

# V&V Reference Report

## L2 ASCDS Version : 8.4.4

Observation 6615 - L2 Version 4  
Chandra X-Ray Center

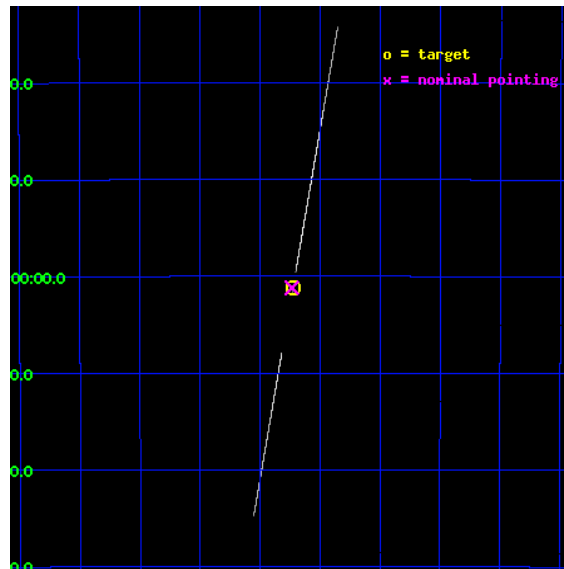
L2 Processing Date : May 28 2012

## 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

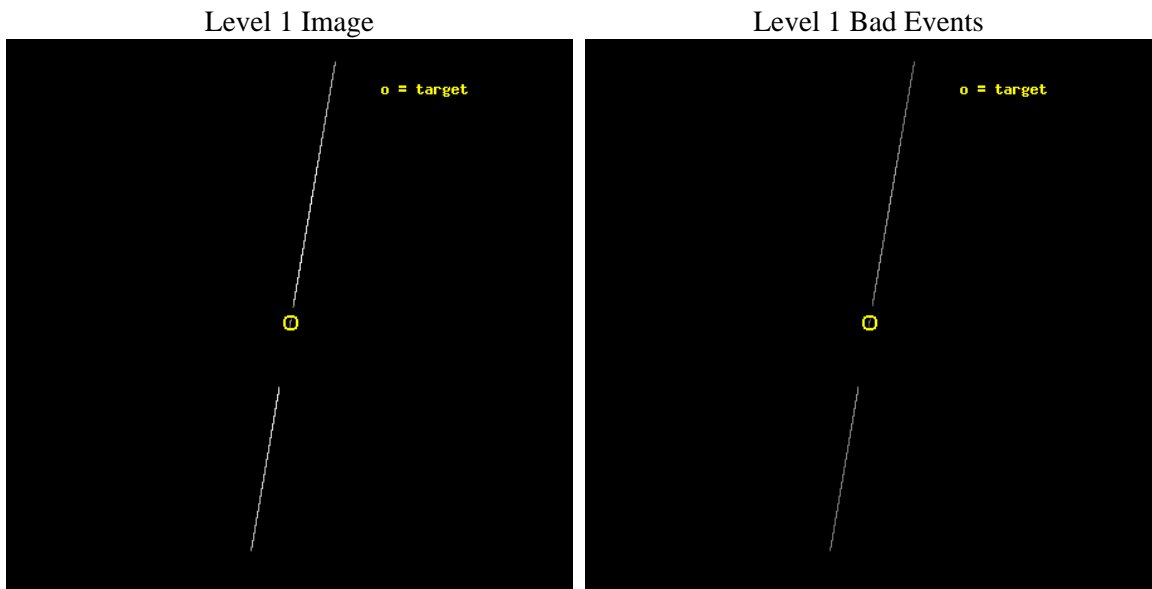
|          |   |                                       |
|----------|---|---------------------------------------|
| seq_num  | 400520  | Sequence number                       |
| obs_id   | 6615  | Observation id                        |
| title    | Relativistic Effects and Outflows in a Black Hole Transient | Propos                                |
| observer | Dr Jon Miller   | Principal investigator                |
| object   | XTE J1817-330   | Source name                           |
| ra_targ  | 274.431404  | Observer's specified target RA [deg]  |
| dec_targ | -33.018833  | Observer's specified target Dec [deg] |
| ra_nom   | 274.43366217006   | Nominal RA [deg]                      |
| dec_nom  | -33.019995795792  | Nominal Dec [deg]                     |
| roll_nom | 99.828924088059   | Nominal Roll [deg]                    |
| revision | 4   | Processing version of data            |
| ontime   | 17453.607567042   | Sum of GTIs [s]                       |
| livetime | 17385.429412483   | Livetime [s]                          |
| ontime4  | 33934.891055912   | Sum of GTIs [s]                       |
| ontime5  | 50142.25  | Sum of GTIs [s]                       |
| ontime6  | 15203.402793676   | Sum of GTIs [s]                       |
| ontime7  | 17453.607567042   | Sum of GTIs [s]                       |
| ontime8  | 23023.598361582   | Sum of GTIs [s]                       |
| ontime9  | 35369.66026631  | Sum of GTIs [s]                       |
| l2events | 17342904  | Number of level 2 events              |



## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



### 2.1.2 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 50000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 8.4.4               | Processing system revision     | ontime         | 17453.607567042 | Sum of GTIs [s]                         |
| caldbver | 4.4.9               | &#160                          | ontime4        | 33934.891055912 | Sum of GTIs [s]                         |
| date     | 2012-05-24T03:36:48 | Date and time of file creation | ontime5        | 50142.25        | Sum of GTIs [s]                         |
| revision | 4                   | Processing version of data     | ontime6        | 15203.402793676 | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 17453.607567042 | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 23023.598361582 | Sum of GTIs [s]                         |
|          |                     |                                | ontime9        | 35369.66026631  | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 19246097        | Number of level 1 events                |

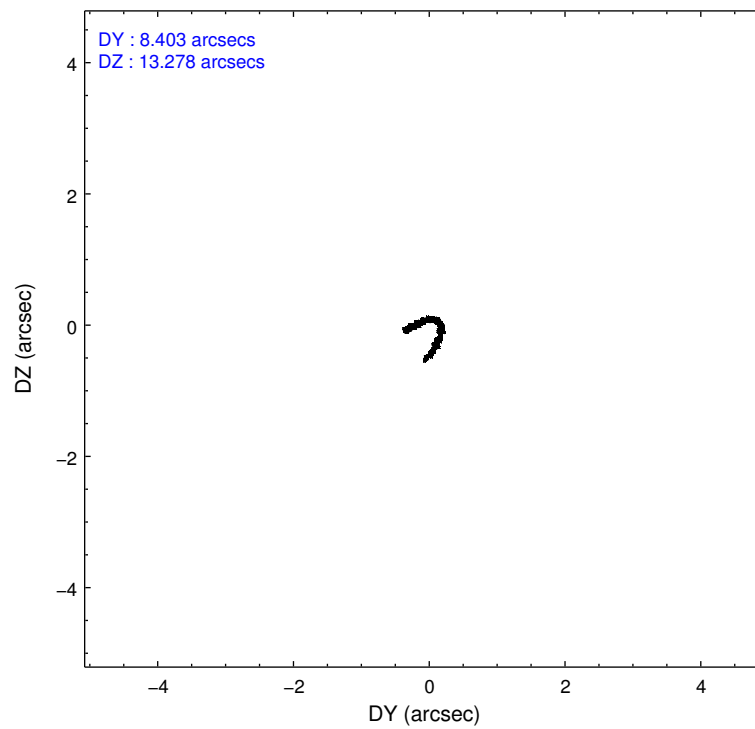
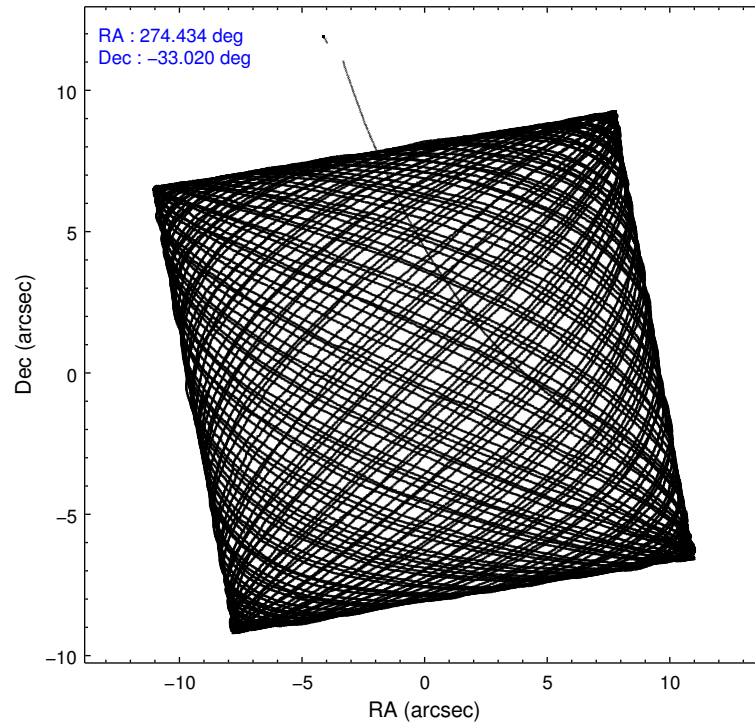
### 2.1.3 Events

