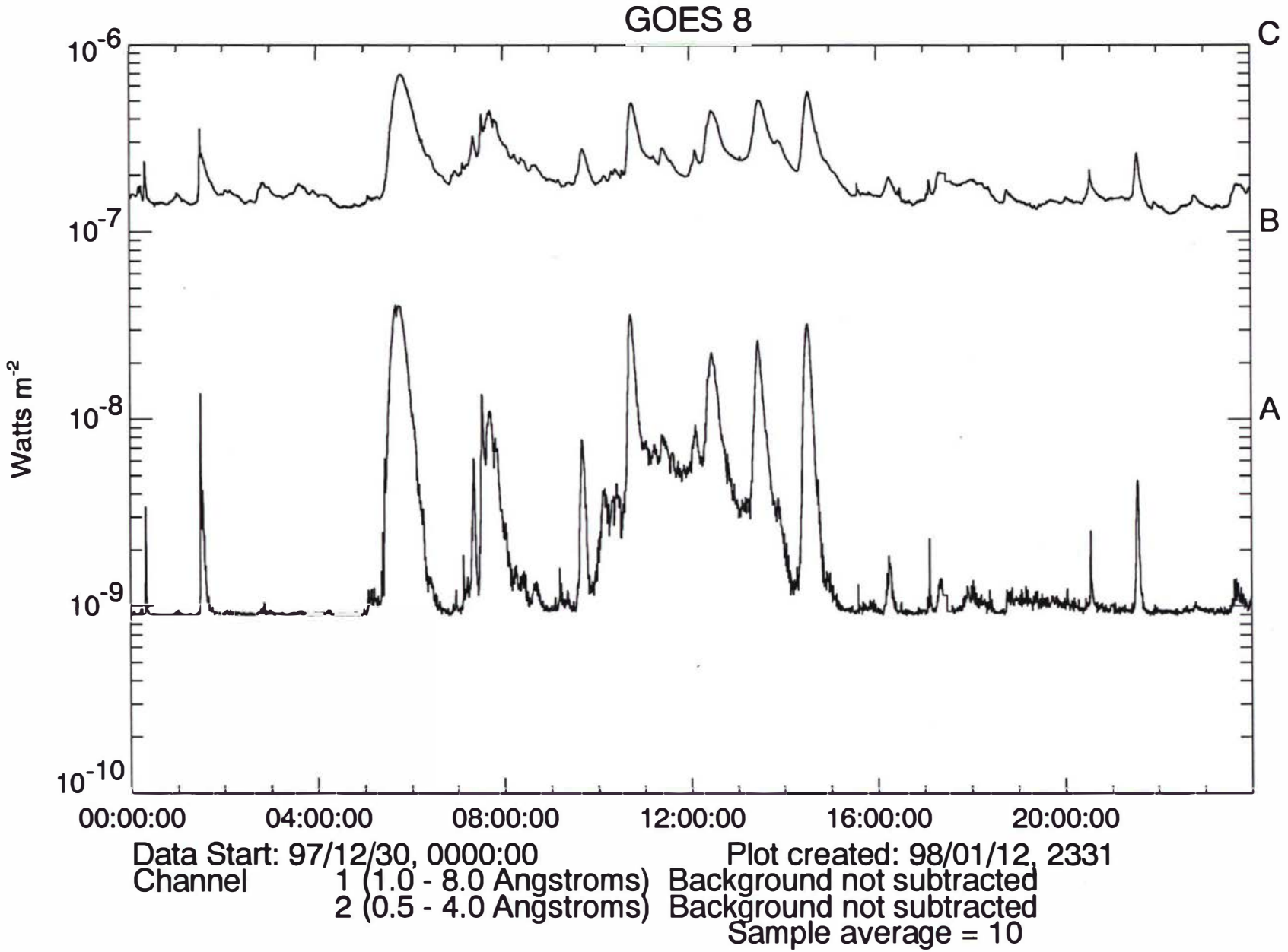
30/12/97  85431.648 s

22- 148 keV

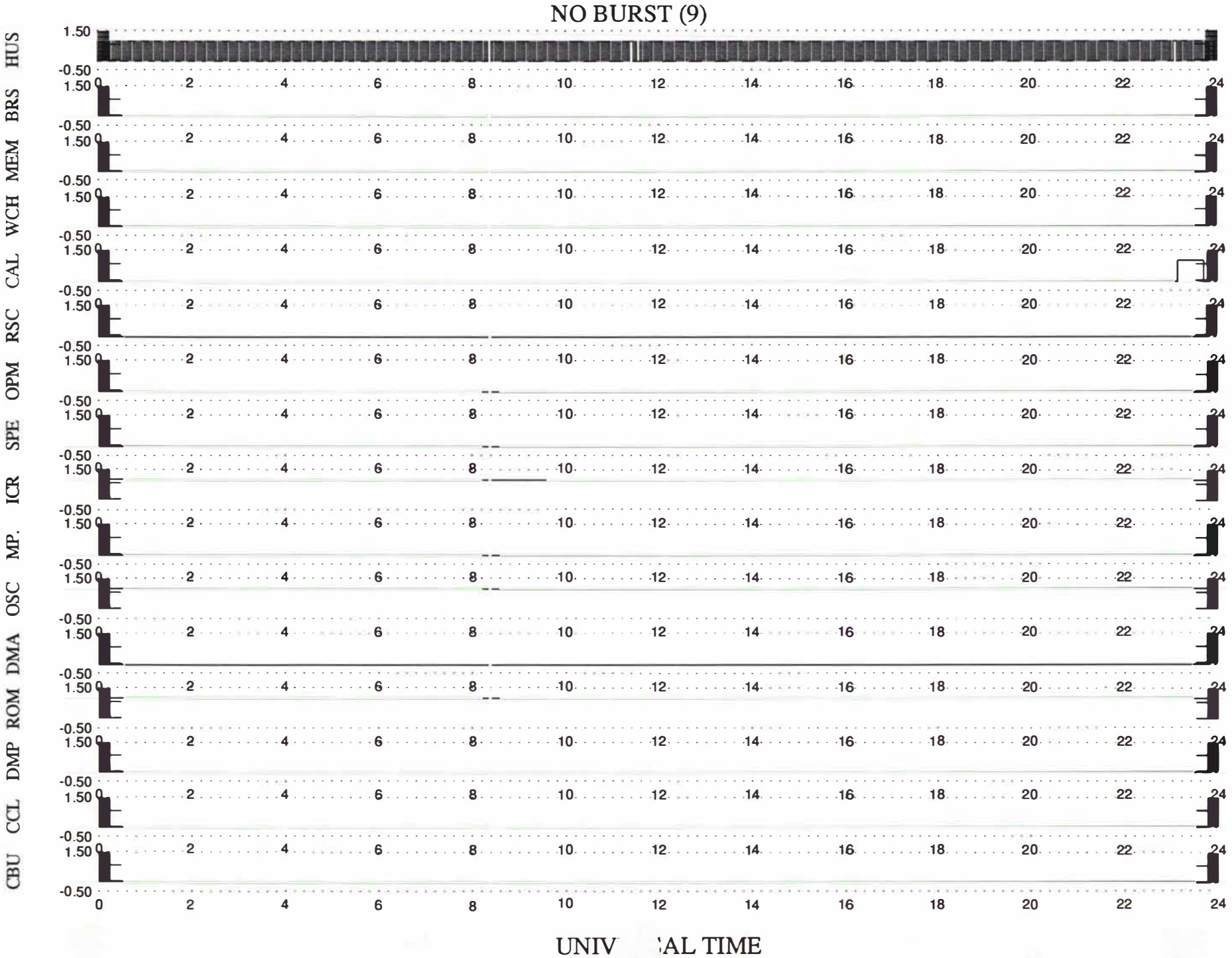



NEAR
30/12/97 83732.816
100-2400 keV
COUNTS/1.000 S
400
500
600
700
-80
-60
-40
-20
0
20
40
60
80
TIME, SECS
24/11/98


BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/30
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 98/01/12, 2332 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare

