

# V&V Reference Report

## L2 ASCDS Version : 7.6.10

Observation 700 - L2 Version 5  
Chandra X-Ray Center

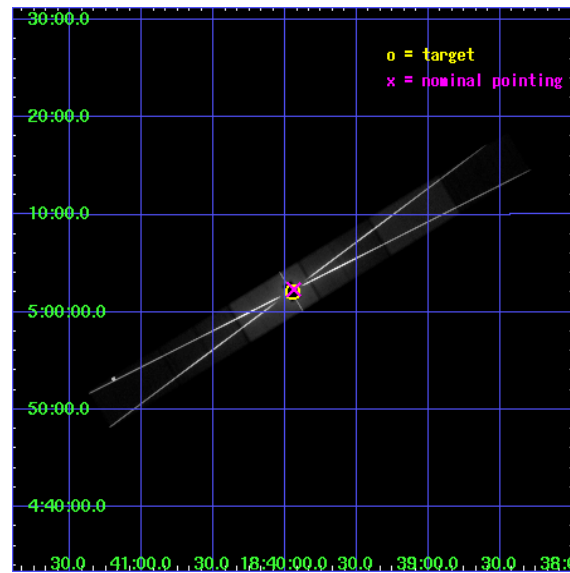
L2 Processing Date : Jul 25 2007

## Contents

|          |                               |           |
|----------|-------------------------------|-----------|
| <b>1</b> | <b>Front</b>                  | <b>2</b>  |
| <b>2</b> | <b>OBI</b>                    | <b>3</b>  |
| 2.1      | OBI . . . . .                 | 3         |
| 2.1.1    | Images . . . . .              | 3         |
| 2.1.2    | Parameters . . . . .          | 4         |
| 2.1.3    | Events . . . . .              | 4         |
| 2.2      | Compared Parameters . . . . . | 5         |
| 2.3      | Aspect . . . . .              | 6         |
| 2.4      | Star Slots . . . . .          | 9         |
| 2.4.1    | Slot 3 . . . . .              | 9         |
| 2.4.2    | Slot 4 . . . . .              | 10        |
| 2.4.3    | Slot 5 . . . . .              | 11        |
| 2.4.4    | Slot 6 . . . . .              | 12        |
| 2.4.5    | Slot 7 . . . . .              | 13        |
| 2.5      | FID Slots . . . . .           | 14        |
| 2.5.1    | Slot 0 . . . . .              | 14        |
| 2.5.2    | Slot 1 . . . . .              | 15        |
| 2.5.3    | Slot 2 . . . . .              | 16        |
| <b>3</b> | <b>Gratings</b>               | <b>17</b> |
| 3.1      | HEG Arm . . . . .             | 17        |
| 3.2      | MEG Arm . . . . .             | 19        |
| <b>A</b> | <b>Summary</b>                | <b>21</b> |
| A.1      | Status . . . . .              | 21        |
| A.2      | Comments . . . . .            | 21        |

# 1 Front

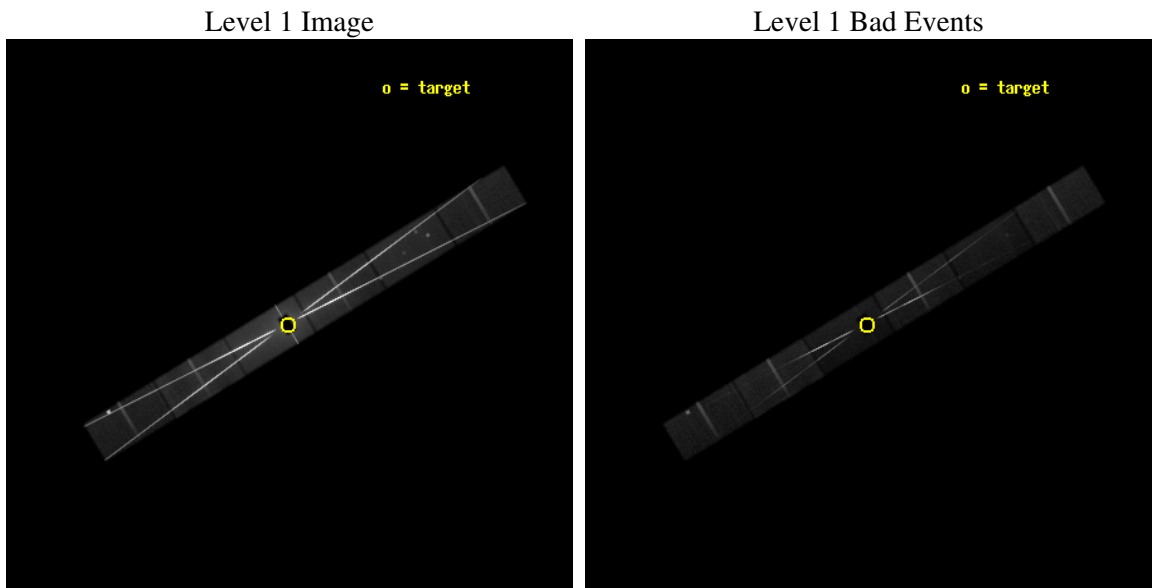
|          |   |
|----------|---|
| seq_num  | 400067  |
| obs_id   | 700   |
| title    | HETGS STUDY OF PERSISTENT AND BURST EMISSION FROM TWO LUMINOUS BURSTERS |
| observer | Dr. Jean Swank  |
| object   | SERPENS X-1   |
| dtcycle  | 0   |
| cycle    | P   |
| ra_targ  | 279.9875  |
| dec_targ | 5.035   |
| ra_nom   | 279.98474485452   |
| dec_nom  | 5.0387876048712   |
| roll_nom | 148.72867891825   |
| revision | 5   |
| ontime   | 78163.158870429   |
| livetime | 76420.765418879   |
| ontime4  | 78164.999870583   |
| ontime5  | 78164.999870583   |
| ontime6  | 78163.158850491   |
| ontime7  | 78163.158870429   |
| ontime8  | 78164.999870583   |
| ontime9  | 78164.999870583   |
| l2events | 8383339   |



## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



## 2.1.2 Parameters

|          |                     |
|----------|---------------------|
| obi_num  | 0                   |
| ascdsver | 7.6.10              |
| caldsver | 3.4.0               |
| date     | 2007-05-25T18:15:13 |
| revision | 4                   |

|                |                 |
|----------------|-----------------|
| sched_exp_time | 78000.000000    |
| ontime         | 78163.158870429 |
| ontime4        | 78164.999870583 |
| ontime5        | 78164.999870583 |
| ontime6        | 78163.158850491 |
| ontime7        | 78163.158870429 |
| ontime8        | 78164.999870583 |
| ontime9        | 78164.999870583 |
| l1events       | 10659795        |

## 2.1.3 Events

|                 | ccd 4  | ccd 5   | ccd 6   | ccd 7   | ccd 8   | ccd 9  |
|-----------------|--------|---------|---------|---------|---------|--------|
| level 1 events  | 446196 | 1037645 | 3479995 | 3248030 | 1816454 | 631475 |
| rejected events | 275353 | 205144  | 385685  | 377520  | 318605  | 243626 |
| rejected %      | 61%    | 19%     | 11%     | 11%     | 17%     | 38%    |

