

# V&V Reference Report

## L2 ASCDS Version : 8.5.1.1

Observation 7186 - L2 Version 3  
Chandra X-Ray Center

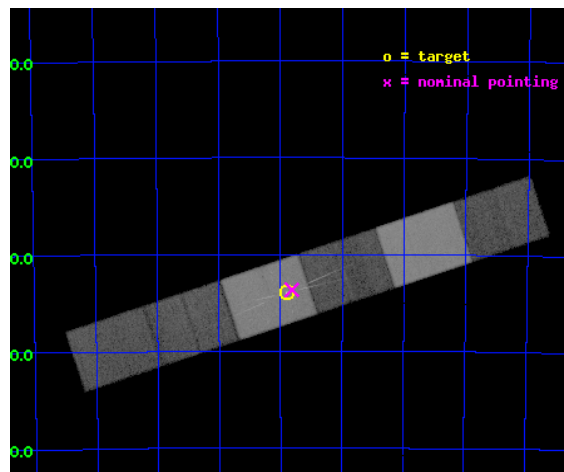
L2 Processing Date : Dec 30 2012

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# 1 Front

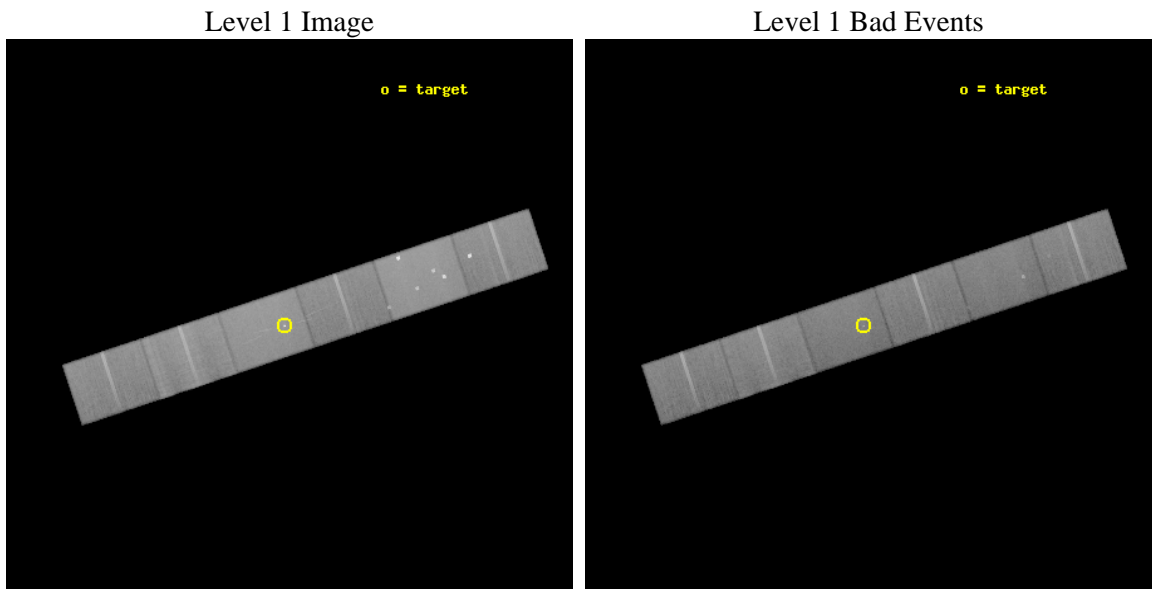
|          |  |   |
|----------|--|---|
| seq_num  | 300171   | Sequence number                             |
| obs_id   | 7186   | Observation id                              |
| title    | HETGS Observation of a Transient Hard X-ray Symbiotic Binary | Propo                                       |
| observer | Dr. Jennifer Sokoloski                                       | Principal investigator                      |
| object   | RT Cru   | Source name                                 |
| dtycle   | 0  | &#160                                       |
| cycle    | P  | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 188.72375  | Observer's specified target RA [deg]        |
| dec_targ | -64.565556   | Observer's specified target Dec [deg]       |
| ra_nom   | 188.70395579651  | Nominal RA [deg]                            |
| dec_nom  | -64.560944919339   | Nominal Dec [deg]                           |
| roll_nom | 161.60578697764  | Nominal Roll [deg]                          |
| revision | 3  | Processing version of data                  |
| ontime   | 50155.0  | Sum of GTIs [s]                             |
| livetime | 49344.953247489  | Livetime [s]                                |
| ontime4  | 50155.0  | Sum of GTIs [s]                             |
| ontime5  | 50155.0  | Sum of GTIs [s]                             |
| ontime6  | 50155.0  | Sum of GTIs [s]                             |
| ontime7  | 50155.0  | Sum of GTIs [s]                             |
| ontime8  | 50155.0  | Sum of GTIs [s]                             |
| ontime9  | 50155.0  | Sum of GTIs [s]                             |
| l2events | 507706   | Number of level 2 events                    |



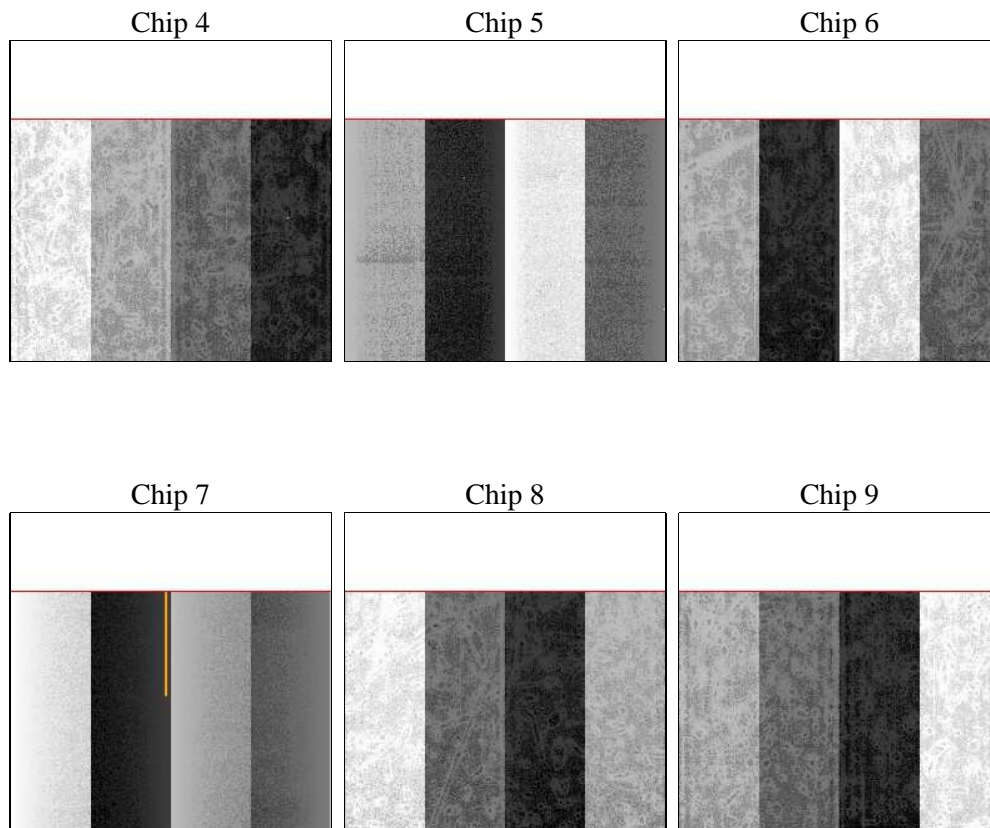
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |              |   |
|----------|---------------------|--------------------------------|----------------|--------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 50000.000000 | [s] Scheduled observation exposure time |
| ascdsver | 8.5.1.1             | Processing system revision     | ontime         | 50155.0      | Sum of GTIs [s]                         |
| caldbver | 4.5.5               | &#160                          | ontime4        | 50155.0      | Sum of GTIs [s]                         |
| date     | 2012-12-30T22:08:45 | Date and time of file creation | ontime5        | 50155.0      | Sum of GTIs [s]                         |
| revision | 3                   | Processing version of data     | ontime6        | 50155.0      | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 50155.0      | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 50155.0      | Sum of GTIs [s]                         |
|          |                     |                                | ontime9        | 50155.0      | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 2274031      | Number of level 1 events                |

### 2.1.4 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  | 355136 | 488020 | 307208 | 423562 | 394976 | 305129 | grade 0 events | 32729  | 47908  | 14925  | 16935  | 26134  | 15413  |
| rejected events | 299891 | 250461 | 269396 | 243468 | 309488 | 267524 |                | 9%     | 9%     | 4%     | 3%     | 6%     | 5%     |
| rejected %      | 84%    | 51%    | 87%    | 57%    | 78%    | 87%    | grade 1 events | 318    | 2409   | 133    | 444    | 239    | 145    |
|                 |        |        |        |        |        |        |                | 0%     | 0%     | 0%     | 0%     | 0%     | 0%     |
|                 |        |        |        |        |        |        | grade 2 events | 8587   | 61043  | 7824   | 36784  | 19191  | 7513   |
|                 |        |        |        |        |        |        |                | 2%     | 12%    | 2%     | 8%     | 4%     | 2%     |
|                 |        |        |        |        |        |        | grade 3 events | 4064   | 9924   | 3968   | 16455  | 9292   | 3866   |
|                 |        |        |        |        |        |        |                | 1%     | 2%     | 1%     | 3%     | 2%     | 1%     |
|                 |        |        |        |        |        |        | grade 4 events | 4014   | 9855   | 3787   | 16227  | 8689   | 3857   |
|                 |        |        |        |        |        |        |                | 1%     | 2%     | 1%     | 3%     | 2%     | 1%     |
|                 |        |        |        |        |        |        | grade 5 events | 13507  | 35550  | 14143  | 39943  | 18597  | 15115  |
|                 |        |        |        |        |        |        |                | 3%     | 7%     | 4%     | 9%     | 4%     | 4%     |
|                 |        |        |        |        |        |        | grade 6 events | 6324   | 110927 | 7604   | 95218  | 22899  | 7258   |
|                 |        |        |        |        |        |        |                | 1%     | 22%    | 2%     | 22%    | 5%     | 2%     |
|                 |        |        |        |        |        |        | grade 7 events | 285593 | 210404 | 254824 | 201556 | 289935 | 251962 |
|                 |        |        |        |        |        |        |                | 80%    | 43%    | 82%    | 47%    | 73%    | 82%    |