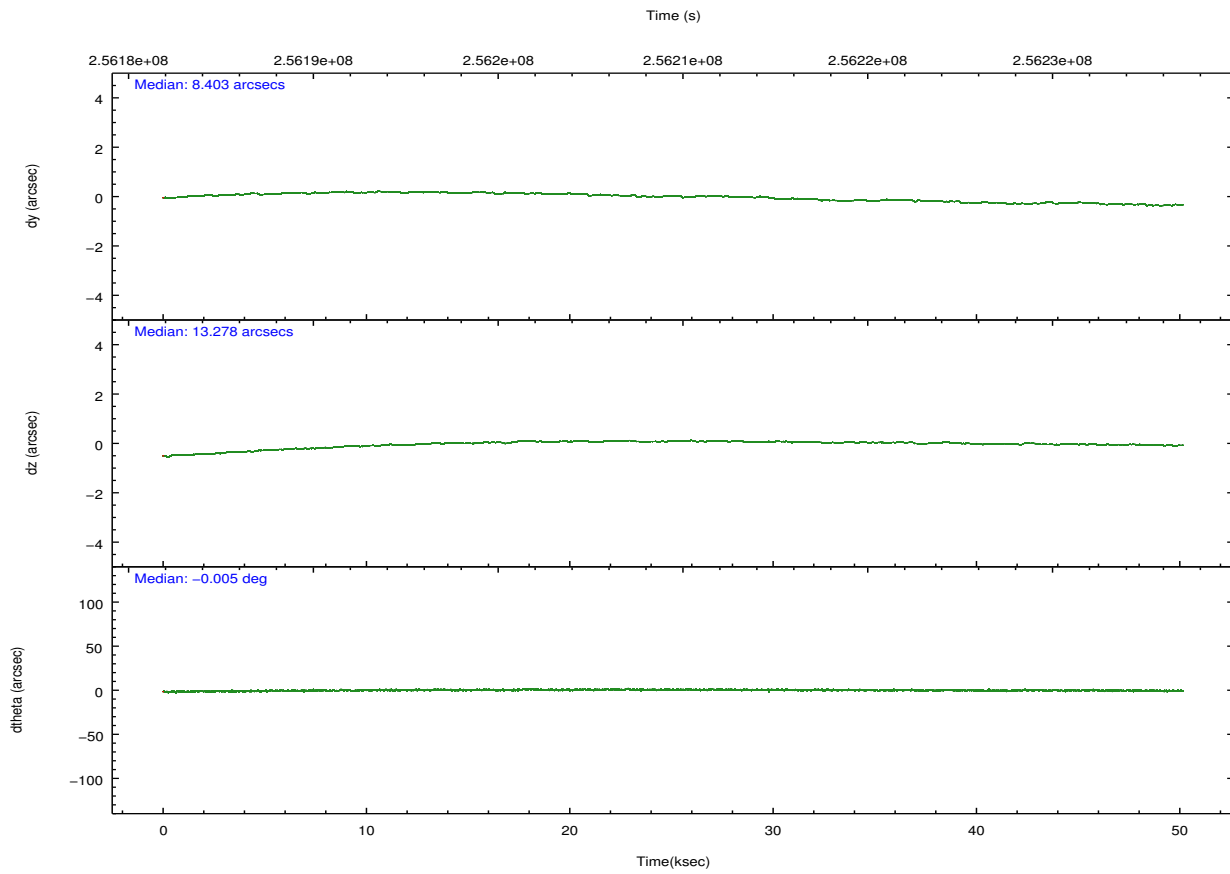
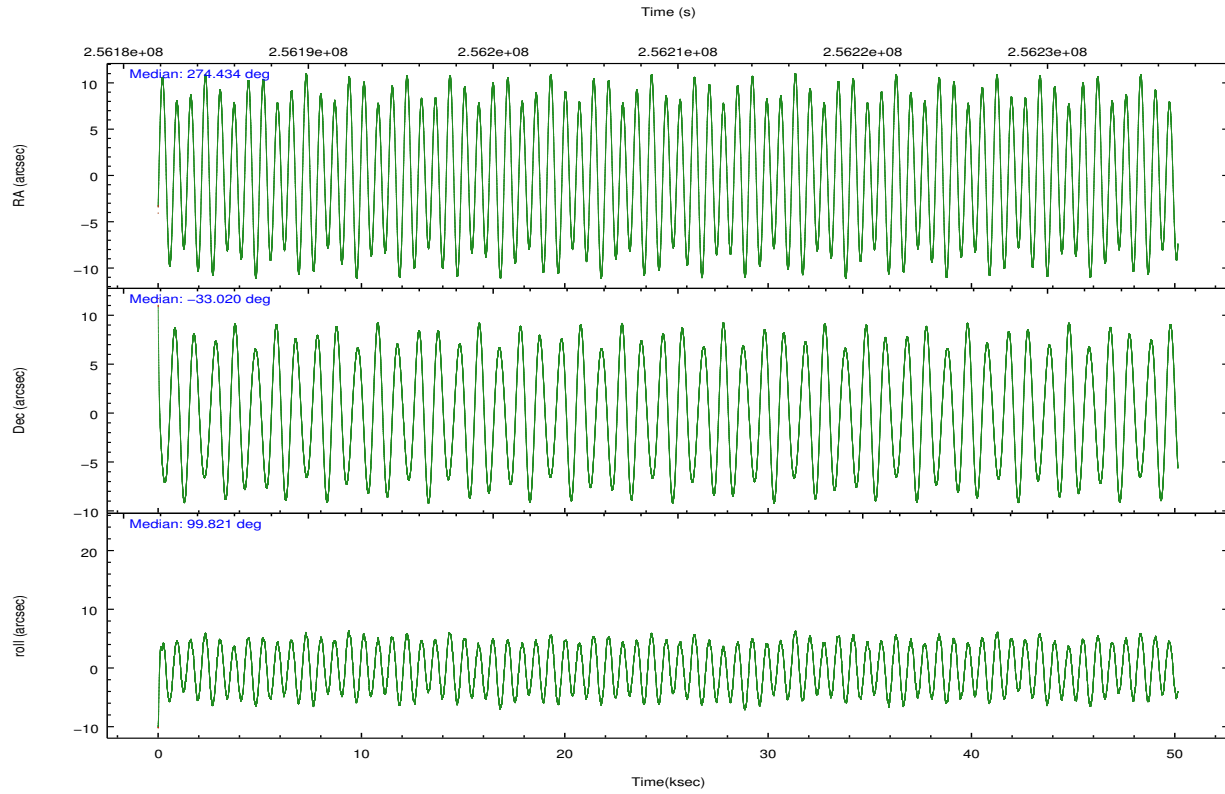
|                 | ccd 4   | ccd 5   | ccd 6   | ccd 7 | ccd 8   | ccd 9   |                | ccd 4  | ccd 5   | ccd 6   | ccd 7 | ccd 8   | ccd 9  |
|-----------------|---------|---------|---------|-------|---------|---------|----------------|--------|---------|---------|-------|---------|--------|
| level 1 events  | 1033767 | 6543895 | 5710813 | 45540 | 4448253 | 1463829 | grade 0 events | 353066 | 1312311 | 652297  | 5660  | 2253692 | 533002 |
| rejected events | 31630   | 166001  | 88522   | 6152  | 57769   | 27880   |                | 34%    | 20%     | 11%     | 12%   | 50%     | 36%    |
| rejected %      | 3%      | 2%      | 1%      | 13%   | 1%      | 1%      | grade 1 events | 946    | 2545    | 2921    | 1066  | 6899    | 1505   |
|                 |         |         |         |       |         |         |                | 0%     | 0%      | 0%      | 2%    | 0%      | 0%     |
|                 |         |         |         |       |         |         | grade 2 events | 578243 | 2969705 | 4542769 | 9970  | 1851028 | 792186 |
|                 |         |         |         |       |         |         |                | 55%    | 45%     | 79%     | 21%   | 41%     | 54%    |
|                 |         |         |         |       |         |         | grade 3 events | 19171  | 337274  | 29844   | 3299  | 89486   | 22868  |
|                 |         |         |         |       |         |         |                | 1%     | 5%      | 0%      | 7%    | 2%      | 1%     |
|                 |         |         |         |       |         |         | grade 4 events | 19112  | 335649  | 29810   | 3716  | 88616   | 23240  |
|                 |         |         |         |       |         |         |                | 1%     | 5%      | 0%      | 8%    | 1%      | 1%     |
|                 |         |         |         |       |         |         | grade 5 events | 14695  | 114030  | 43241   | 4852  | 29160   | 18541  |
|                 |         |         |         |       |         |         |                | 1%     | 1%      | 0%      | 10%   | 0%      | 1%     |
|                 |         |         |         |       |         |         | grade 6 events | 48534  | 1472381 | 409931  | 16977 | 129372  | 72487  |
|                 |         |         |         |       |         |         |                | 4%     | 22%     | 7%      | 37%   | 2%      | 4%     |
|                 |         |         |         |       |         |         | grade 7 events | 0      | 0       | 0       | 0     | 0       | 0      |
|                 |         |         |         |       |         |         |                | 0%     | 0%      | 0%      | 0%    | 0%      | 0%     |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar format version number          | 7         | 7       |
| Detector                          | ACIS-456789         | ACIS-456789          | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                           | HETG                | HETG                 | Obspar update status                  | NONE      | UPDATED |
| Data mode                         | CC33_GRADED         | CC33_GRADED          | Number of optional ACIS chips dropped | 0         | 0       |
| Observation mode                  | POINTING            | POINTING             | On-chip summing requested             | N         | N       |
| [deg] Pointing RA                 | 274.454801          | 274.4336621700566    | Subarray requested                    | NONE      | NONE    |
| [deg] Pointing Dec                | -33.040683          | -33.01999579579181   | Alternating exposures requested       | N         | N       |
| [deg] Pointing Roll               | 99.683816           | 99.82892408805874    | [s] Primary exposure time             | 0.000000  | 0       |
| [mm] SIM focus pos                | -0.684267           | -0.6828225247311905  |                                       |           |         |
| [mm] SIM defocus                  | 0                   | 0.001444936568705701 |                                       |           |         |
| [mm] SIM translation stage pos    | -185.632523         | -185.6369273447779   |                                       |           |         |
| [mm] SIM translation stage offset | -4.5                | -4.495595238229896   |                                       |           |         |
| [s] Observation start time (MET)  | 256184539.184000    | 256183455.37607      |                                       |           |         |
| Observation start date            | 2006-02-13T02:21:14 | 2006-02-13T02:04:15  |                                       |           |         |
| [s] Observation end time (MET)    | 256234539.184000    | 256235458.24099      |                                       |           |         |
| Observation end date              | 2006-02-13T16:14:34 | 2006-02-13T16:30:58  |                                       |           |         |
| Read mode                         | CONTINUOUS          | CONTINUOUS           |                                       |           |         |

## 2.3 Aspect



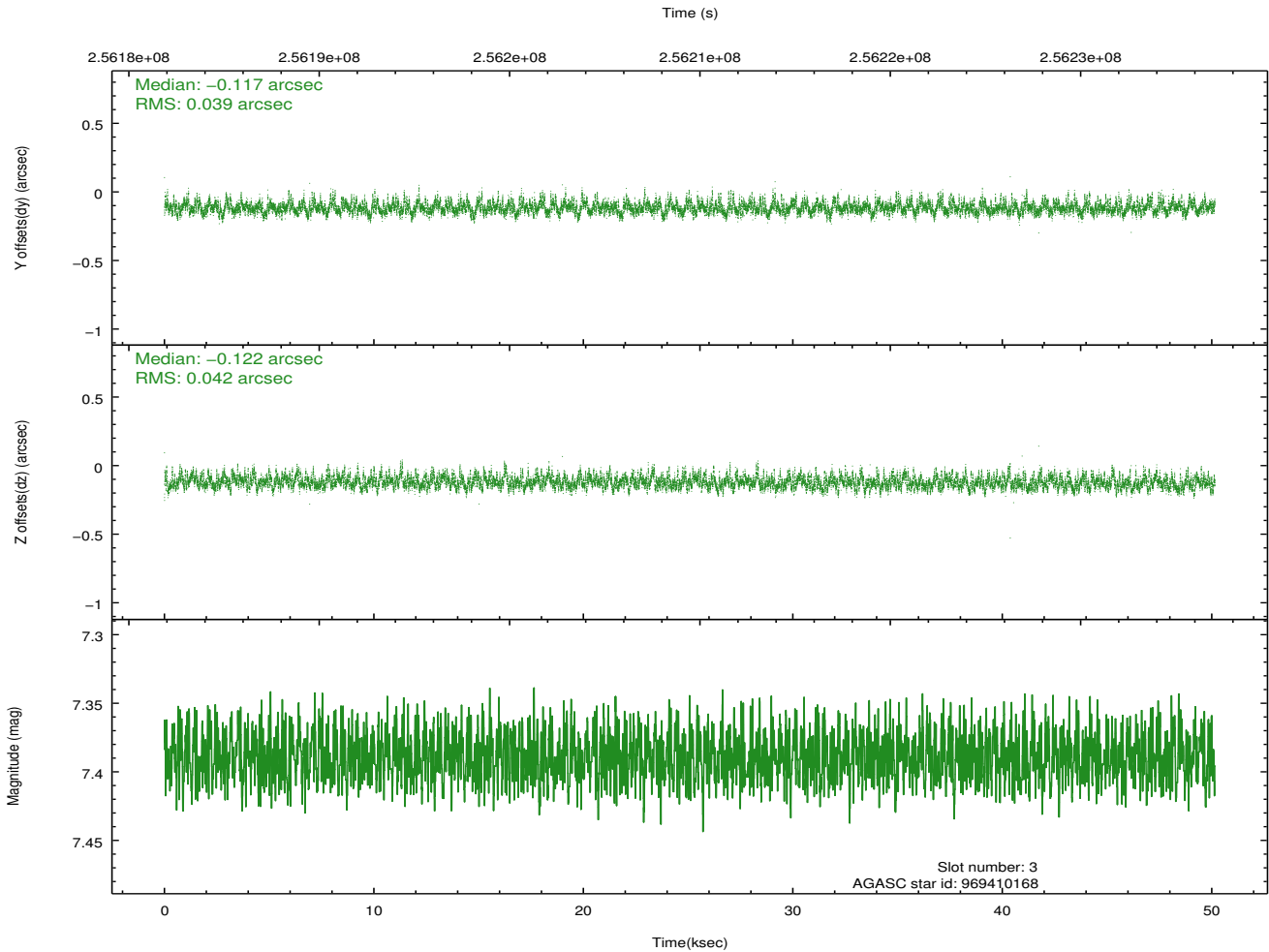
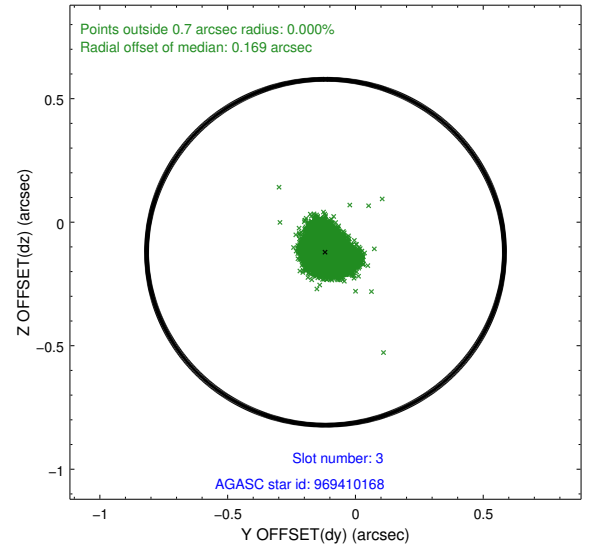
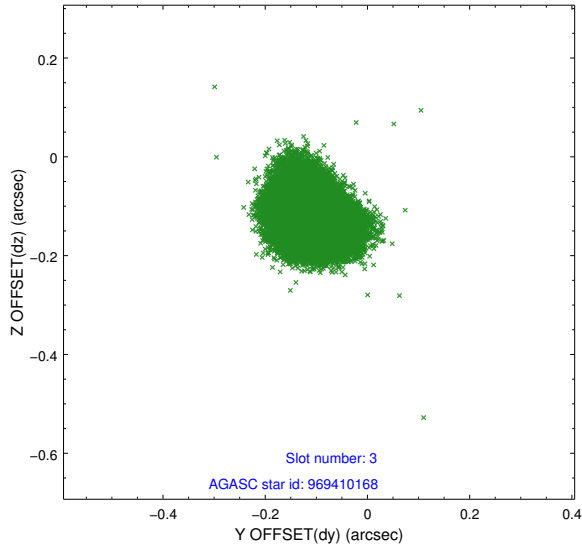


