

# V&V Reference Report

## L2 ASCDS Version : 8.4.4

Observation 10660 - L2 Version 2  
Chandra X-Ray Center

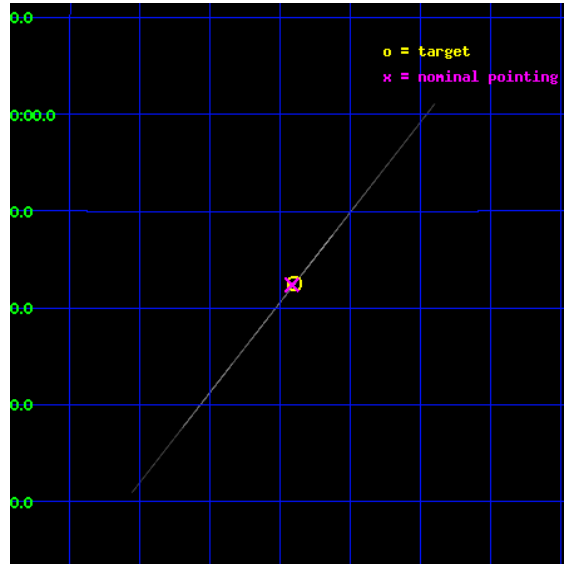
L2 Processing Date : May 26 2012

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# 1 Front

|          |  |                                       |
|----------|--|---------------------------------------|
| seq_num  | 790197                                       | Sequence number                       |
| obs_id   | 10660  | Observation id                        |
| title    | AO-10 Calibration Observations of 4U 1957+11 | Proposal title                        |
| observer | Dr. CXC Calibration                          | Principal investigator                |
| object   | 4U 1957+11                                   | Source name                           |
| ra_targ  | 299.849583                                   | Observer's specified target RA [deg]  |
| dec_targ | 11.708333                                    | Observer's specified target Dec [deg] |
| ra_nom   | 299.85419226904                              | Nominal RA [deg]                      |
| dec_nom  | 11.70667971303                               | Nominal Dec [deg]                     |
| roll_nom | 308.23827951006                              | Nominal Roll [deg]                    |
| revision | 2  | Processing version of data            |
| ontime   | 19054.0                                      | Sum of GTIs [s]                       |
| livetime | 18979.5703125                                | Livetime [s]                          |
| ontime4  | 10120.922317147                              | Sum of GTIs [s]                       |
| ontime5  | 19054.0                                      | Sum of GTIs [s]                       |
| ontime6  | 10635.309154451                              | Sum of GTIs [s]                       |
| ontime7  | 19054.0                                      | Sum of GTIs [s]                       |
| ontime8  | 11062.066255569                              | Sum of GTIs [s]                       |
| ontime9  | 11033.655516148                              | Sum of GTIs [s]                       |
| l2events | 1169990                                      | Number of level 2 events              |

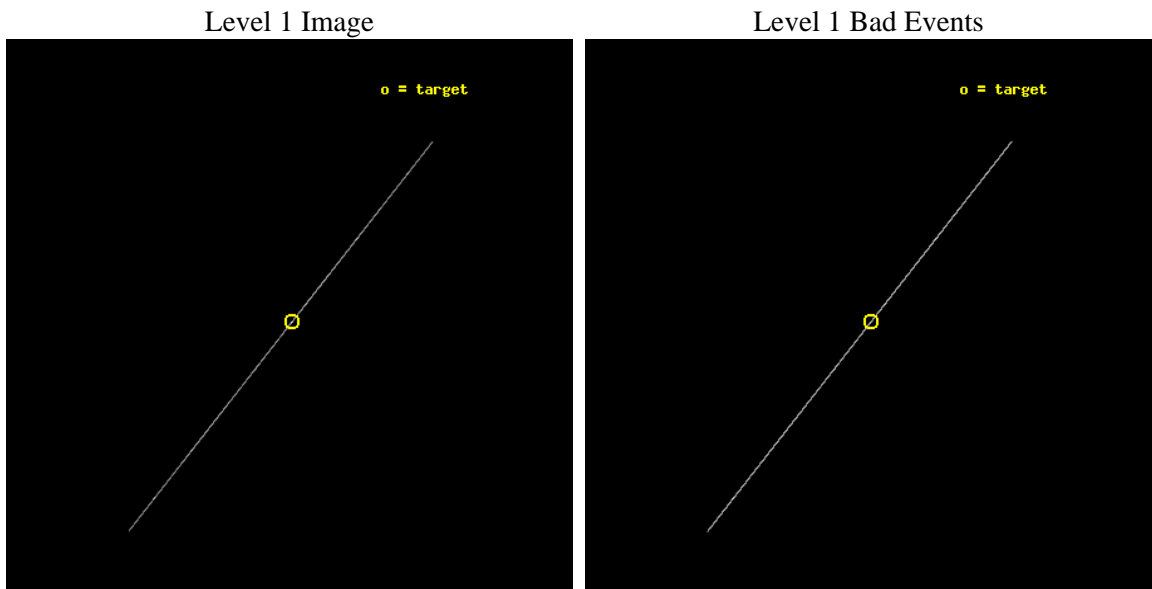




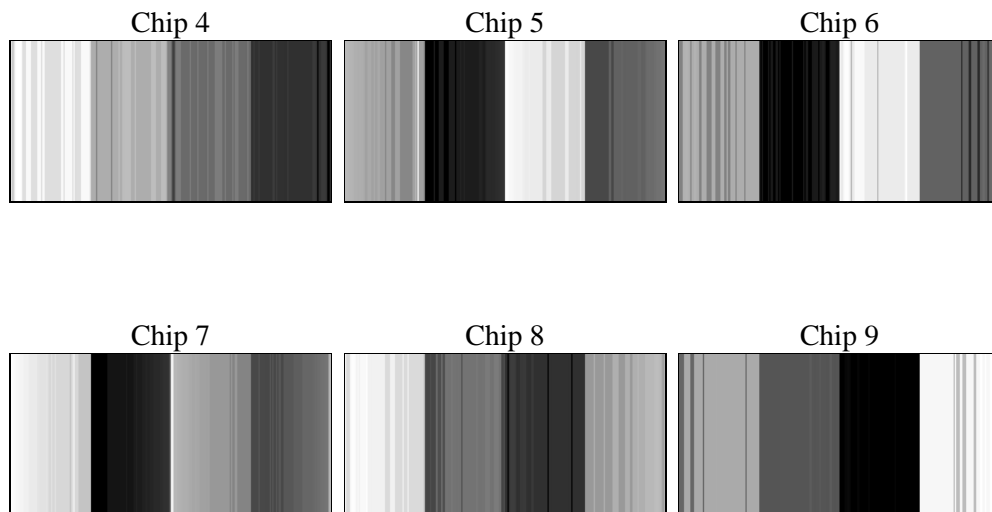
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 19000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 8.4.4               | Processing system revision     | ontime         | 19054.0         | Sum of GTIs [s]                         |
| caldsver | 4.4.9               | &#160                          | ontime4        | 10120.922317147 | Sum of GTIs [s]                         |
| date     | 2012-05-25T19:54:20 | Date and time of file creation | ontime5        | 19054.0         | Sum of GTIs [s]                         |
| revision | 2                   | Processing version of data     | ontime6        | 10635.309154451 | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 19054.0         | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 11062.066255569 | Sum of GTIs [s]                         |
|          |                     |                                | ontime9        | 11033.655516148 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 3265942         | Number of level 1 events                |

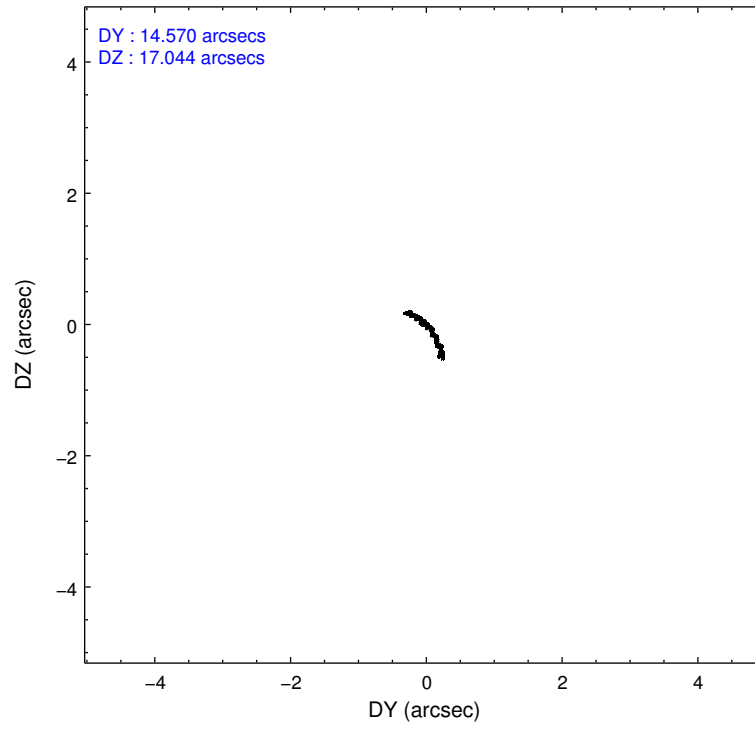
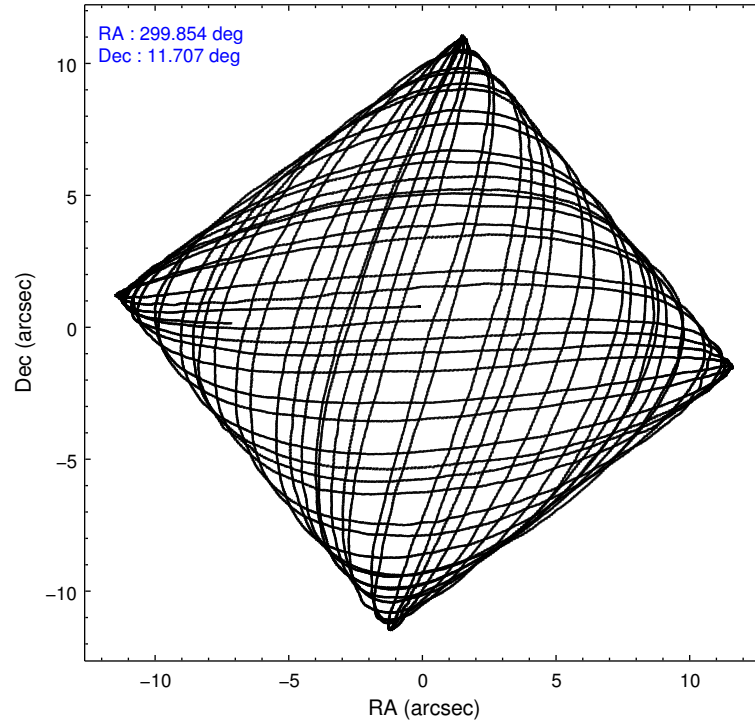
### 2.1.4 Events