## 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                         | FAINT               | FAINT                | Number of optional ACIS chips dropped | 0         | 0       |
| Observation mode                  | POINTING            | POINTING             | On-chip summing requested             | N         | N       |
| [deg] Pointing RA                 | 188.765868          | 188.7039557965149    | Subarray requested                    | CUSTOM    | CUSTOM  |
| [deg] Pointing Dec                | -64.555078          | -64.56094491933888   | Subarray start row                    | 1         | 1       |
| [deg] Pointing Roll               | 161.505073          | 161.6057869776438    | Subarray row count                    | 774       | 774     |
| [mm] SIM focus pos                | -0.684267           | -0.6828225247311905  | Alternating exposures requested       | N         | N       |
| [mm] SIM defocus                  | 0                   | 0.001444936568705701 | [s] Primary exposure time             | 0.000000  | 2.5     |
| [mm] SIM translation stage pos    | -187.132523         | -187.1228876879999   |                                       |           |         |
| [mm] SIM translation stage offset | -3                  | -3.009634895007935   |                                       |           |         |
| [s] Observation start time (MET)  | 246105762.184000    | 246104536.63481      |                                       |           |         |
| Observation start date            | 2005-10-19T10:41:38 | 2005-10-19T10:22:16  |                                       |           |         |
| [s] Observation end time (MET)    | 246155762.184000    | 246156759.36221      |                                       |           |         |
| Observation end date              | 2005-10-20T00:34:58 | 2005-10-20T00:52:39  |                                       |           |         |
| Read mode                         | TIMED               | TIMED                |                                       |           |         |

## 2.3 Aspect

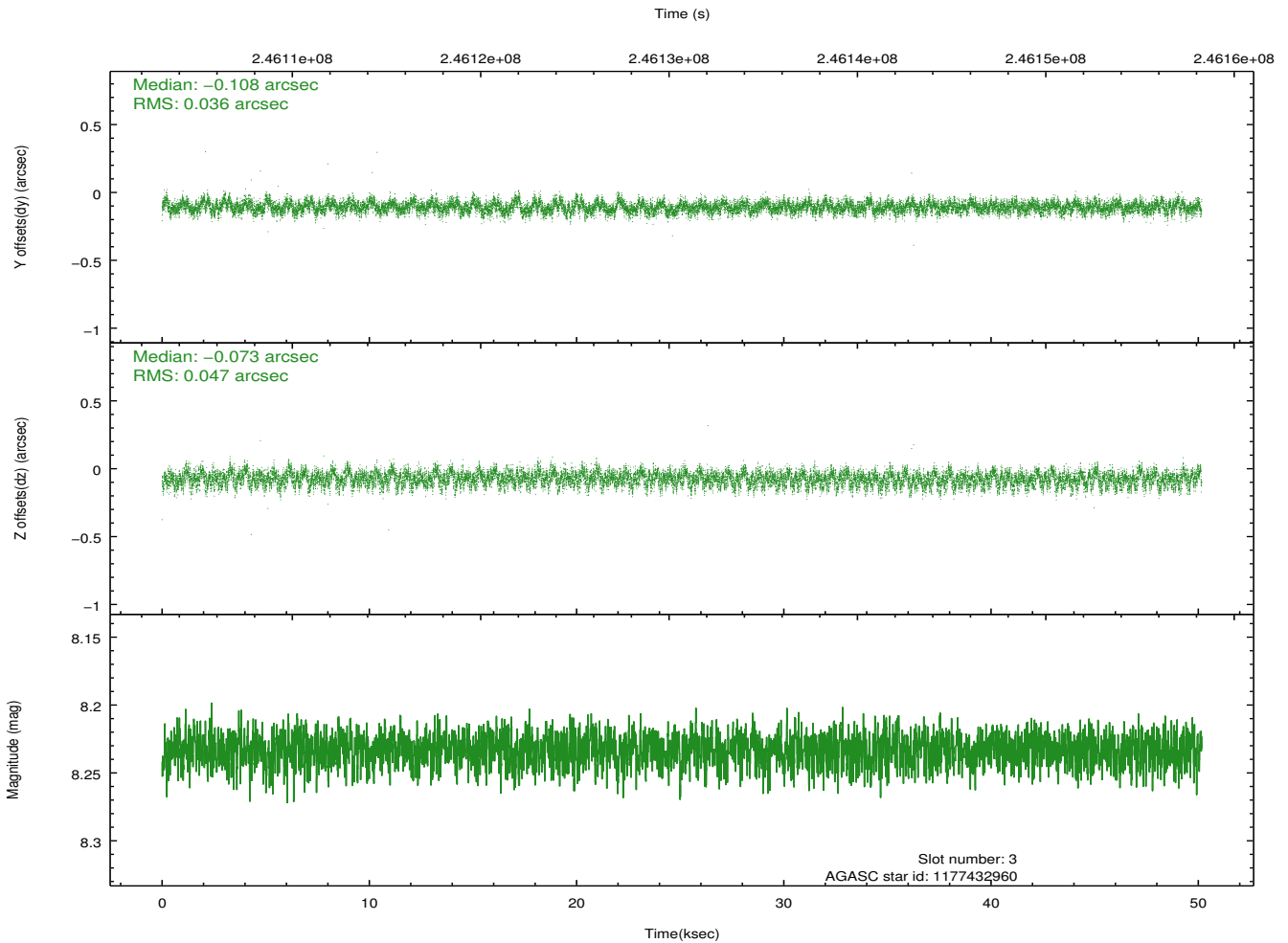
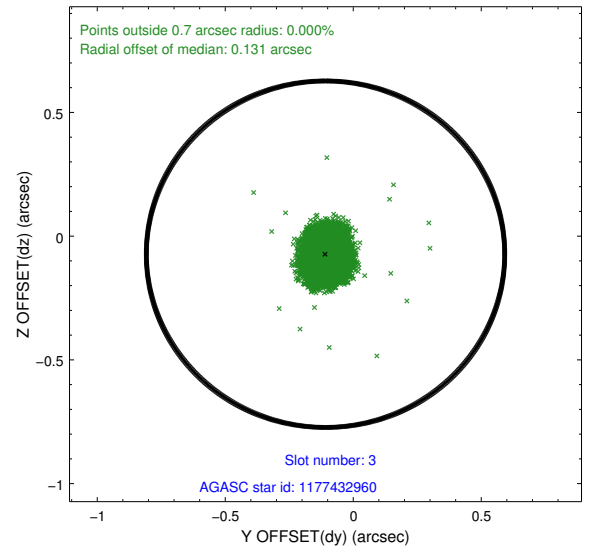
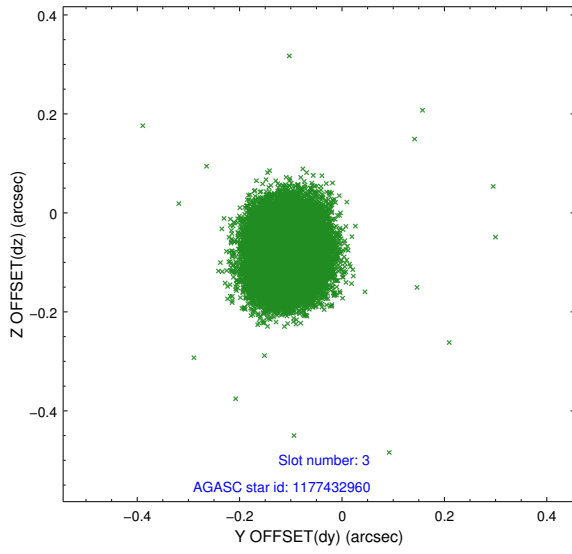