### Slot Statistics

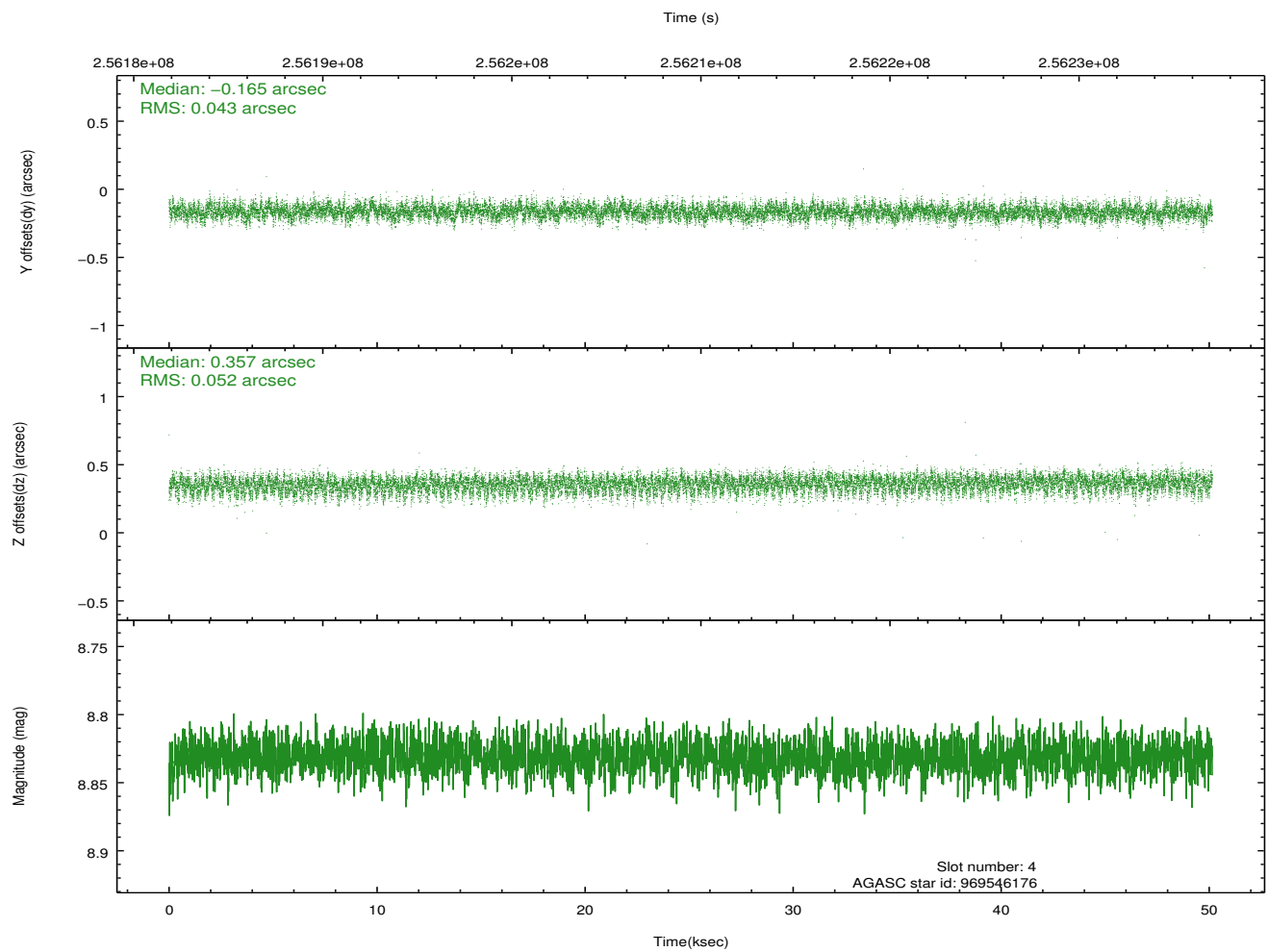
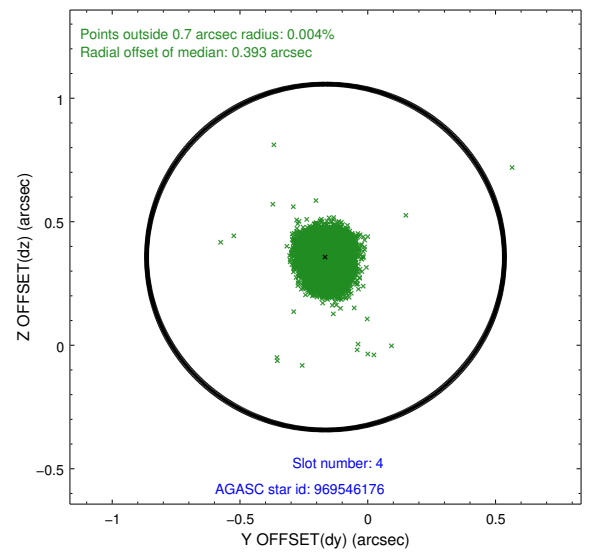
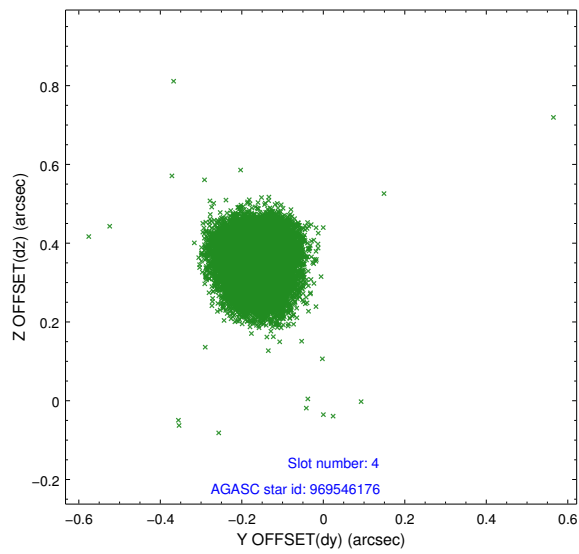
| slot | status | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec        | mean_y   | mean_z   |
|------|--------|-----------|------|-------|--------|--------|-------|-------|------------|------------|----------|----------|
| 0    | FID    | ACIS-S-4  | 7.18 | 12233 | 0.075  | 0.015  | 0.012 | 0.019 | 0.000000   | 0.000000   | 2152.58  | 81.39    |
| 1    | FID    | ACIS-S-5  | 7.23 | 12230 | -0.125 | 0.005  | 0.017 | 0.025 | 0.000000   | 0.000000   | -1813.83 | 74.83    |
| 2    | FID    | ACIS-S-6  | 7.37 | 12232 | 0.021  | -0.006 | 0.009 | 0.014 | 0.000000   | 0.000000   | 400.80   | 718.57   |
| 3    | GUIDE  | 969410168 | 7.39 | 24463 | -0.117 | -0.122 | 0.061 | 0.098 | 273.917435 | -33.091571 | 87.78    | 1629.22  |
| 4    | GUIDE  | 969546176 | 8.83 | 24445 | -0.165 | 0.357  | 0.072 | 0.115 | 275.052671 | -32.702345 | 891.22   | -1988.67 |
| 5    | GUIDE  | 969547152 | 8.73 | 24451 | 0.131  | 0.062  | 0.074 | 0.118 | 274.902625 | -33.021939 | -163.20  | -1343.20 |
| 6    | GUIDE  | 969409112 | 8.97 | 24448 | -0.072 | -0.148 | 0.064 | 0.105 | 274.299121 | -32.495229 | 2014.48  | 136.38   |
| 7    | GUIDE  | 969939248 | 7.65 | 24459 | 0.223  | -0.150 | 0.064 | 0.111 | 274.007989 | -33.757939 | -2323.15 | 1753.03  |

