

# V&V Reference Report

## L2 ASCDS Version : 8.4.3

Observation 13242 - L2 Version 2  
Chandra X-Ray Center

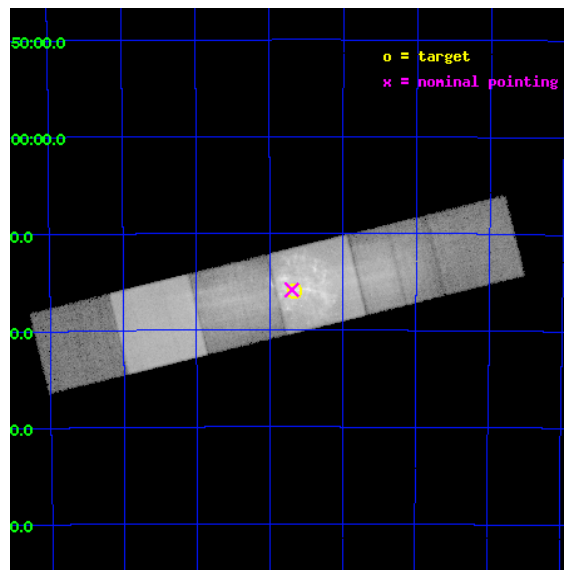
L2 Processing Date : Feb 6 2012

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# 1 Front

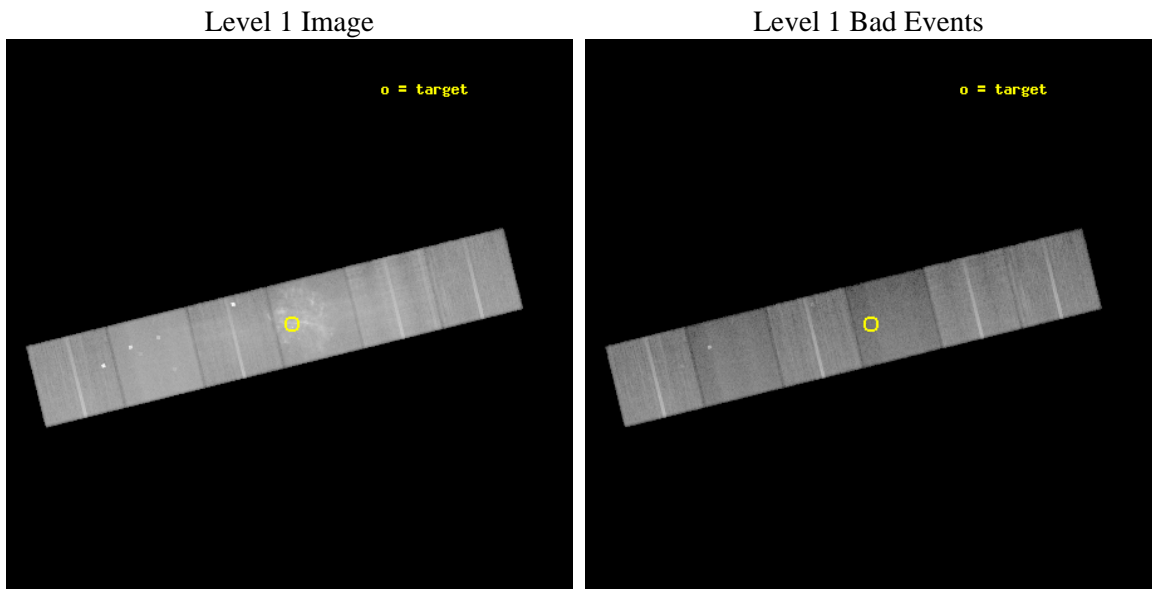
|          |   |   |
|----------|---|---|
| seq_num  | 501388  | Sequence number                             |
| obs_id   | 13242   | Observation id                              |
| title    | Chandra HETGS Observation of the Oxygen-Rich Supernova Remnant G292.0+1.8 | Proposal title                              |
| observer | Sangwook Park   | Principal investigator                      |
| object   | G292.0+1.8  | Source name                                 |
| dtcycle  | 0   | &#160                                       |
| cycle    | P   | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 171.164583  | Observer's specified target RA [deg]        |
| dec_targ | -59.265667  | Observer's specified target Dec [deg]       |
| ra_nom   | 171.17362908333   | Nominal RA [deg]                            |
| dec_nom  | -59.264187777061  | Nominal Dec [deg]                           |
| roll_nom | 346.16439965662   | Nominal Roll [deg]                          |
| revision | 2   | Processing version of data                  |
| ontime   | 44003.199836135   | Sum of GTIs [s]                             |
| livetime | 43446.004824264   | Livetime [s]                                |
| ontime4  | 43990.235694826   | Sum of GTIs [s]                             |
| ontime5  | 44003.199836135   | Sum of GTIs [s]                             |
| ontime6  | 43999.958805799   | Sum of GTIs [s]                             |
| ontime7  | 44003.199836135   | Sum of GTIs [s]                             |
| ontime8  | 44003.199836135   | Sum of GTIs [s]                             |
| ontime9  | 43999.958795846   | Sum of GTIs [s]                             |
| l2events | 861844  | Number of level 2 events                    |



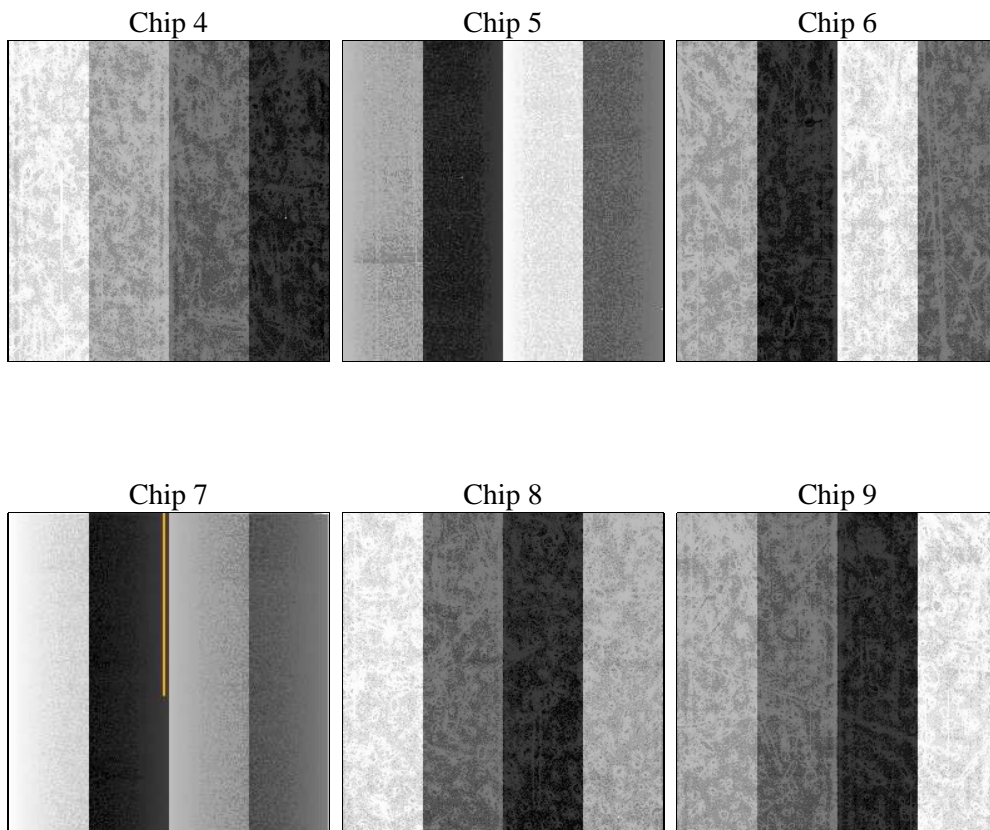
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 43956.842000    | [s] Scheduled observation exposure time |
| ascdsver | 8.4.3               | Processing system revision     | ontime         | 44003.199836135 | Sum of GTIs [s]                         |
| caldbver | 4.4.7               | &#160                          | ontime4        | 43990.235694826 | Sum of GTIs [s]                         |
| date     | 2012-02-06T22:32:52 | Date and time of file creation | ontime5        | 44003.199836135 | Sum of GTIs [s]                         |
| revision | 2                   | Processing version of data     | ontime6        | 43999.958805799 | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 44003.199836135 | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 44003.199836135 | Sum of GTIs [s]                         |
|          |                     |                                | ontime9        | 43999.958795846 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 2389906         | Number of level 1 events                |

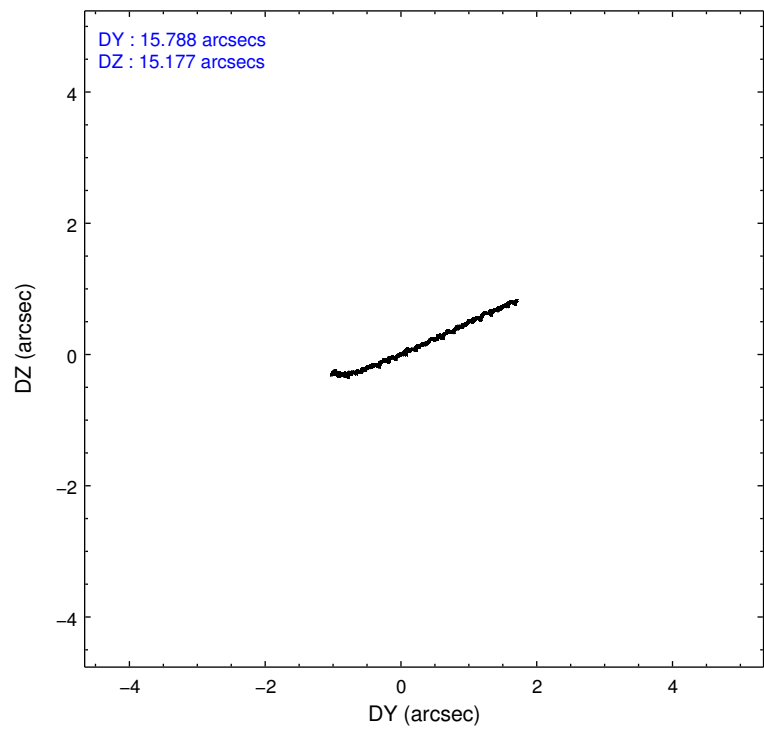
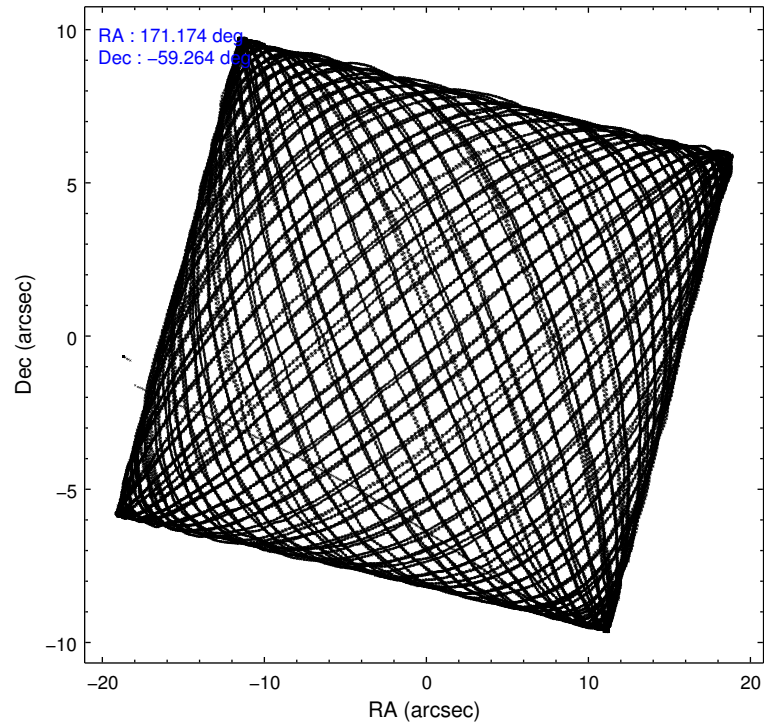
### 2.1.4 Events