### Slot Statistics

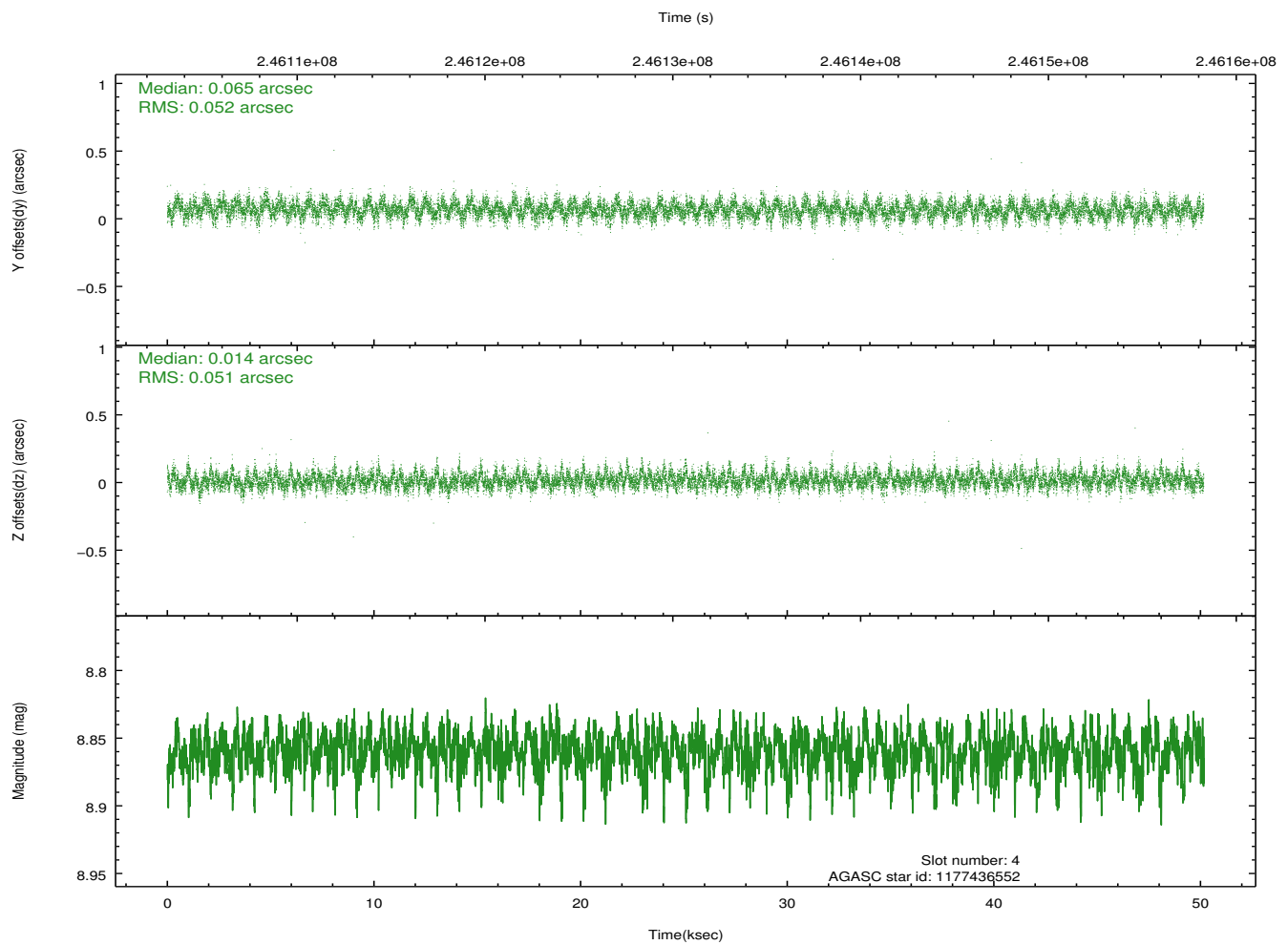
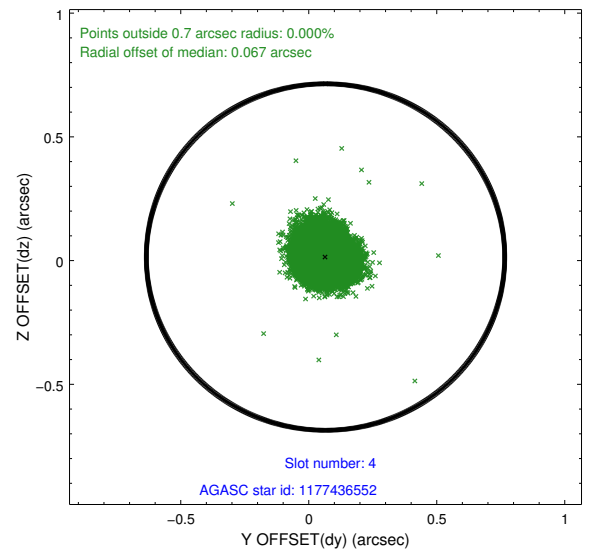
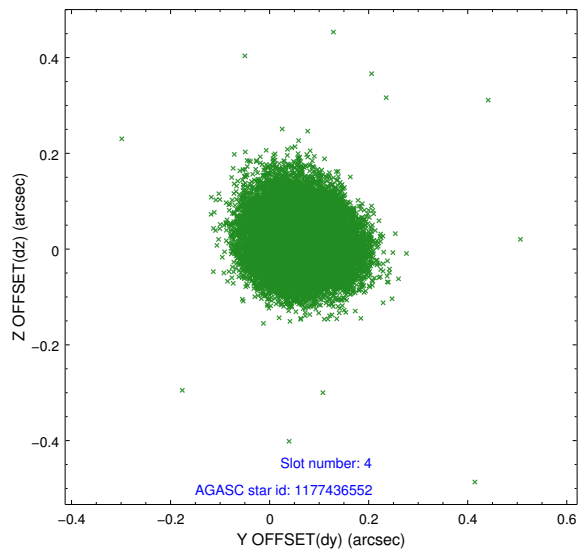
| slot | status | id         | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec        | mean_y   | mean_z   |
|------|--------|------------|------|-------|--------|--------|-------|-------|------------|------------|----------|----------|
| 0    | FID    | ACIS-S-2   | 7.09 | 12234 | -0.079 | -0.079 | 0.018 | 0.038 | 0.000000   | 0.000000   | -759.94  | -1795.71 |
| 1    | FID    | ACIS-S-4   | 7.19 | 12233 | 0.120  | 0.059  | 0.011 | 0.020 | 0.000000   | 0.000000   | 2153.52  | 112.96   |
| 2    | FID    | ACIS-S-5   | 7.23 | 12233 | -0.074 | 0.027  | 0.021 | 0.041 | 0.000000   | 0.000000   | -1812.82 | 106.54   |
| 3    | GUIDE  | 1177432960 | 8.23 | 24464 | -0.108 | -0.073 | 0.063 | 0.102 | 187.860990 | -64.880924 | 936.08   | 1560.63  |
| 4    | GUIDE  | 1177436552 | 8.86 | 24456 | 0.065  | 0.014  | 0.078 | 0.125 | 188.059614 | -64.178277 | 1479.08  | -928.91  |
| 5    | GUIDE  | 1179126976 | 8.64 | 24467 | 0.133  | 0.200  | 0.072 | 0.117 | 190.268902 | -64.540566 | -2197.29 | -761.28  |
| 6    | GUIDE  | 1179131192 | 9.14 | 24456 | 0.000  | -0.202 | 0.115 | 0.177 | 188.912026 | -65.278046 | -1034.27 | 2398.61  |
| 7    | GUIDE  | 1179128056 | 7.90 | 24461 | -0.091 | 0.059  | 0.061 | 0.096 | 189.145049 | -64.556116 | -557.77  | -180.66  |

## 2.4 Star Slots

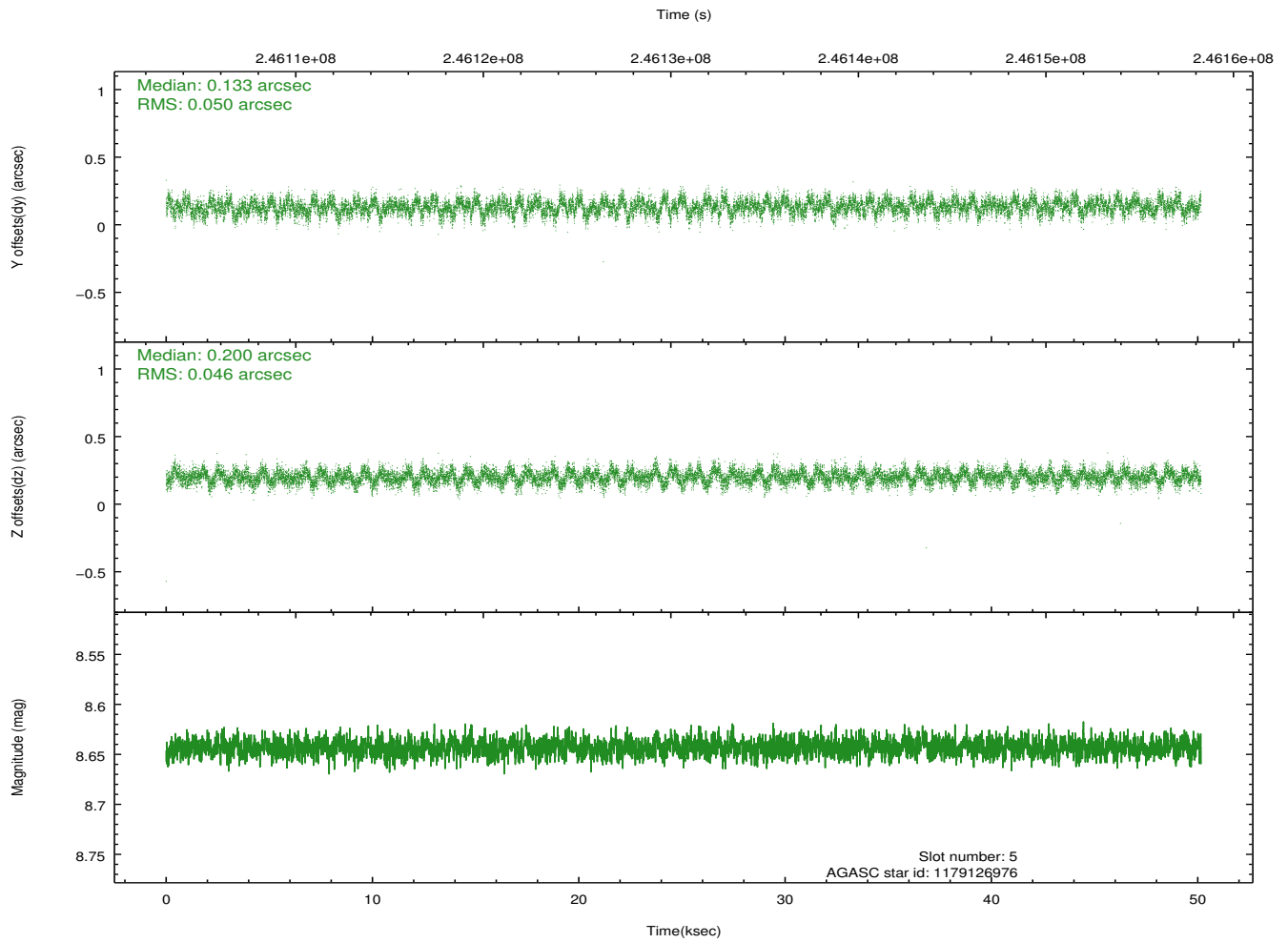
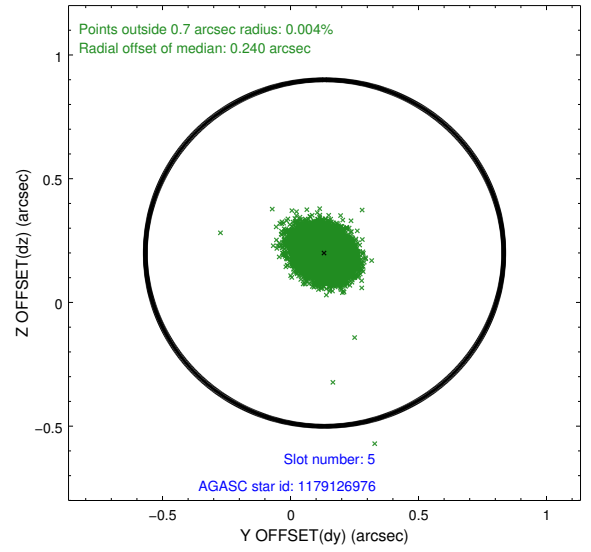
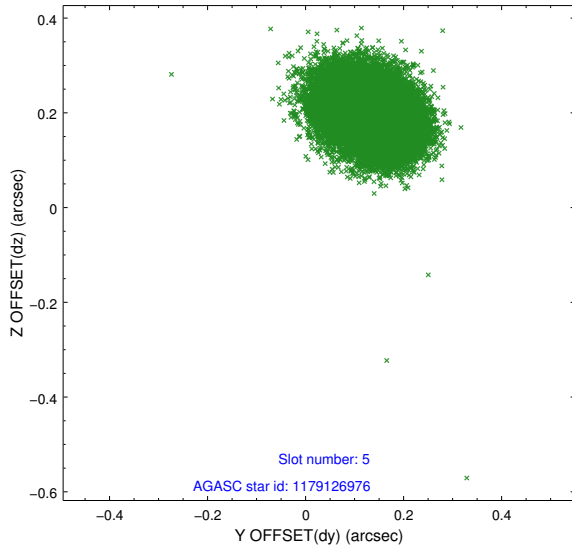
### 2.4.1 Slot 3