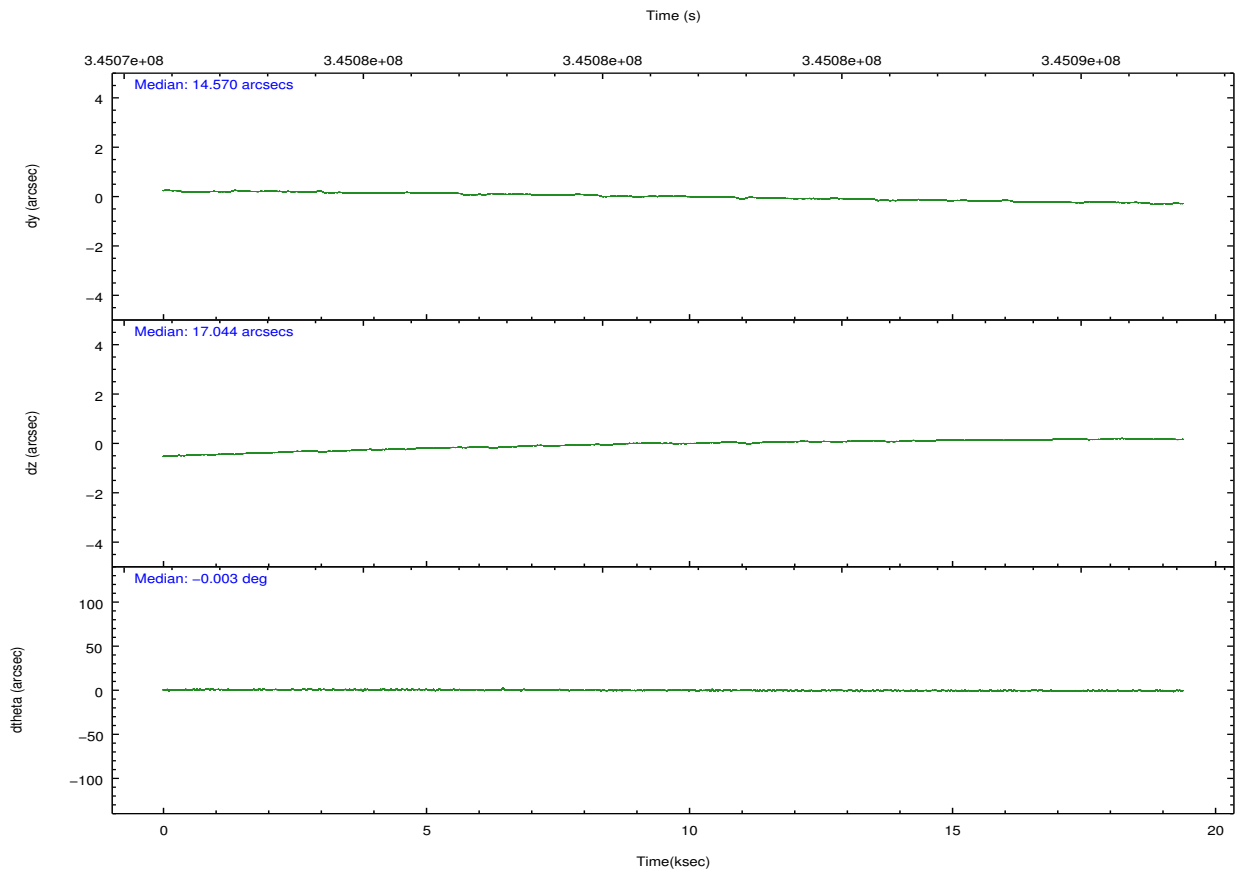
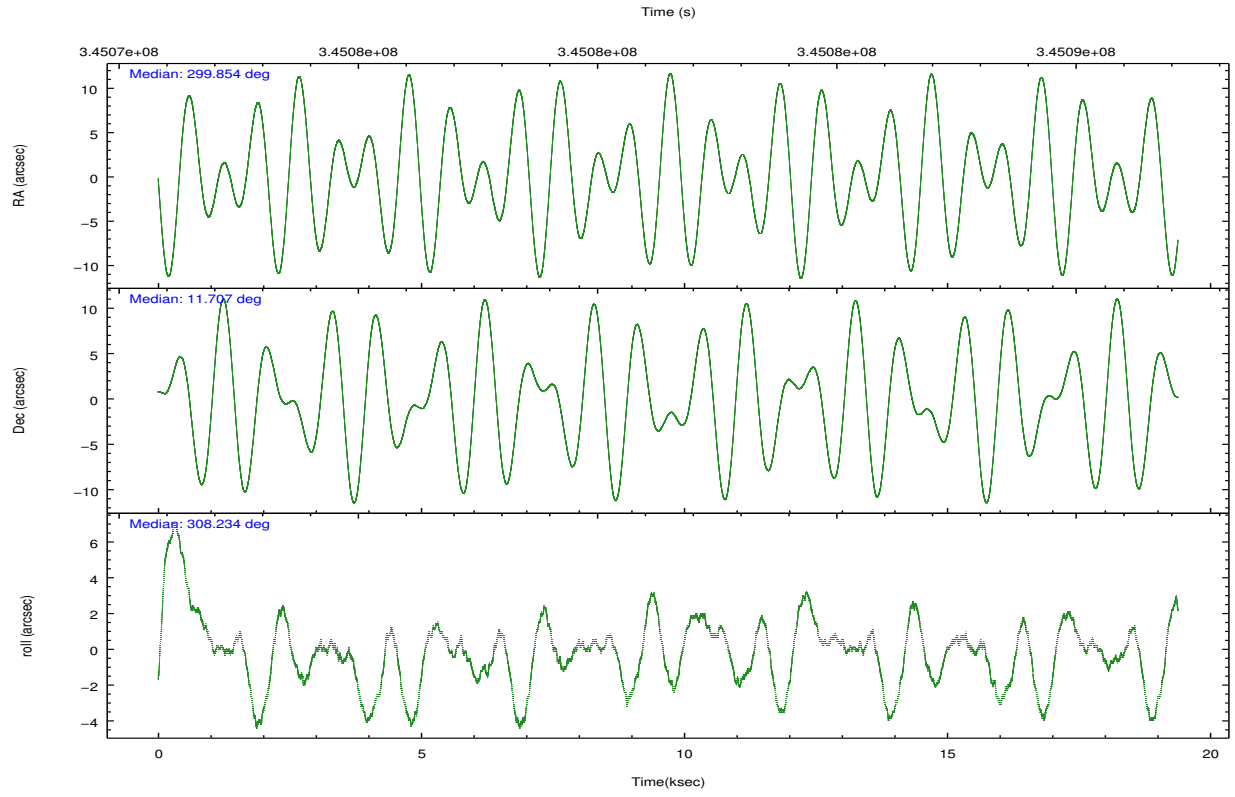
|                 | ccd 4  | ccd 5  | ccd 6  | ccd 7   | ccd 8  | ccd 9  |                | ccd 4  | ccd 5  | ccd 6  | ccd 7  | ccd 8  | ccd 9  |
|-----------------|--------|--------|--------|---------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|
| level 1 events  | 320961 | 554652 | 436857 | 1110971 | 501461 | 341040 | grade 0 events | 3777   | 47442  | 41740  | 135784 | 47972  | 5764   |
| rejected events | 297289 | 323270 | 291747 | 368078  | 398688 | 311309 |                | 1%     | 8%     | 9%     | 12%    | 9%     | 1%     |
| rejected %      | 92%    | 58%    | 66%    | 33%     | 79%    | 91%    | grade 1 events | 112    | 341    | 161    | 3024   | 292    | 129    |
|                 |        |        |        |         |        |        |                | 0%     | 0%     | 0%     | 0%     | 0%     | 0%     |
|                 |        |        |        |         |        |        | grade 2 events | 10900  | 75515  | 82042  | 201484 | 29300  | 13391  |
|                 |        |        |        |         |        |        |                | 3%     | 13%    | 18%    | 18%    | 5%     | 3%     |
|                 |        |        |        |         |        |        | grade 3 events | 2202   | 6573   | 3967   | 71158  | 5953   | 2327   |
|                 |        |        |        |         |        |        |                | 0%     | 1%     | 0%     | 6%     | 1%     | 0%     |
|                 |        |        |        |         |        |        | grade 4 events | 2412   | 6199   | 3711   | 70805  | 5655   | 2489   |
|                 |        |        |        |         |        |        |                | 0%     | 1%     | 0%     | 6%     | 1%     | 0%     |
|                 |        |        |        |         |        |        | grade 5 events | 4243   | 18736  | 5478   | 35998  | 7035   | 5392   |
|                 |        |        |        |         |        |        |                | 1%     | 3%     | 1%     | 3%     | 1%     | 1%     |
|                 |        |        |        |         |        |        | grade 6 events | 4387   | 95682  | 13661  | 263767 | 13902  | 5762   |
|                 |        |        |        |         |        |        |                | 1%     | 17%    | 3%     | 23%    | 2%     | 1%     |
|                 |        |        |        |         |        |        | grade 7 events | 292928 | 304164 | 286097 | 328951 | 391352 | 305786 |
|                 |        |        |        |         |        |        |                | 91%    | 54%    | 65%    | 29%    | 78%    | 89%    |

## 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_FAINT          | CC33_FAINT           | CCD I0 on                             | N         | N       |
| Observation mode                  | POINTING            | POINTING             | CCD I1 on                             | N         | N       |
| [deg] Pointing RA                 | 299.828155          | 299.8541922690396    | CCD I2 on                             | N         | N       |
| [deg] Pointing Dec                | 11.716451           | 11.70667971303026    | CCD I3 on                             | N         | N       |
| [deg] Pointing Roll               | 308.086943          | 308.2382795100593    | CCD S0 on                             | O1        | Y       |
| [mm] SIM focus pos                | -0.684267           | -0.6828225247311905  | CCD S1 on                             | Y         | Y       |
| [mm] SIM defocus                  | 0                   | 0.001444936568705701 | CCD S2 on                             | Y         | Y       |
| [mm] SIM translation stage pos    | -183.332523         | -183.3237572673427   | CCD S3 on                             | Y         | Y       |
| [mm] SIM translation stage offset | -6.8                | -6.808765315665084   | CCD S4 on                             | Y         | Y       |
| [s] Observation start time (MET)  | 345072155.184000    | 345071573.18215      | CCD S5 on                             | Y         | Y       |
| Observation start date            | 2008-12-07T21:21:30 | 2008-12-07T21:12:53  | Number of optional ACIS chips dropped | 0         | 0       |
| [s] Observation end time (MET)    | 345091155.184000    | 345091289.05812      | On-chip summing requested             | N         | N       |
| Observation end date              | 2008-12-08T02:38:10 | 2008-12-08T02:41:29  | Subarray requested                    | NONE      | NONE    |
| Read mode                         | CONTINUOUS          | CONTINUOUS           | Alternating exposures requested       | N         | N       |
|                                   |                     |                      | [s] Primary exposure time             | 0.000000  | 0       |