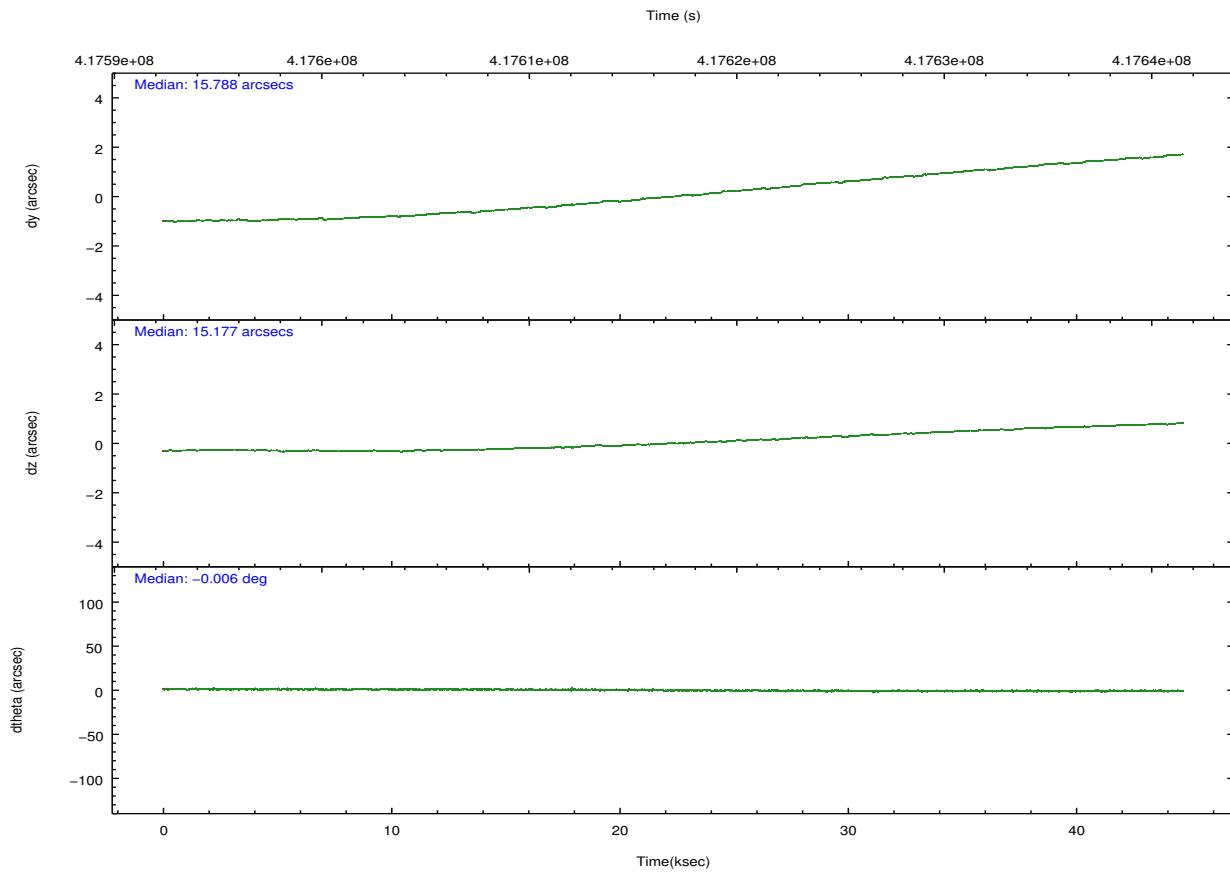
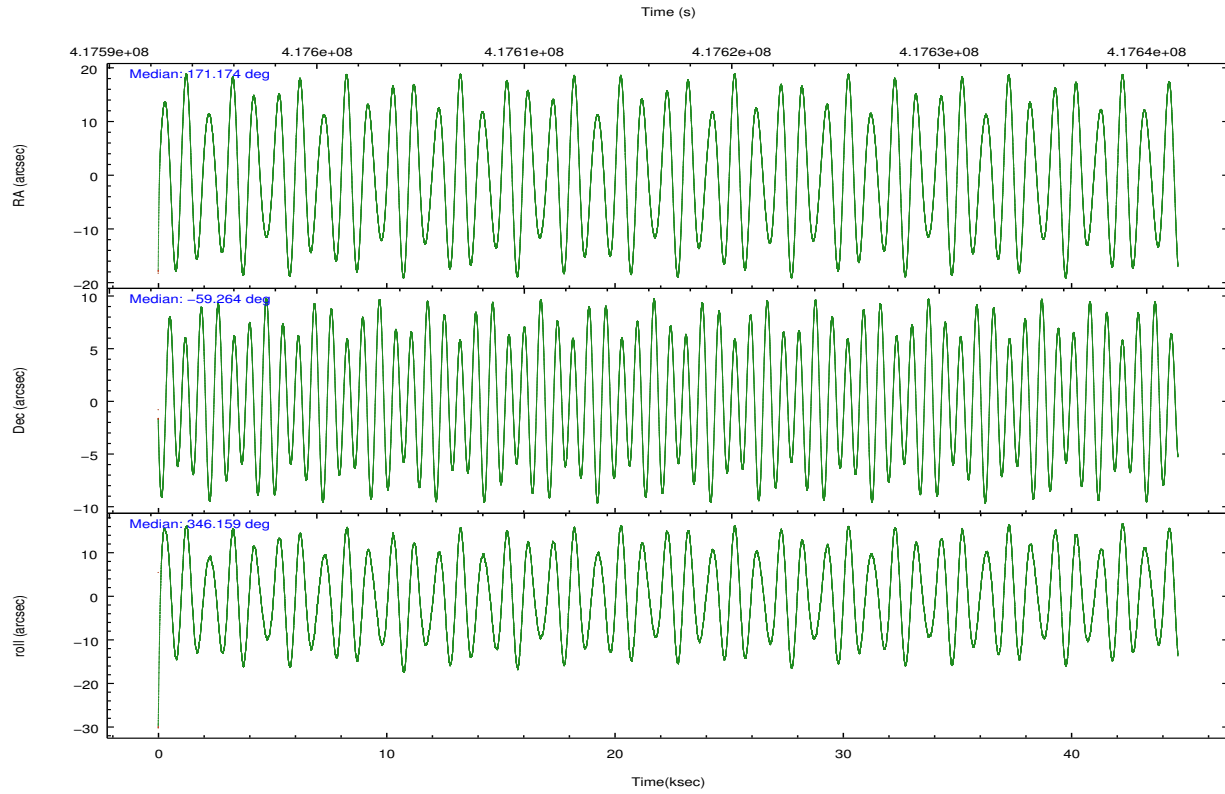
|                 | ccd 4  | ccd 5  | ccd 6  | ccd 7  | ccd 8  | ccd 9  |                | ccd 4  | ccd 5  | ccd 6  | ccd 7  | ccd 8  | ccd 9  |
|-----------------|--------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|
| level 1 events  | 341027 | 429548 | 391466 | 500400 | 436338 | 291127 | grade 0 events | 29379  | 33680  | 104356 | 71704  | 95464  | 25558  |
| rejected events | 290070 | 190350 | 251576 | 155768 | 259050 | 243178 |                | 8%     | 7%     | 26%    | 14%    | 21%    | 8%     |
| rejected %      | 85%    | 44%    | 64%    | 31%    | 59%    | 83%    | grade 1 events | 395    | 2246   | 538    | 464    | 580    | 235    |
|                 |        |        |        |        |        |        |                | 0%     | 0%     | 0%     | 0%     | 0%     | 0%     |
|                 |        |        |        |        |        |        | grade 2 events | 8851   | 74193  | 16269  | 85654  | 30431  | 8320   |
|                 |        |        |        |        |        |        |                | 2%     | 17%    | 4%     | 17%    | 6%     | 2%     |
|                 |        |        |        |        |        |        | grade 3 events | 3670   | 11078  | 5793   | 36970  | 12366  | 3729   |
|                 |        |        |        |        |        |        |                | 1%     | 2%     | 1%     | 7%     | 2%     | 1%     |
|                 |        |        |        |        |        |        | grade 4 events | 3566   | 10920  | 5673   | 36374  | 11466  | 3747   |
|                 |        |        |        |        |        |        |                | 1%     | 2%     | 1%     | 7%     | 2%     | 1%     |
|                 |        |        |        |        |        |        | grade 5 events | 11343  | 30892  | 11365  | 32819  | 17289  | 12676  |
|                 |        |        |        |        |        |        |                | 3%     | 7%     | 2%     | 6%     | 3%     | 4%     |
|                 |        |        |        |        |        |        | grade 6 events | 5496   | 109364 | 7821   | 113977 | 27609  | 6603   |
|                 |        |        |        |        |        |        |                | 1%     | 25%    | 1%     | 22%    | 6%     | 2%     |
|                 |        |        |        |        |        |        | grade 7 events | 278327 | 157175 | 239651 | 122438 | 241133 | 230259 |
|                 |        |        |        |        |        |        |                | 81%    | 36%    | 61%    | 24%    | 55%    | 79%    |

## 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                         | VFAINT              | VFAINT               | CCD I0 on                             | N         | N       |
| Observation mode                  | POINTING            | POINTING             | CCD I1 on                             | N         | N       |
| [deg] Pointing RA                 | 171.122429          | 171.1736290833271    | CCD I2 on                             | N         | N       |
| [deg] Pointing Dec                | -59.272146          | -59.26418777706073   | CCD I3 on                             | N         | N       |
| [deg] Pointing Roll               | 345.963762          | 346.1643996566202    | 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    | -190.132523         | -190.1425803651734   | CCD S3 on                             | Y         | Y       |
| [mm] SIM translation stage offset | 0                   | 0.01005778216563158  | CCD S4 on                             | Y         | Y       |
| [s] Observation start time (MET)  | 417595293.184000    | 417593866.69128      | CCD S5 on                             | Y         | Y       |
| Observation start date            | 2011-03-27T06:40:27 | 2011-03-27T06:17:46  | Number of optional ACIS chips dropped | 0         | 0       |
| [s] Observation end time (MET)    | 417639250.184000    | 417639475.09365      | On-chip summing requested             | N         | N       |
| Observation end date              | 2011-03-27T18:53:04 | 2011-03-27T18:57:55  | Subarray requested                    | NONE      | NONE    |
| Read mode                         | TIMED               | TIMED                | Alternating exposures requested       | N         | N       |
|                                   |                     |                      | [s] Primary exposure time             | 0.000000  | 3.2     |