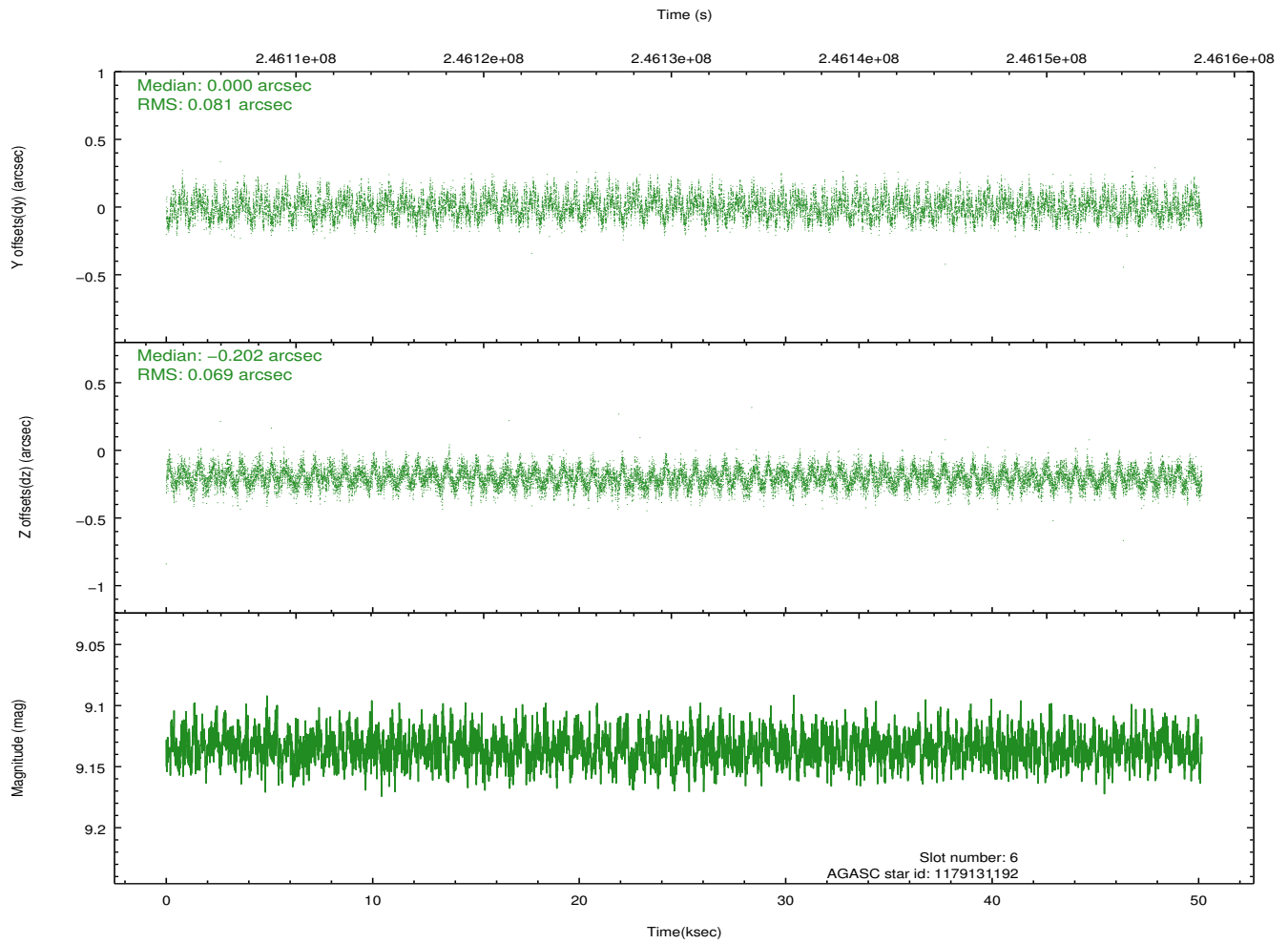
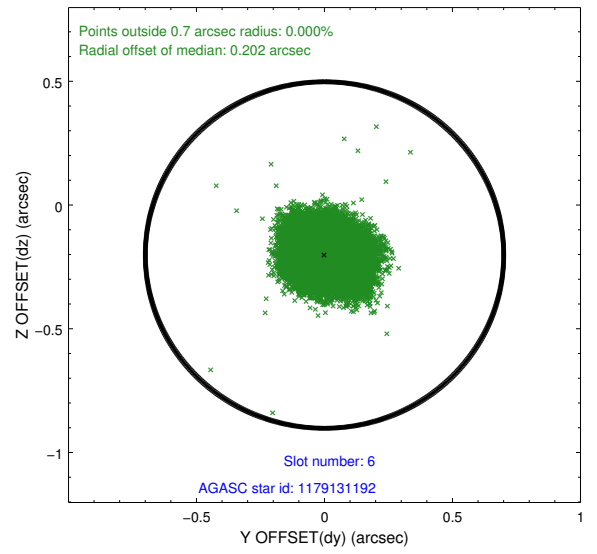
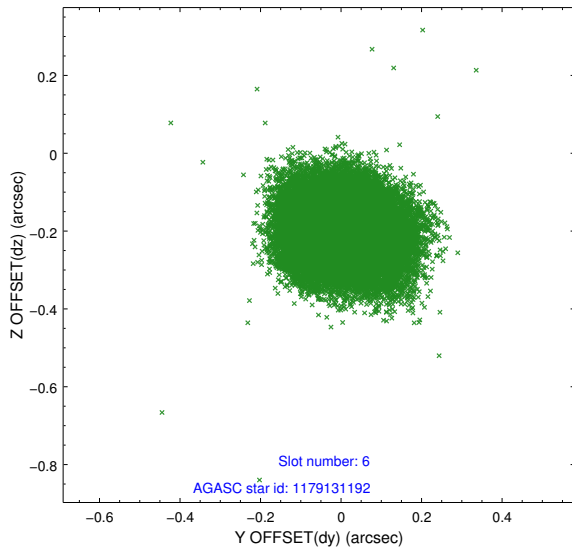
## 2.4.2 Slot 4



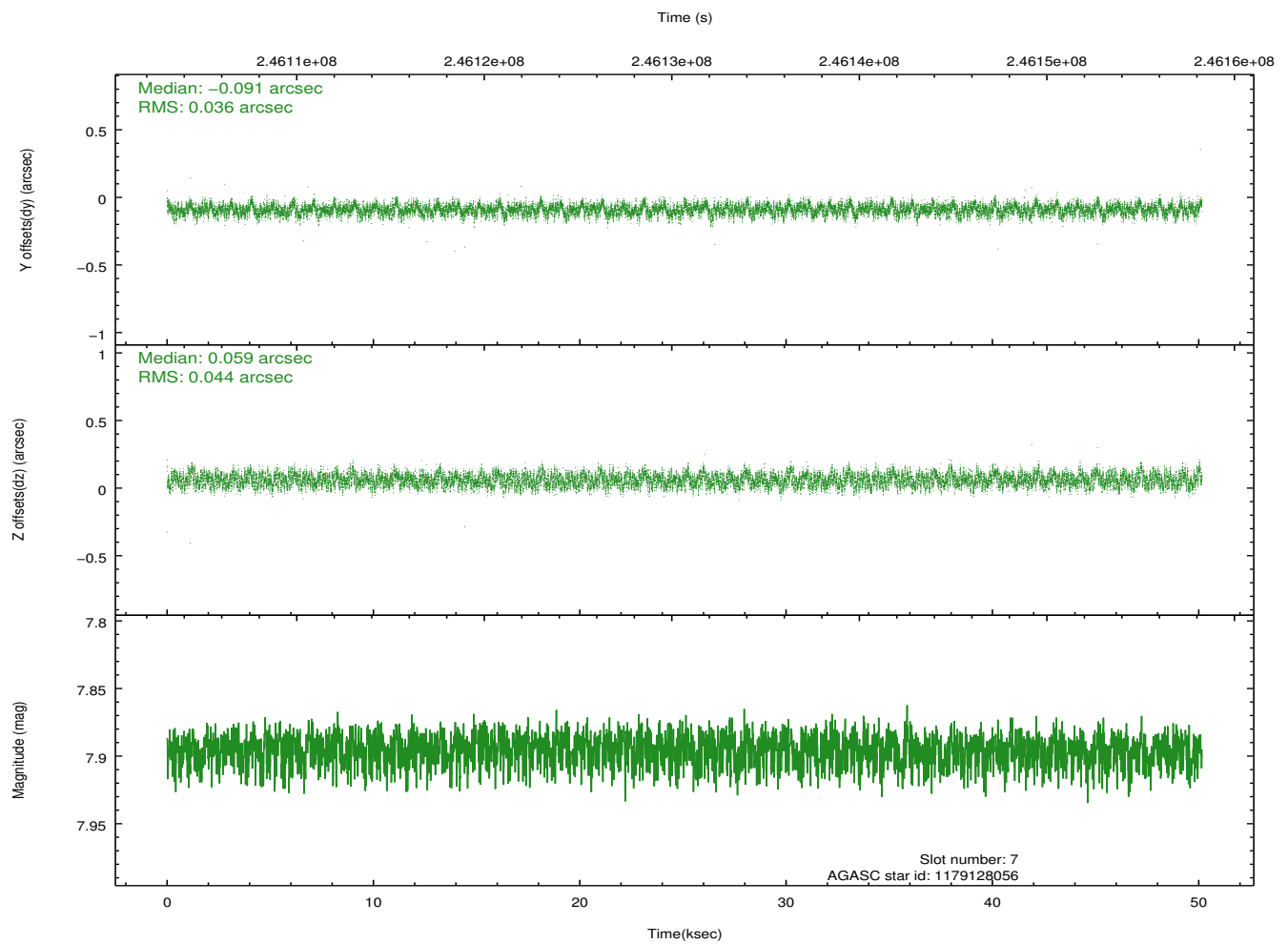
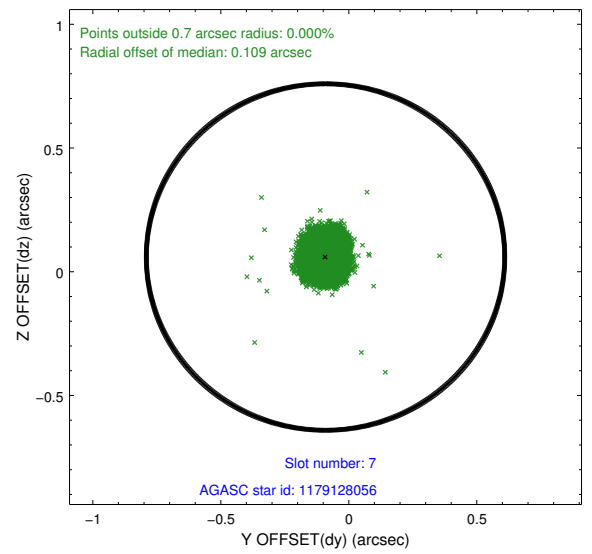
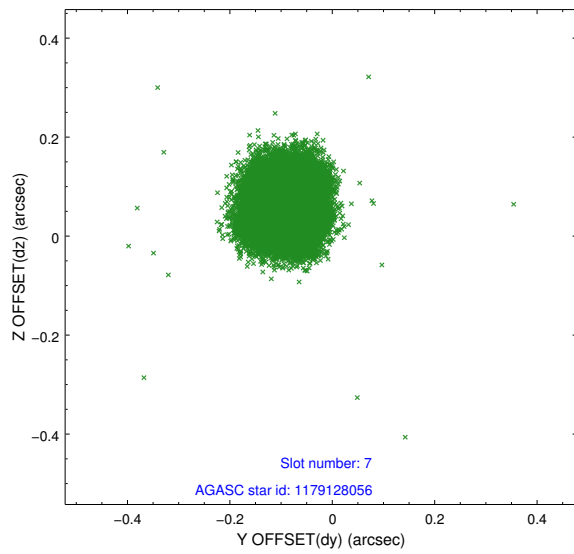
### 2.4.3 Slot 5