## 2.3 Aspect



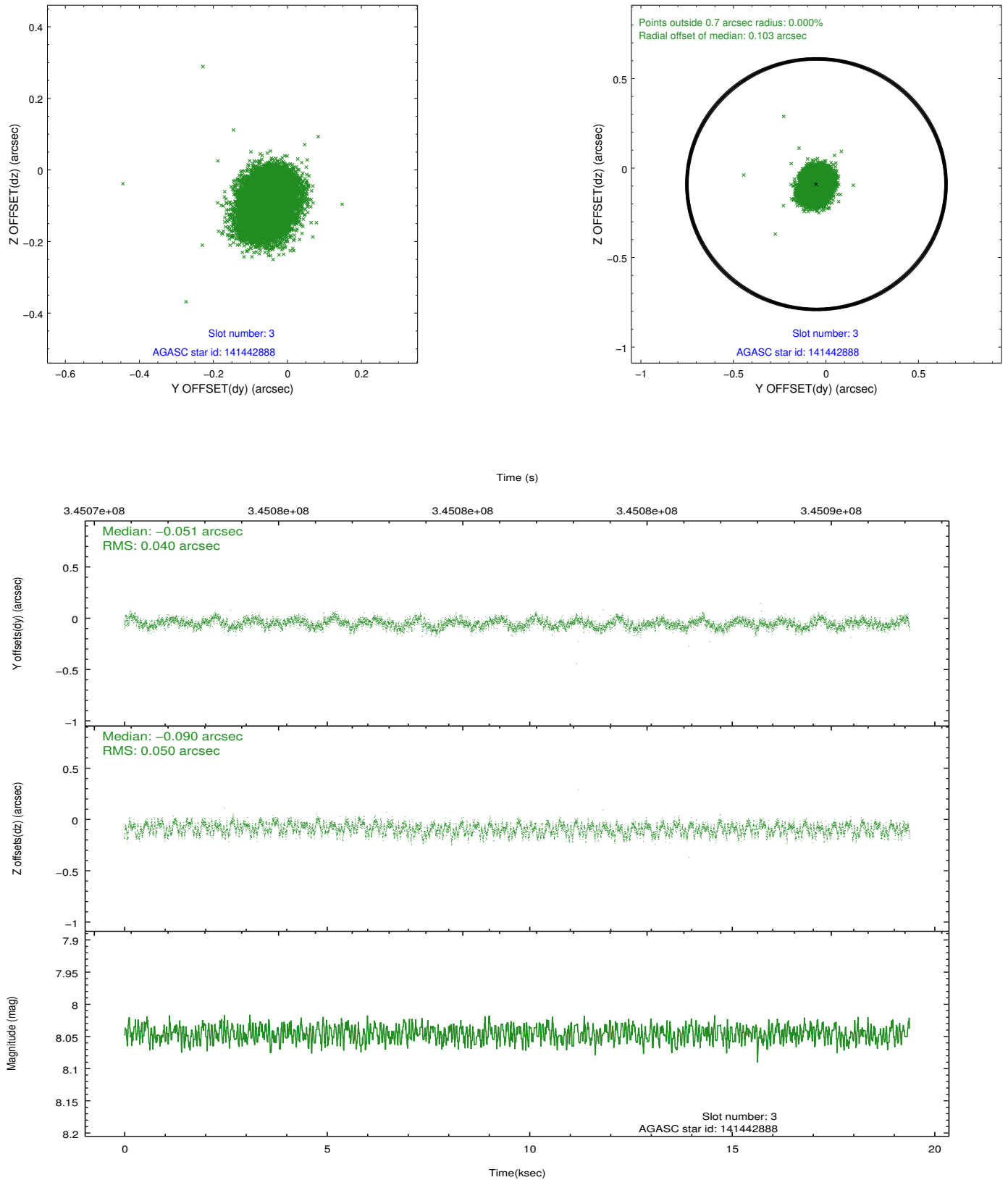


### Slot Statistics

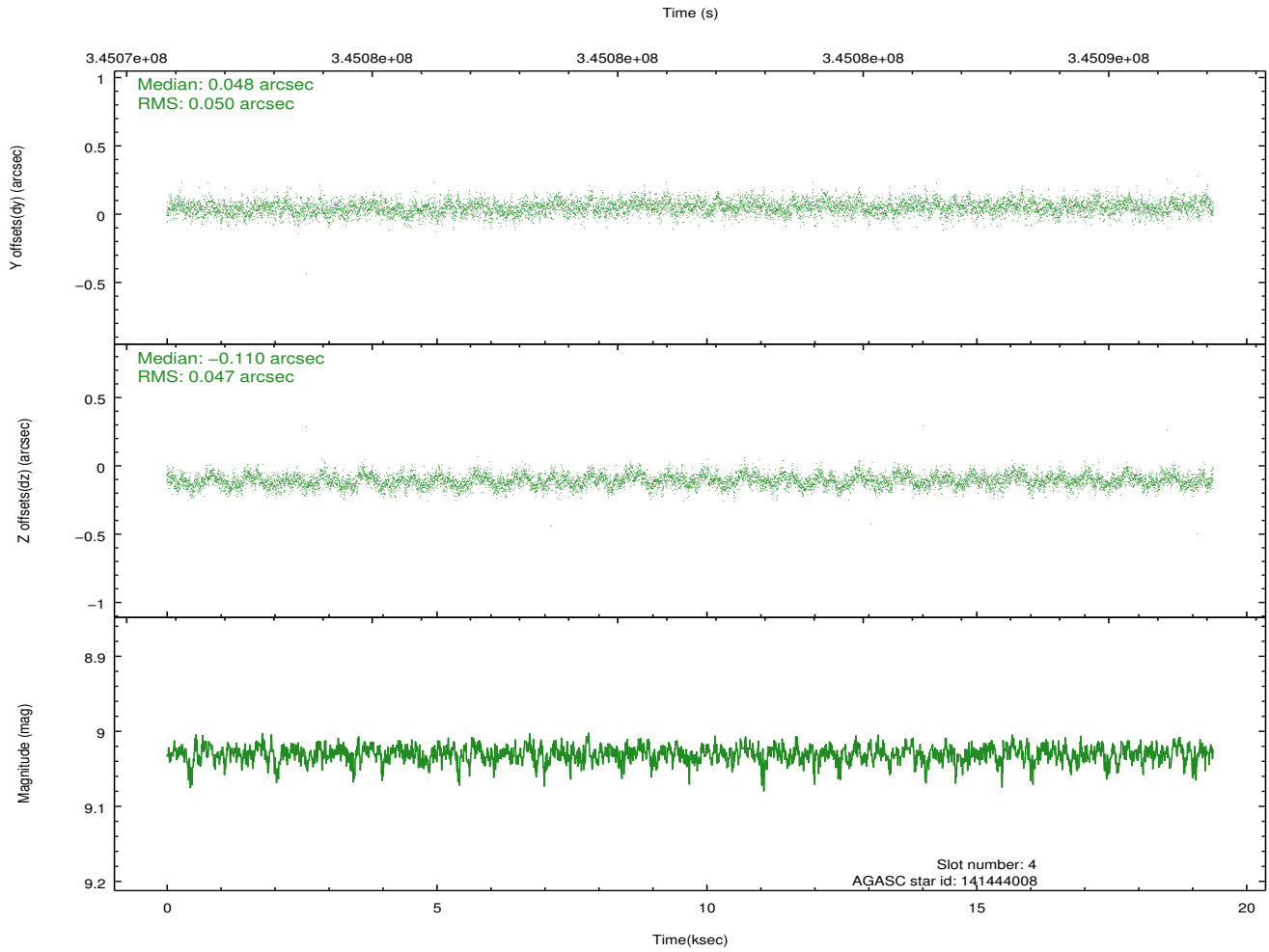
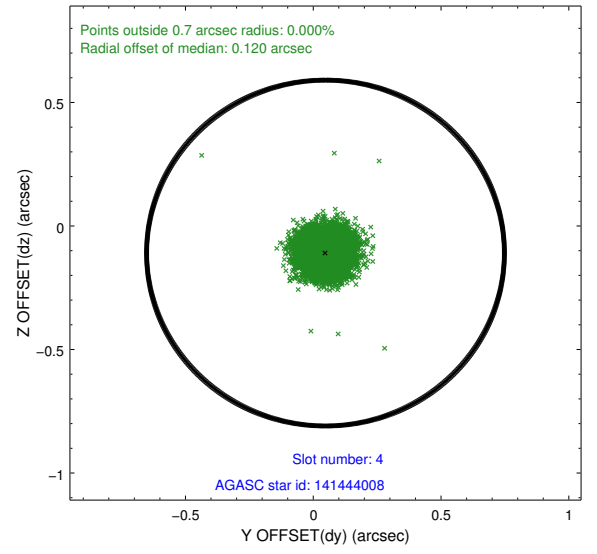
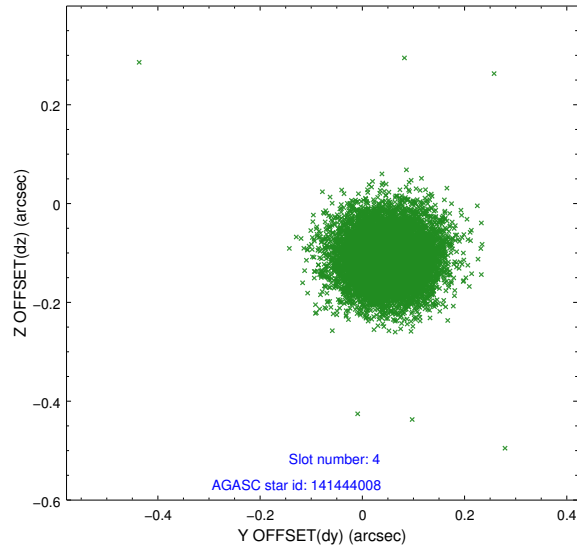
| slot | status | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec       | mean_y   | mean_z   |
|------|--------|-----------|------|-------|--------|--------|-------|-------|------------|-----------|----------|----------|
| 0    | FID    | ACIS-S-2  | 6.87 | 4729  | -0.082 | -0.147 | 0.008 | 0.014 | 0.000000   | 0.000000  | -767.15  | -1878.86 |
| 1    | FID    | ACIS-S-4  | 6.94 | 4729  | 0.215  | 0.079  | 0.008 | 0.014 | 0.000000   | 0.000000  | 2146.36  | 29.55    |
| 2    | FID    | ACIS-S-5  | 7.00 | 4729  | -0.164 | 0.076  | 0.009 | 0.015 | 0.000000   | 0.000000  | -1819.79 | 23.51    |
| 3    | GUIDE  | 141442888 | 8.05 | 9451  | -0.051 | -0.090 | 0.069 | 0.106 | 299.399699 | 11.590250 | -574.85  | -1468.80 |
| 4    | GUIDE  | 141444008 | 9.03 | 9451  | 0.048  | -0.110 | 0.072 | 0.119 | 300.296191 | 11.310054 | 2170.05  | 398.86   |
| 5    | GUIDE  | 141453064 | 7.89 | 9452  | 0.126  | 0.034  | 0.067 | 0.105 | 299.483987 | 11.414705 | 106.19   | -1625.29 |
| 6    | GUIDE  | 141453280 | 8.52 | 9452  | -0.189 | 0.102  | 0.066 | 0.106 | 299.888387 | 12.264129 | -1420.99 | 1382.99  |
| 7    | GUIDE  | 141563816 | 9.14 | 9451  | 0.063  | 0.065  | 0.102 | 0.159 | 300.647752 | 11.777144 | 1606.72  | 2411.34  |