## 2.3 Aspect



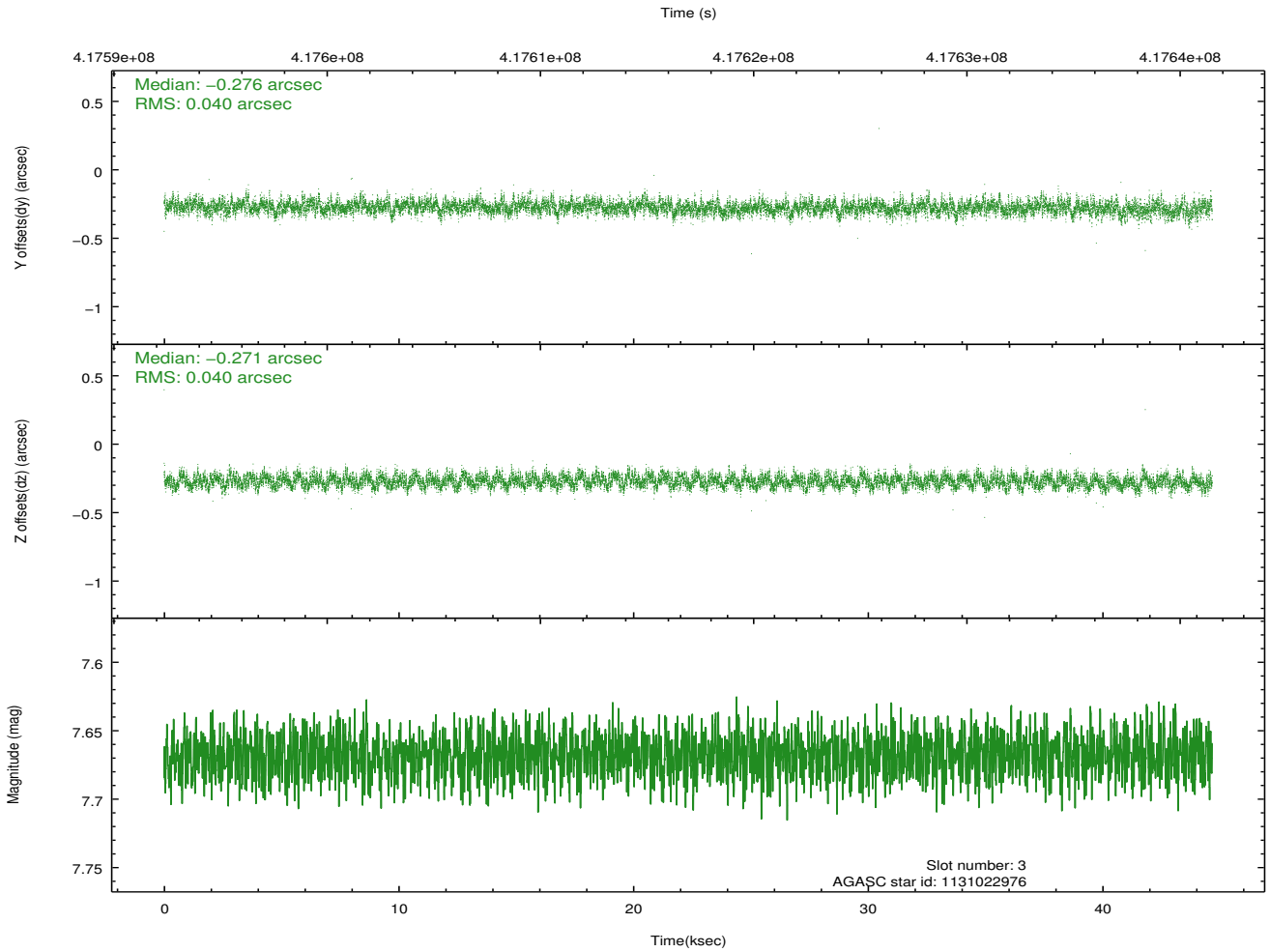
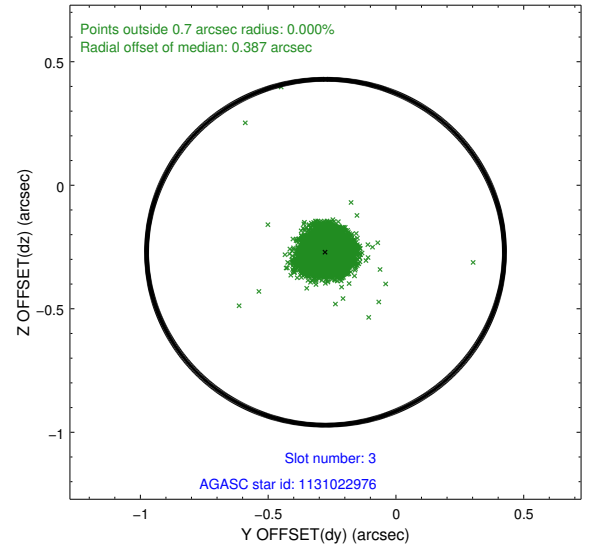
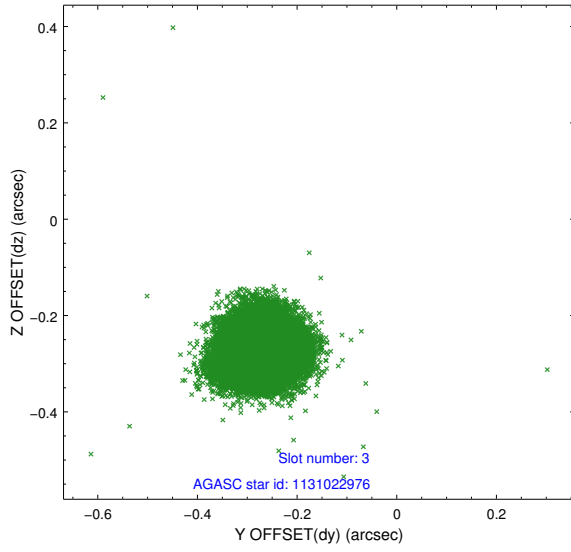


### Slot Statistics

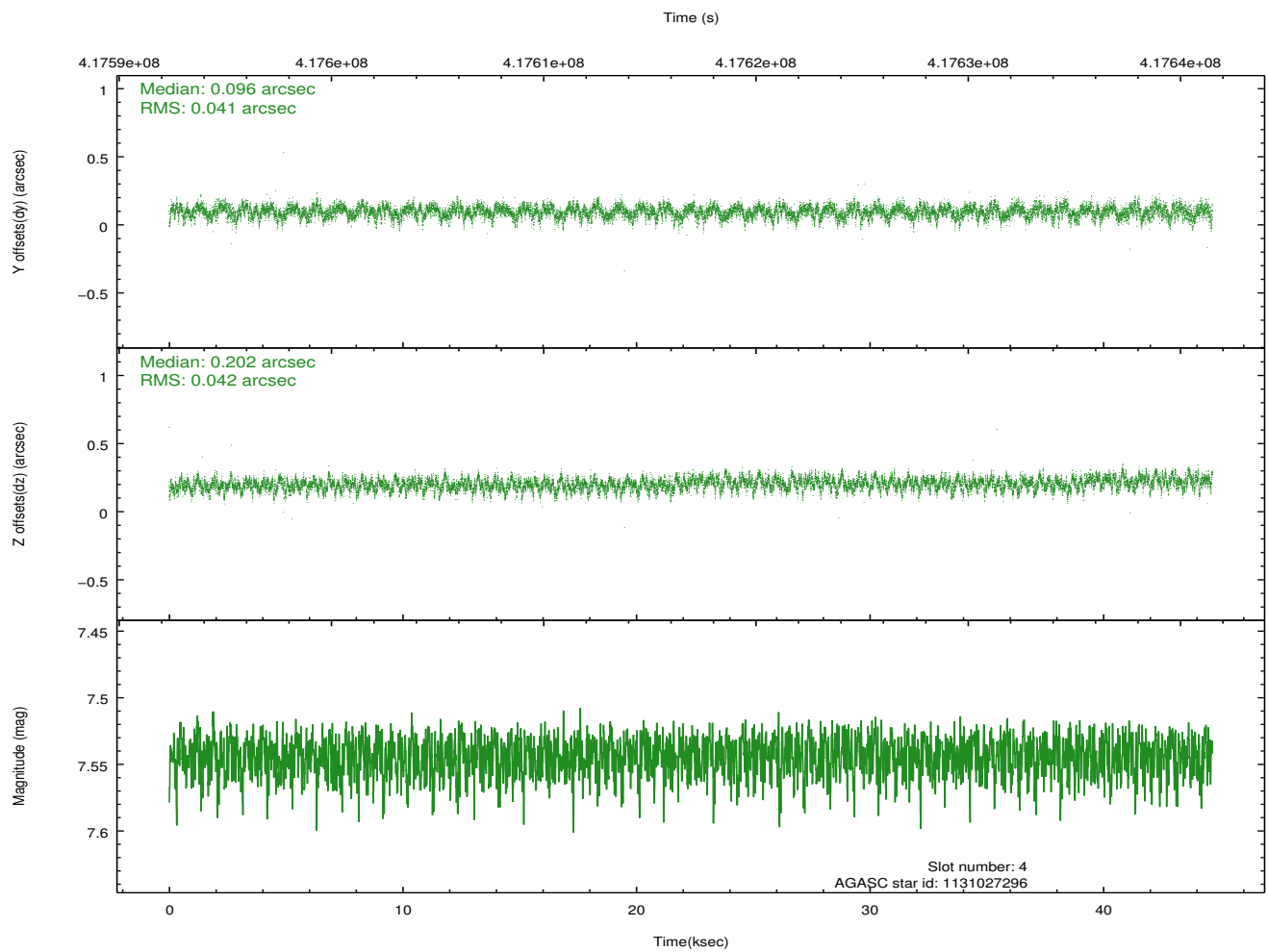
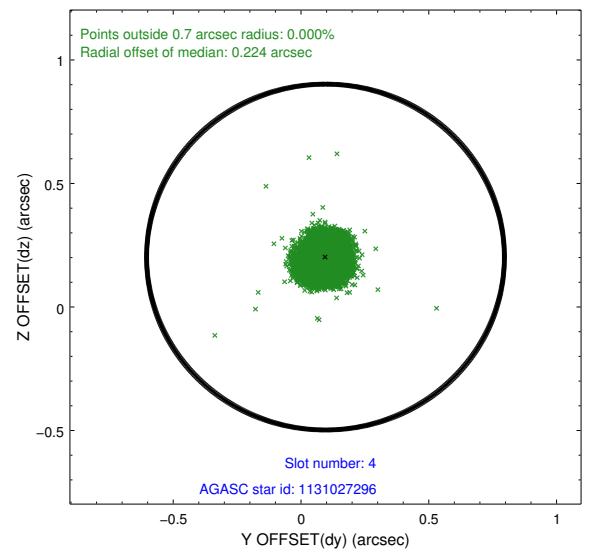
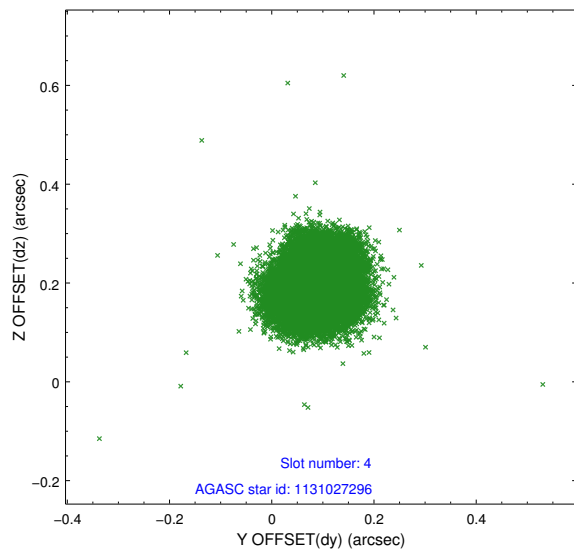
| slot | status | id         | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec        | mean_y   | mean_z   |
|------|--------|------------|------|-------|--------|--------|-------|-------|------------|------------|----------|----------|
| 0    | FID    | ACIS-S-1   | 7.05 | 10895 | 0.025  | -0.040 | 0.020 | 0.050 | 0.000000   | 0.000000   | 927.19   | -1732.28 |
| 1    | FID    | ACIS-S-4   | 7.07 | 10896 | 0.151  | 0.022  | 0.018 | 0.029 | 0.000000   | 0.000000   | 2144.69  | 171.97   |
| 2    | FID    | ACIS-S-5   | 7.10 | 10895 | -0.215 | 0.032  | 0.022 | 0.034 | 0.000000   | 0.000000   | -1821.95 | 165.52   |
| 3    | GUIDE  | 1131022976 | 7.67 | 21788 | -0.276 | -0.271 | 0.060 | 0.095 | 171.601311 | -59.282289 | 863.81   | 175.23   |
| 4    | GUIDE  | 1131027296 | 7.54 | 21788 | 0.096  | 0.202  | 0.062 | 0.102 | 170.725176 | -59.738880 | -290.67  | -1806.45 |
| 5    | GUIDE  | 1131026392 | 8.75 | 21780 | 0.193  | 0.205  | 0.094 | 0.144 | 170.009630 | -59.570346 | -1703.39 | -1549.76 |
| 6    | GUIDE  | 1131020360 | 8.24 | 21783 | 0.048  | -0.023 | 0.078 | 0.137 | 170.215940 | -58.486440 | -2338.70 | 2319.02  |
| 7    | GUIDE  | 1131025432 | 8.98 | 21776 | -0.072 | -0.117 | 0.128 | 0.225 | 171.164117 | -58.617489 | -496.03  | 2305.60  |