## 2.4.4 Slot 6

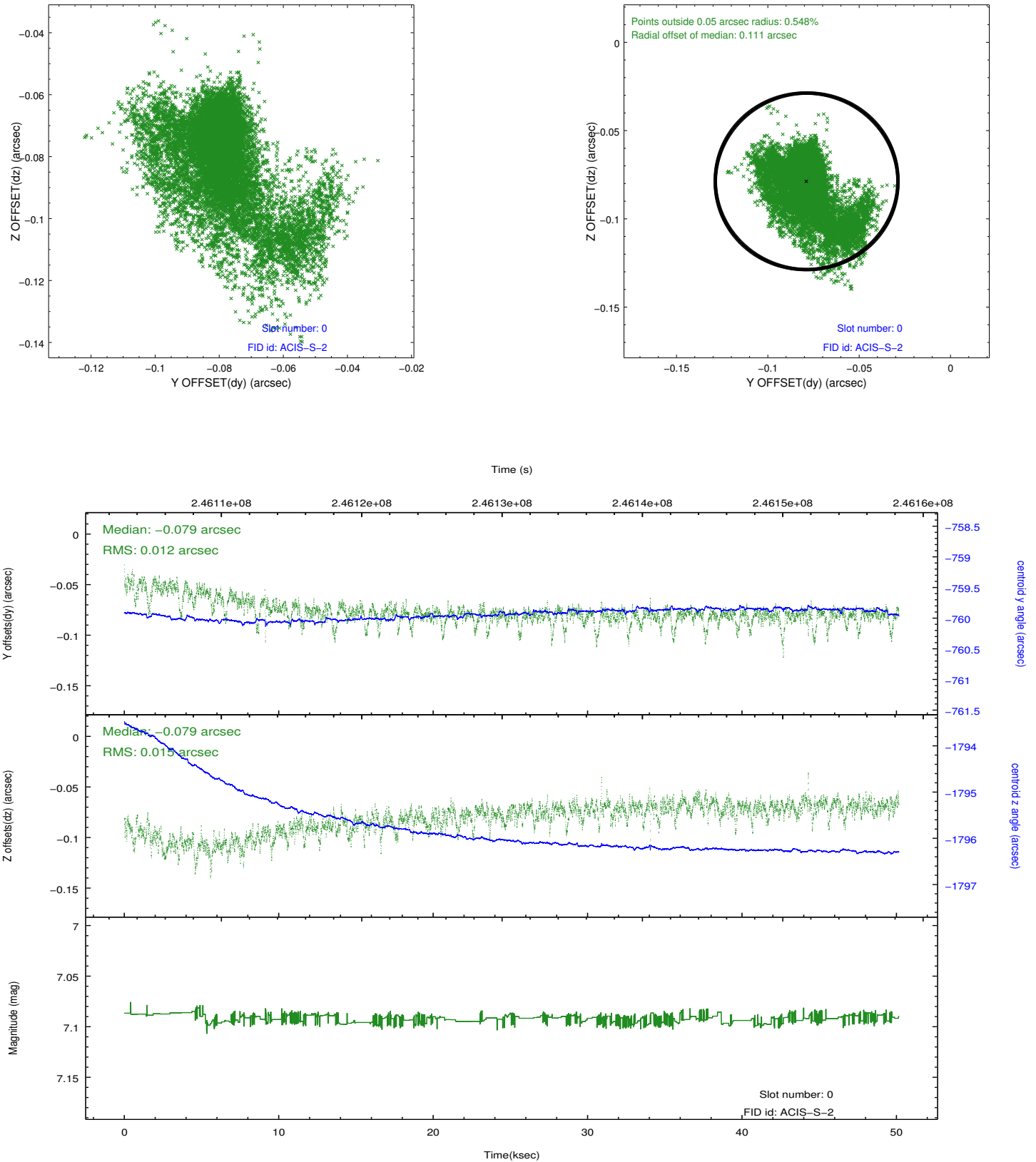


## 2.4.5 Slot 7

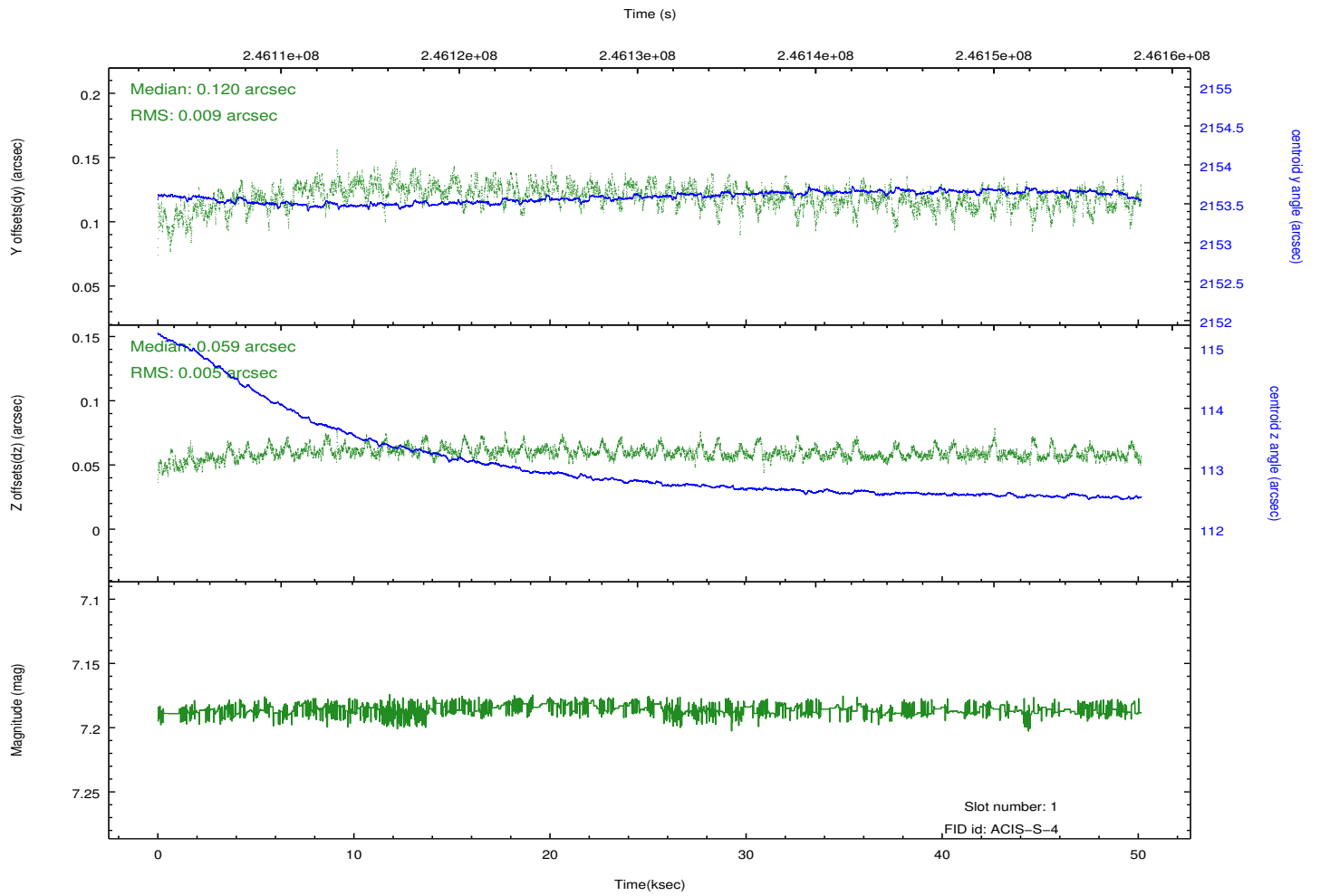
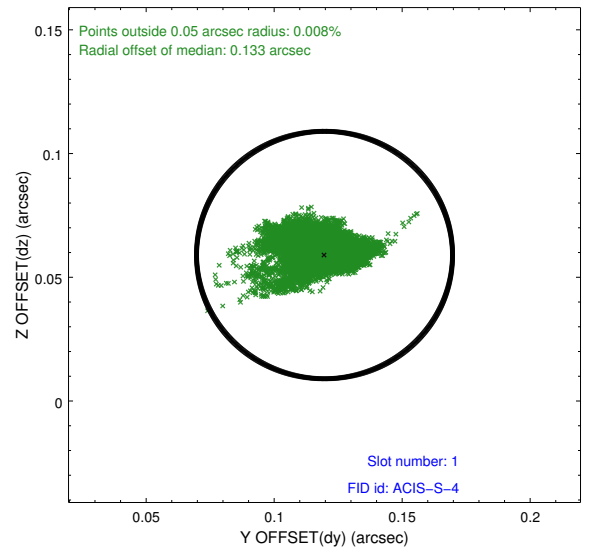
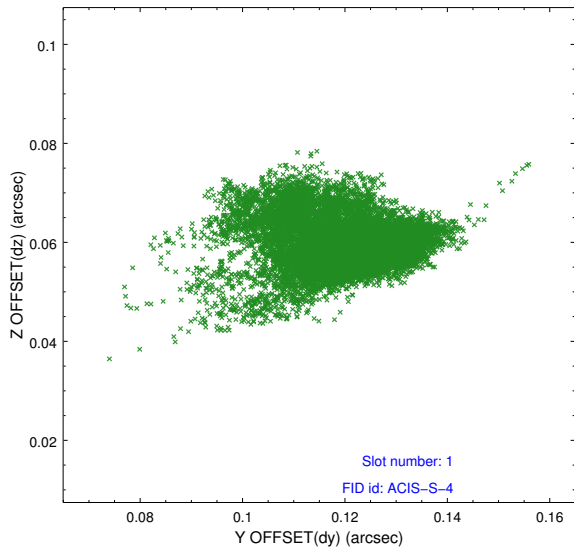