## 2.4 Star Slots

### 2.4.1 Slot 3

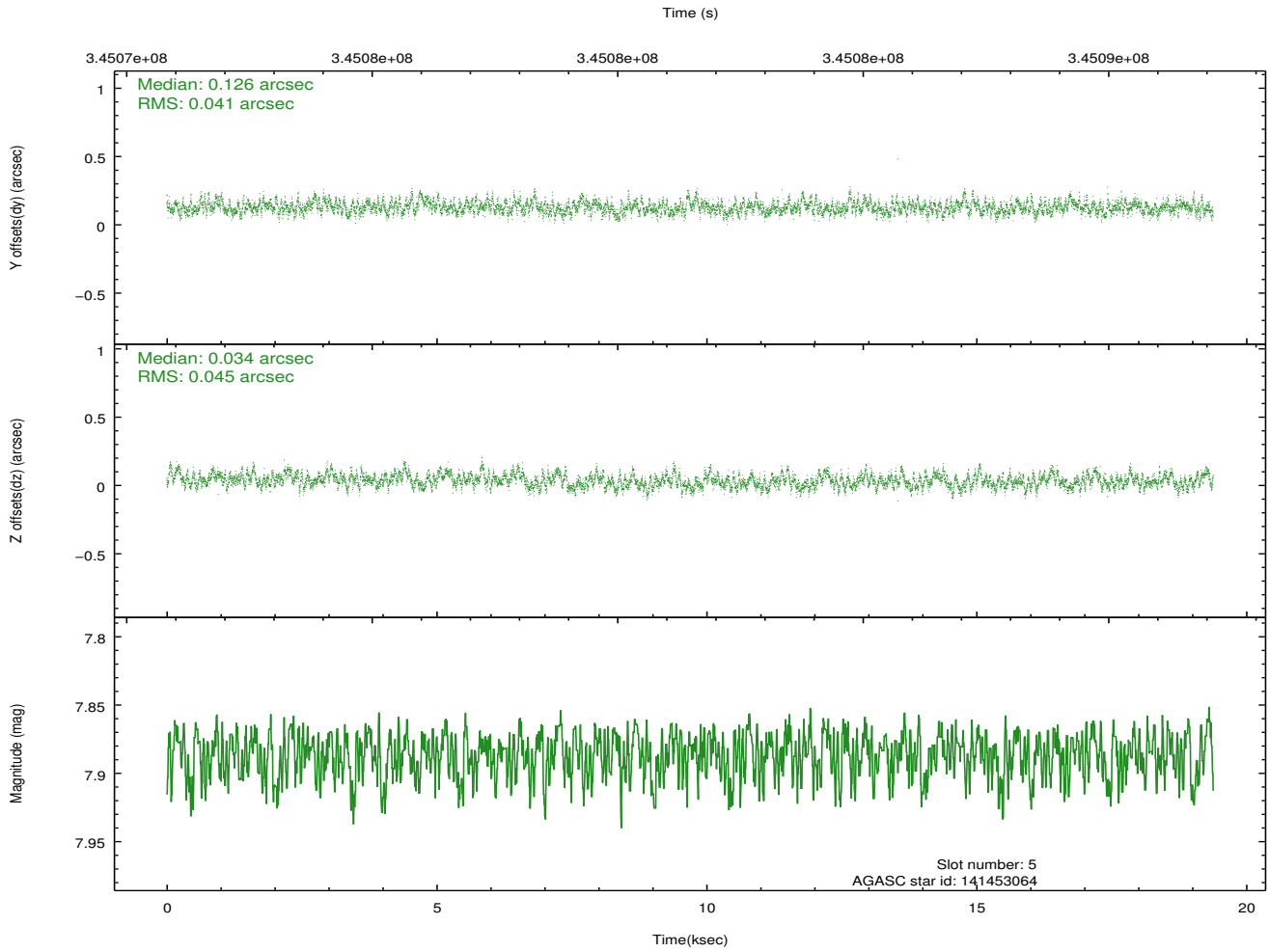
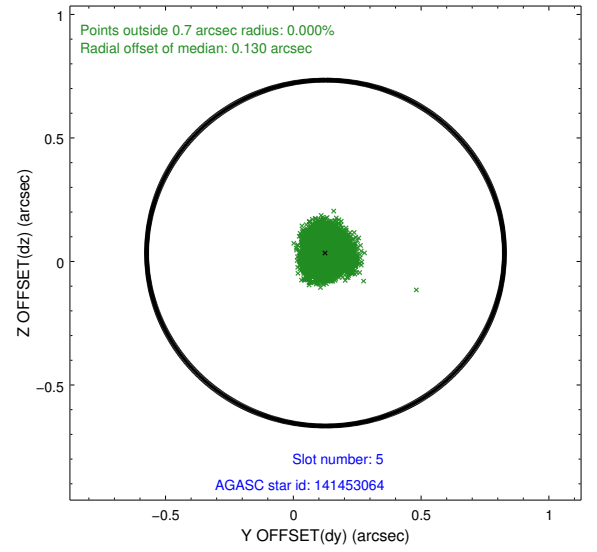
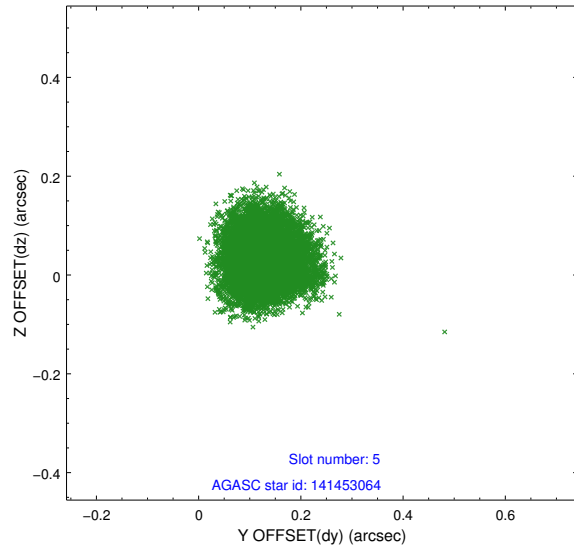


## 2.4.2 Slot 4

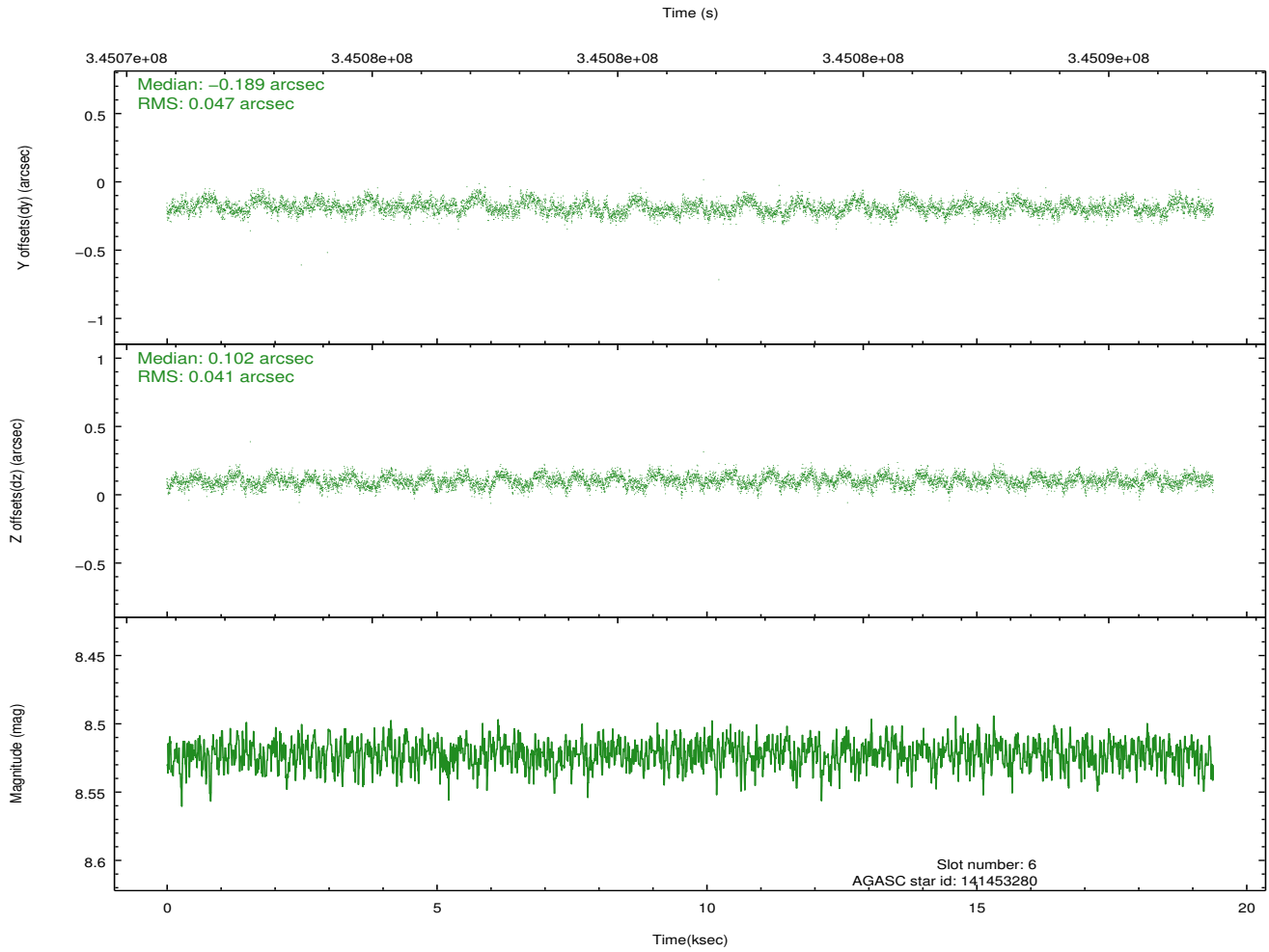
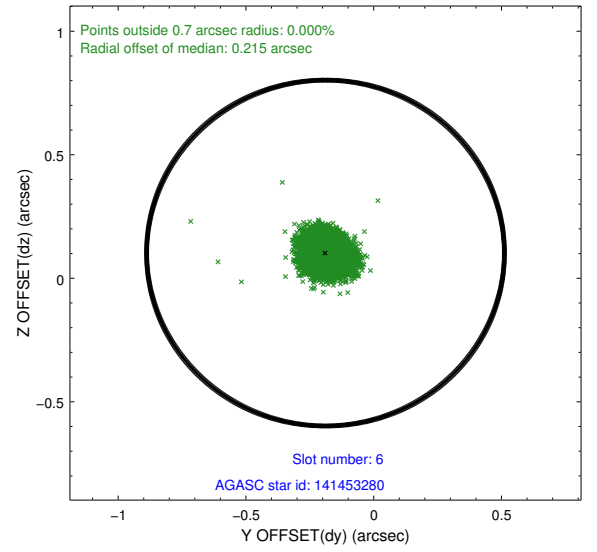
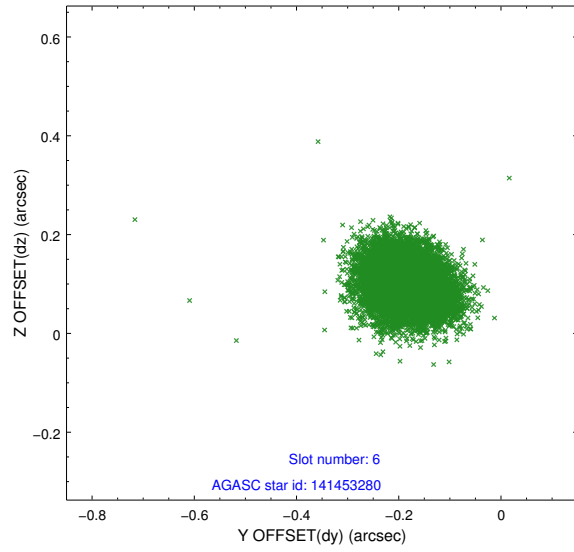