## 2.4 Star Slots

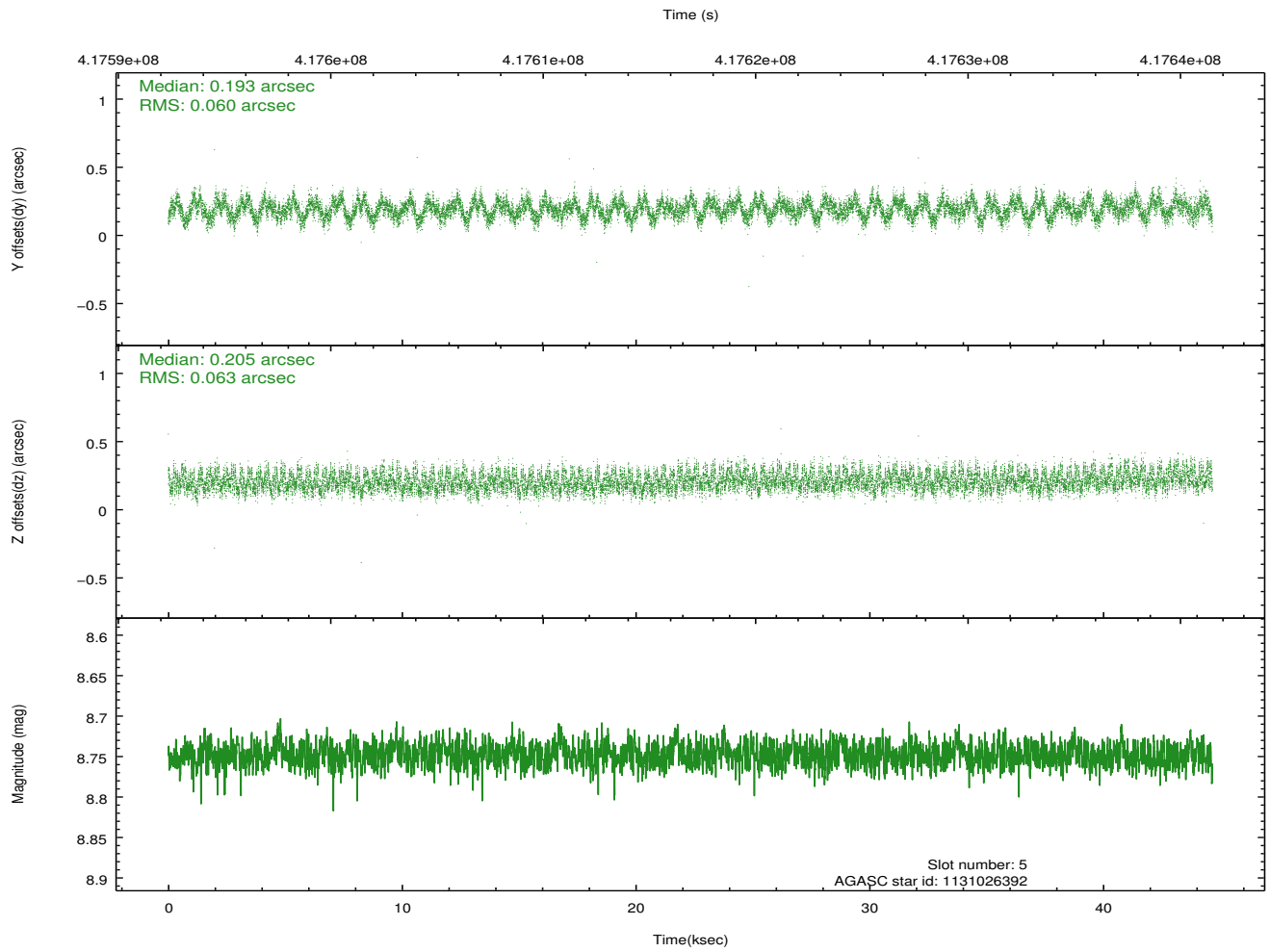
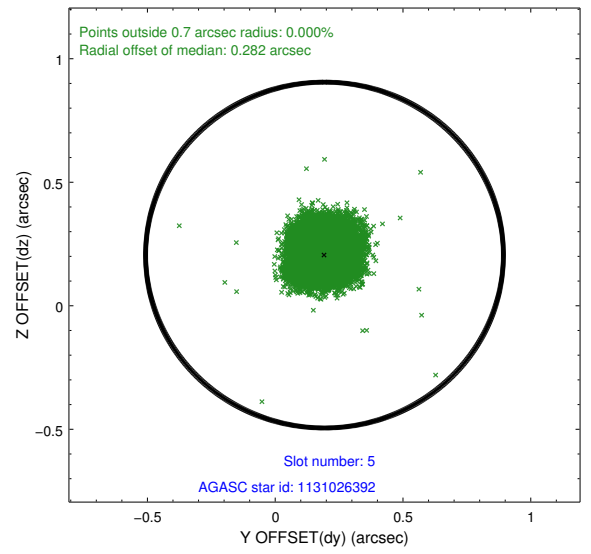
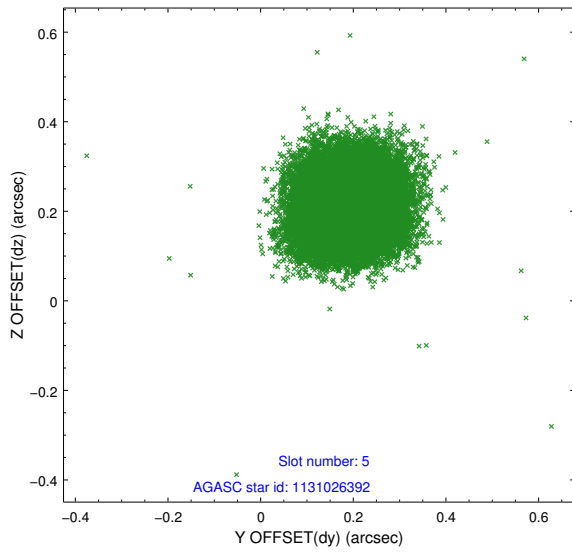
### 2.4.1 Slot 3



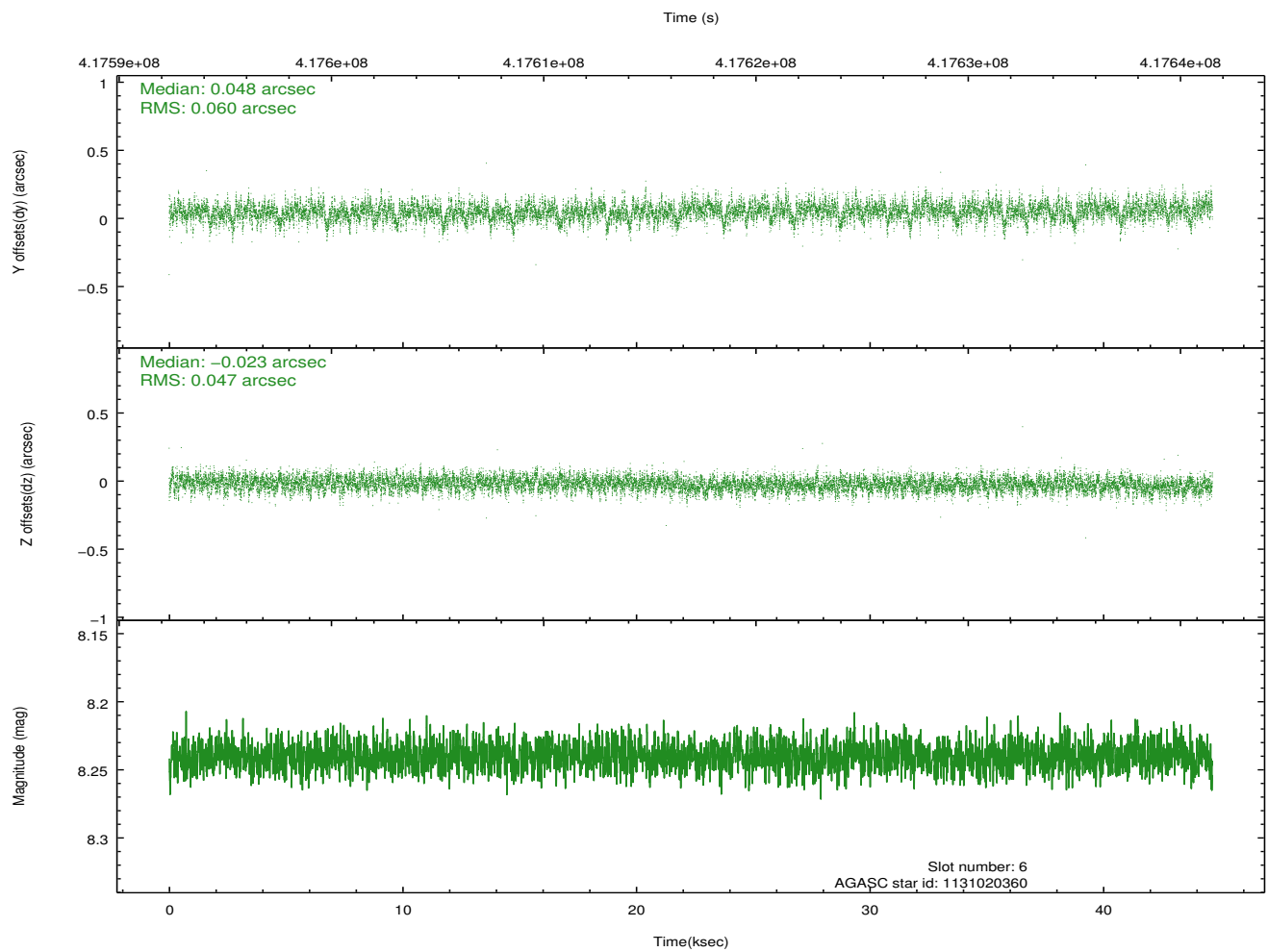
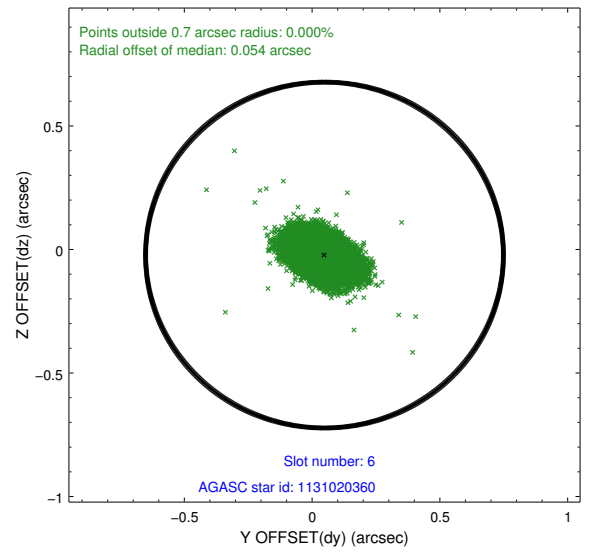
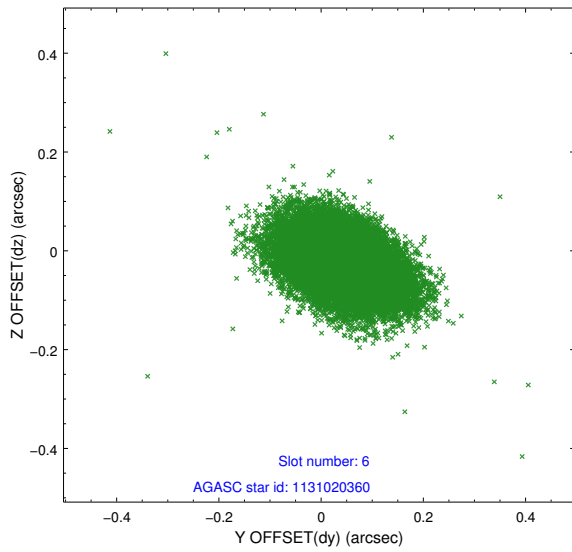
## 2.4.2 Slot 4