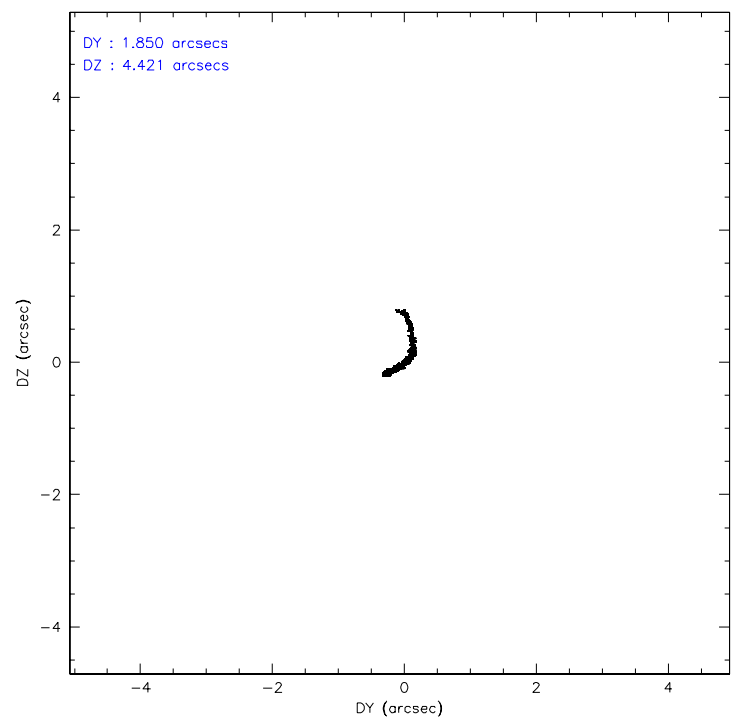
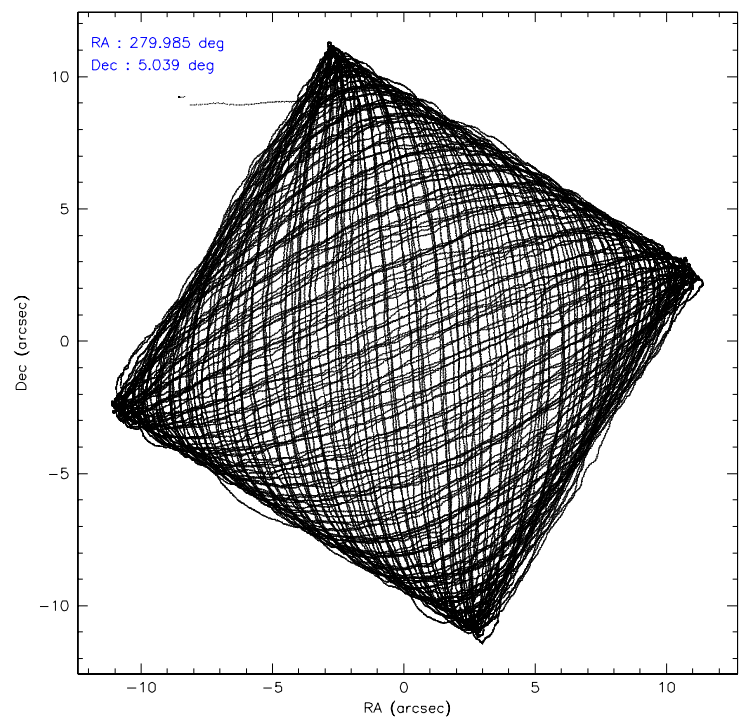
|                | ccd 4  | ccd 5  | ccd 6   | ccd 7   | ccd 8   | ccd 9  |
|----------------|--------|--------|---------|---------|---------|--------|
| grade 0 events | 123299 | 227324 | 2306217 | 523593  | 1171726 | 283819 |
|                | 27%    | 21%    | 66%     | 16%     | 64%     | 44%    |
| grade 1 events | 384    | 2150   | 61539   | 17096   | 15171   | 3403   |
|                | 0%     | 0%     | 1%      | 0%      | 0%      | 0%     |
| grade 2 events | 24002  | 278807 | 395252  | 760445  | 165882  | 38491  |
|                | 5%     | 26%    | 11%     | 23%     | 9%      | 6%     |
| grade 3 events | 7654   | 62470  | 137271  | 287498  | 58605   | 12647  |
|                | 1%     | 6%     | 3%      | 8%      | 3%      | 2%     |
| grade 4 events | 7538   | 62611  | 135039  | 285855  | 57492   | 40375  |
|                | 1%     | 6%     | 3%      | 8%      | 3%      | 6%     |
| grade 5 events | 7499   | 26422  | 50721   | 101308  | 19080   | 14060  |
|                | 1%     | 2%     | 1%      | 3%      | 1%      | 2%     |
| grade 6 events | 8704   | 203293 | 126373  | 1018949 | 47626   | 13636  |
|                | 1%     | 19%    | 3%      | 31%     | 2%      | 2%     |
| grade 7 events | 267116 | 174568 | 267583  | 253286  | 280872  | 225044 |
|                | 59%    | 16%    | 7%      | 7%      | 15%     | 35%    |

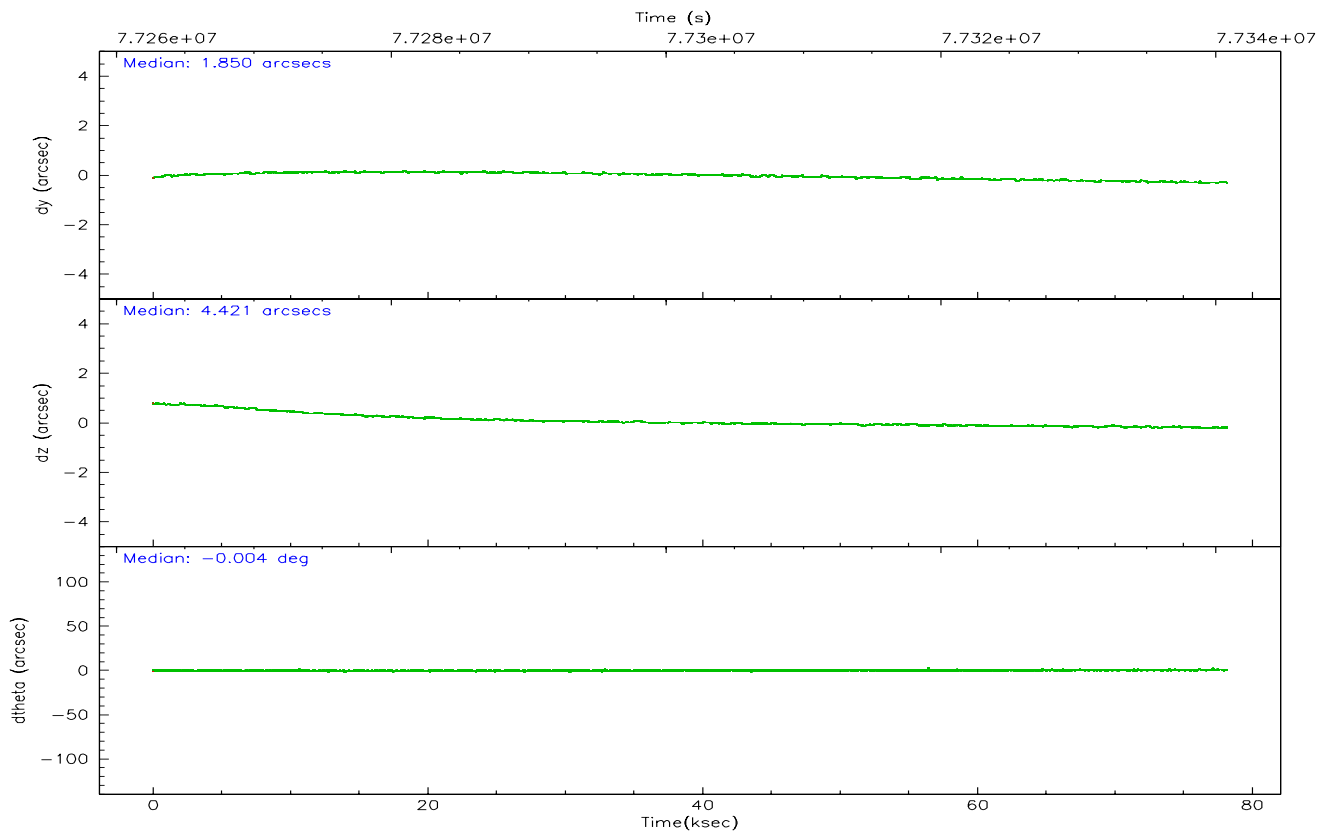
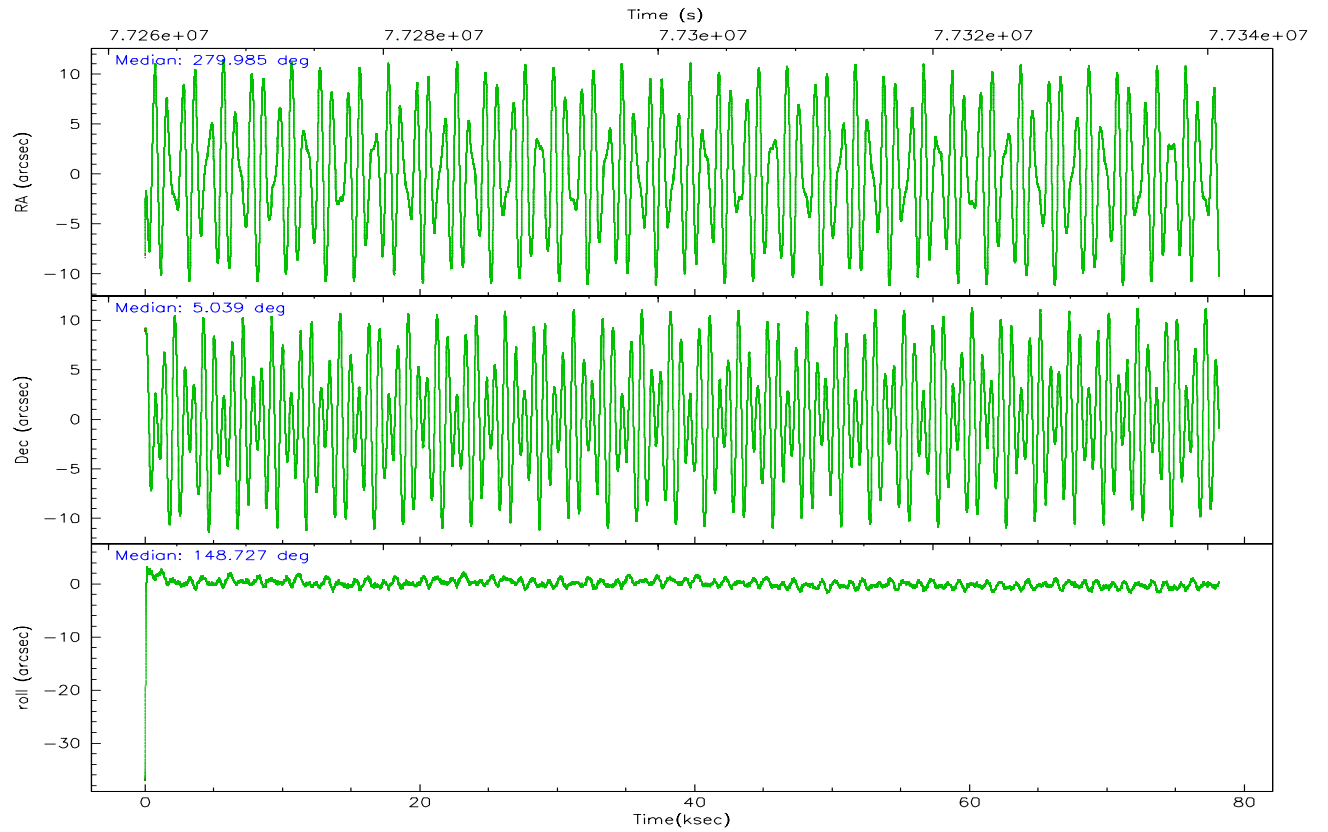


## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar format version number          | 6         | 6       |
| Detector                          | ACIS-456789         | ACIS-456789          | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                           | HETG                | HETG                 | Obspar update status                  | NONE      | UPDATED |
| Data mode                         | GRADED              | GRADED               | Number of optional ACIS chips dropped | 0         | 0       |
| Observation mode                  | POINTING            | POINTING             | On-chip summing requested             | N         | N       |
| Pointing RA                       | 280.012257          | 279.9847448545223    | Subarray requested                    | CUSTOM    | CUSTOM  |
| Pointing Dec                      | 5.038292            | 5.038787604871164    | Subarray start row                    | 15        | 15      |
| Pointing Roll                     | 148.569636          | 148.7286789182495    | Subarray row count                    | 542       | 542     |
| SIM focus pos (mm)                | -0.684267           | -0.6828225247311905  | Alternating exposures requested       | N         | N       |
| SIM defocus (mm)                  | 0                   | 0.001444936568705701 | Primary exposure time                 | 3.200000  | 1.8     |
| SIM translation stage pos (mm)    | -184.532523         | -184.52811429679     |                                       |           |         |
| SIM translation stage offset (mm) | -5.6                | -5.604408286217847   |                                       |           |         |
| Observation start time            | 77262849.184000     | 77261798.158168      |                                       |           |         |
| Observation start date            | 2000-06-13T05:53:05 | 2000-06-13T05:36:38  |                                       |           |         |
| Observation end time              | 77340849.184000     | 77341300.748596      |                                       |           |         |
| Observation end date              | 2000-06-14T03:33:05 | 2000-06-14T03:41:40  |                                       |           |         |
| Read mode                         | TIMED               | TIMED                |                                       |           |         |

2.3 Aspect



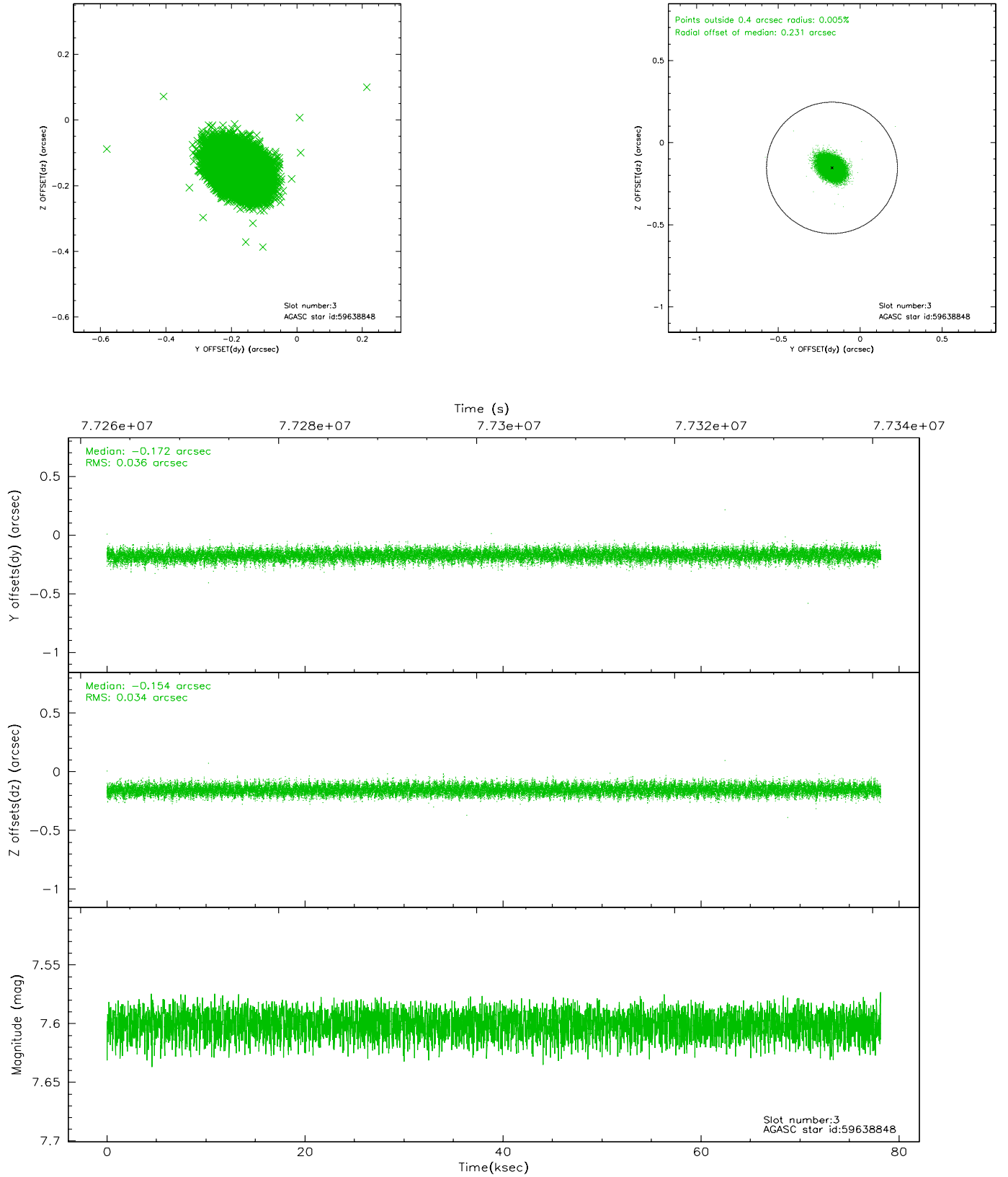


### Slot Statistics

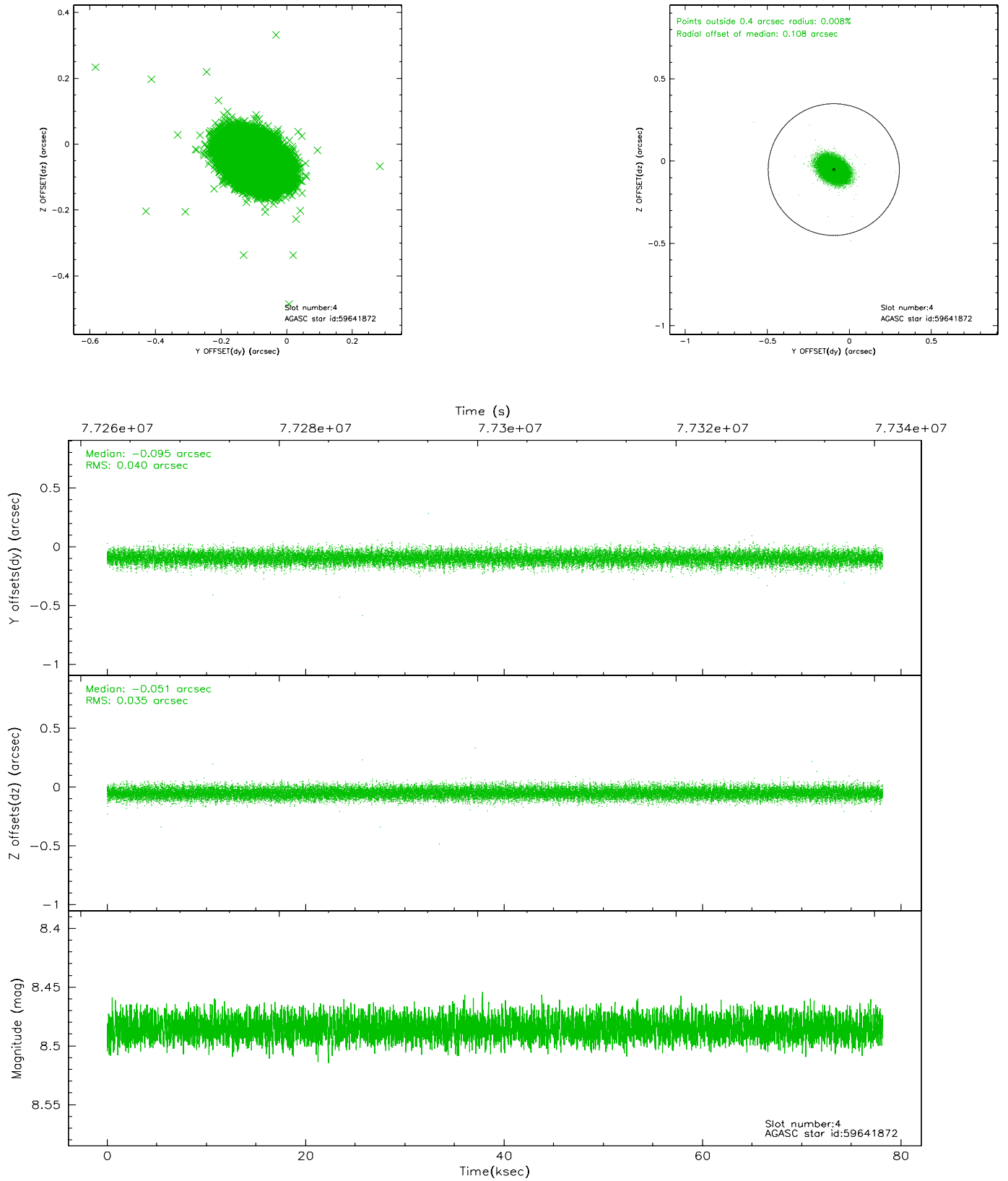
| slot | status | id       | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec      | mean_y   | mean_z   |
|------|--------|----------|------|-------|--------|--------|-------|-------|------------|----------|----------|----------|
| 0    | FID    | ACIS-S-2 | 7.10 | 19064 | -0.043 | -0.027 | 0.007 | 0.013 | 0.000000   | 0.000000 | -754.07  | -1841.18 |
| 1    | FID    | ACIS-S-4 | 7.19 | 19063 | -0.002 | 0.034  | 0.007 | 0.014 | 0.000000   | 0.000000 | 2159.27  | 67.43    |
| 2    | FID    | ACIS-S-6 | 7.40 | 19065 | 0.017  | 0.000  | 0.007 | 0.012 | 0.000000   | 0.000000 | 407.88   | 704.71   |
| 3    | GUIDE  | 59638848 | 7.60 | 38123 | -0.172 | -0.154 | 0.053 | 0.087 | 279.399276 | 5.260505 | 2292.59  | 462.02   |
| 4    | GUIDE  | 59641872 | 8.49 | 38122 | -0.095 | -0.051 | 0.056 | 0.094 | 279.855622 | 4.834479 | 96.86    | 918.68   |
| 5    | GUIDE  | 59642696 | 8.89 | 38118 | 0.098  | 0.077  | 0.076 | 0.120 | 280.765301 | 5.225168 | -1951.81 | -1983.48 |
| 6    | GUIDE  | 59646120 | 9.08 | 38117 | 0.093  | 0.153  | 0.075 | 0.126 | 279.824494 | 5.230224 | 934.82   | -238.82  |
| 7    | GUIDE  | 59644008 | 9.23 | 38115 | 0.078  | -0.026 | 0.079 | 0.135 | 280.168585 | 4.764768 | -991.85  | 547.35   |