## 2.5 FID Slots

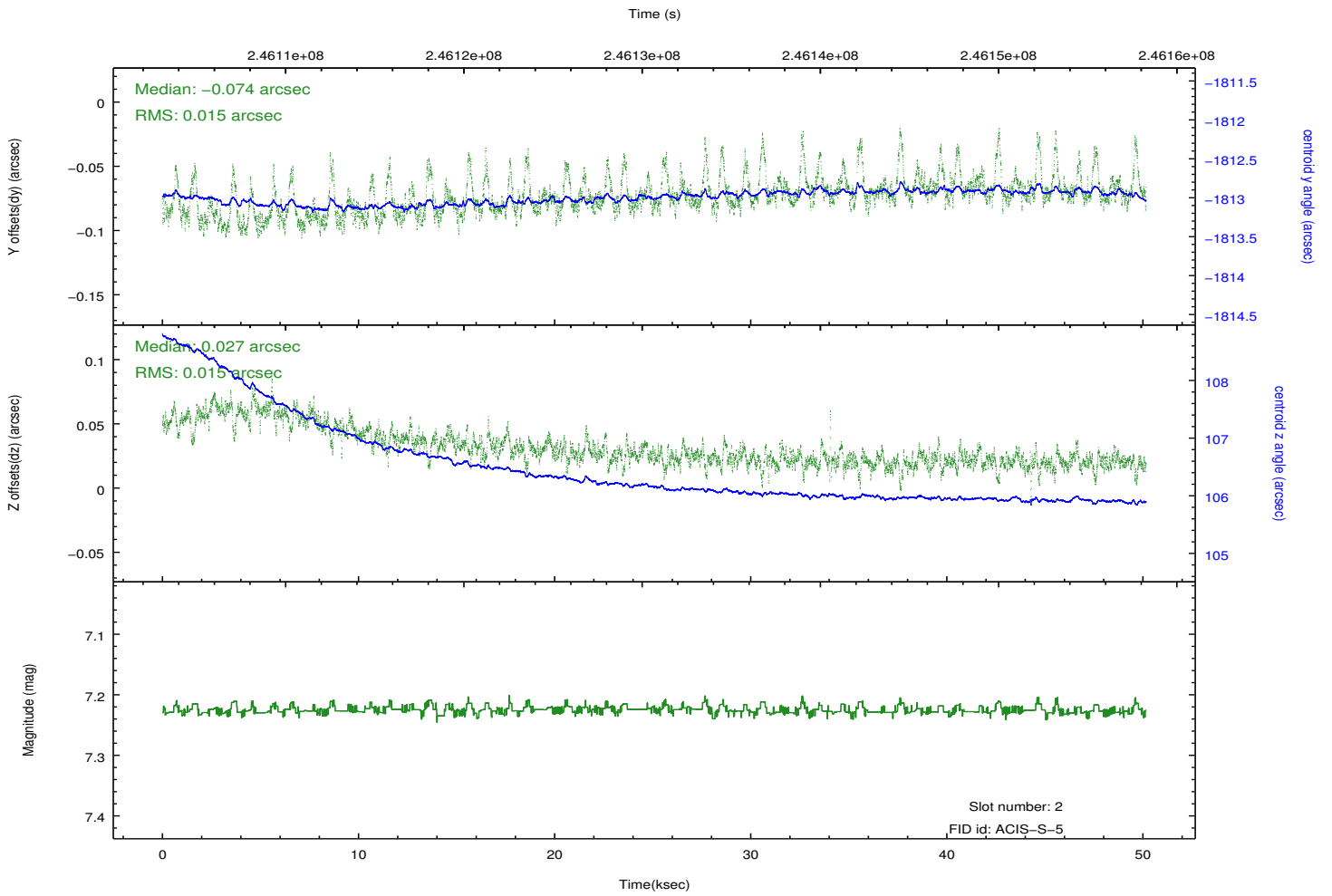
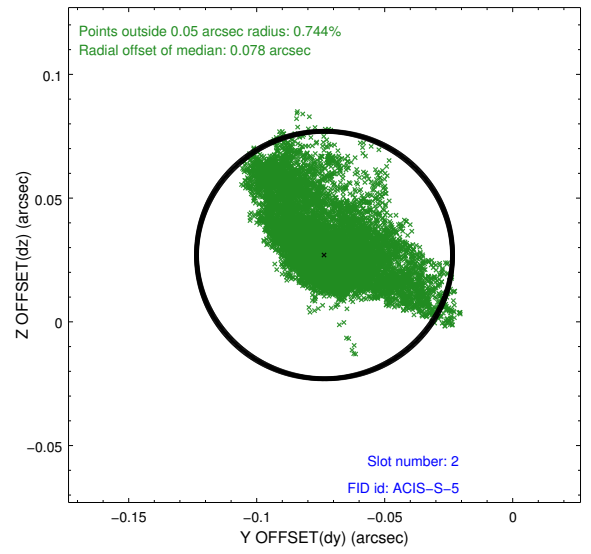
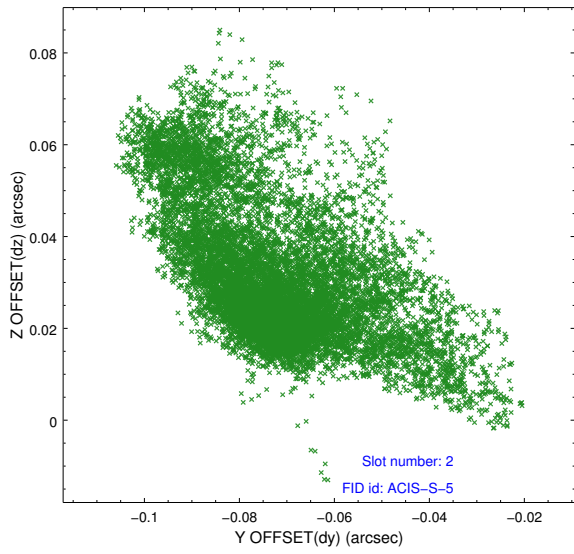
### 2.5.1 Slot 0