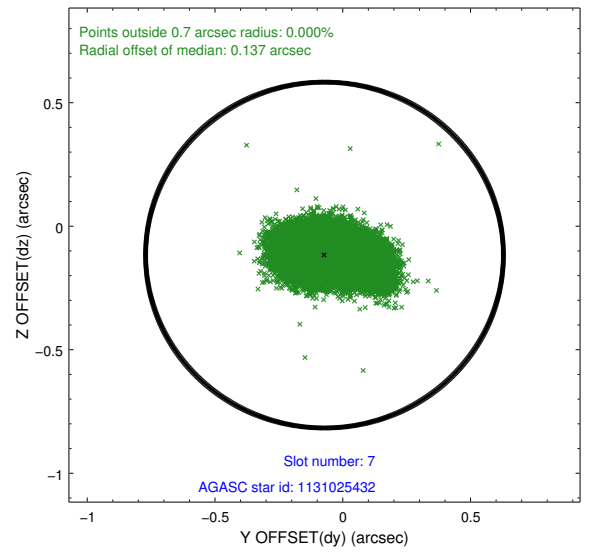
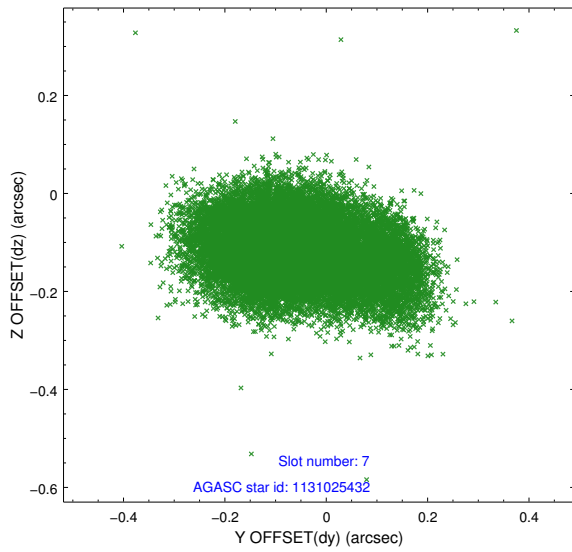
### 2.4.3 Slot 5



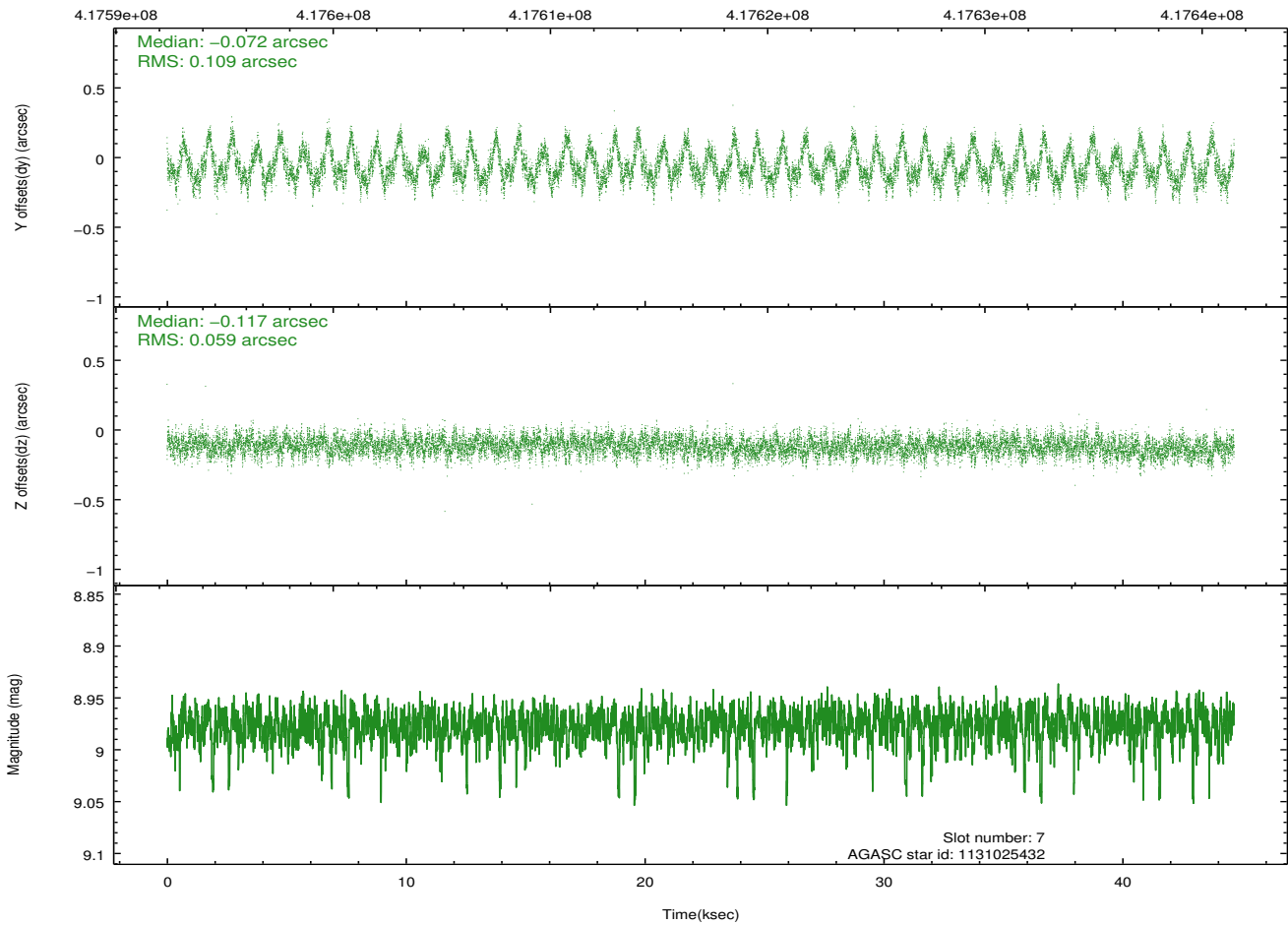
## 2.4.4 Slot 6



## 2.4.5 Slot 7

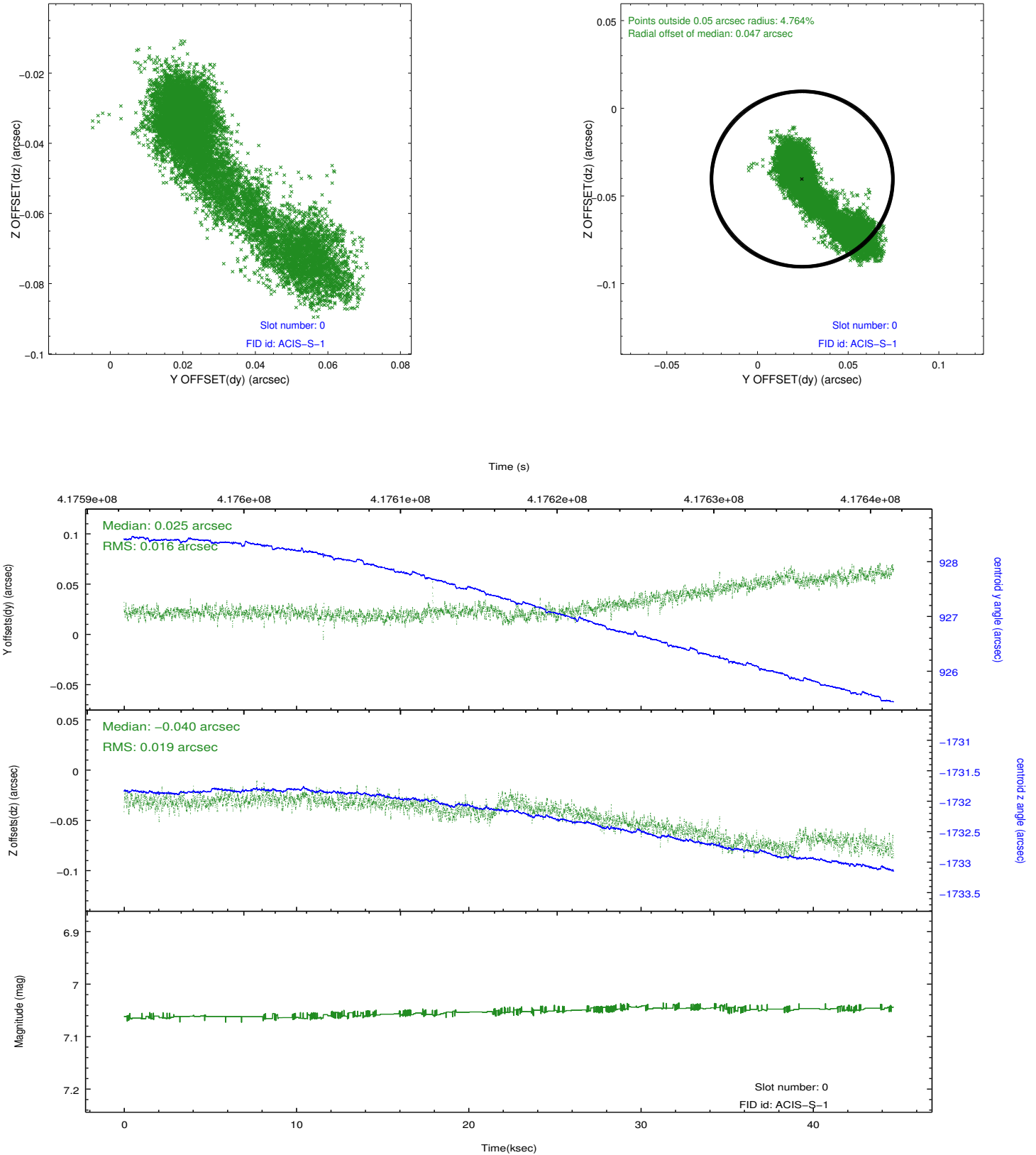


Time (s)