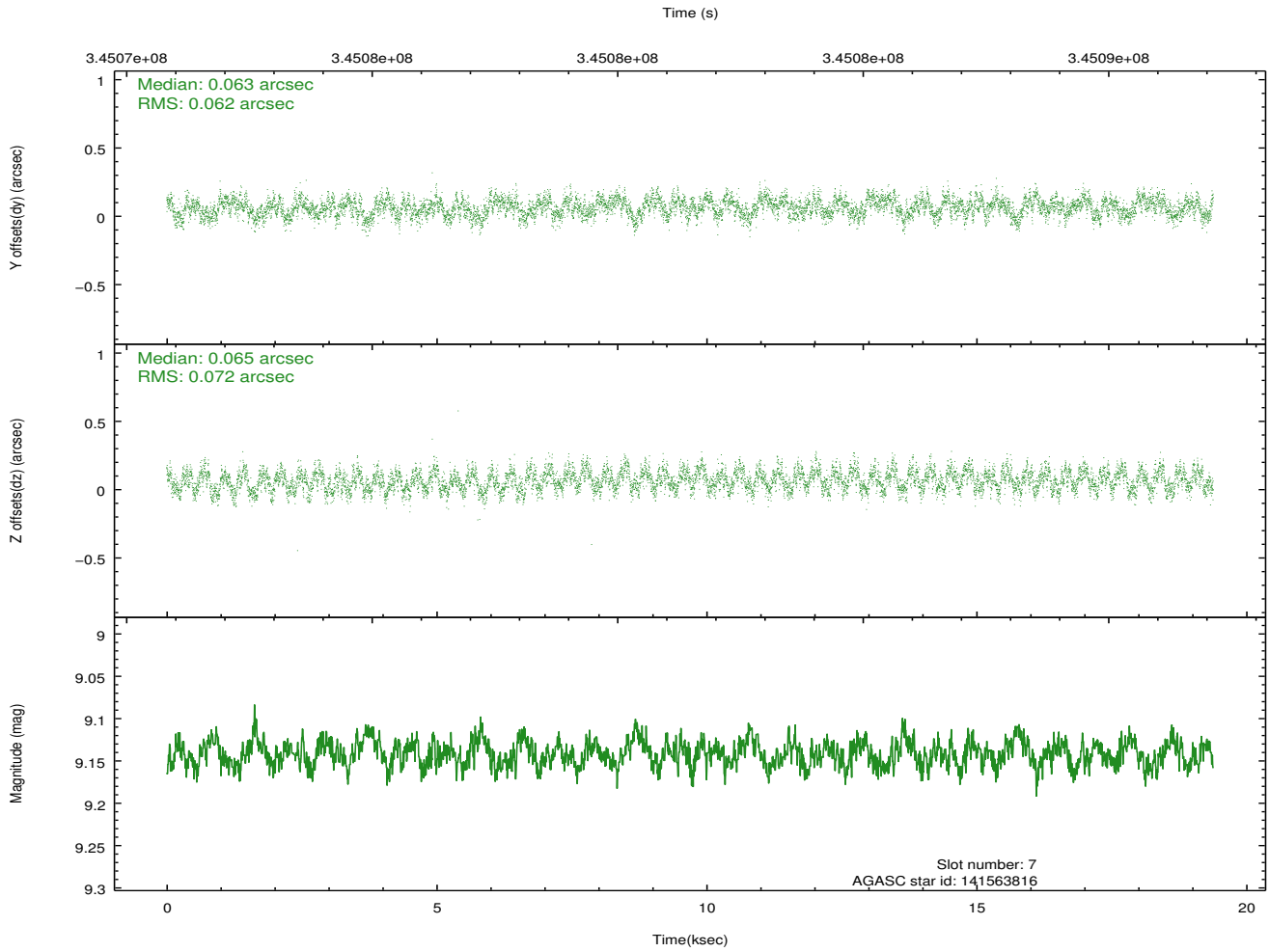
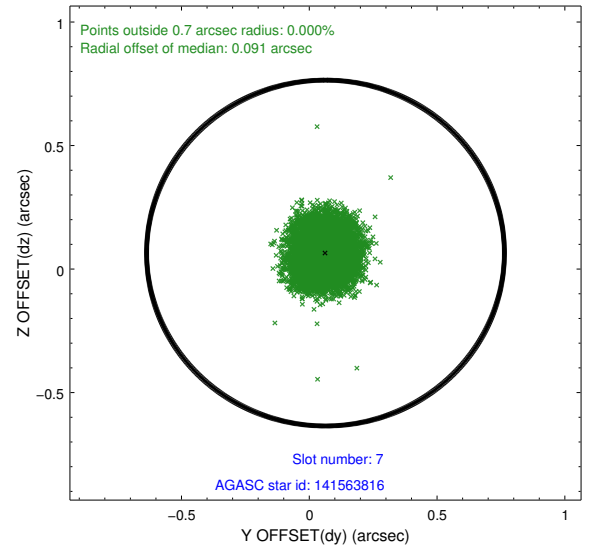
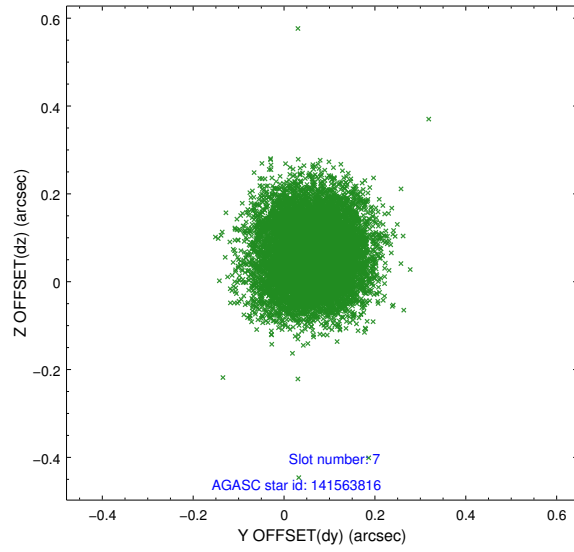
### 2.4.3 Slot 5