## 2.5.2 Slot 1

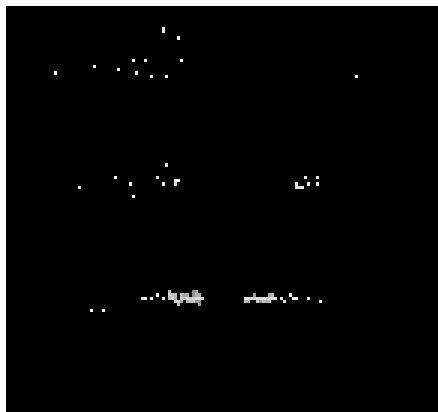


### 2.5.3 Slot 2

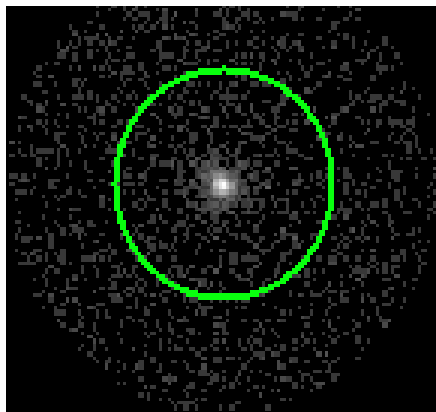


### 3 Gratings

#### 3.1 HEG Arm



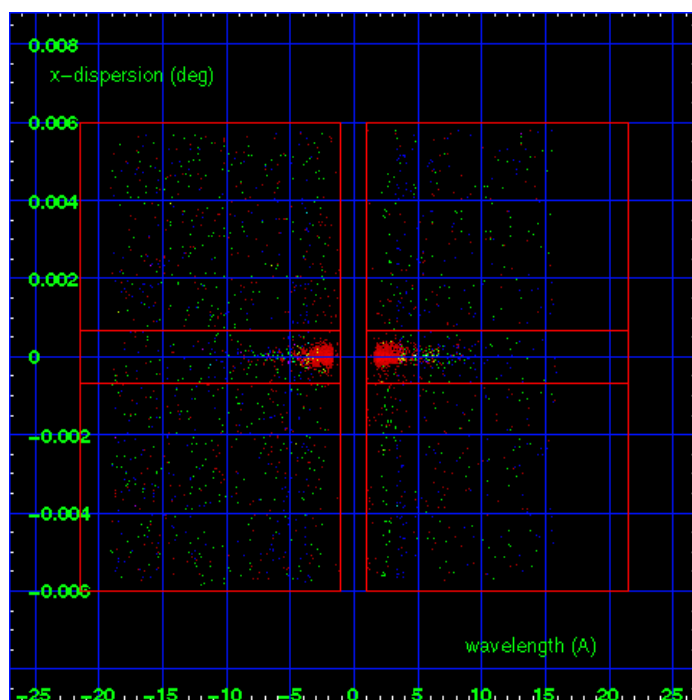
HEG Order Sort 123



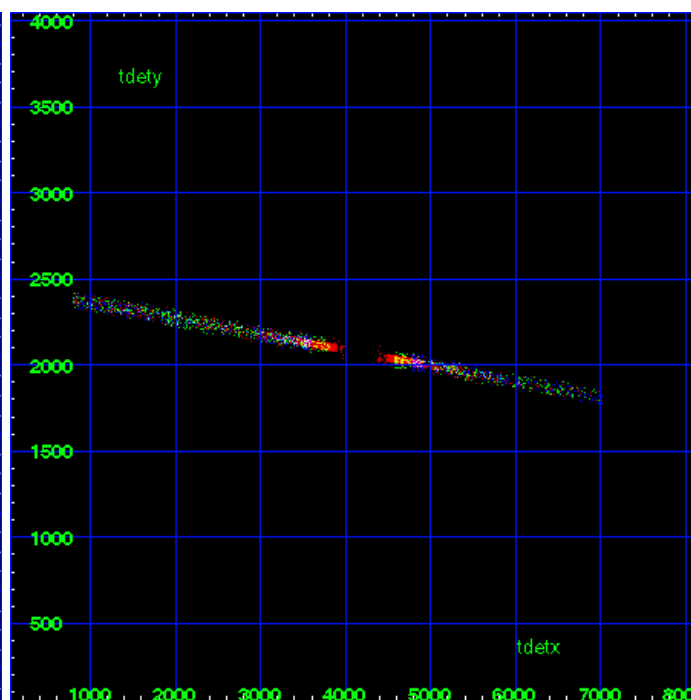
HEG Zero Order



HEG Order Sort ALL

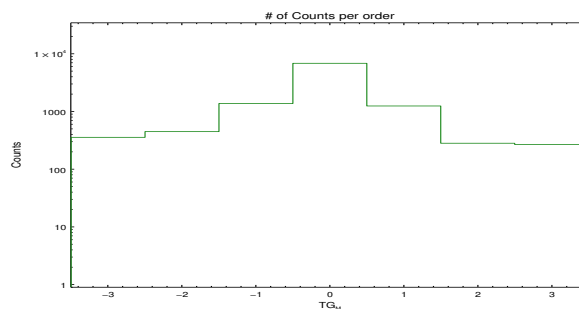


Spot Image HEG

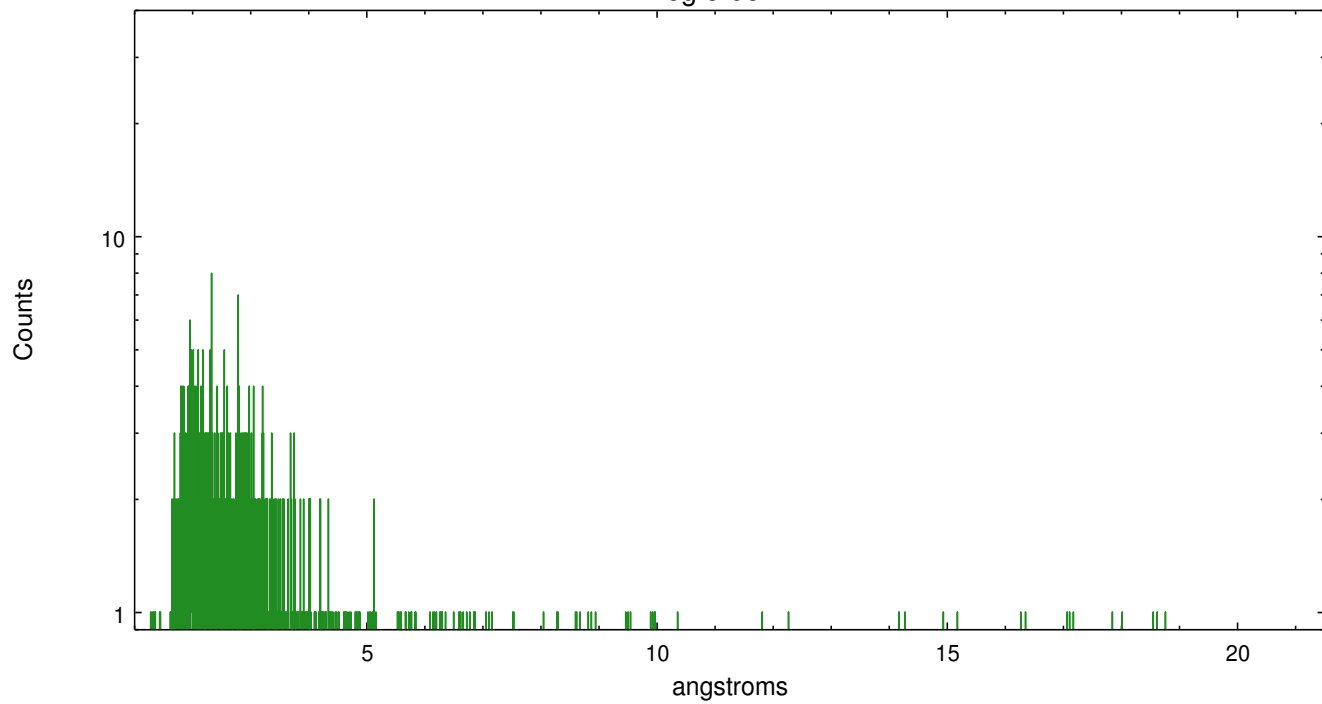


Full Detector HEG

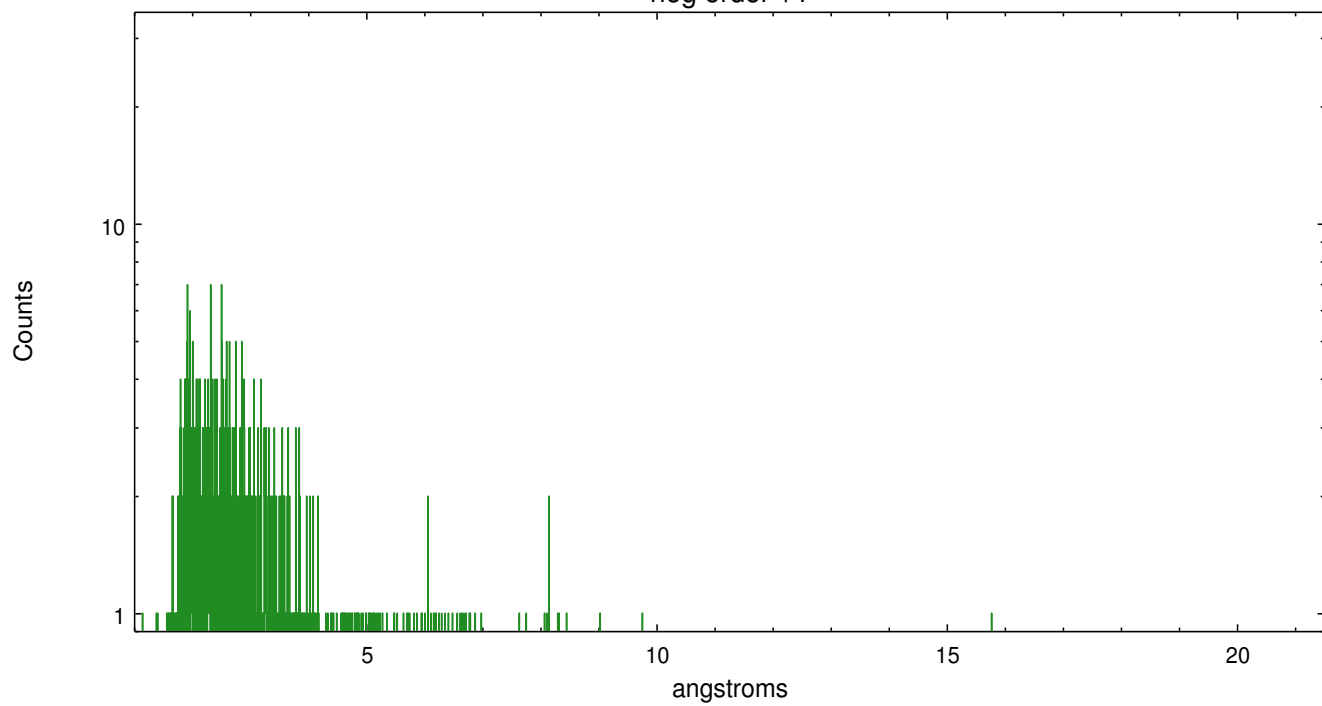
|        | order<br>-3 | order<br>-2 | order<br>-1 | order<br>0 | order<br>1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 357         | 449         | 1381        | 6882       | 1251       | 282        | 269        |