## 2.4 Star Slots

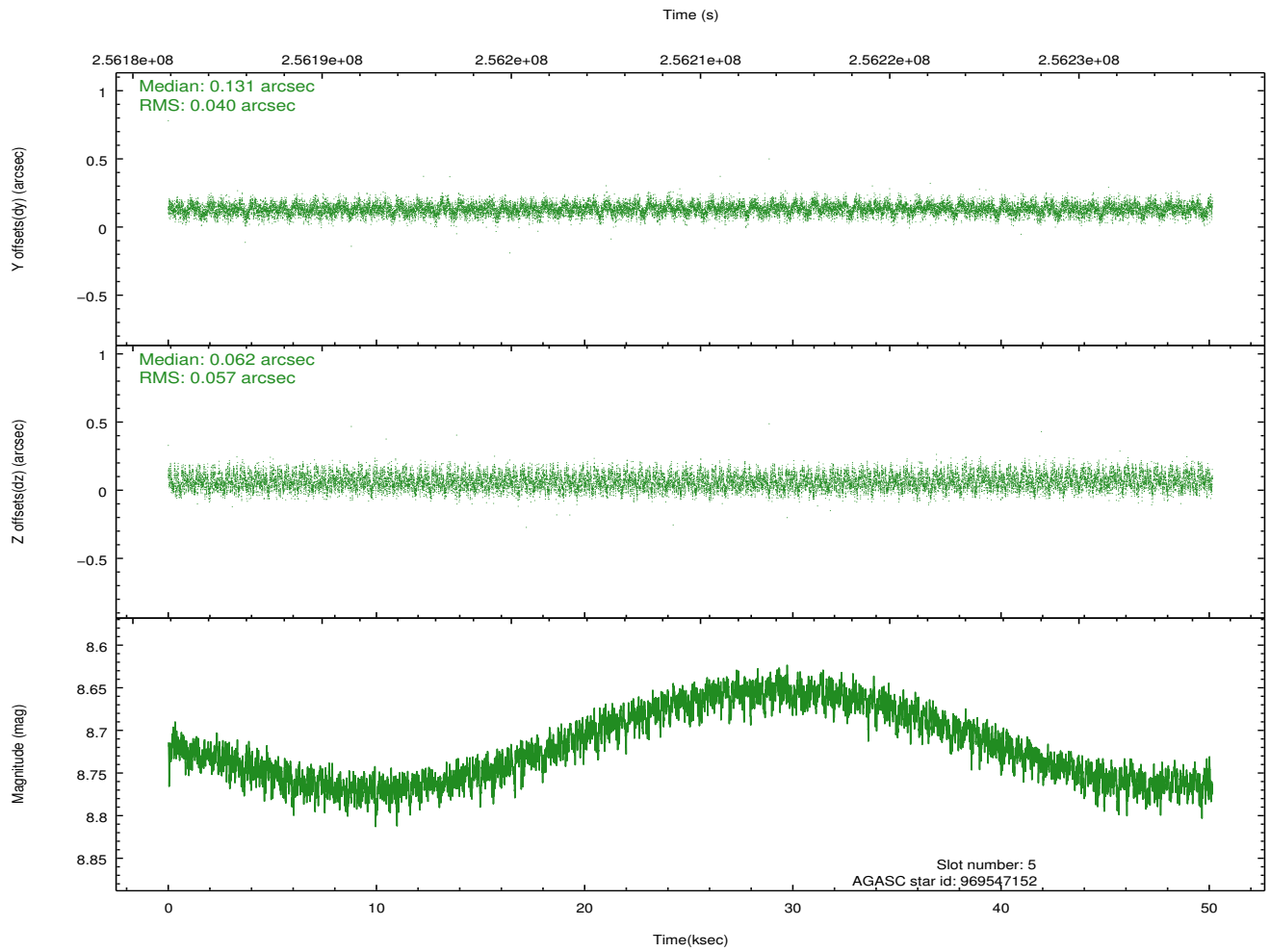
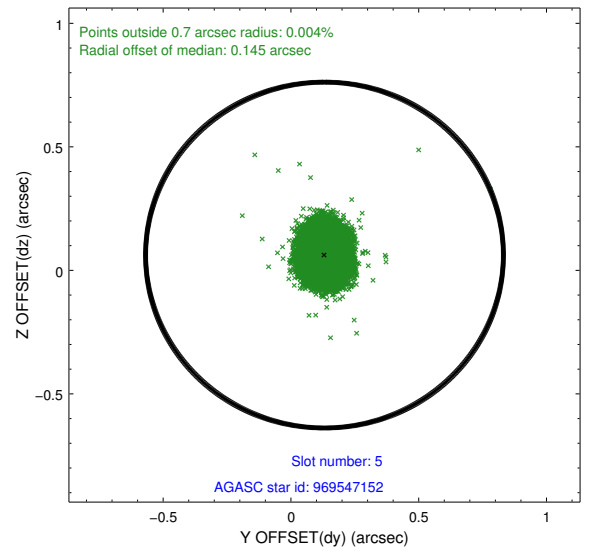
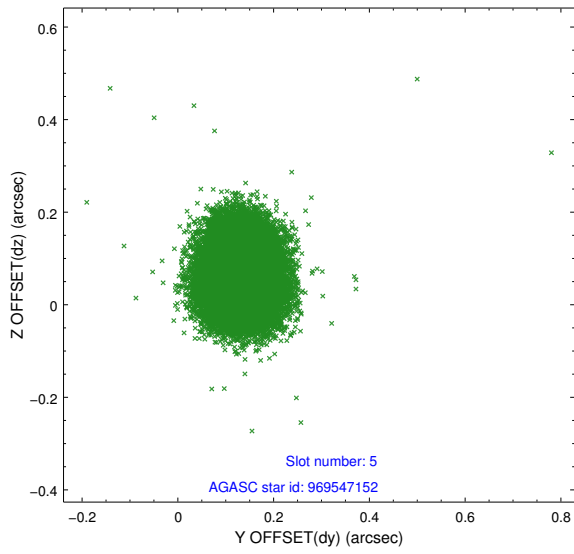
### 2.4.1 Slot 3



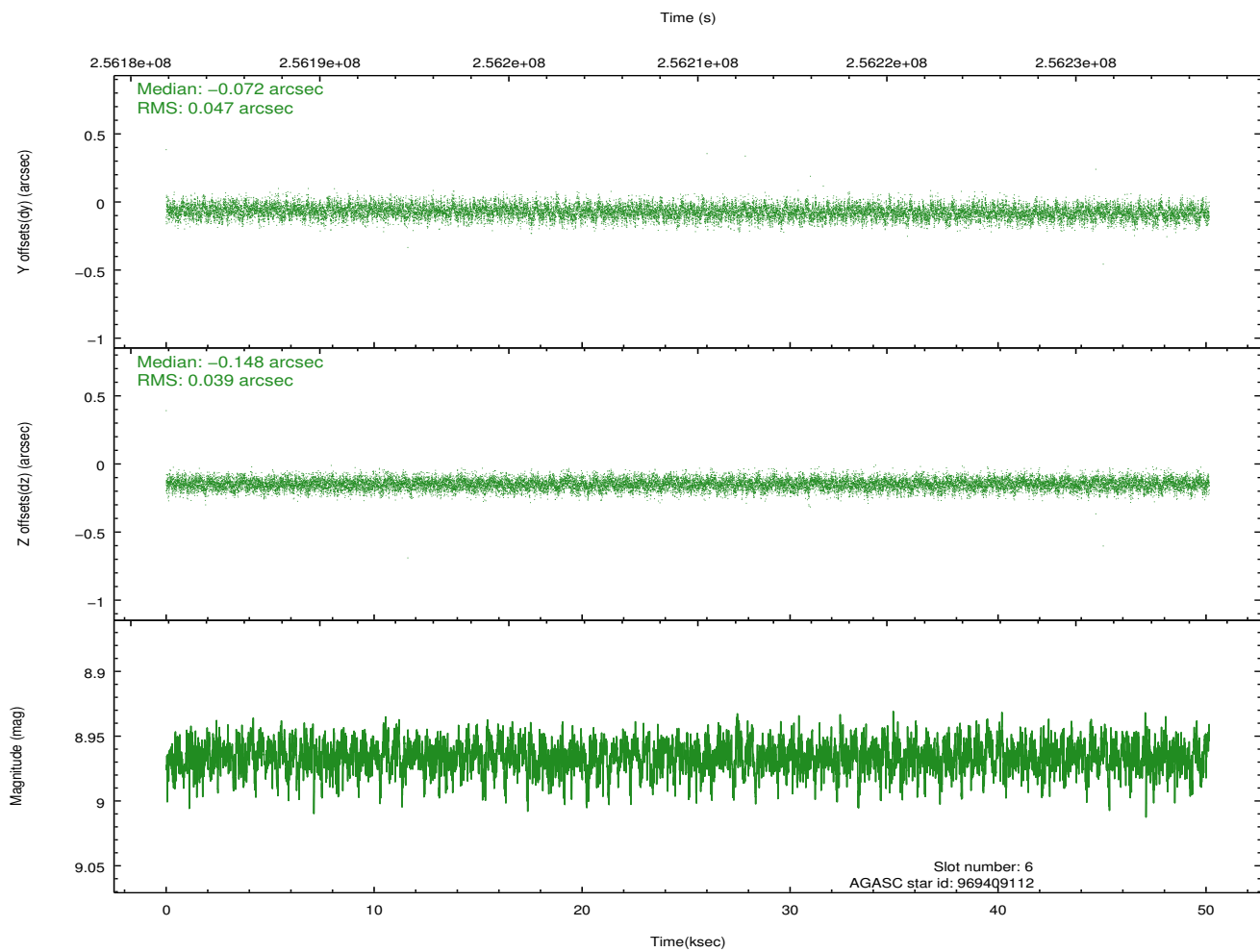
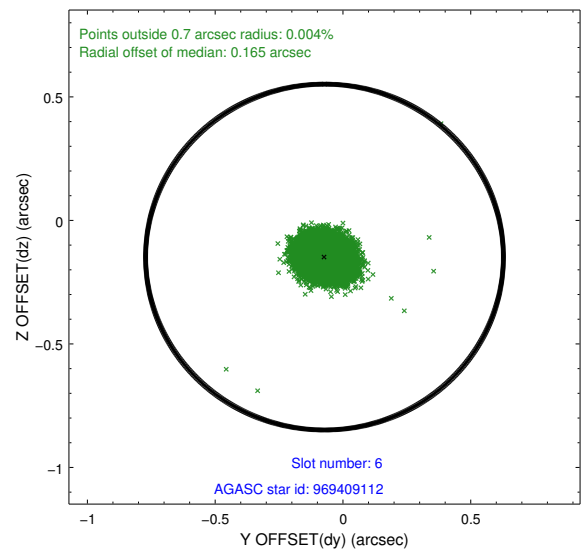
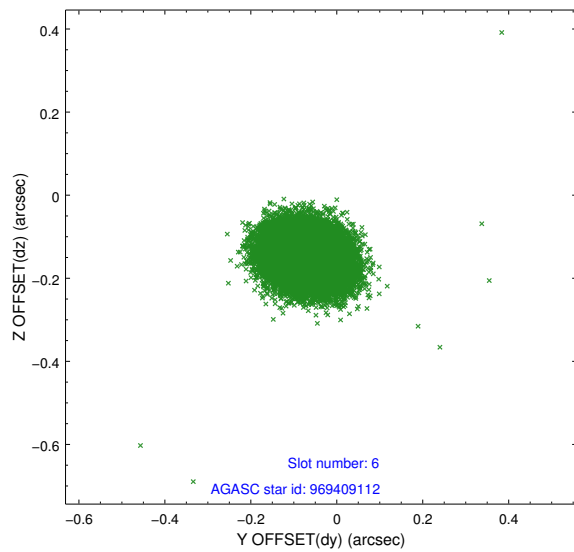
## 2.4.2 Slot 4