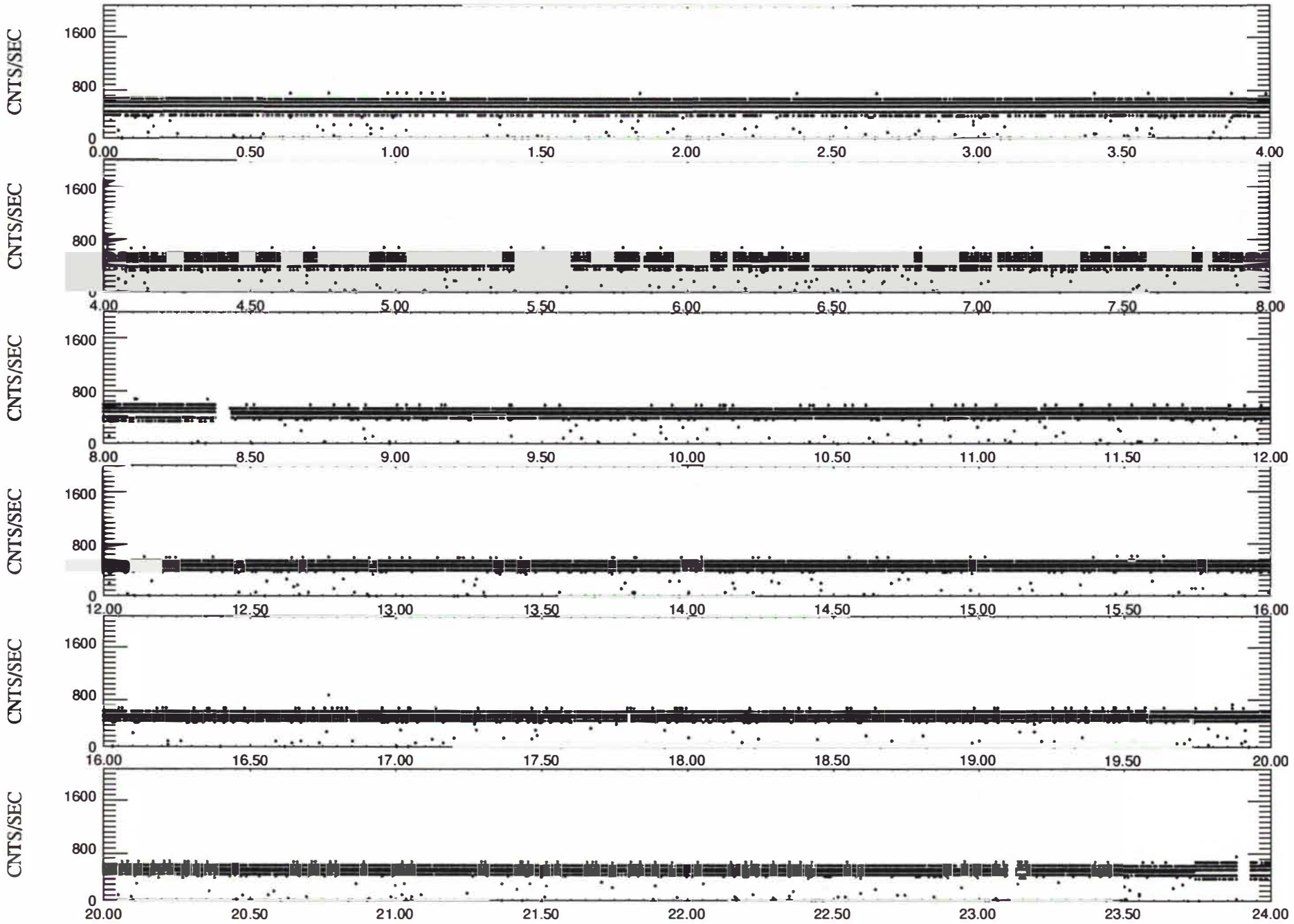

GOES 8
C
B
A
Watts m-2
10-6
10-7
10-8
10-9
10-10
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/30, 0000:00
Plot created: 98/01/12, 2331
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 364, year 1997 to day 364, year 1997 3/12/98