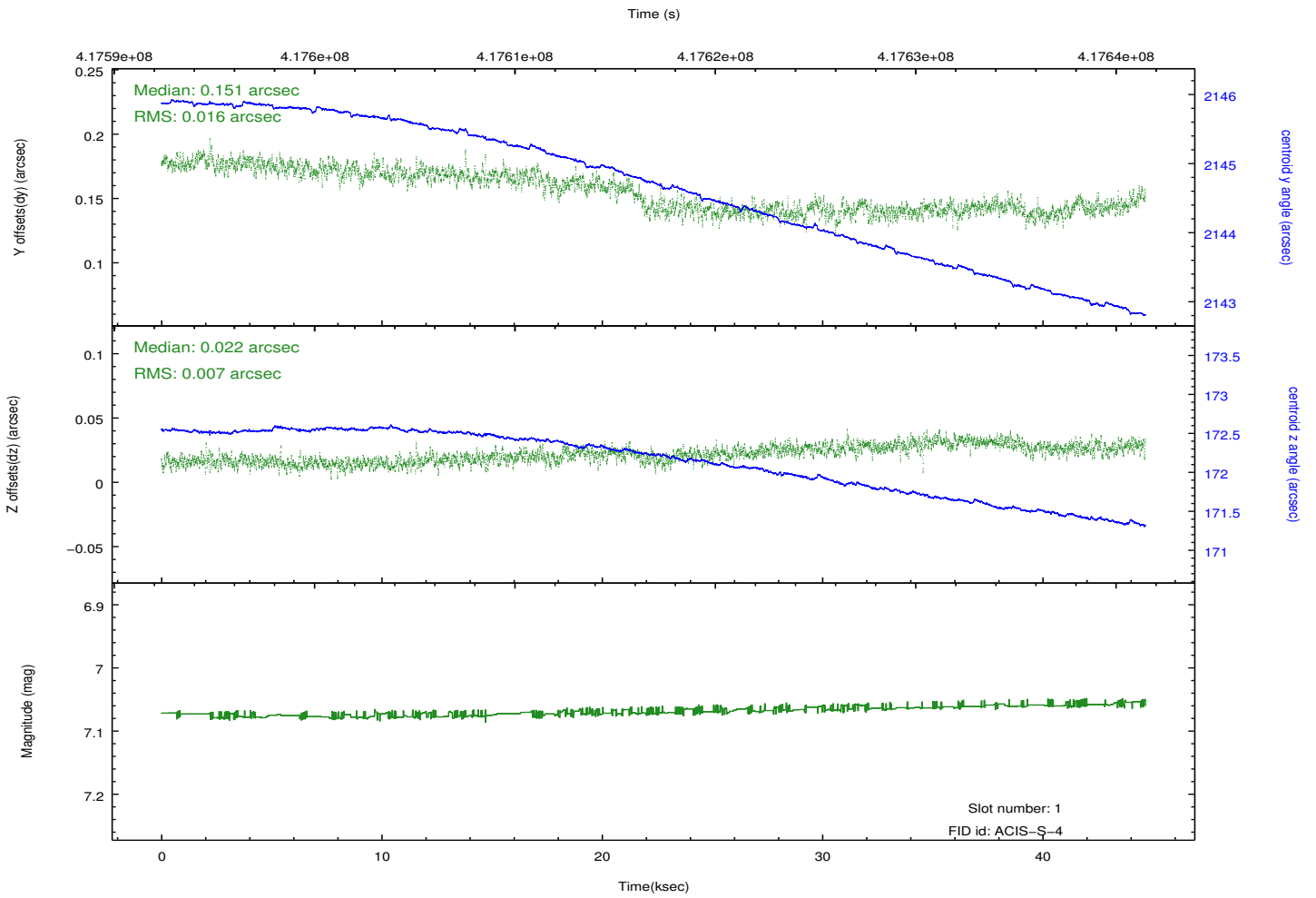
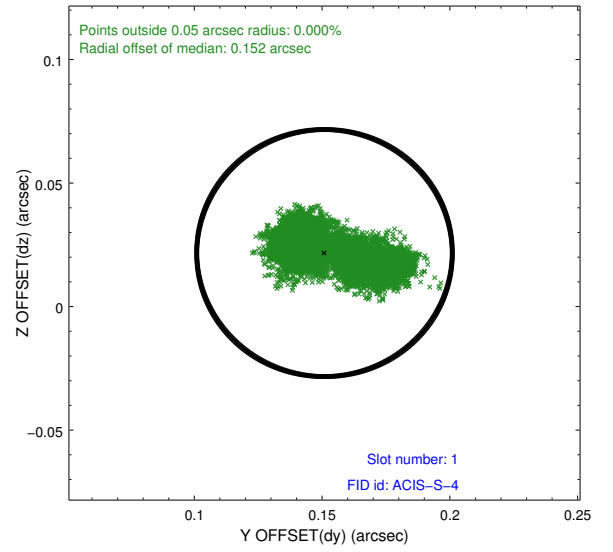
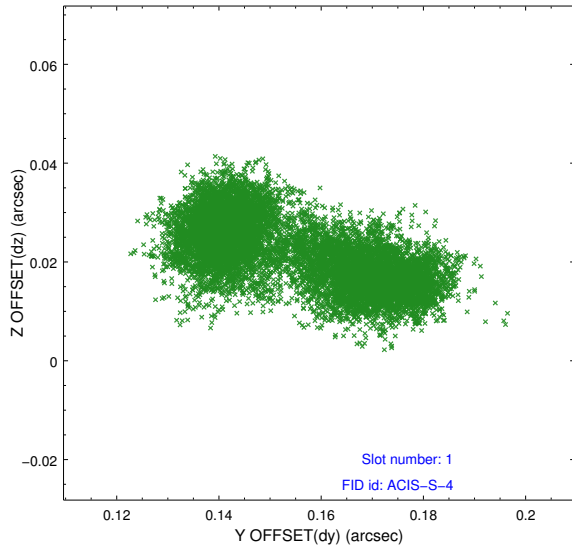


## 2.5 FID Slots

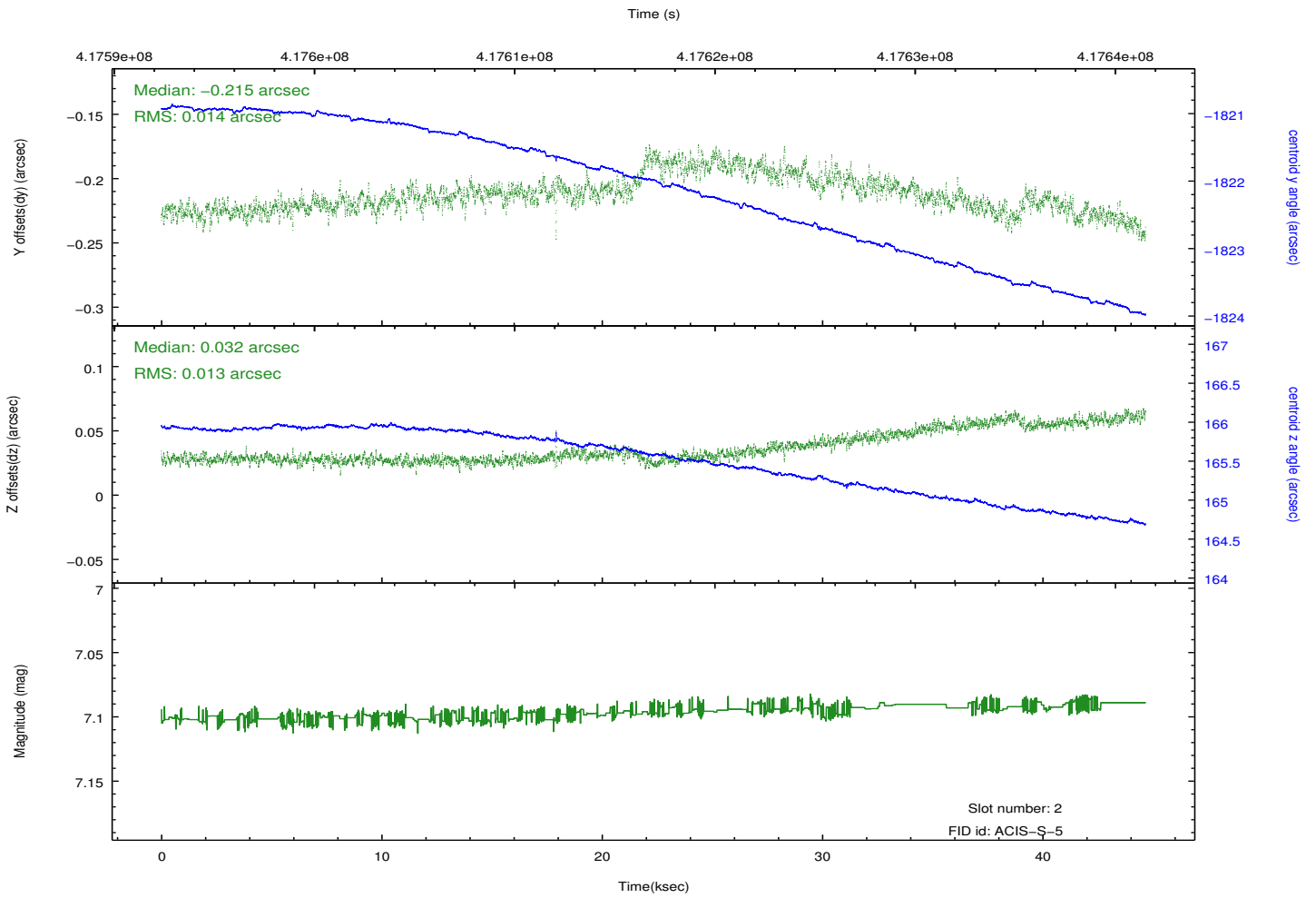
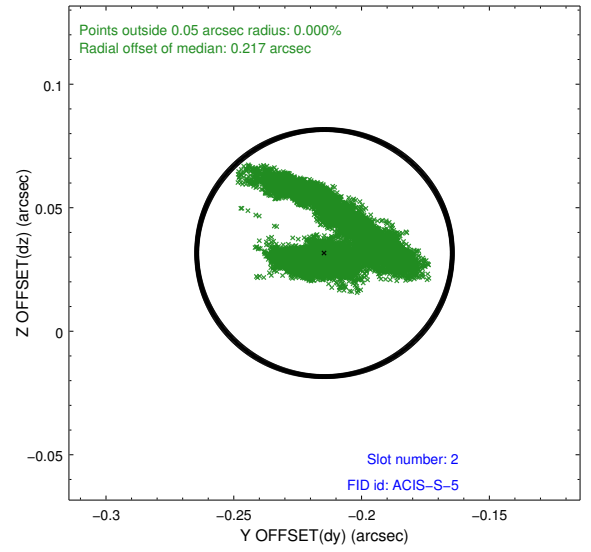
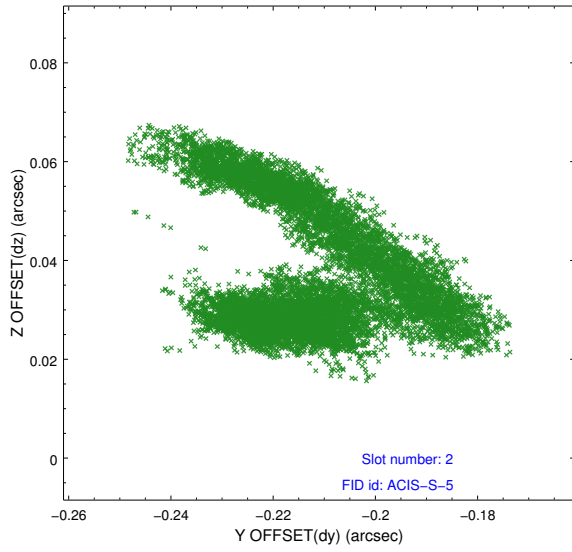
### 2.5.1 Slot 0