## 2.4.4 Slot 6

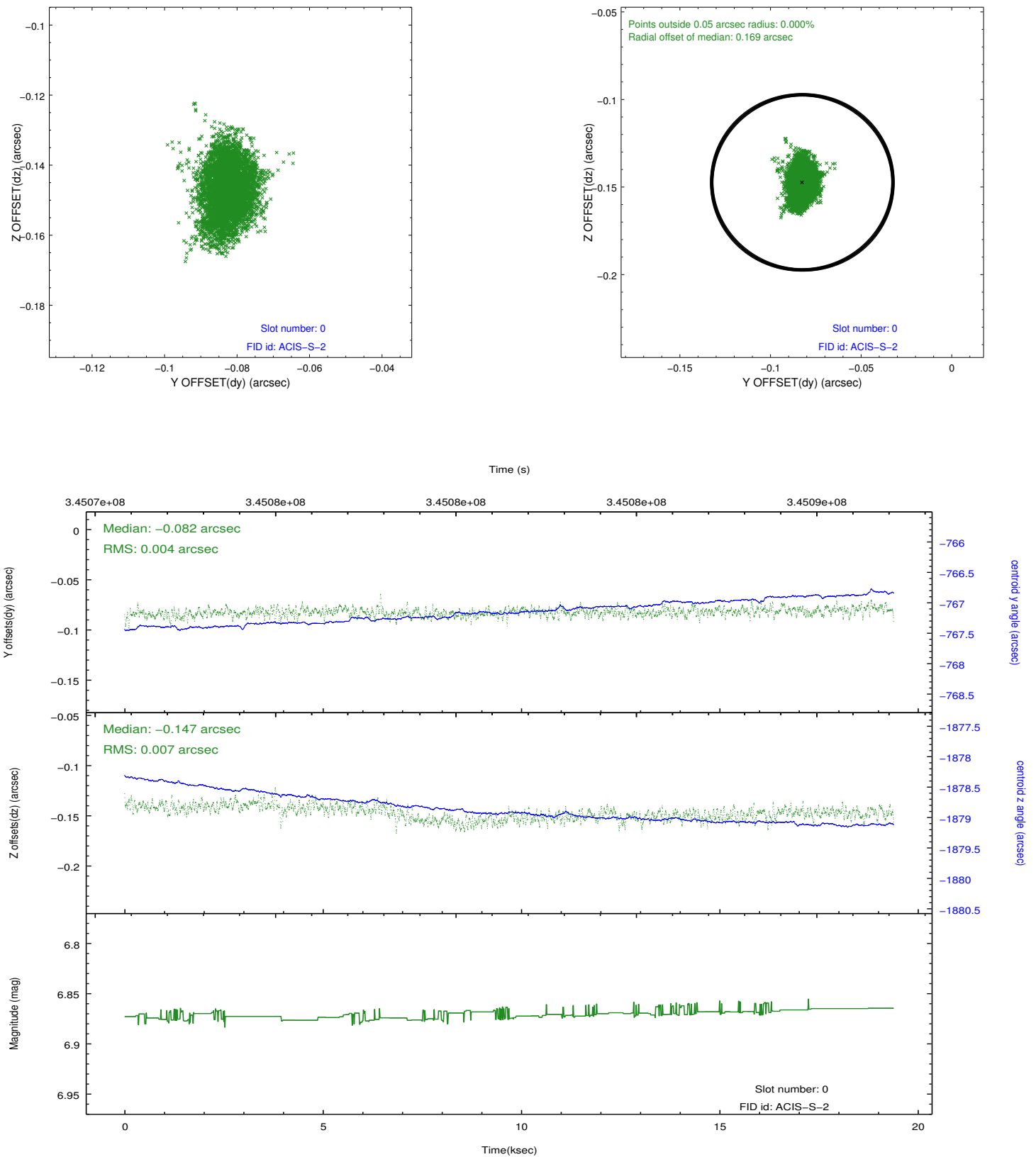


## 2.4.5 Slot 7

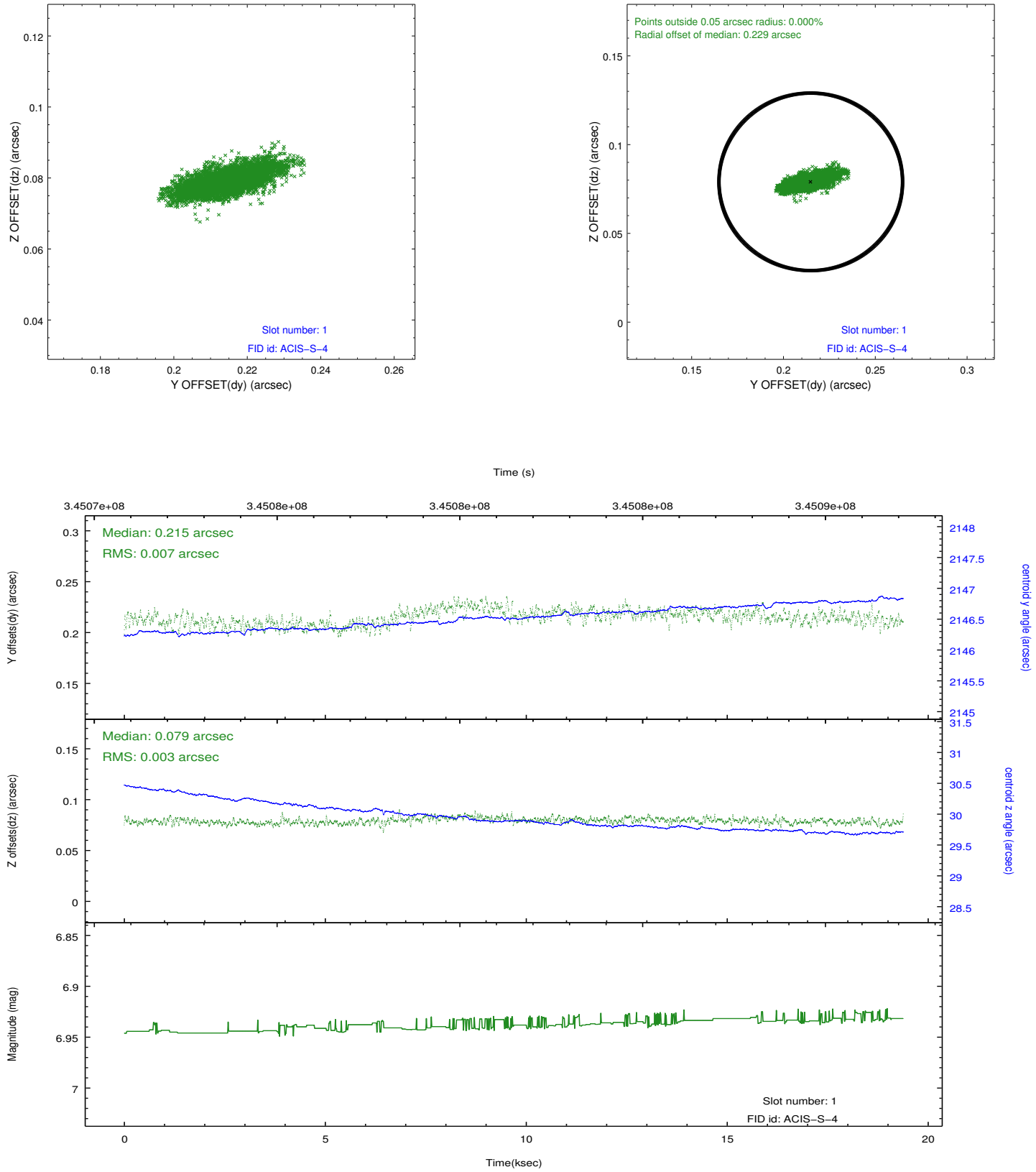


## 2.5 FID Slots

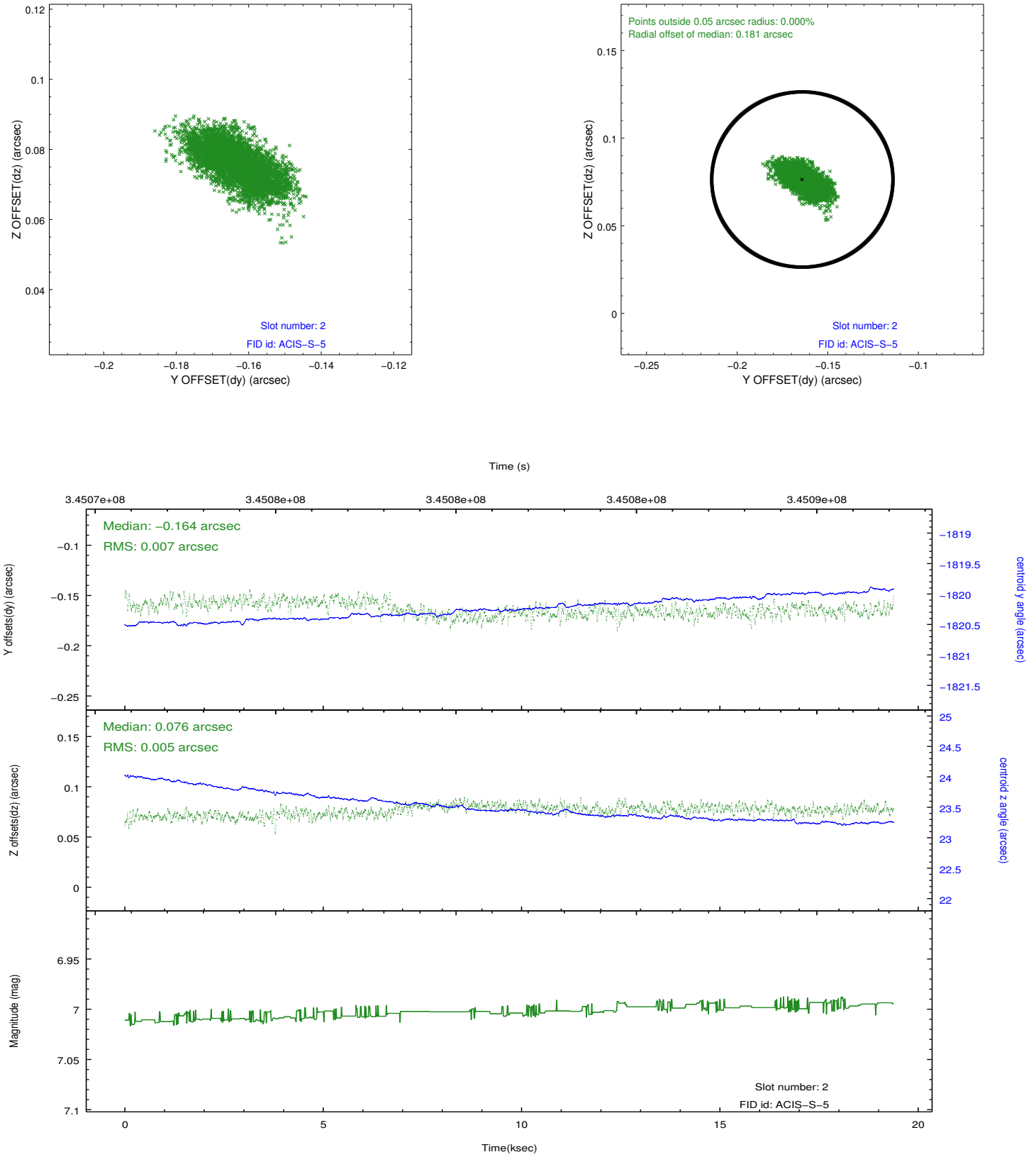
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# 3 Gratings