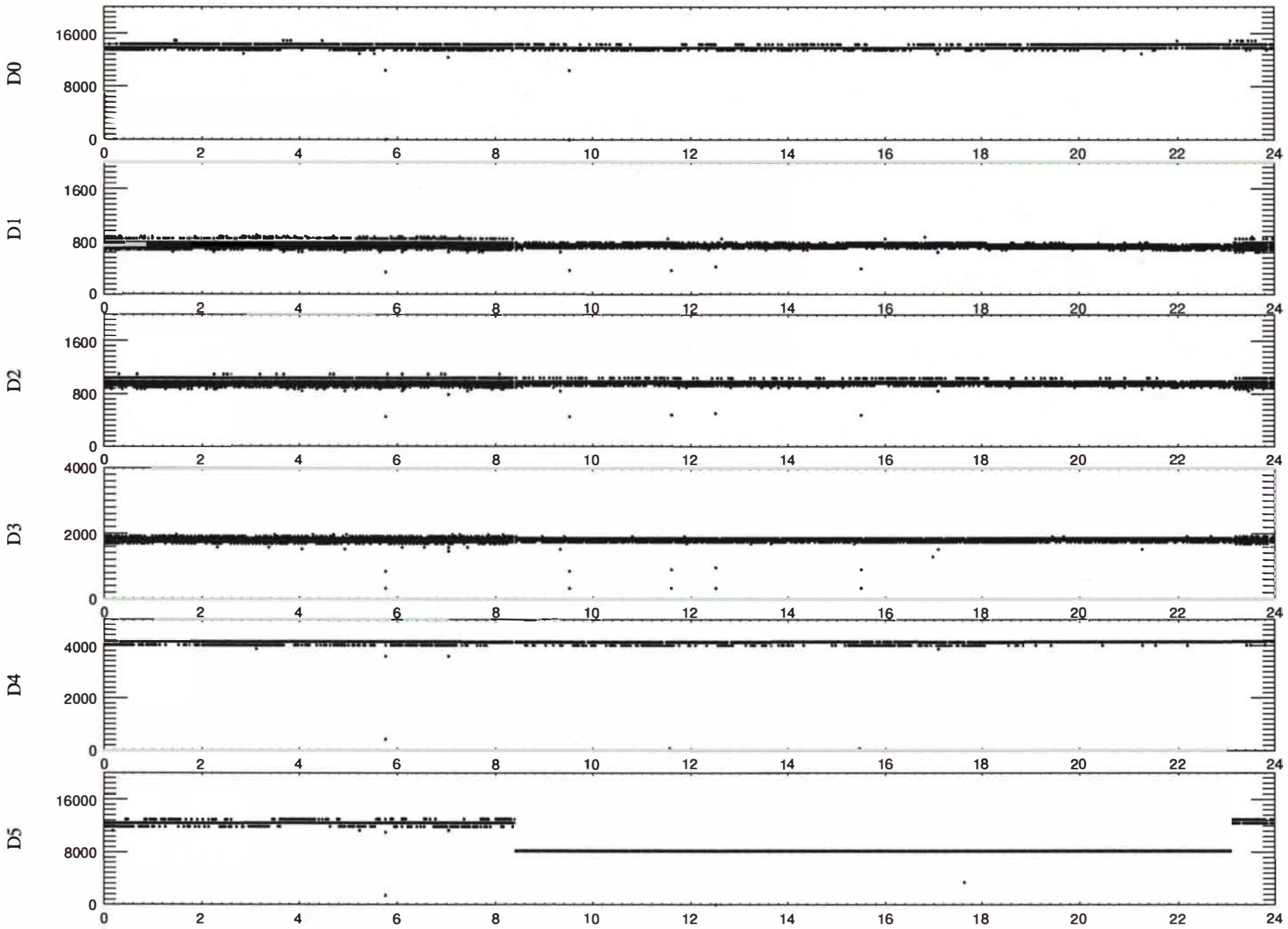
HUS 2A, MODE 1, NOT AVERAGED EDR day 364, year 1997 to day 364, year 1997 3/12/98