## 2.4 Star Slots

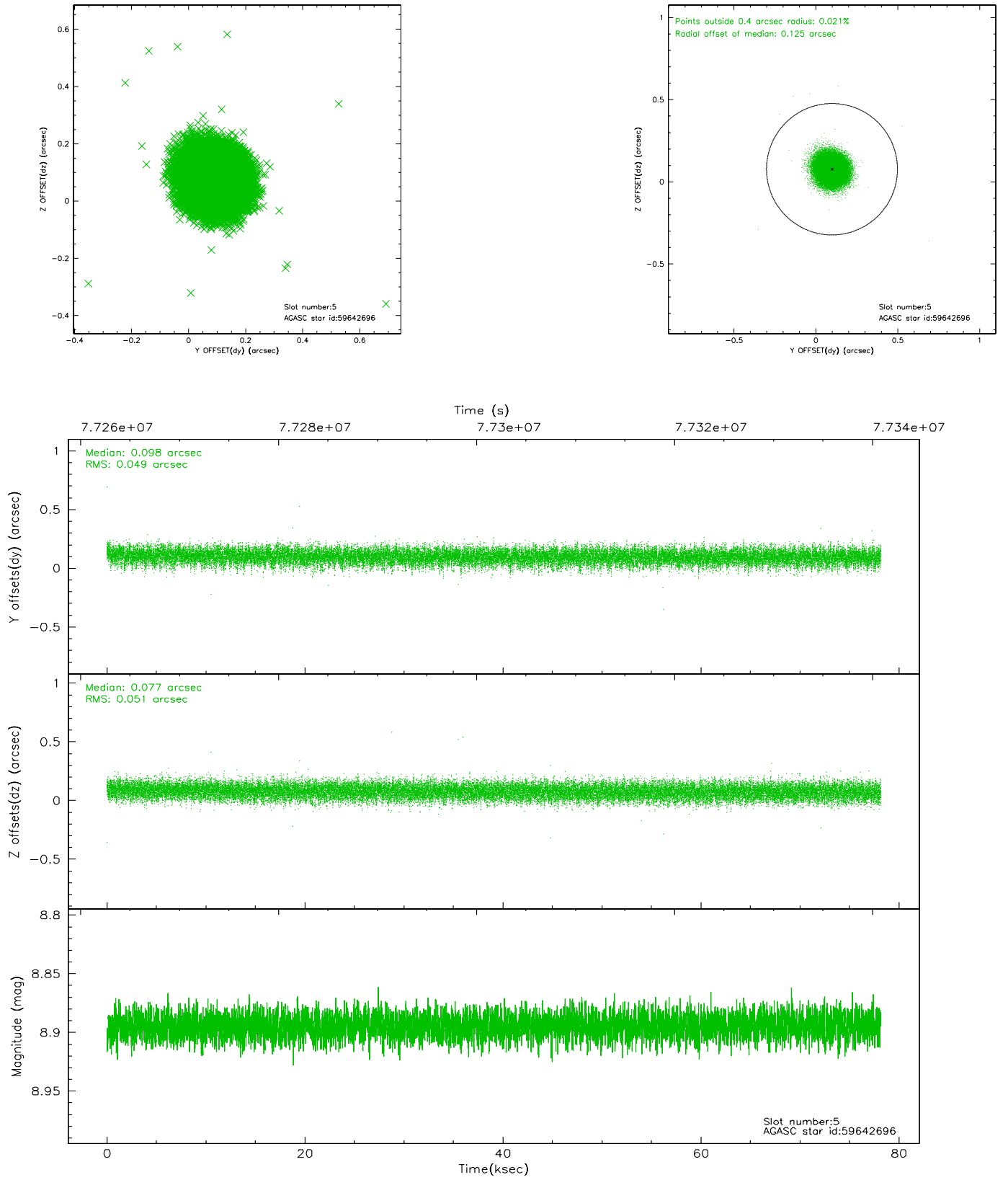
### 2.4.1 Slot 3



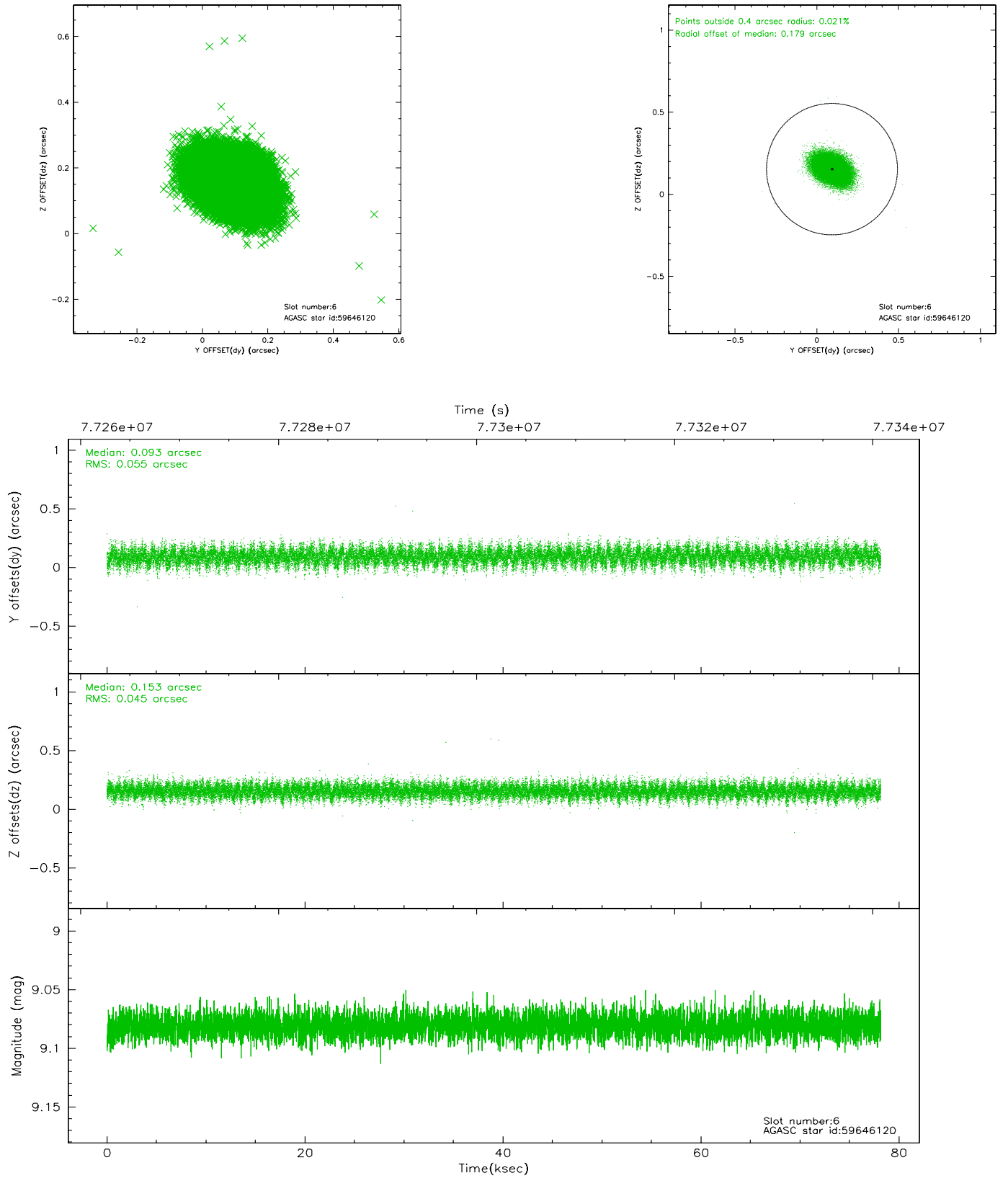
## 2.4.2 Slot 4



### 