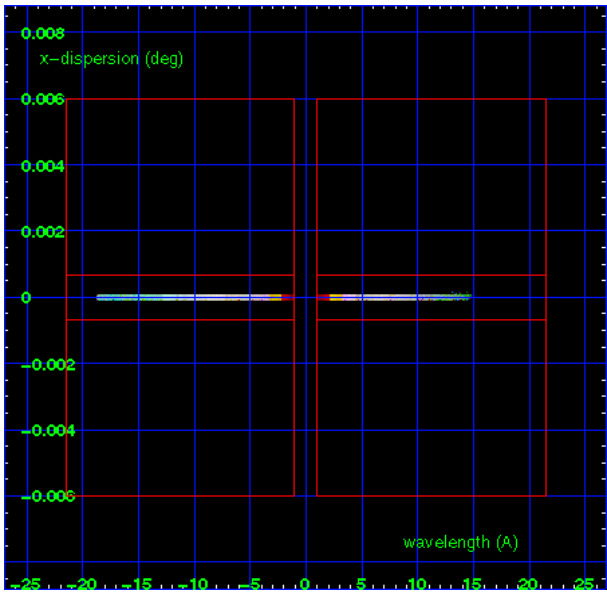
## 3.1 HEG Arm



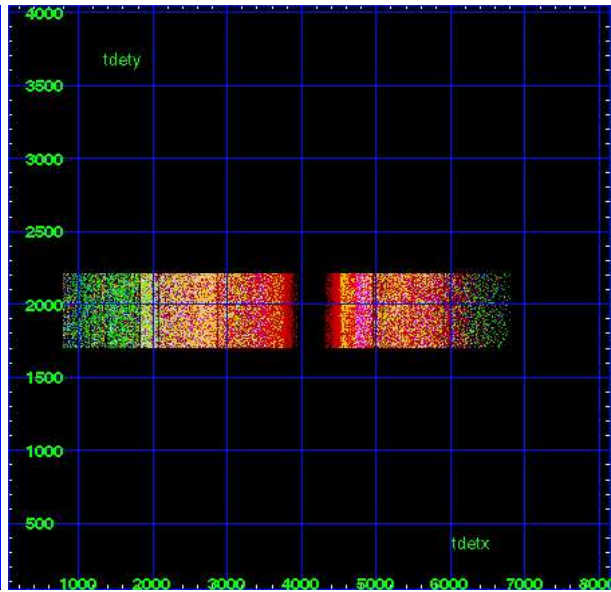
HEG Order Sort 123



HEG Order Sort ALL

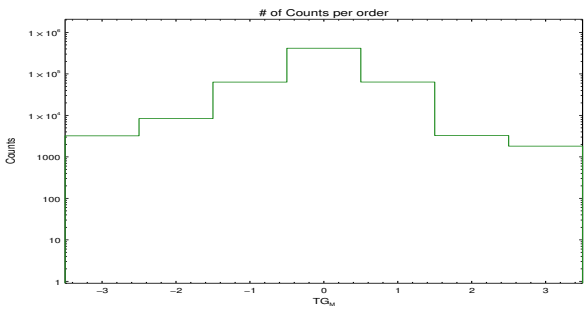


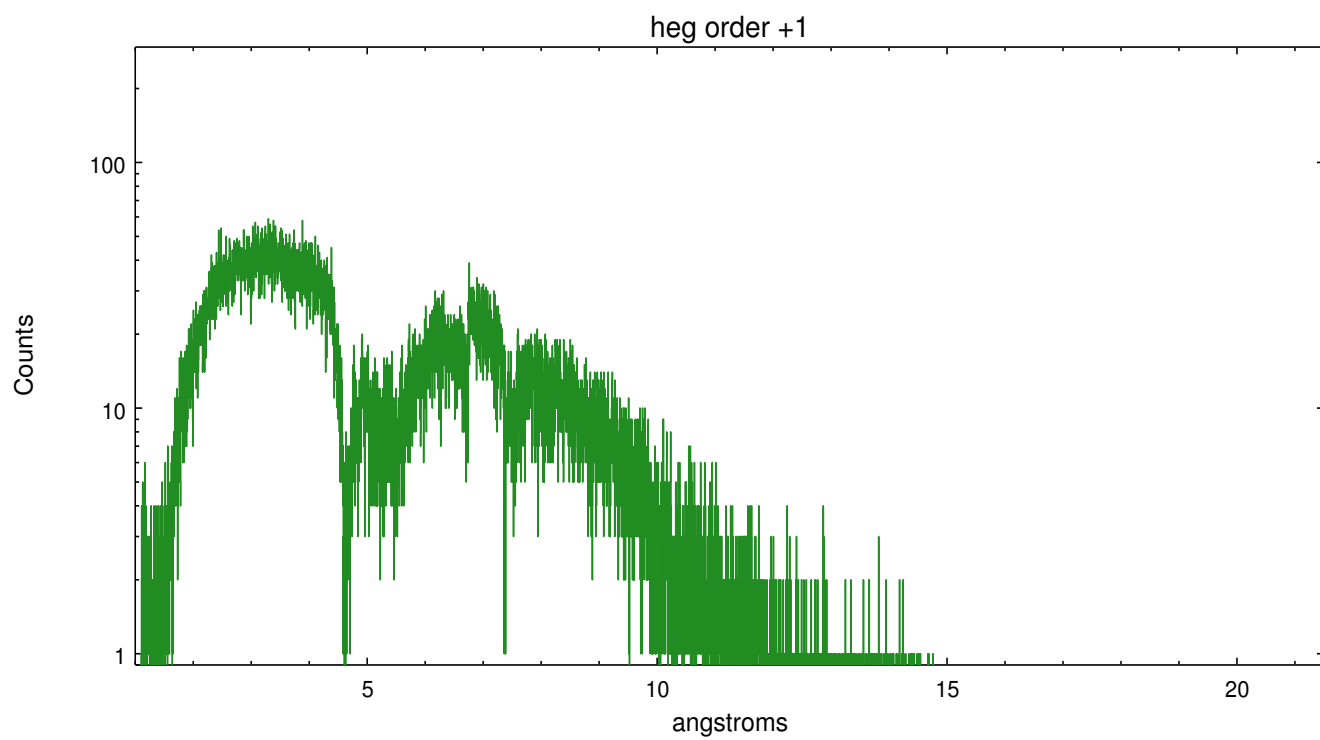
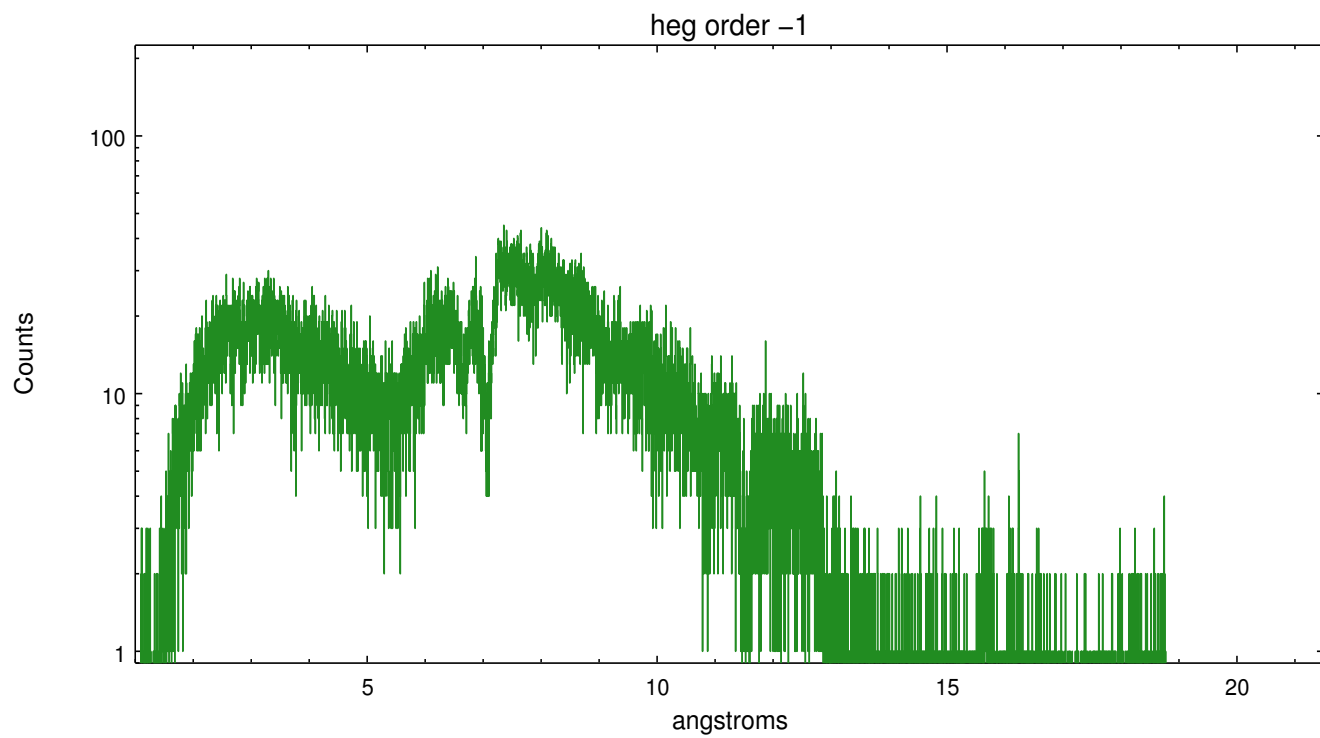
Spot Image HEG



Full Detector HEG

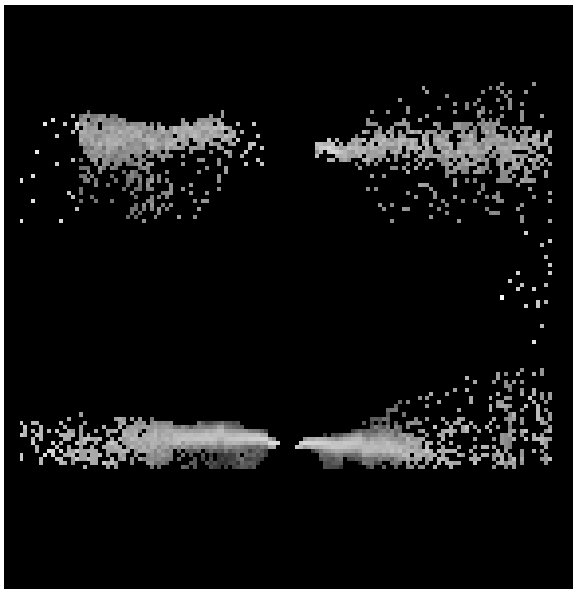
|        | order<br>-3 | order<br>-2 | order<br>-1 | order 0 | order<br>1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|---------|------------|------------|------------|
| Events | 3217        | 8377        | 63402       | 415123  | 63599      | 3262       | 1813       |