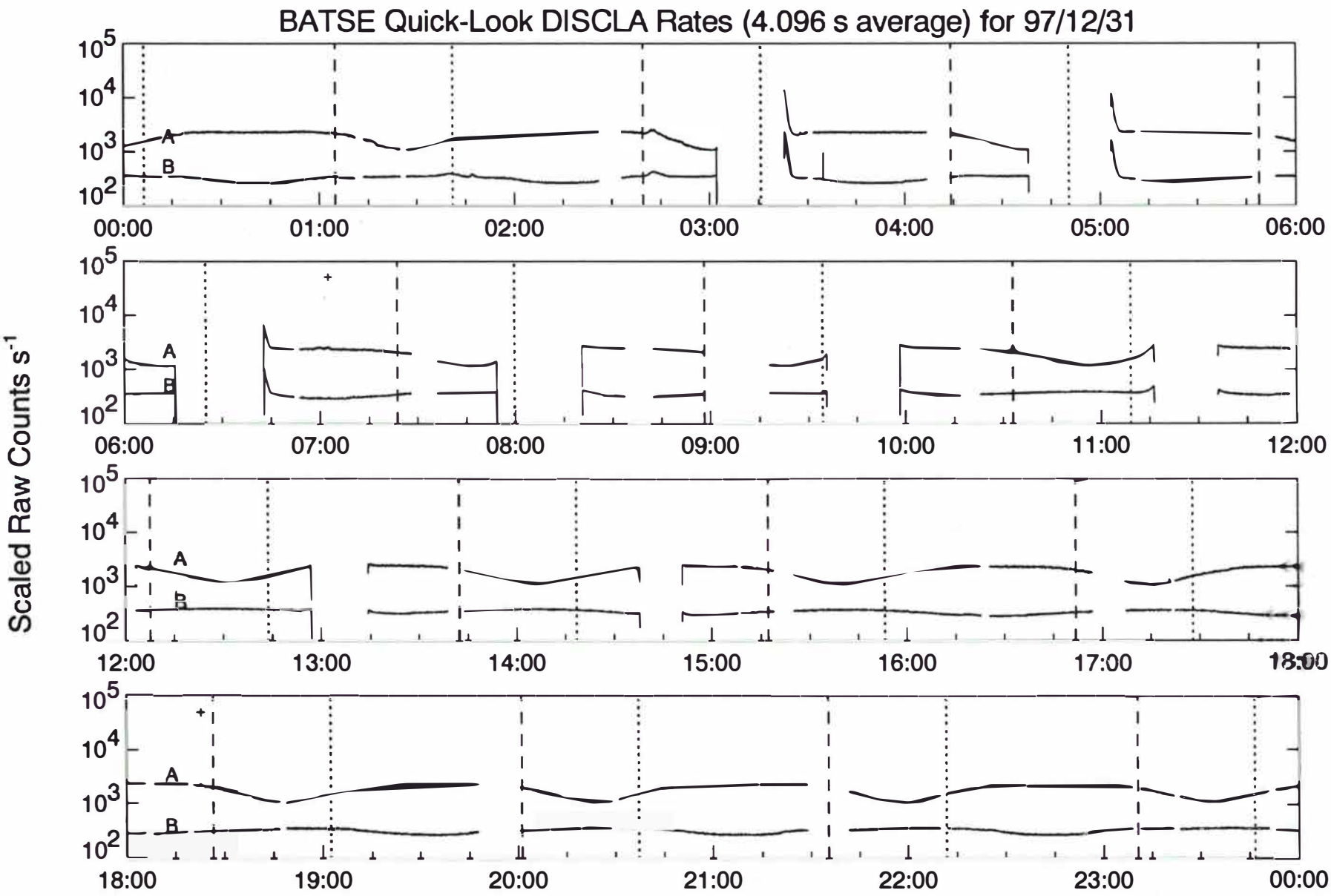
CALIBRATION DATA INCLUDED

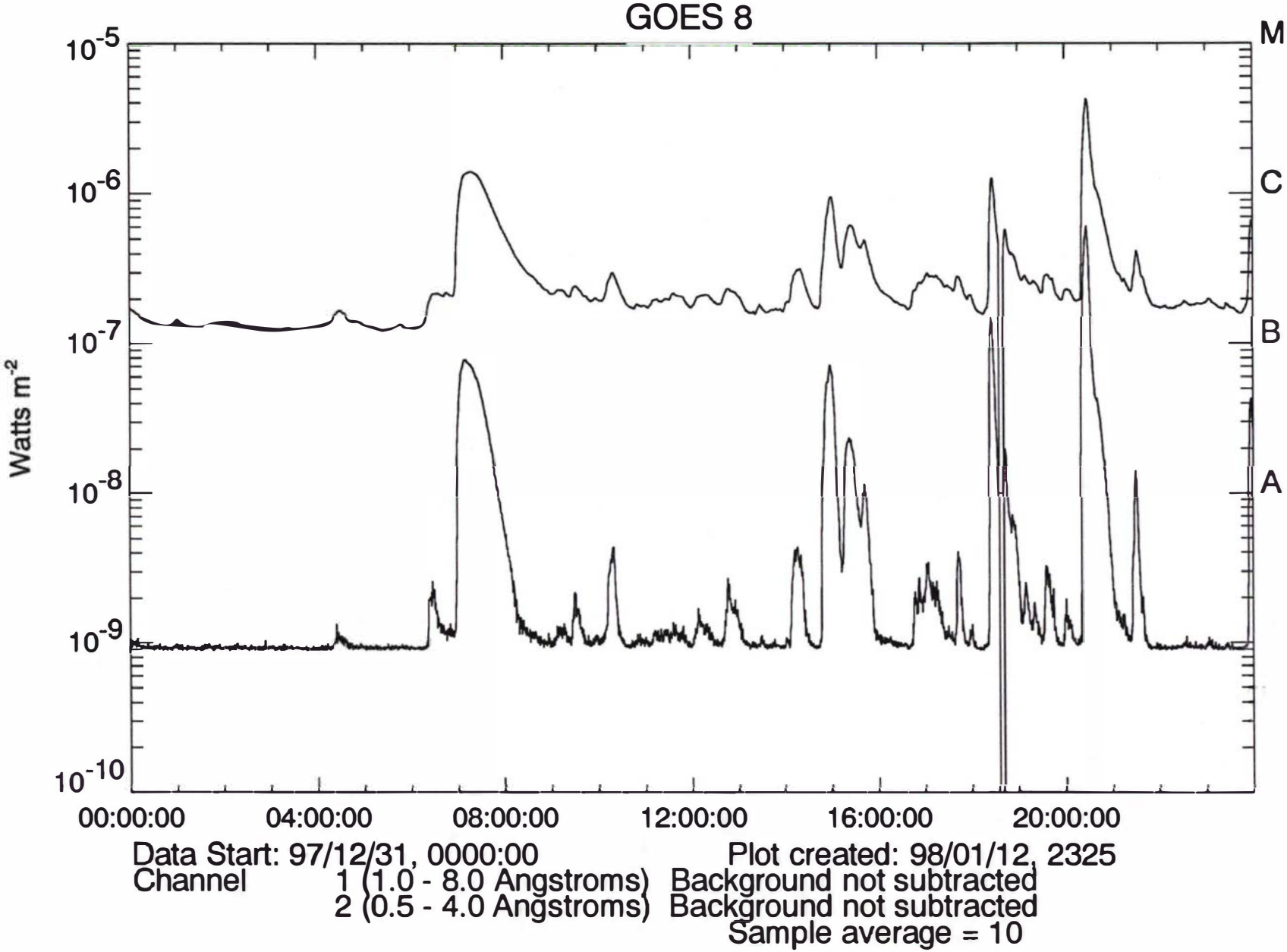



UNIV `AL TIME

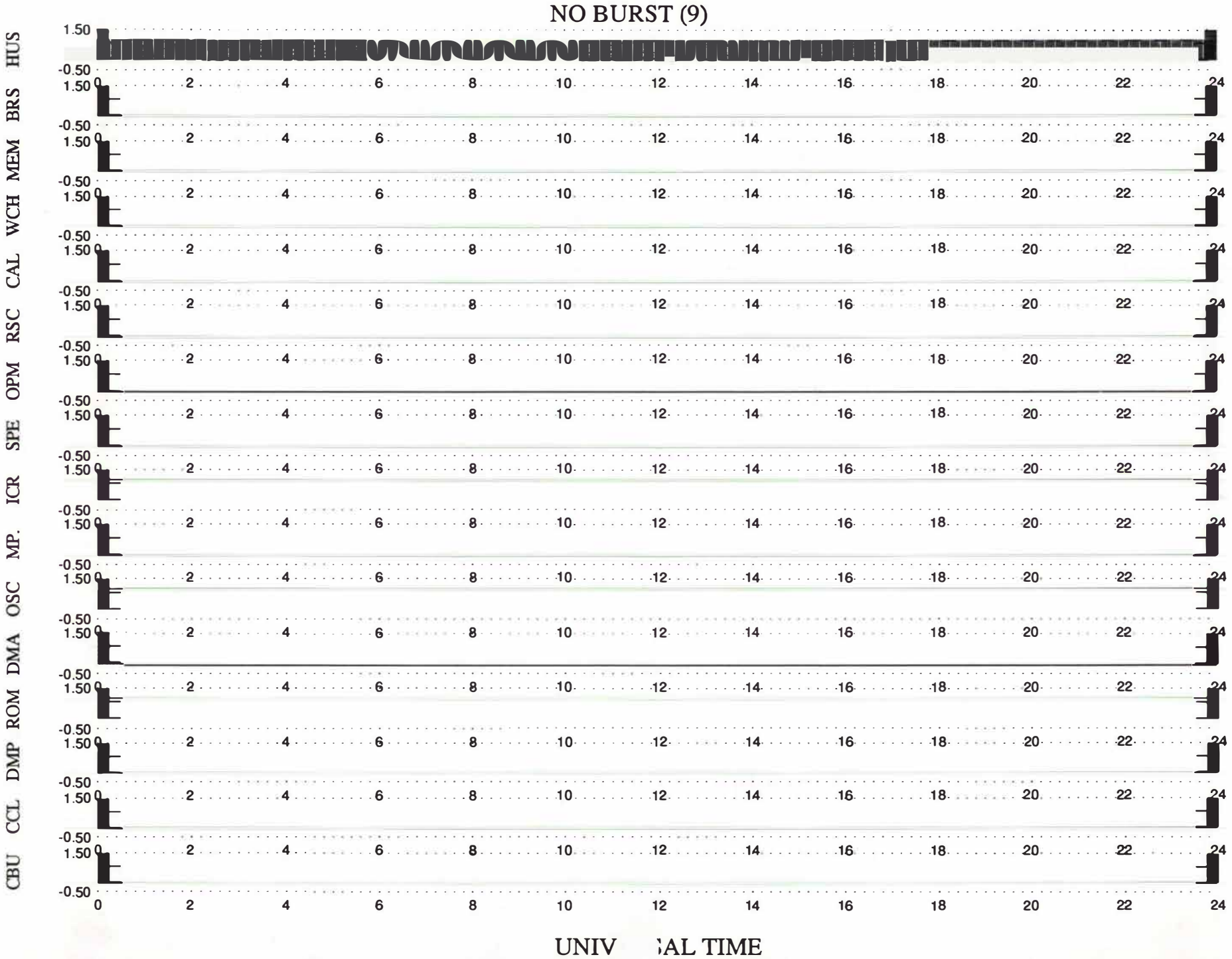
HUS 2B COUNTS / SEC EDR day 364, year 1997 to day 364, year 1997 3/12/98




BATSE Quick-Look DISCLA Rates (4.096 s average) for 97/12/31
Scaled Raw Counts s-1
10^5
10^4
10^3
10^2
A
B
00:00
01:00
02:00
03:00
04:00
05:00
06:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Current Time: 98/01/12, 2326 EDT
A: Channel 0 Most Sunward LAD
B: Sum Channel 0 Anti-Sunward LADs X .05
Dotted line: Day entry
Dashed line: Night entry
* Solar Burst Trigger
+ Solar Flare


GOES 8
$10^{-5}$
$10^{-6}$
$10^{-7}$
$10^{-8}$
$10^{-9}$
$10^{-10}$
Watts $m^{-2}$
M
C
B
A
00:00:00
04:00:00
08:00:00
12:00:00
16:00:00
20:00:00
Data Start: 97/12/31, 0000:00
Plot created: 98/01/12, 2325
Channel 1 (1.0 - 8.0 Angstroms) Background not subtracted
2 (0.5 - 4.0 Angstroms) Background not subtracted
Sample average = 10

HUS MODES EDR day 365, year 1997 to day 365, year 1997 3/12/98



HUS 2A, MODE 1, NOT AVERAGED EDR day 365, year 1997 to day 365, year 1997 3/12/98

CALIBRATION DATA INCLUDED




UNIV AL TIME

HUS 2B COUNTS / SEC EDR day 365, year 1997 to day 365, year 1997 3/12/98