2.4.3 Slot 5

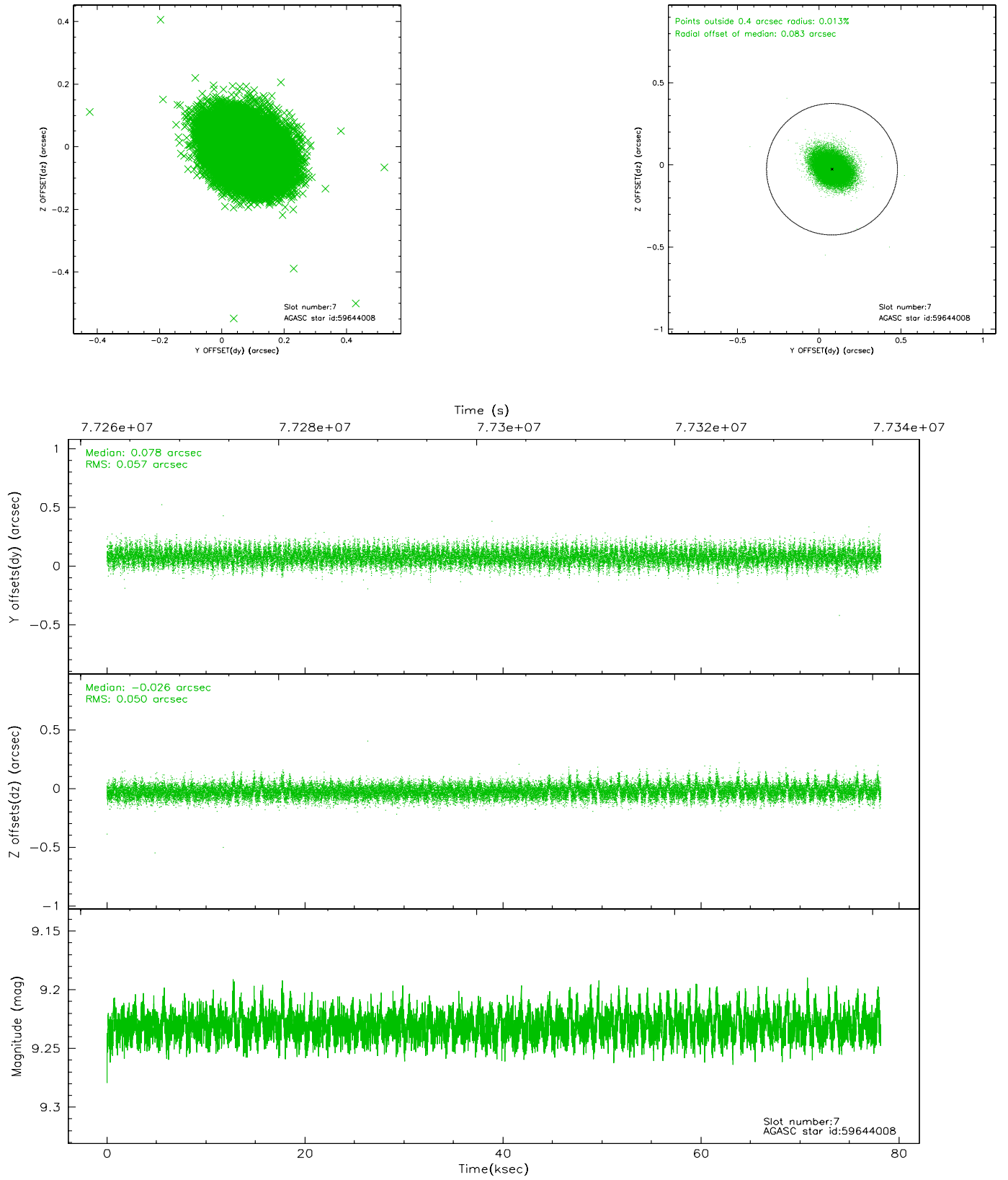


## 2.4.4 Slot 6



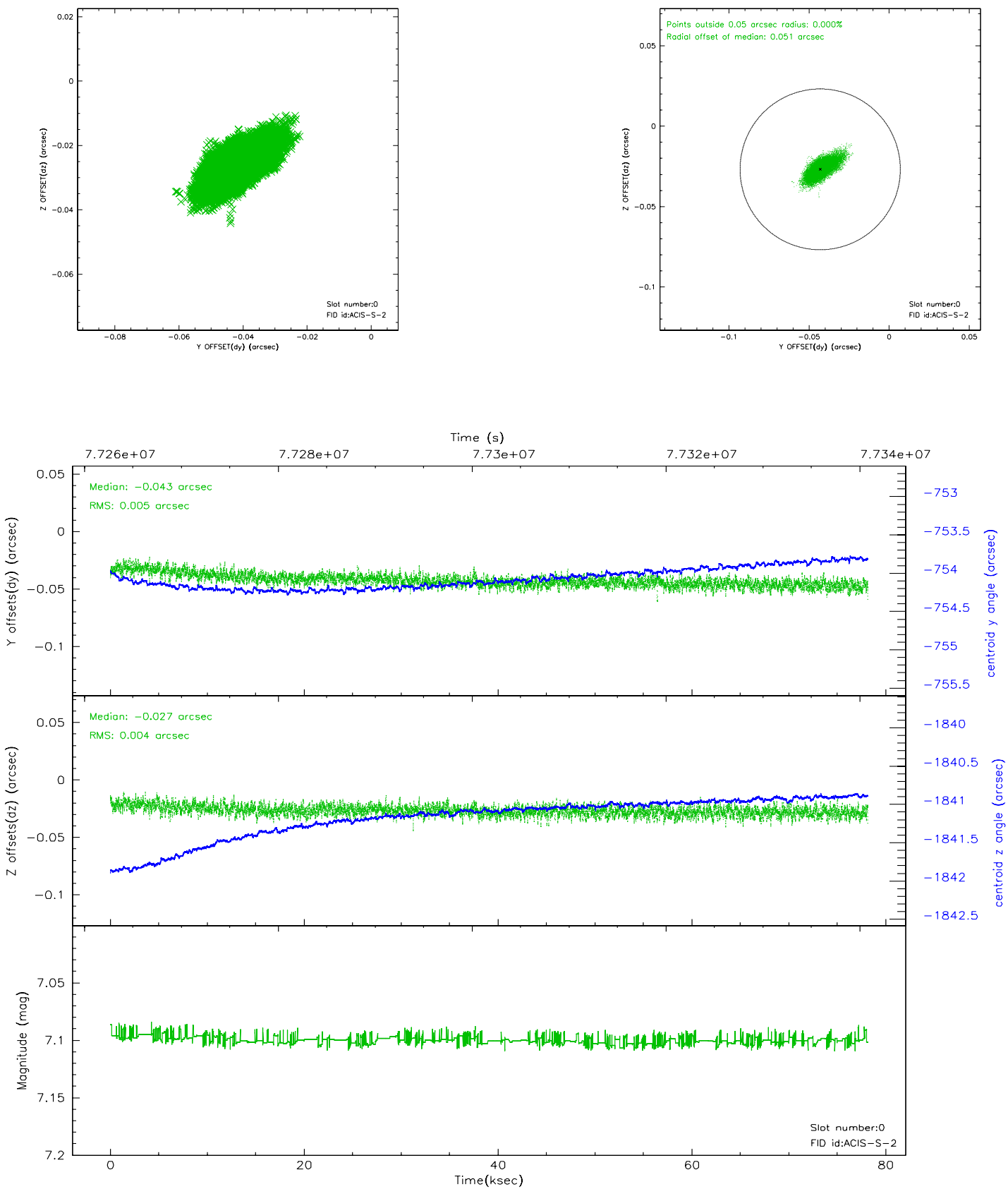


## 2.4.5 Slot 7