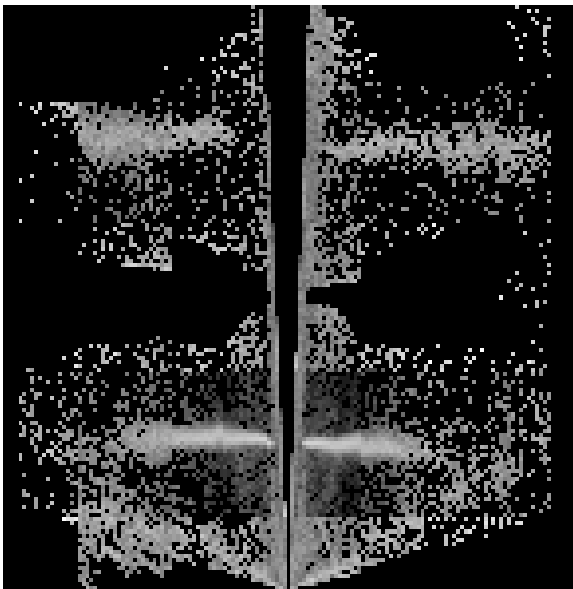




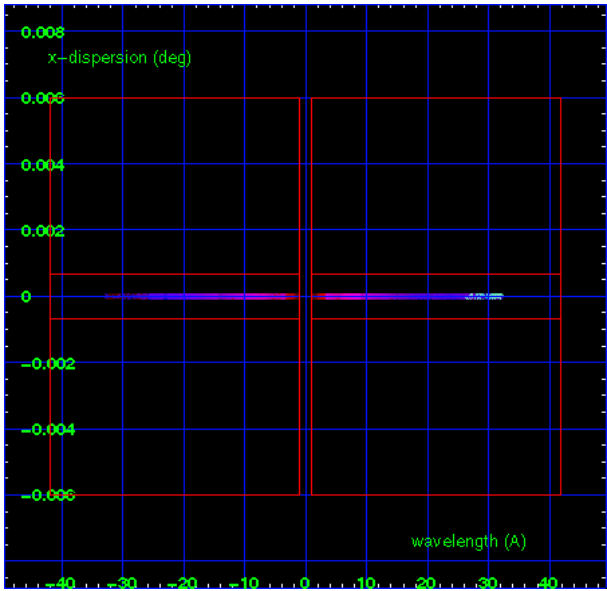
3.2 MEG Arm



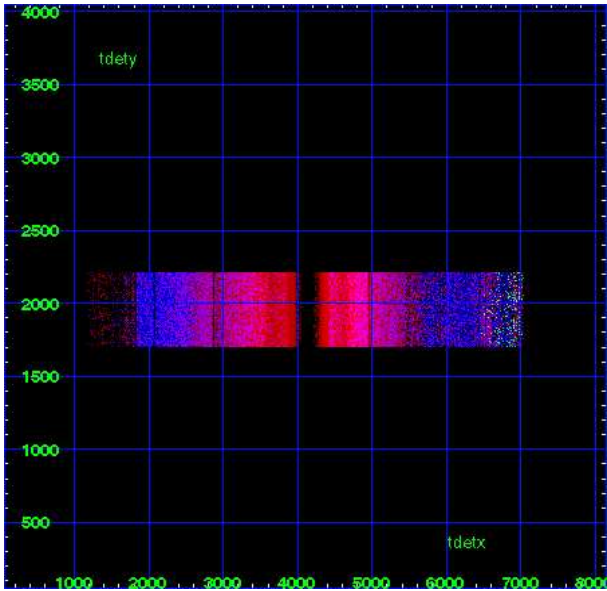
MEG Order Sort 123



MEG Order Sort ALL

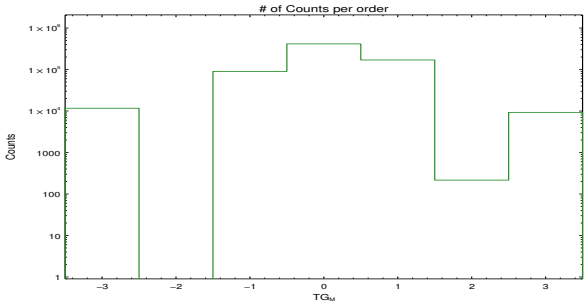


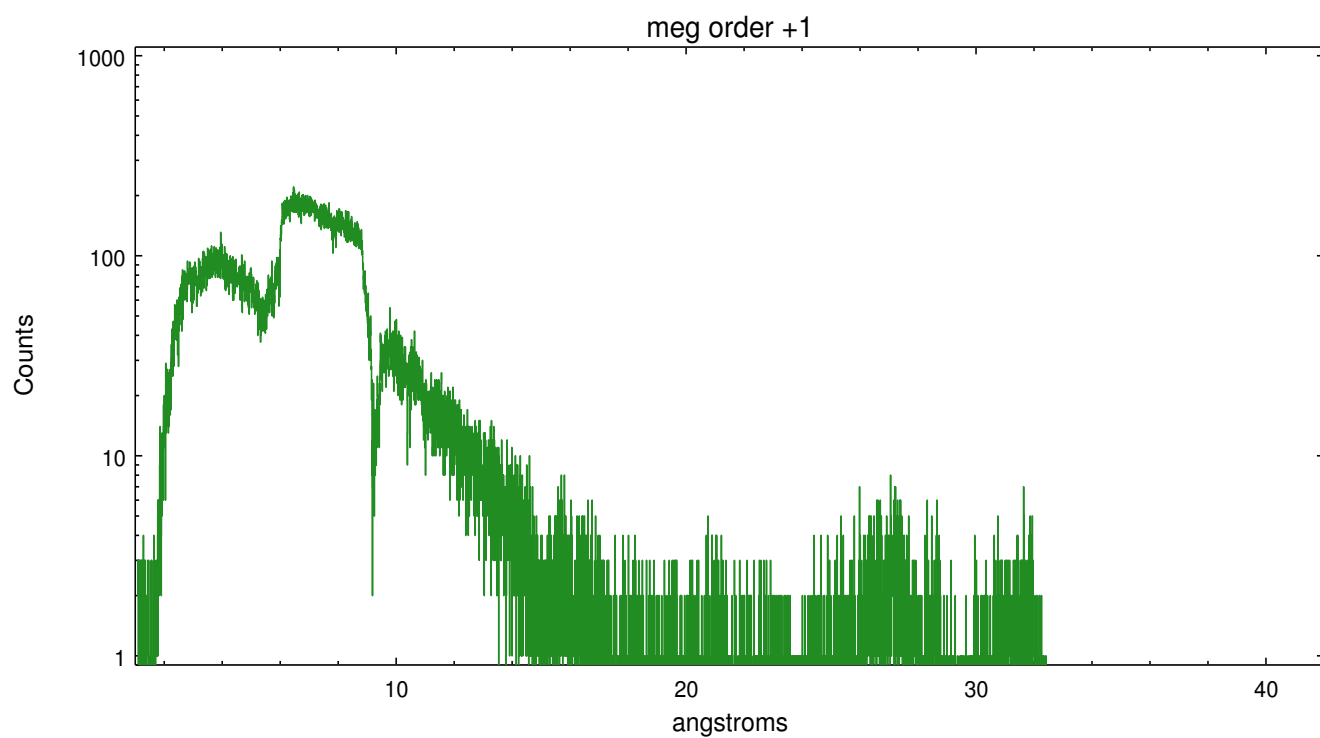
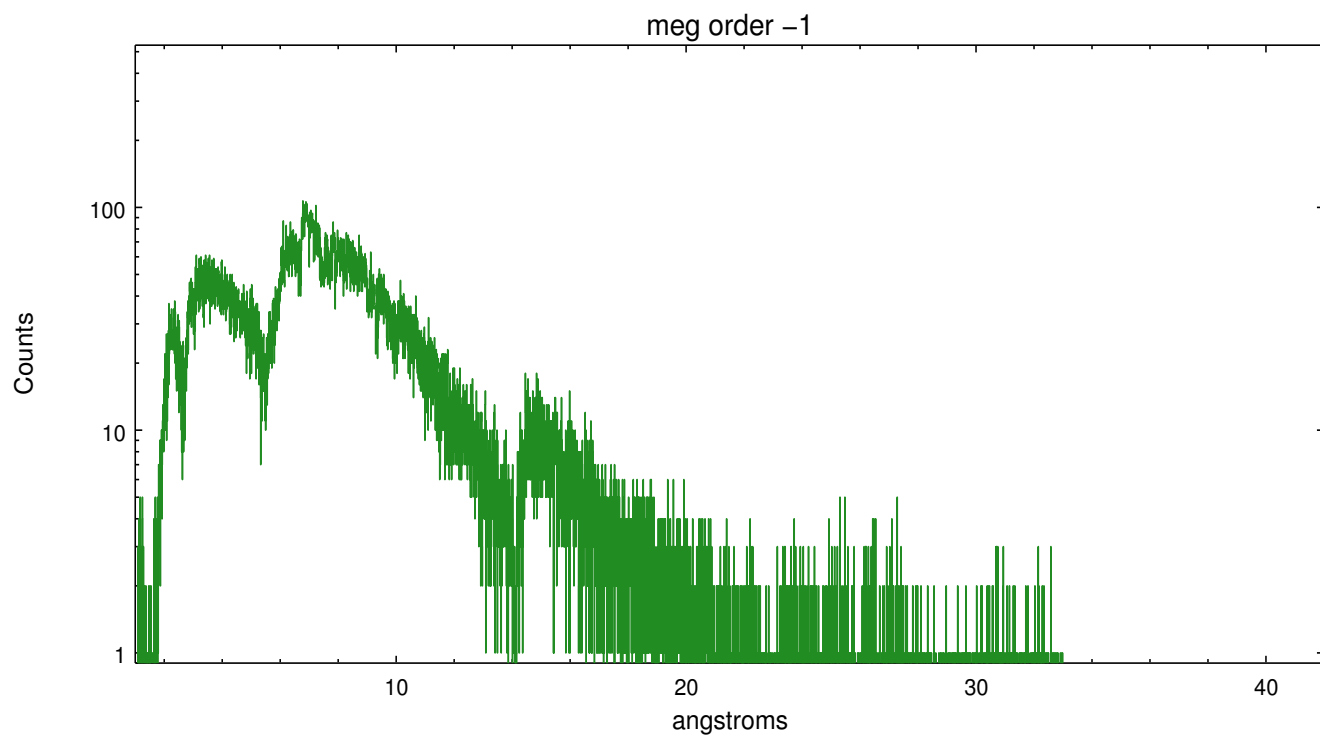
Spot Image MEG



Full Detector MEG

|        | order<br>-3 | order<br>-2 | order<br>-1 | order 0 | order 1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|---------|---------|------------|------------|
| Events | 11664       | 0           | 90213       | 415123  | 169958  | 216        | 9279       |





## A Summary

### A.1 Status

|                            |                    |
|----------------------------|--------------------|
| V&V Scientist              | David Huenemoerder |
| V&V Date (YYYY-MM-DD)      | 2012.05.29         |
| V&V Edition                | 1                  |
| V&V Disposition and Status | OK                 |
| V&V Charge Time            | 19.054             |

### A.2 Comments