## 2.5.2 Slot 1

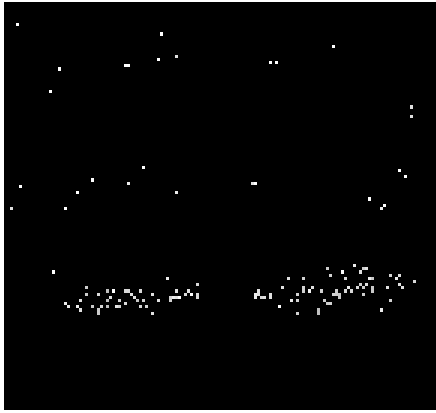


### 2.5.3 Slot 2

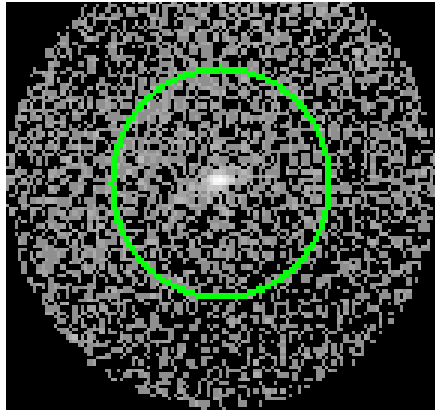


# 3 Gratings

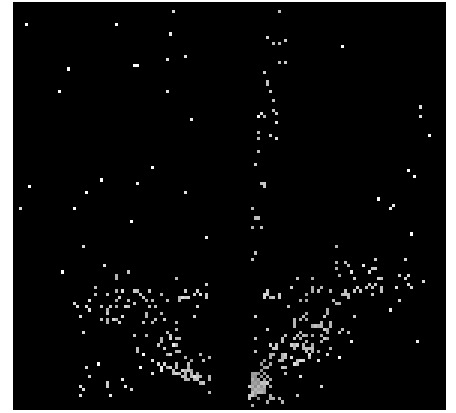
## 3.1 HEG Arm



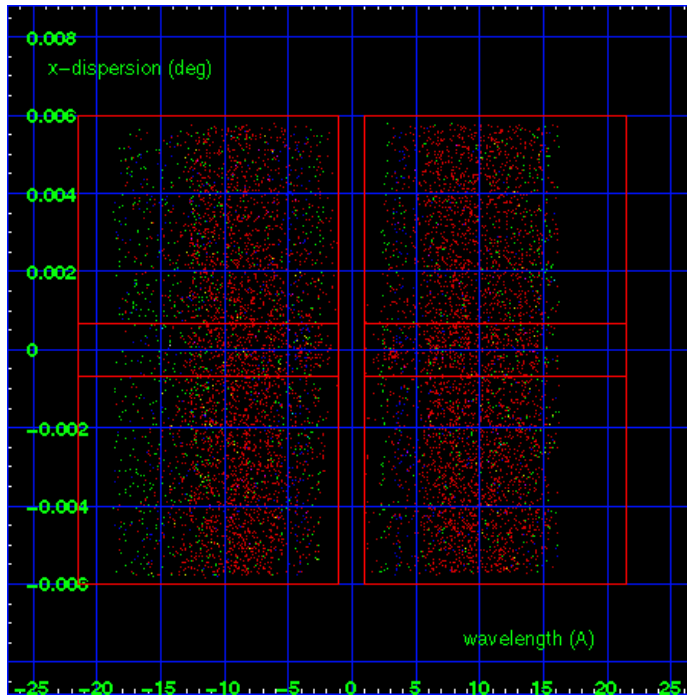
HEG Order Sort 123



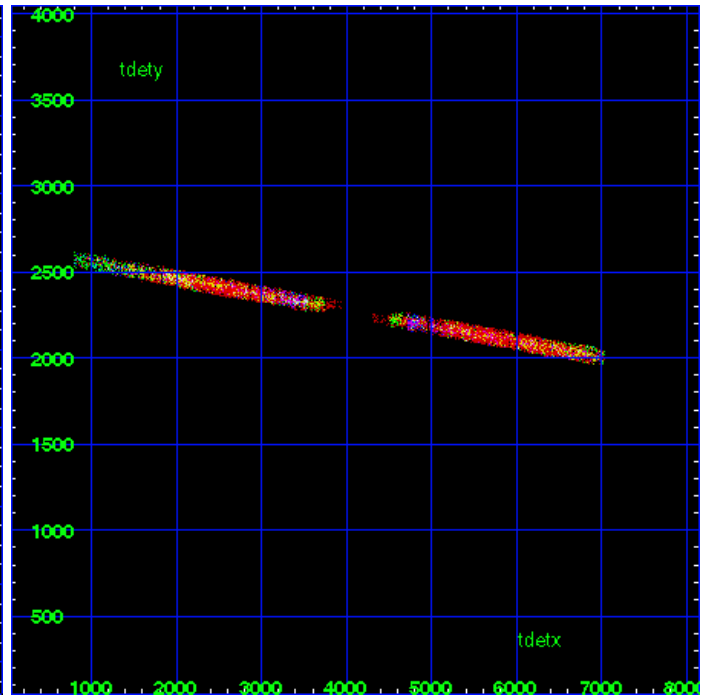
HEG Zero Order



HEG Order Sort ALL

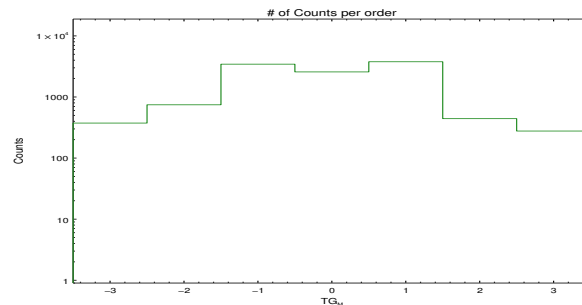


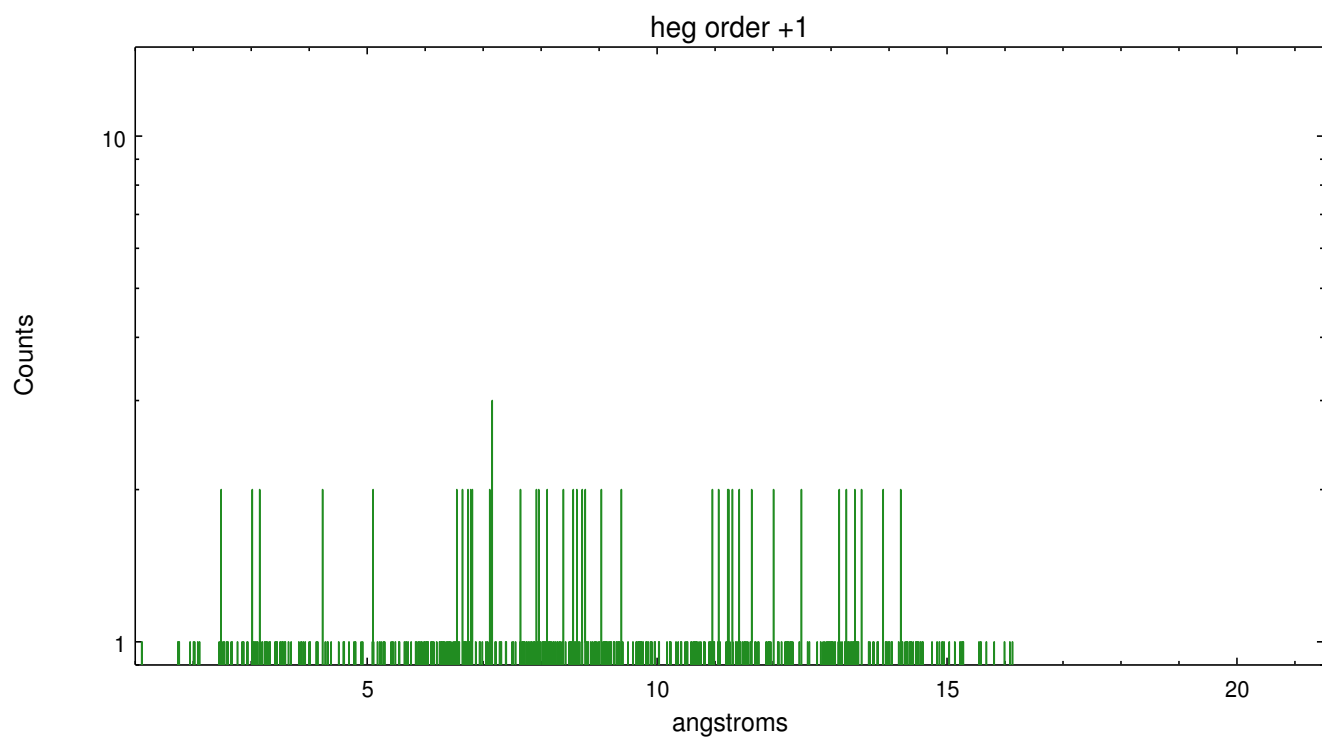
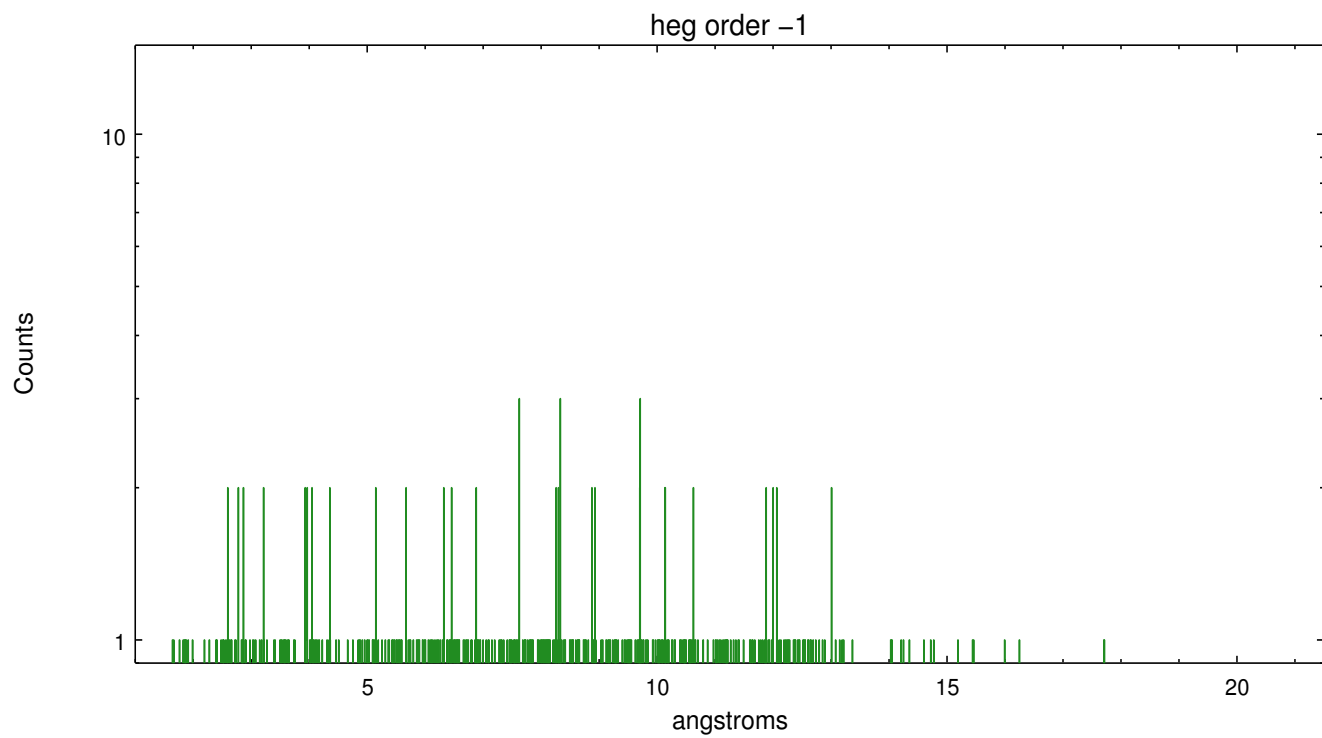
Spot Image HEG



Full Detector HEG

|        | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|----------|----------|----------|---------|---------|---------|---------|
| Events | 374      | 745      | 3444     | 2573    | 3774    | 442     | 277     |