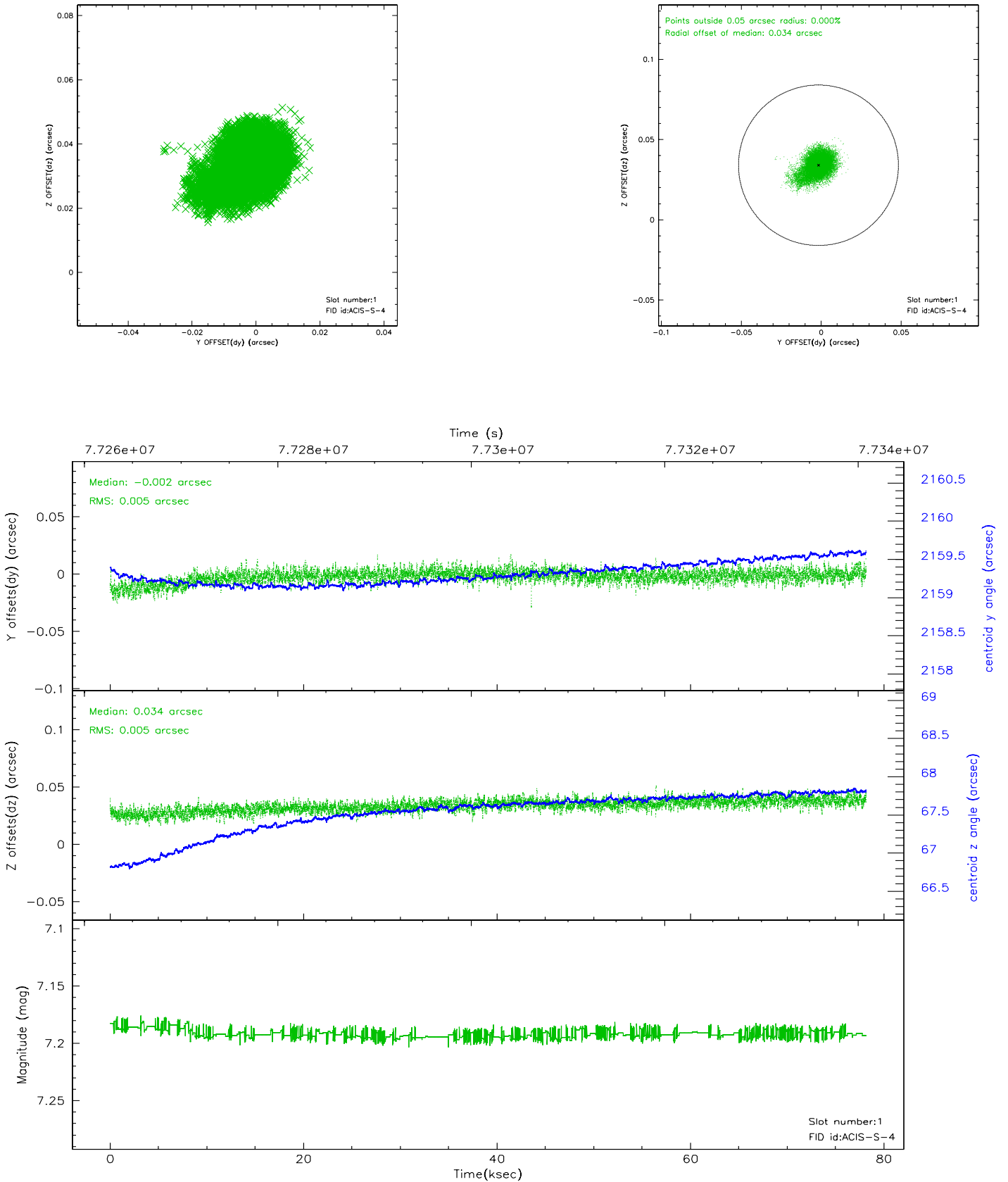


## 2.5 FID Slots

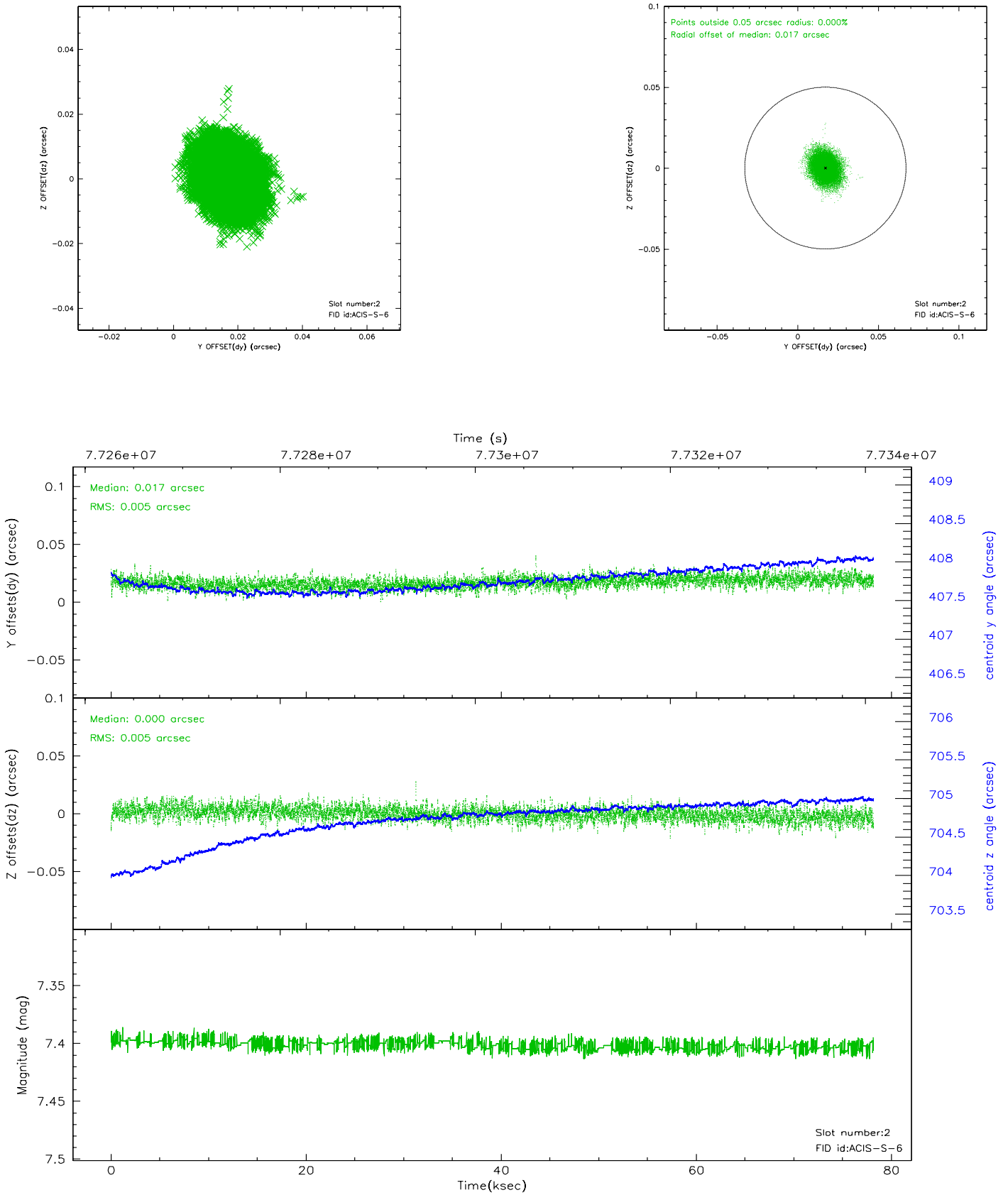
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2