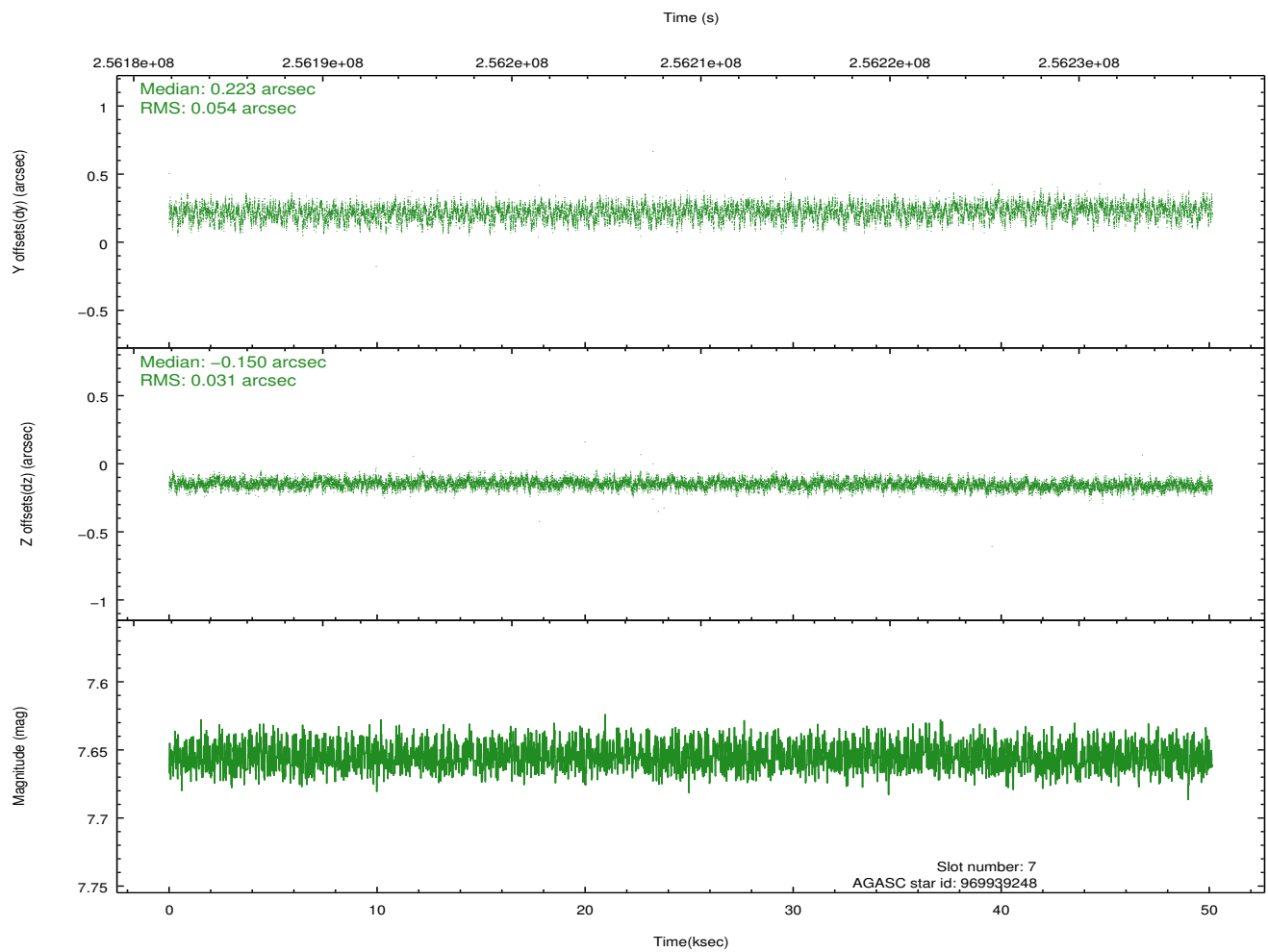
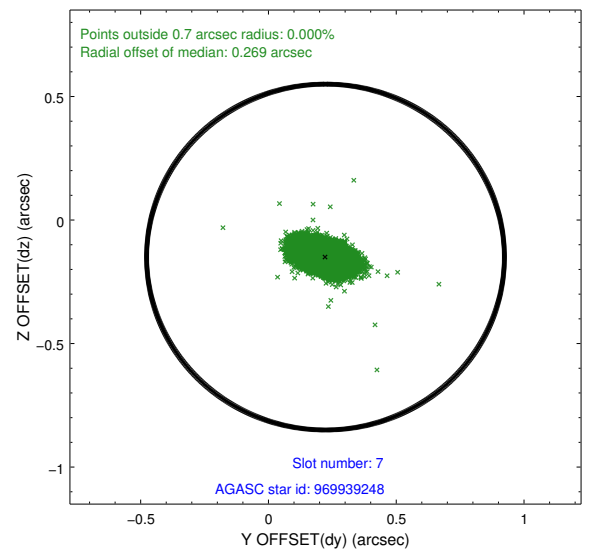
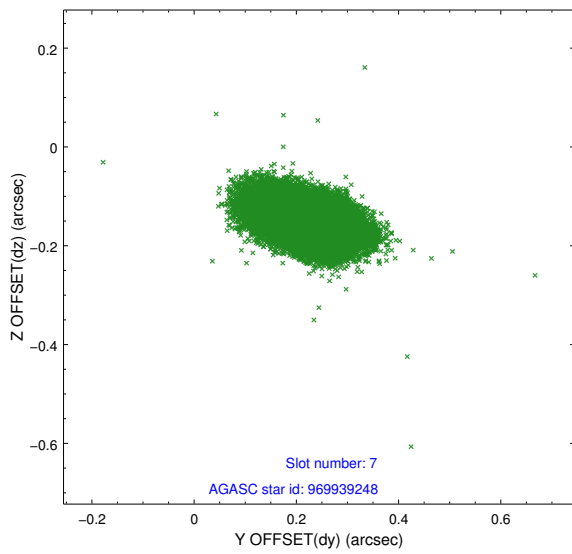
### 2.4.3 Slot 5



## 2.4.4 Slot 6

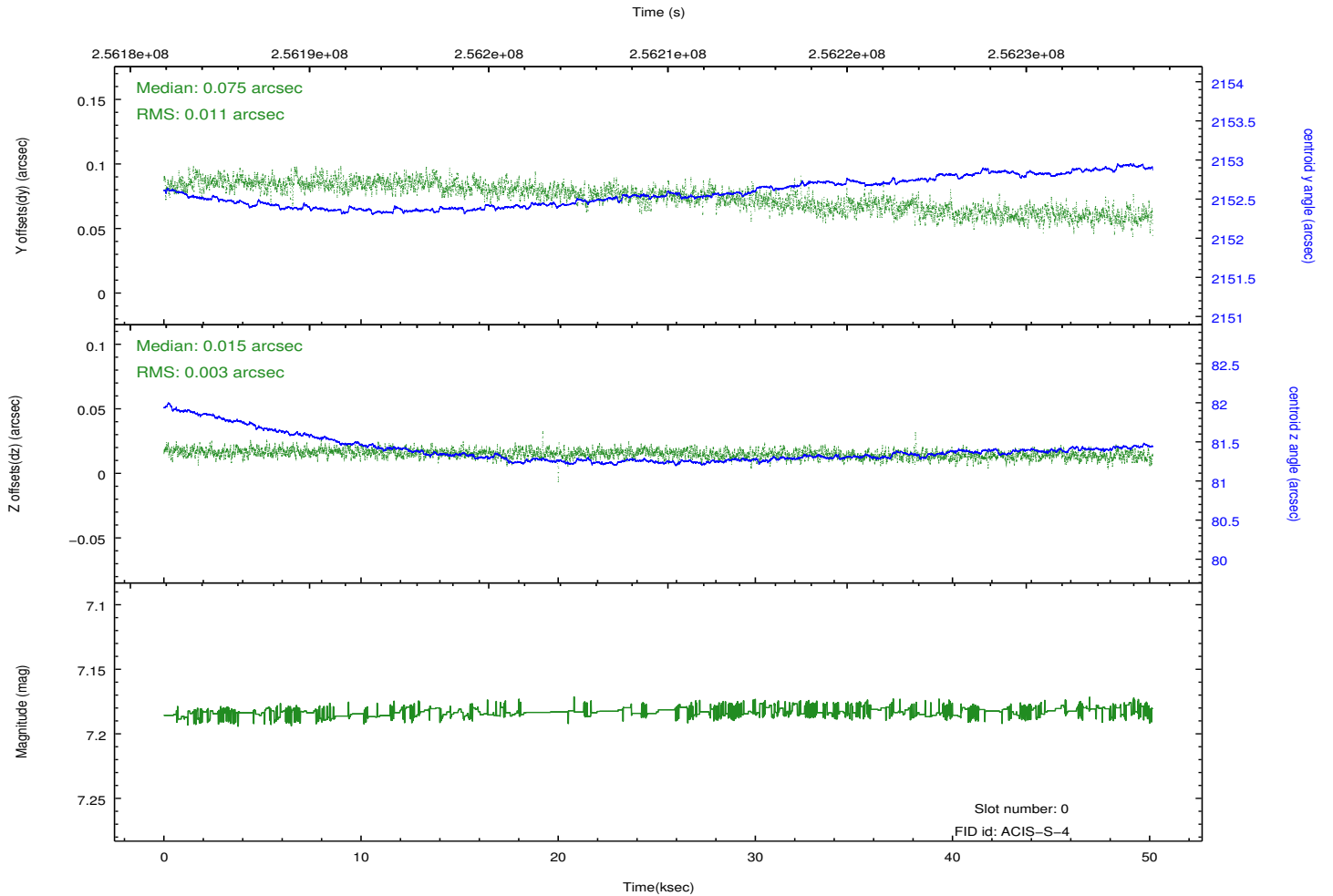
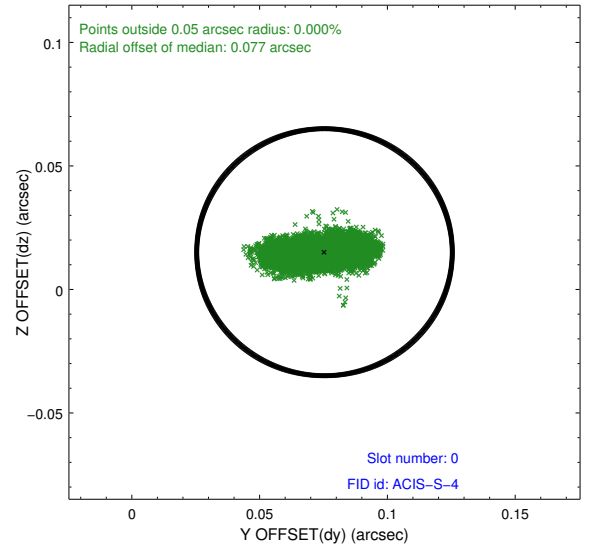
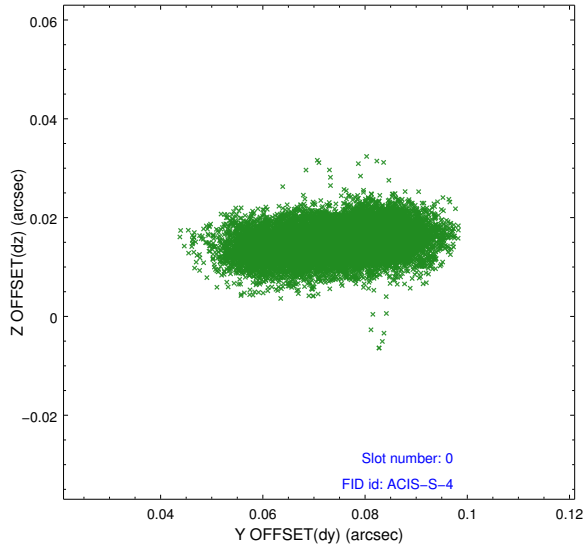