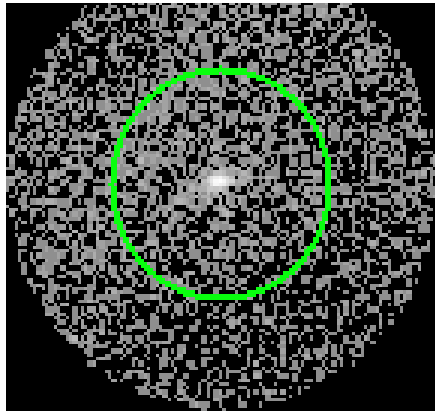




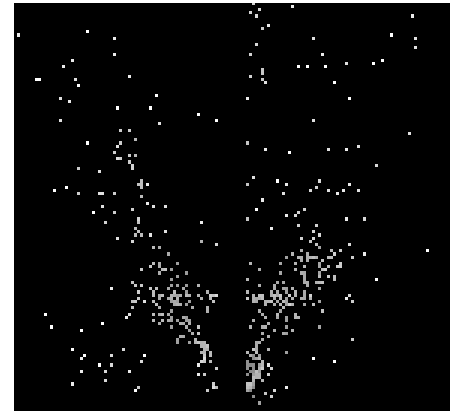
### 3.2 MEG Arm



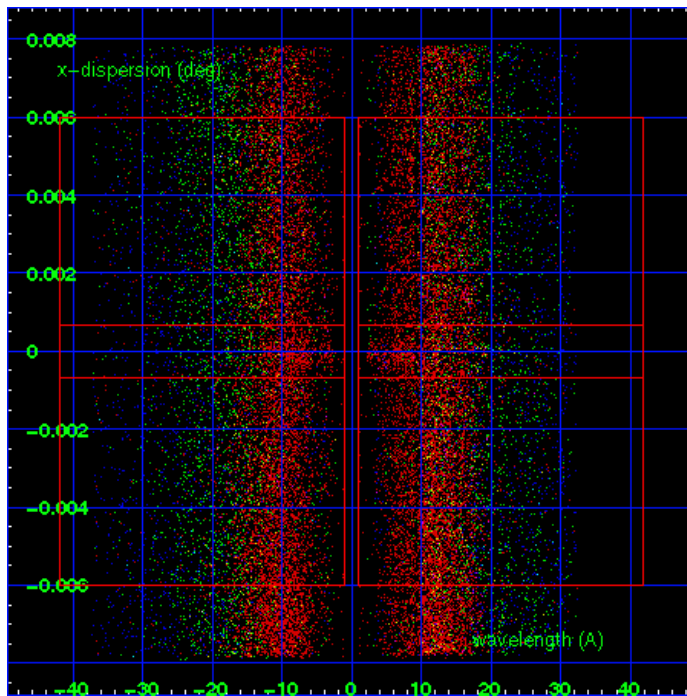
MEG Order Sort 123



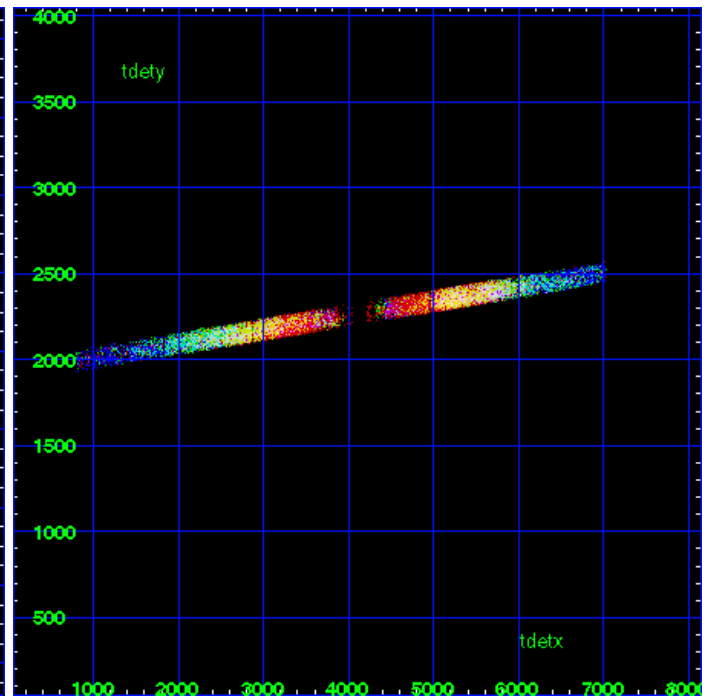
MEG Zero Order



MEG Order Sort ALL

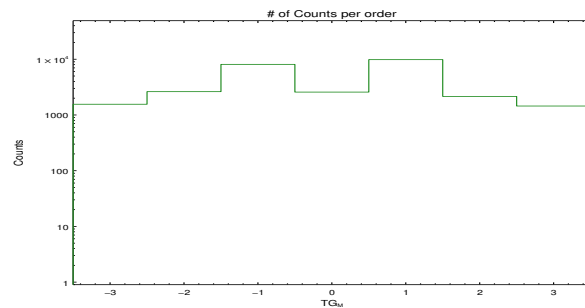


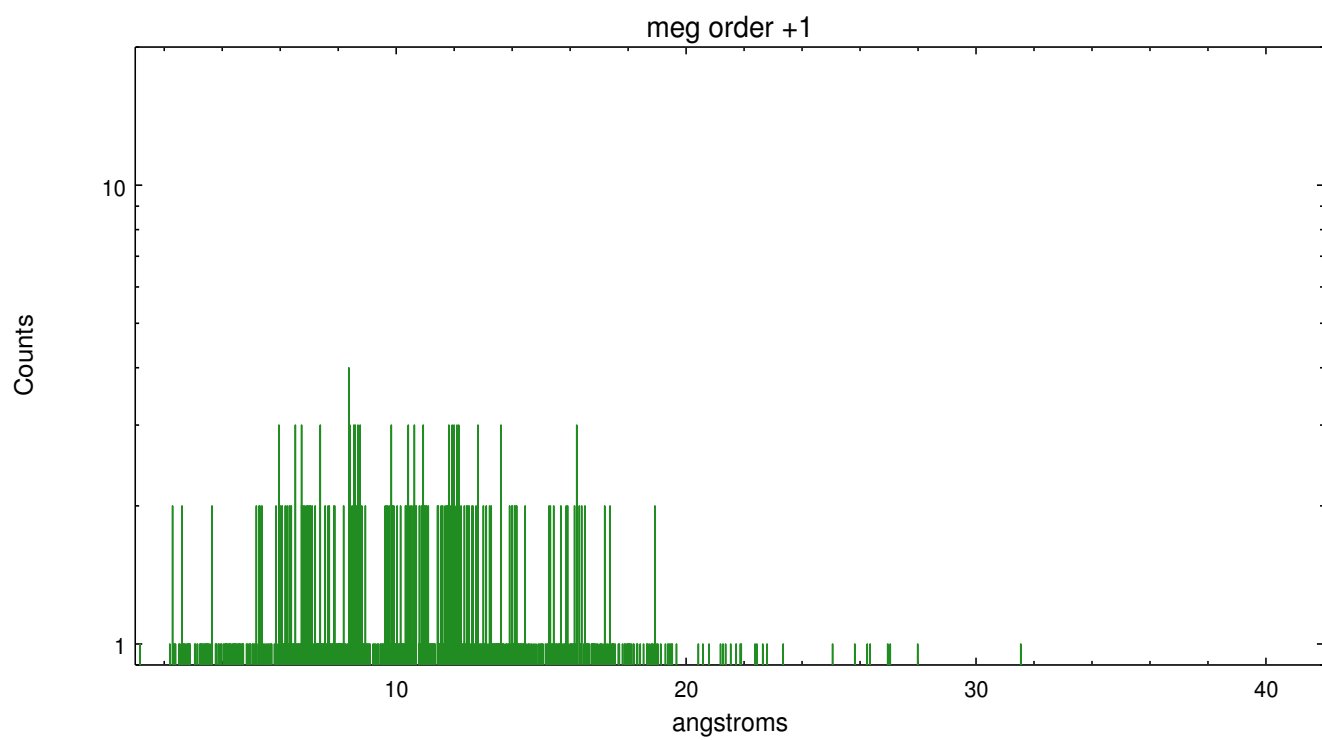
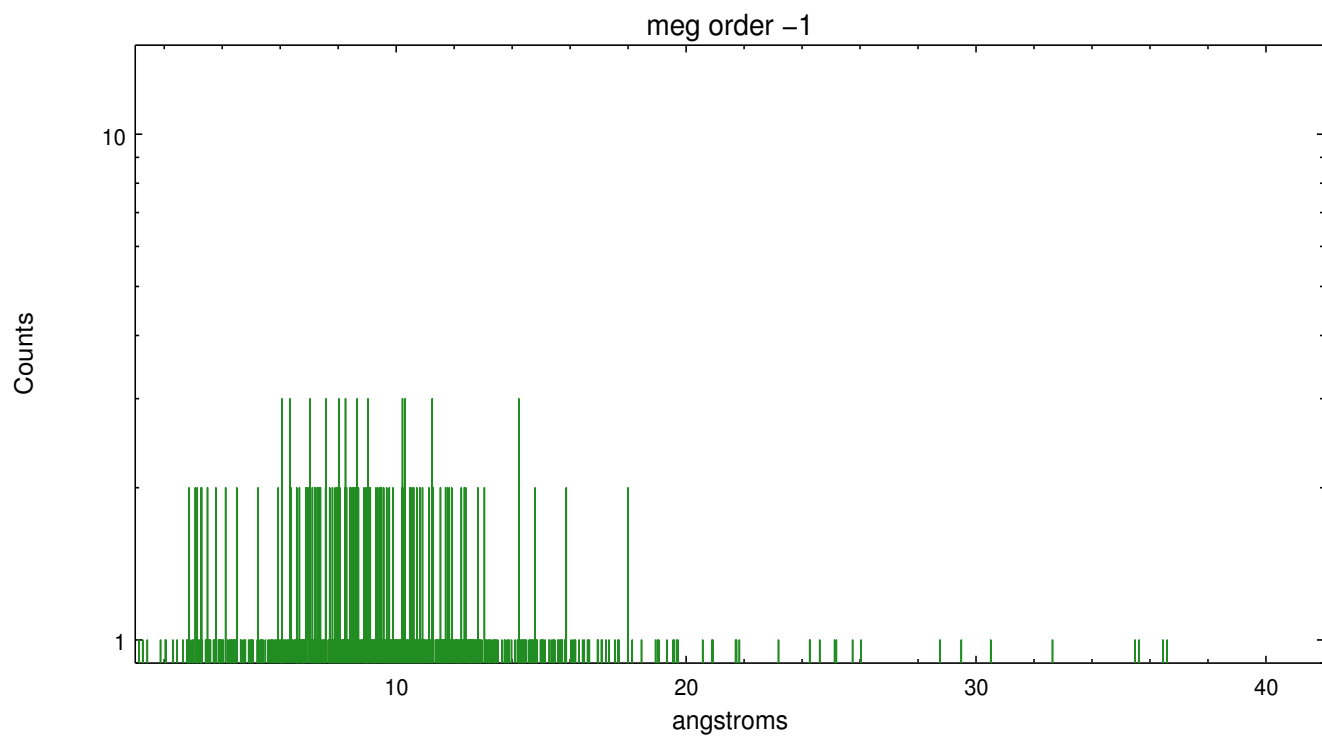
Spot Image MEG



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 | 1557        | 2622        | 8089        | 2573       | 9841       | 2152       | 1447       |





# A Summary

## A.1 Status

|                            |                 |
|----------------------------|-----------------|
| V&V Scientist              | Joy Nichols     |
| V&V Date (YYYY-MM-DD)      | 2012.02.08      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 44.003199836135 |

## A.2 Comments

WARNING: there are no standard ciao tools for analysis of grating spectra from extended sources. The shape of an emission 'line' will be the shape of the zero order spatial structure convolved with the instrumental LSF. Grating extractions can be used, but need to be combined with custom spatial-spectral analysis, since wavelength is multi-valued at any particular diffraction angle. ===== WARNING::Zeroth order selected by pipeline tools is a point source inside the supernova remnant. The user may want to select a region or source of interest, then use software tools such as CIAO to specify the coordinates of the zeroth order source of interest before running the tools to resolve the dispersed events.

=== The data for this observation have been processed using the 'EDSER' sub-pixel event-repositioning algorithm of Li et al. (2004, ApJ, 610, 1204). Small-scale features should become sharper for sources near the aim point. The improvement will be less noticeable for off-axis sources where the size of the point-spread function is comparable to or larger than the size of an ACIS pixel. To take full advantage of the improvement, images should be binned on spatial scales smaller than the size of an ACIS pixel. Note that, at present, the point-spread function has not been calibrated for data to which the EDSER algorithm has been applied. If dither was disabled for the observation, then the algorithm can introduce artificial aliasing effects on spatial scales smaller than a pixel. If you would prefer to use no sub-pixel adjustment or to apply a coordinate randomization, then use `acis_process_events` to reprocess the data with the parameter `pix_adj=NONE` or `RANDOMIZE`, respectively.