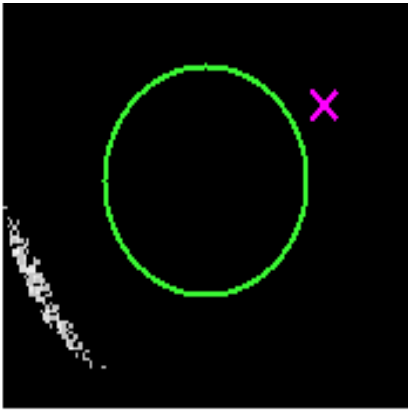


# 3 Gratings

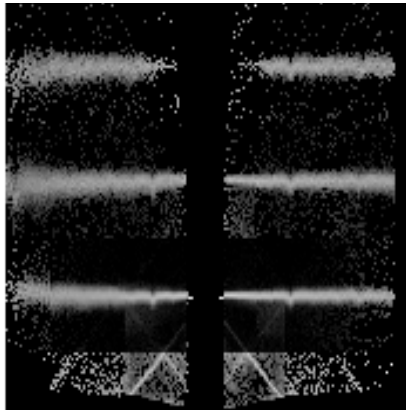
## 3.1 HEG Arm



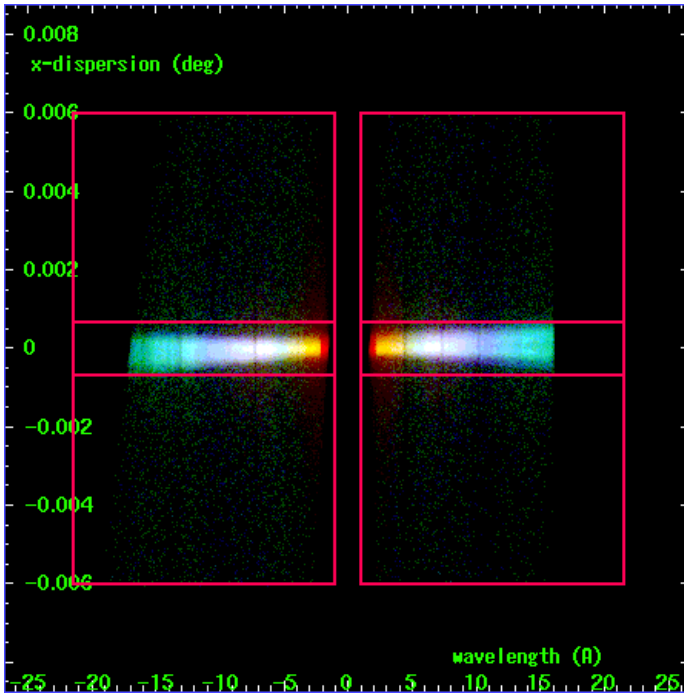
HEG Order Sort 123



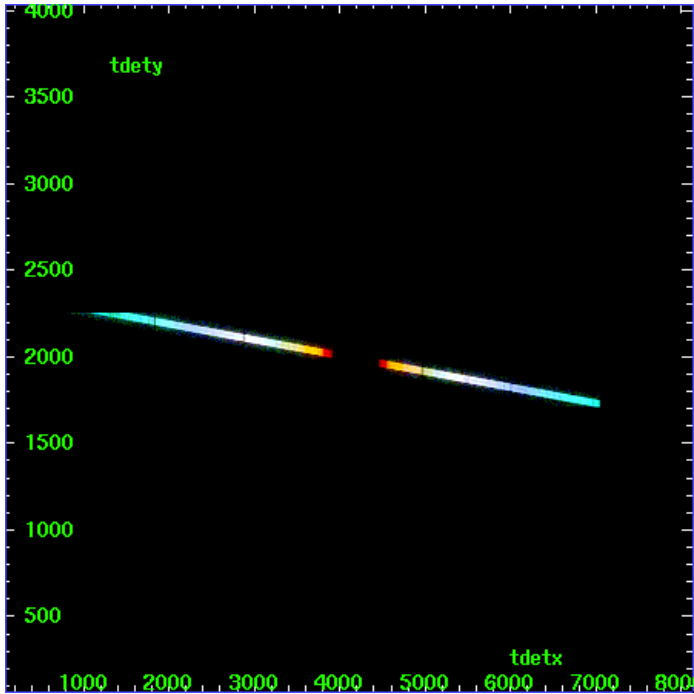
HEG Zero Order



HEG Order Sort ALL

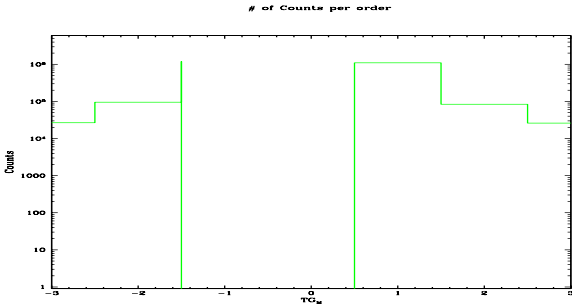


Spot Image HEG

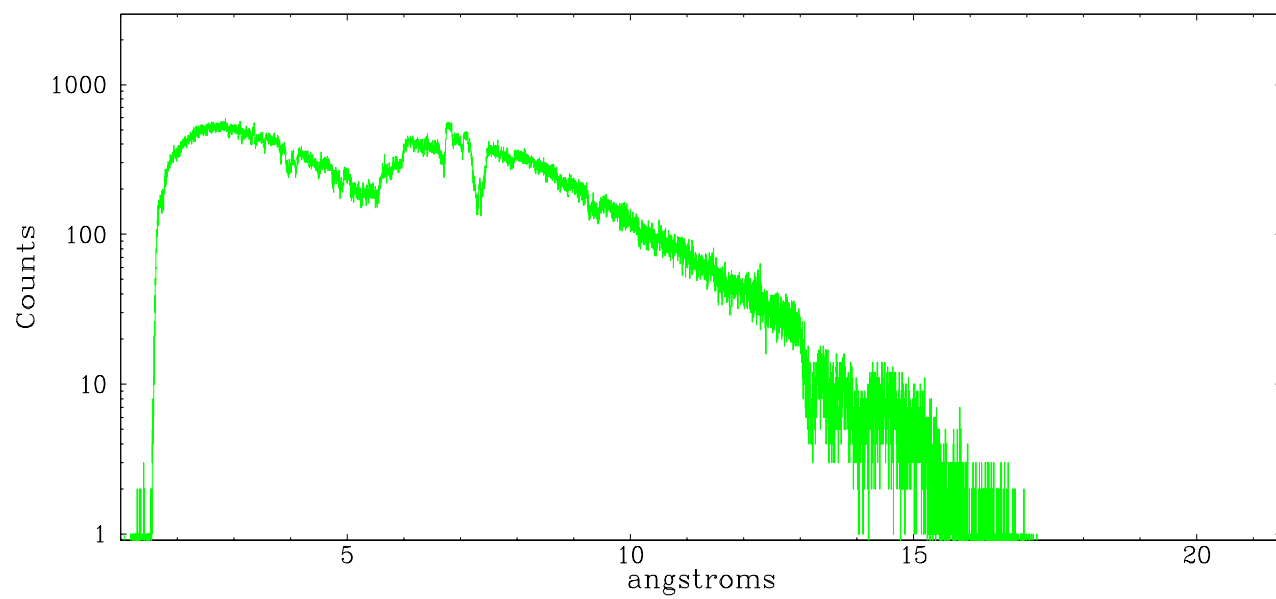


Full Detector HEG

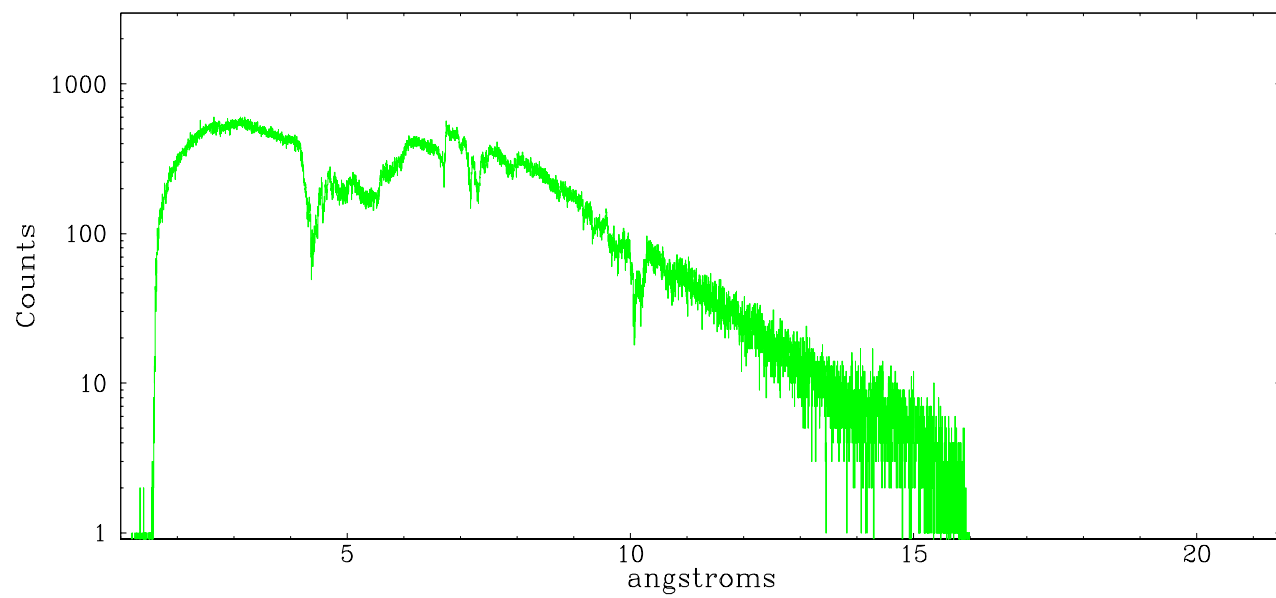
|        | order<br>-3 | order<br>-2 | order -1 | order<br>0 | order 1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|----------|------------|---------|------------|------------|
| Events | 26591       | 96049       | 1189381  | 0          | 1100155 | 83798      | 26227      |