## 2.4.5 Slot 7

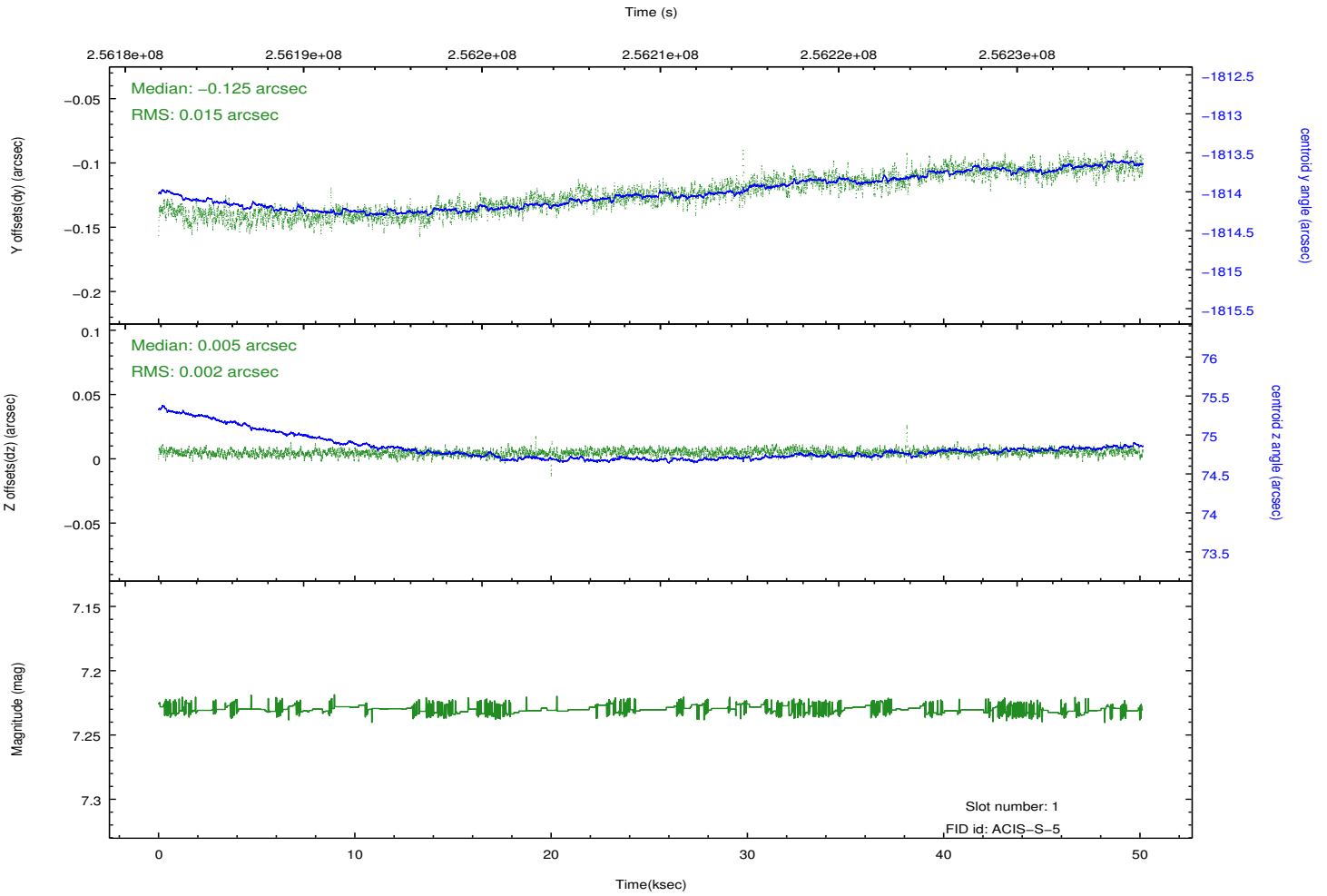
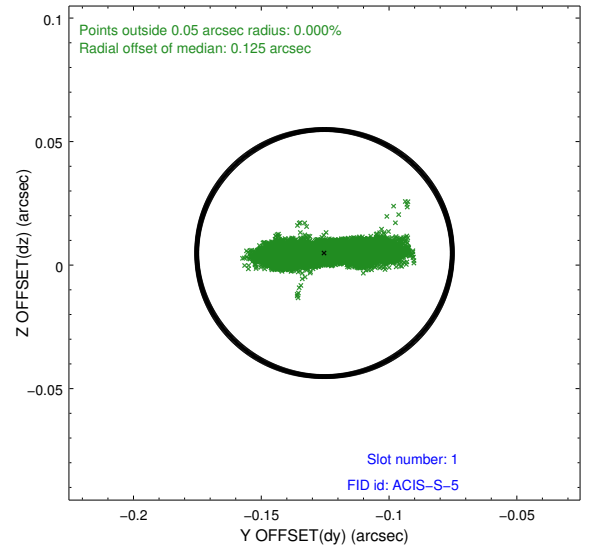
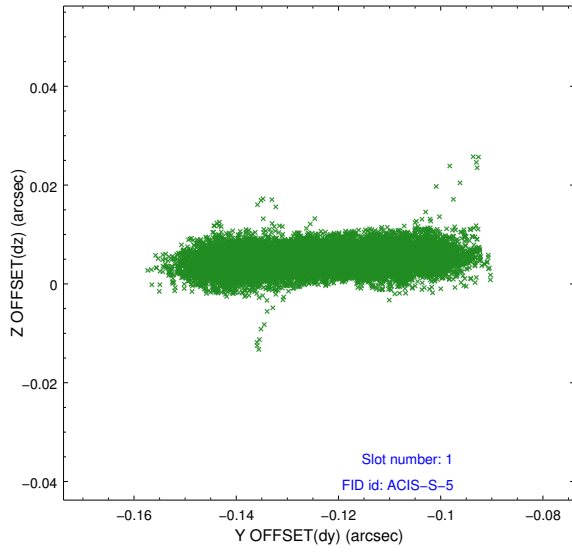


## 2.5 FID Slots

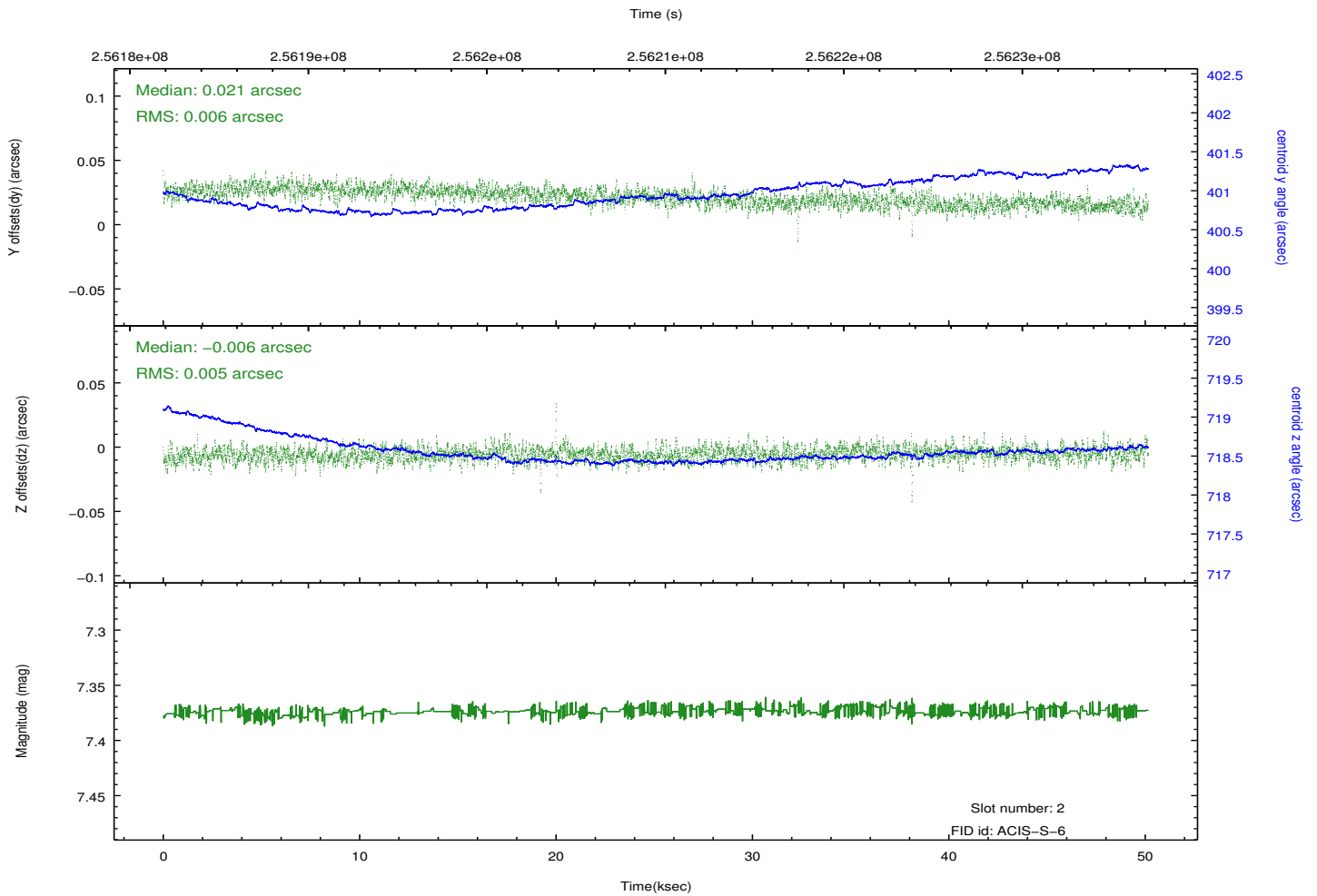
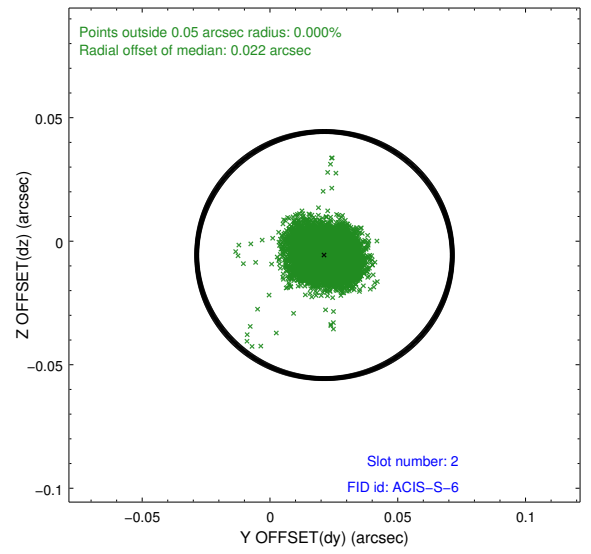
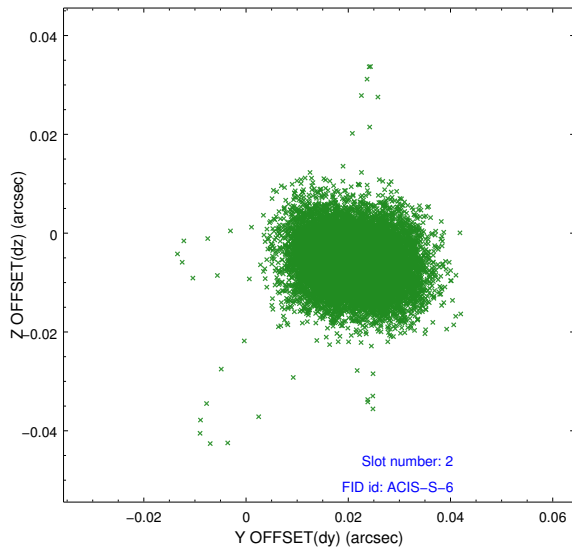
### 2.5.1 Slot 0