heg order -1



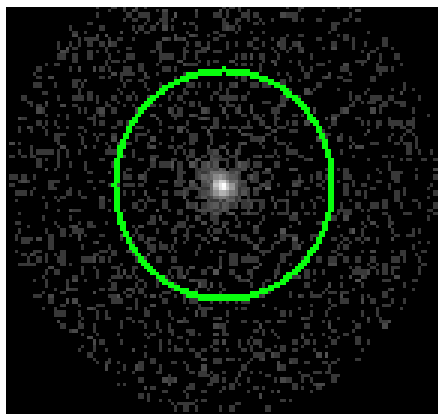
heg order +1



### 3.2 MEG Arm



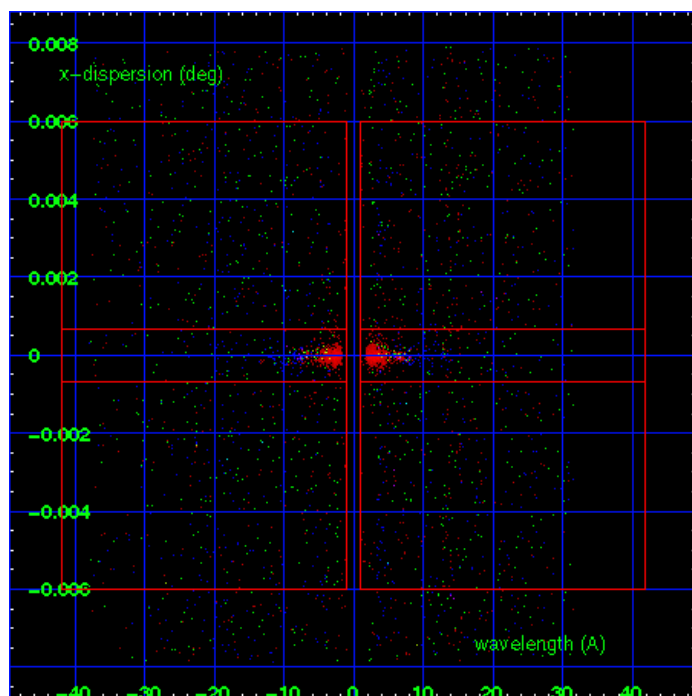
MEG Order Sort 123



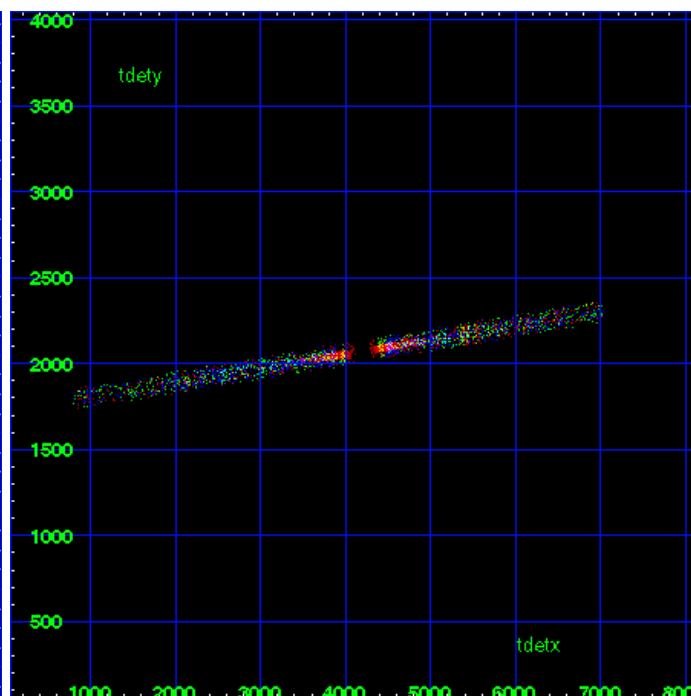
MEG Zero Order



MEG Order Sort ALL

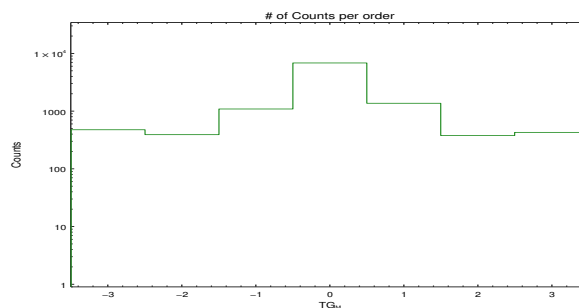


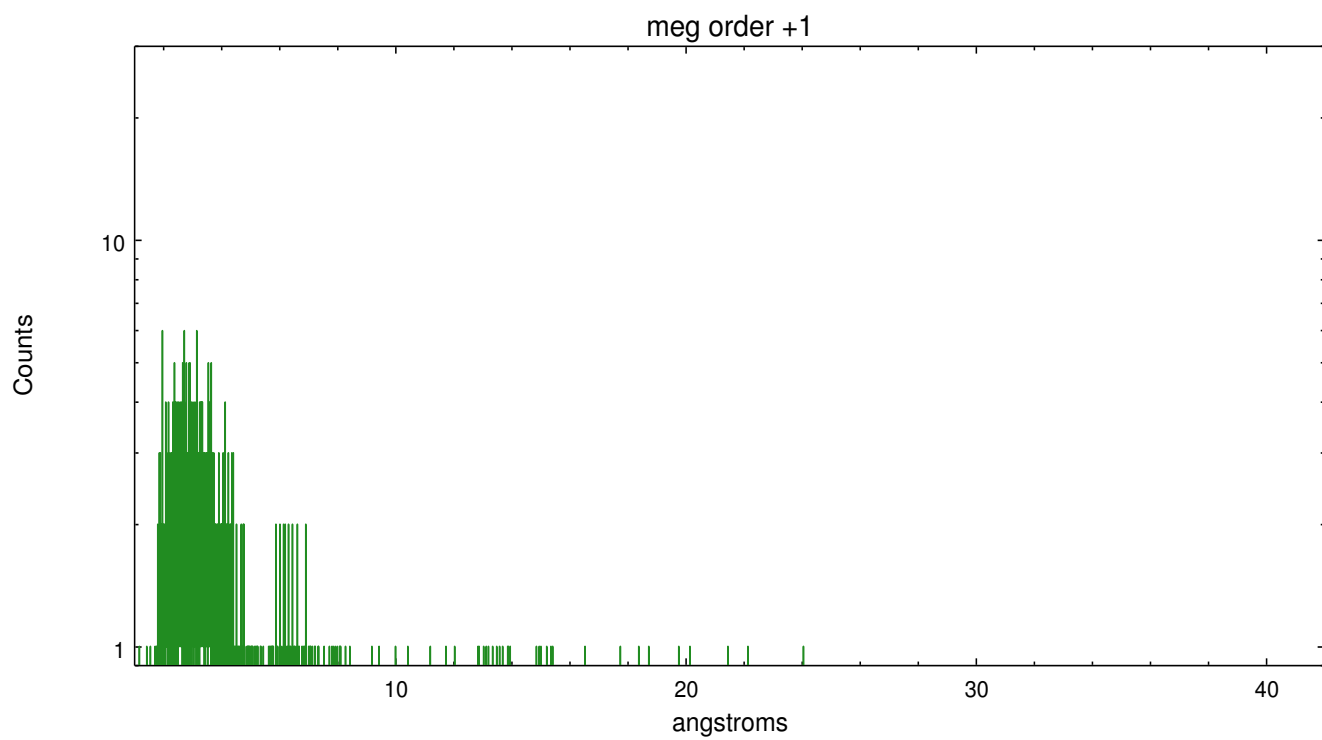
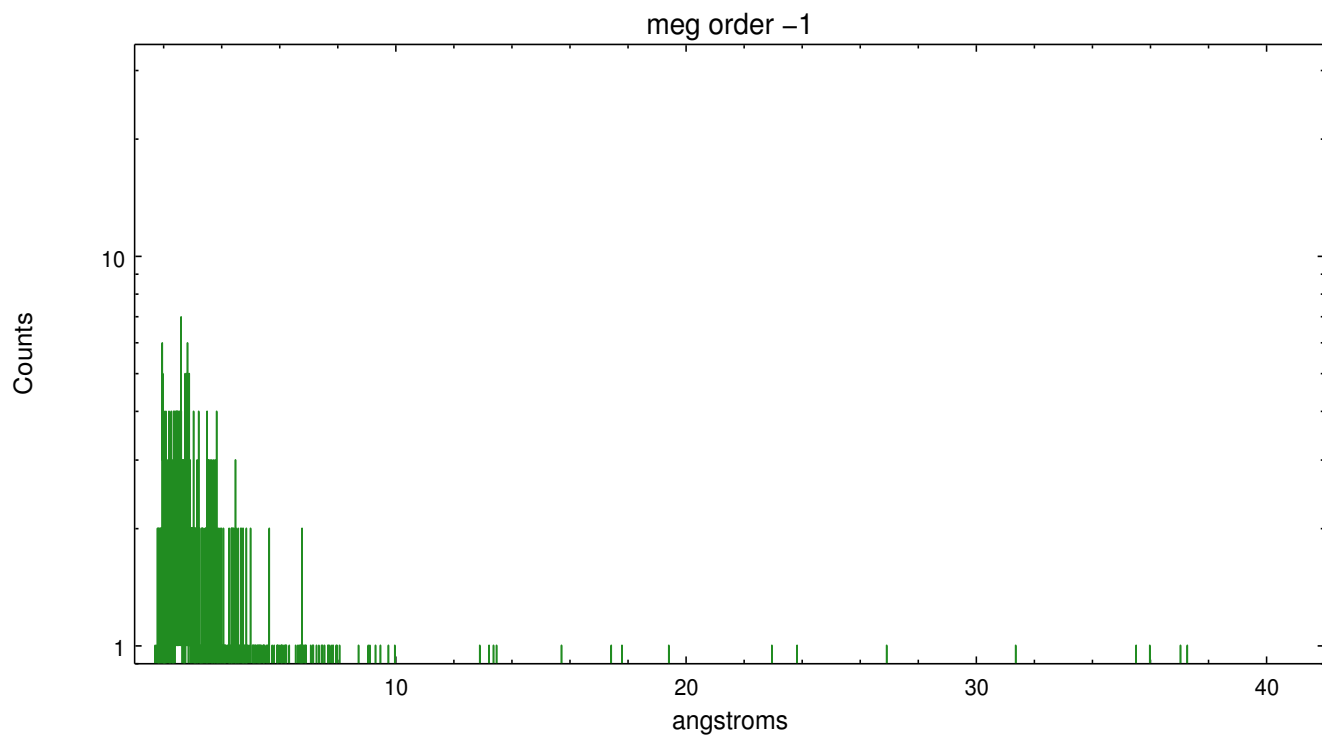
Spot Image MEG



Full Detector MEG

|        | order<br>-3 | order<br>-2 | order<br>-1 | order<br>0 | order<br>1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 477         | 392         | 1093        | 6882       | 1373       | 378        | 429        |





# A Summary

## A.1 Status

|                            |             |
|----------------------------|-------------|
| V&V Scientist              | Joy Nichols |
| V&V Date (YYYY-MM-DD)      | 2013.01.24  |
| V&V Edition                | 1           |
| V&V Disposition and Status | OK          |
| V&V Charge Time            | 50.155      |

## A.2 Comments