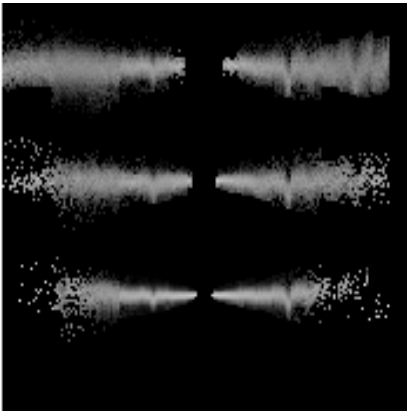
heg order -1



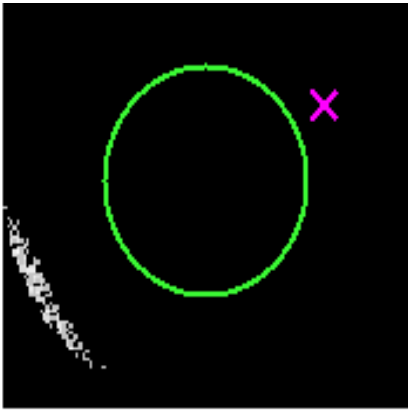
heg order +1



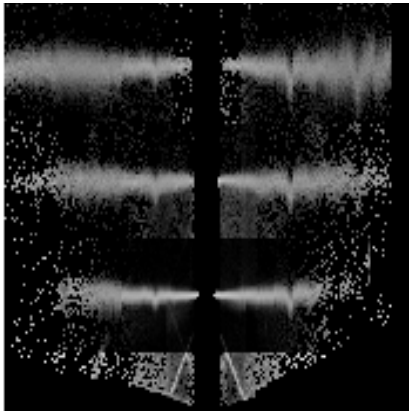
3.2 MEG Arm



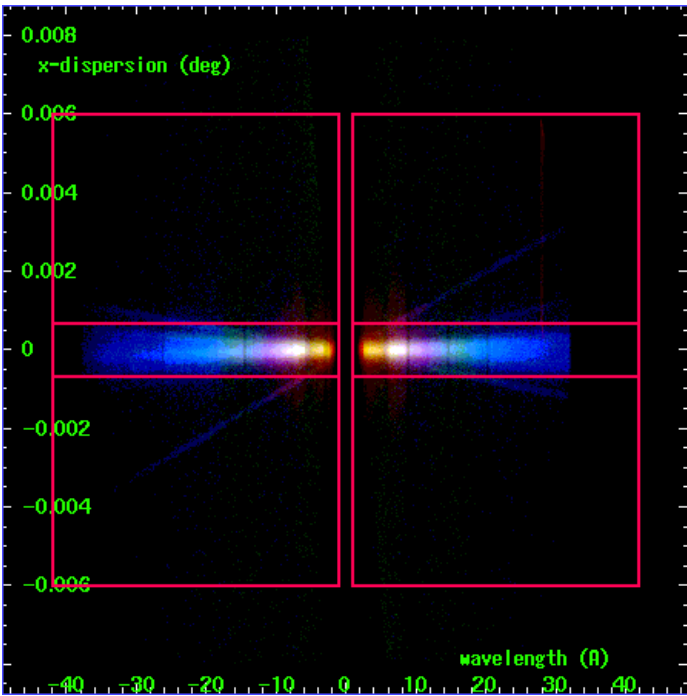
MEG Order Sort 123



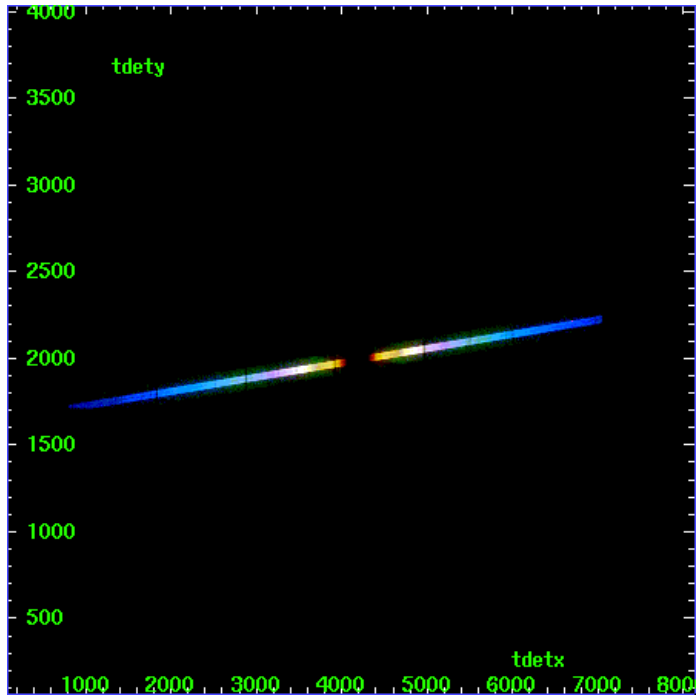
MEG Zero Order



MEG Order Sort ALL

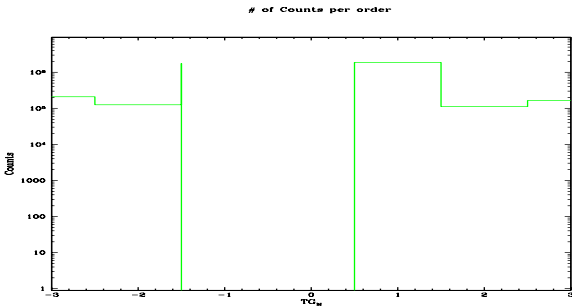


Spot Image MEG

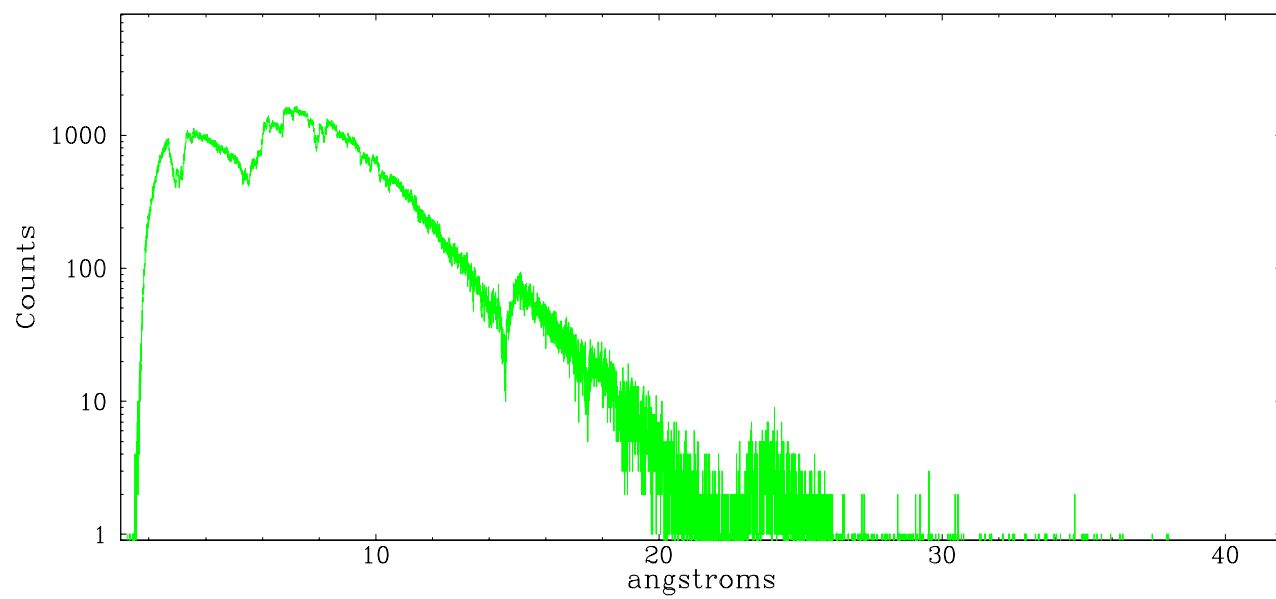


Full Detector MEG

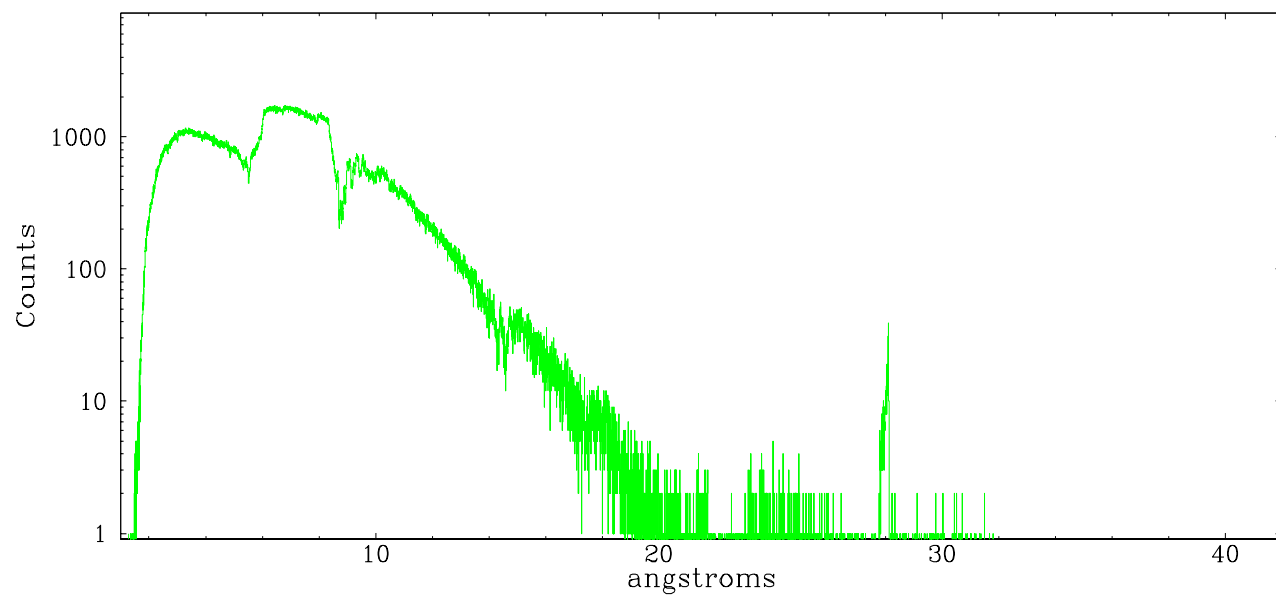
|        | order<br>-3 | order<br>-2 | order -1 | order<br>0 | order 1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|----------|------------|---------|------------|------------|
| Events | 210699      | 125445      | 1765624  | 0          | 1878632 | 112406     | 165491     |



meg order -1



meg order +1





# A Summary

## A.1 Status

|                            |             |
|----------------------------|-------------|
| V&V Scientist              | Joy Nichols |
| V&V Date (YYYY-MM-DD)      | 2007.08.01  |
| V&V Edition                | 1           |
| V&V Disposition and Status | OK          |
| V&V Charge Time            | 78.058      |

## A.2 Comments

Charge time for this ObsId remains at original value of 78.058 ks, although with the current processing the charge time would have been 78.163 ksec.

=====

Standard data processing software did not correctly locate the zeroth order because a spatial exclusion window was used to block the zeroth order image. Manual intervention was used to input the correct sky coordinates (x=4059.73, y=4075.94) into the \*src1a.fits file table. These corrected coordinates were determined using a software tool developed by CXO called findzero, which is expected to be released in CIAO (currently in ISIS). The tool calculates the point of intersection of the readout streak and the meg arm (preferred position), or the readout streak and the heg arm. The zeroth order source position determined by the standard pipeline processing using the tool tgdetect was not used in this processing. The newly determined zeroth order coordinates have been placed in the \*src1a.fits file, replacing the coordinates determined by tgdetect. Note that these corrected coordinates of the zeroth order cannot be reproduced by running tgdetect on the data.==== MEG and HEG spectral arms are piled up.