## 2.5.2 Slot 1

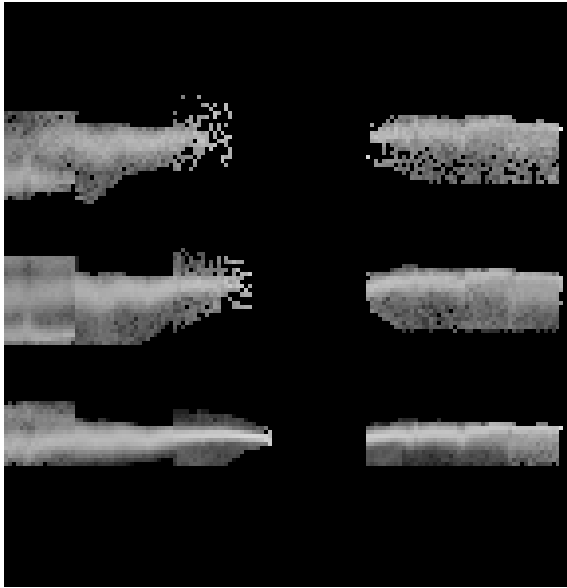


### 2.5.3 Slot 2



# 3 Gratings

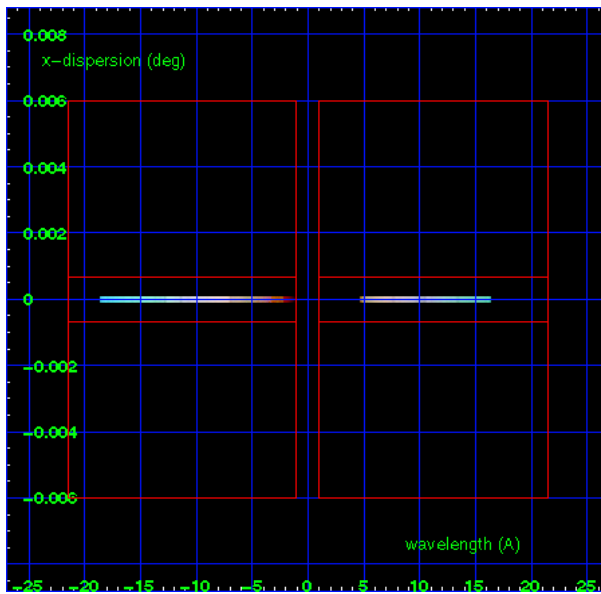
## 3.1 HEG Arm



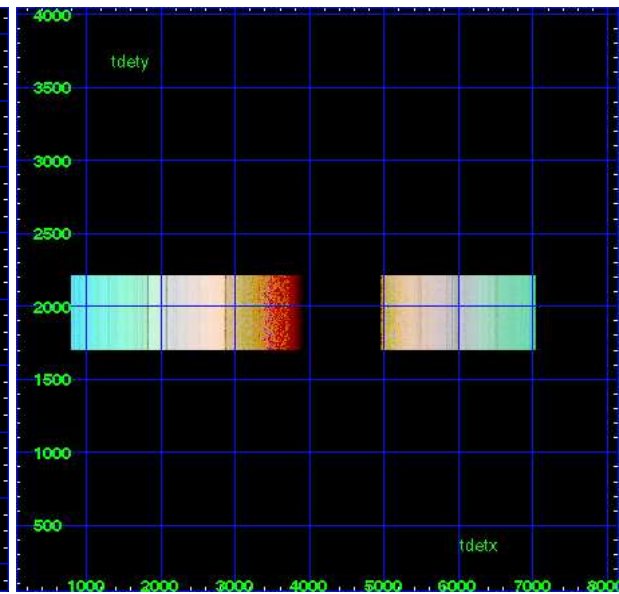
HEG Order Sort 123



HEG Order Sort ALL

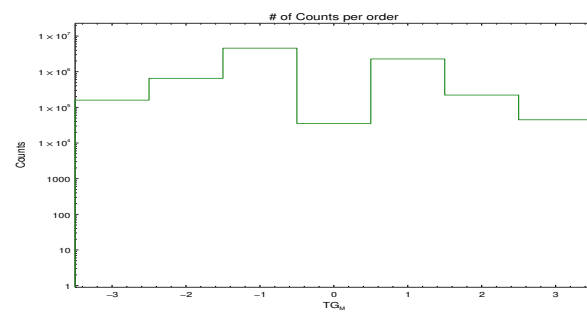


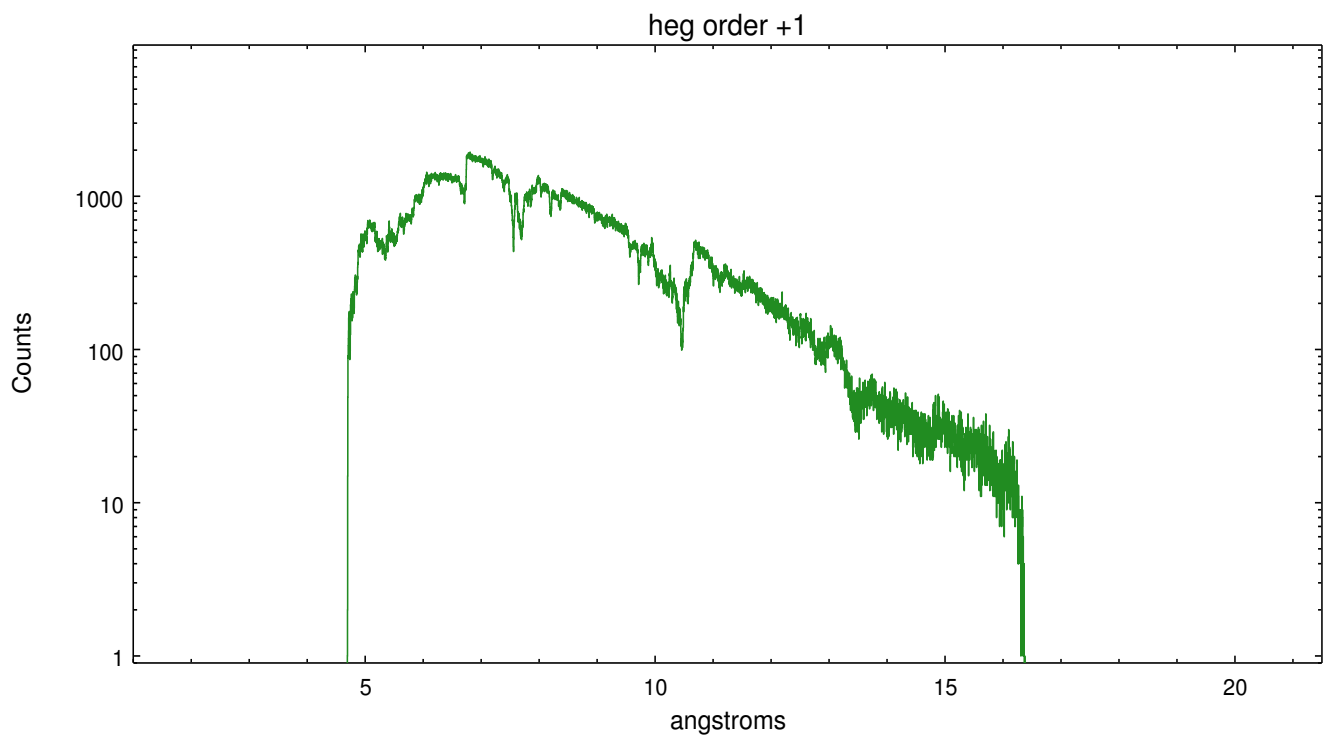
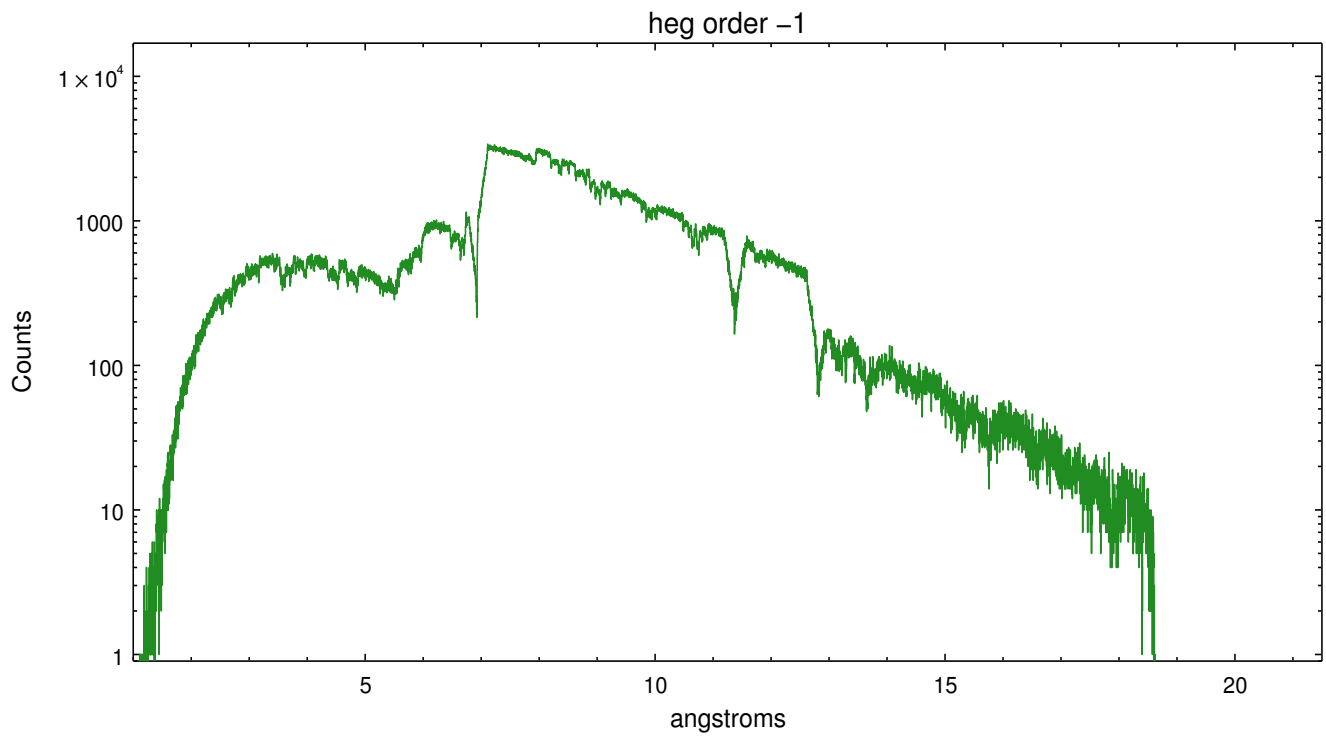
Spot Image HEG



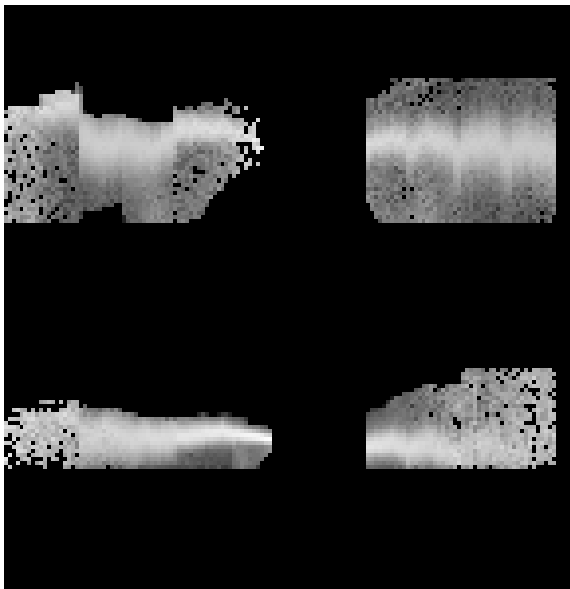
Full Detector HEG

|        | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|----------|----------|----------|---------|---------|---------|---------|
| Events | 159299   | 652089   | 4570511  | 35387   | 2279466 | 221120  | 44828   |

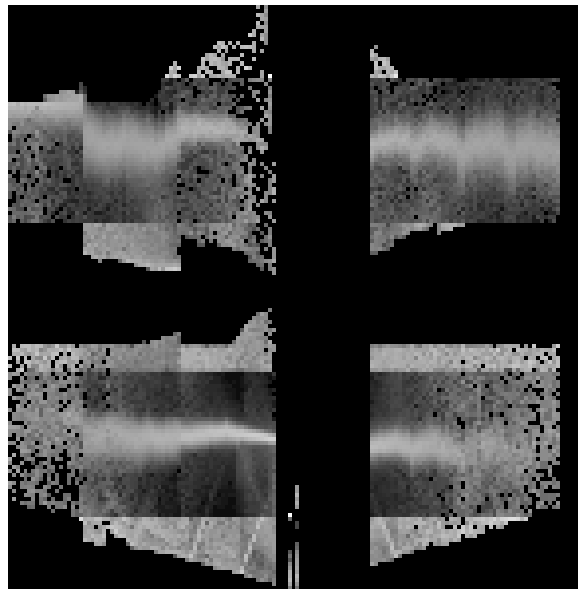




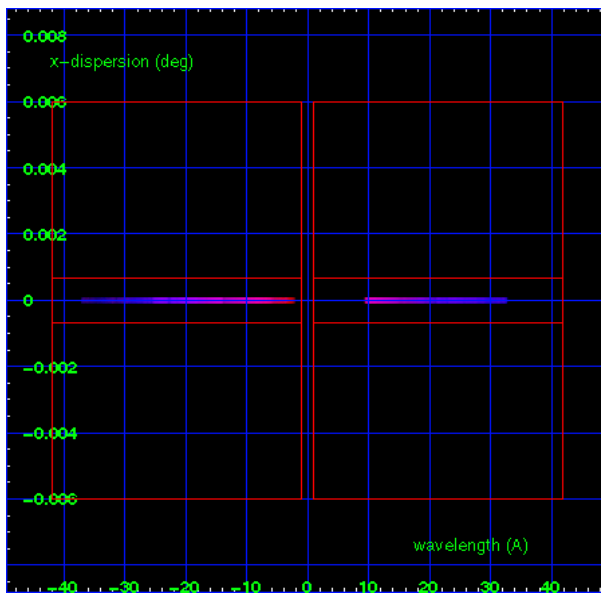
### 3.2 MEG Arm



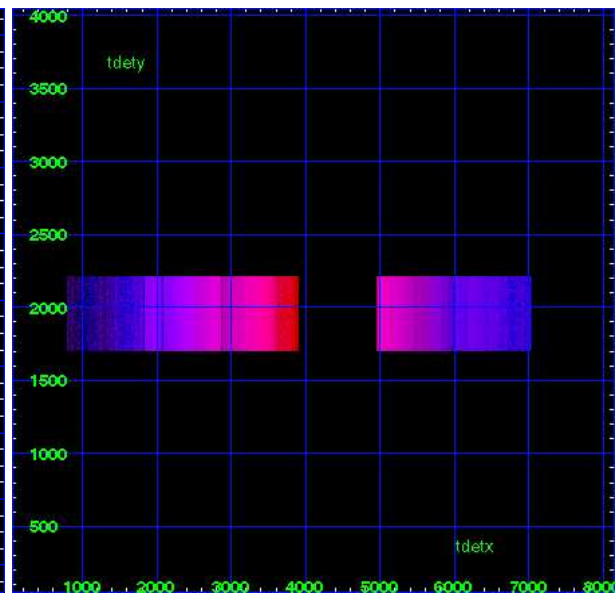
MEG Order Sort 123



MEG Order Sort ALL

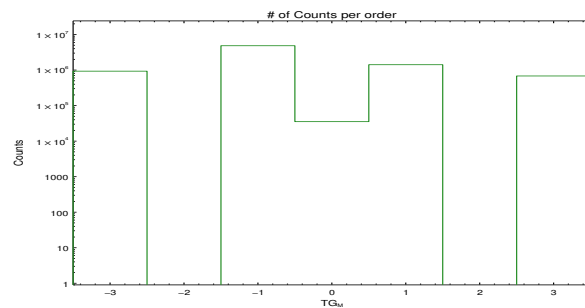


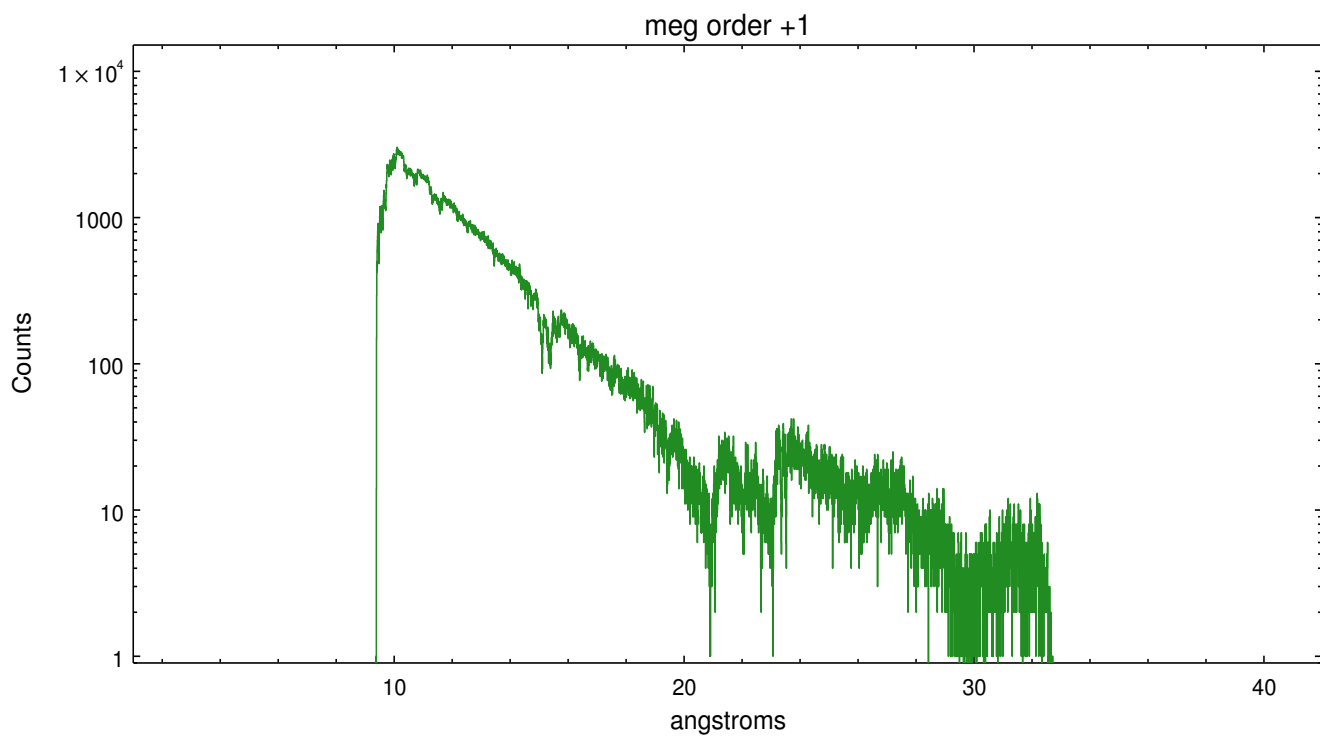
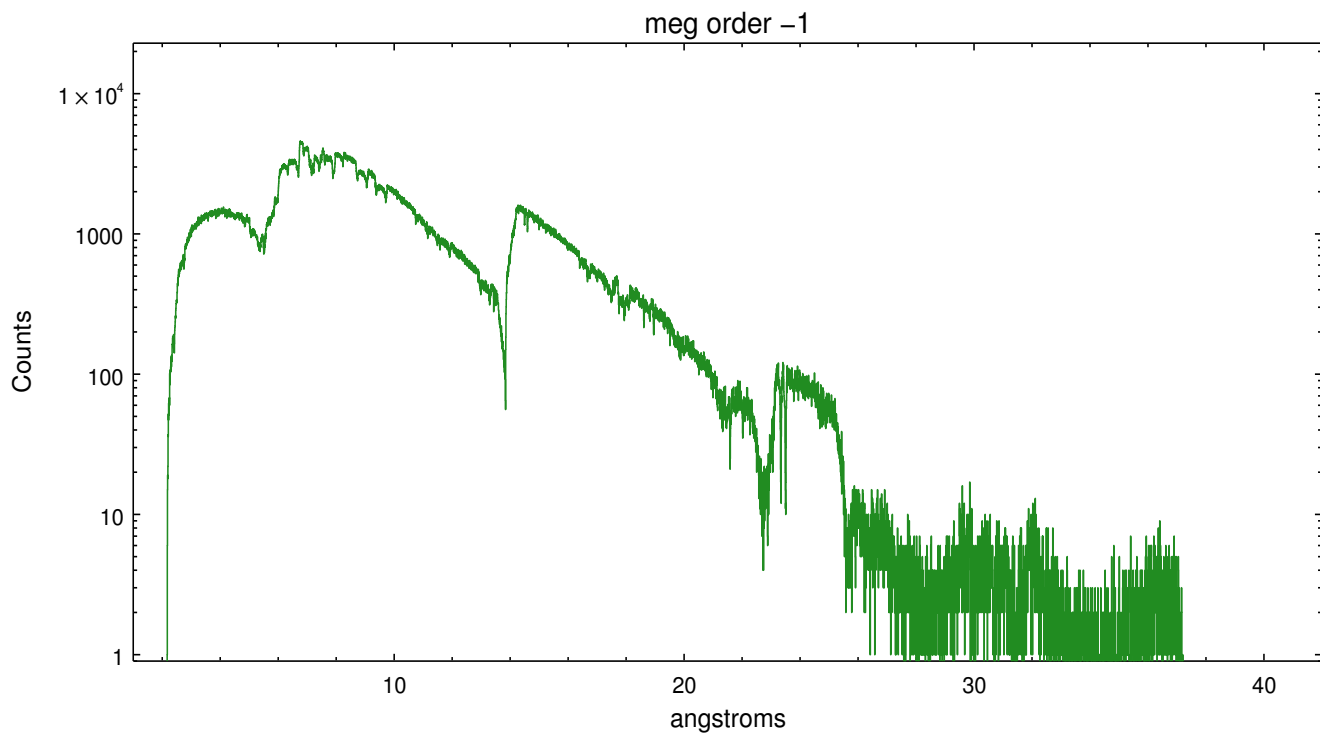
Spot Image MEG



Full Detector MEG

|        | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|----------|----------|----------|---------|---------|---------|---------|
| Events | 931227   | 0        | 4846899  | 35387   | 1416768 | 0       | 682553  |





# A Summary

## A.1 Status

|                            |             |
|----------------------------|-------------|
| V&V Scientist              | Joy Nichols |
| V&V Date (YYYY-MM-DD)      | 2012.05.31  |
| V&V Edition                | 1           |
| V&V Disposition and Status | OK          |
| V&V Charge Time            | 50          |

## A.2 Comments

Charge time: For extremely bright sources, the instrument (or telemetry) can saturate, and effective exposure times vary with chip. For this observation, the time used was from `ccd_id=5`, the longest (least saturated), which is comparable to the elapsed and requested time.

===

A spatial exclusion window was used to allow only 1 in 20 events in a region around the zeroth order. The exclusion window applies to columns 162-261 on chip S3.

===

For ACIS/CC-mode w/ HETG, at with no SIM-Z offset, there are no MEG even order counts. MEG even orders overlap with HEG orders in energy, but MEG even order efficiencies are very low. Since HEG and MEG cannot be spatially separated, events are preferentially assigned to HEG. (MEG odd orders can be resolved.) For observations with a SIM-Z offset, MEG negative and MEG positive orders will be missing (off the array), and remove some of the ambiguity.

===

This reprocessing of obsid 6615 was done to rectify an issue with raw telemetry files in the archive. A 1/4 second overlap between two files was cleaned up.

The science data products were not affected by this fix.