

# V&V Reference Report

## L2 ASCDS Version : 10.6

Observation 20840 - L2 Version 1  
Chandra X-Ray Center

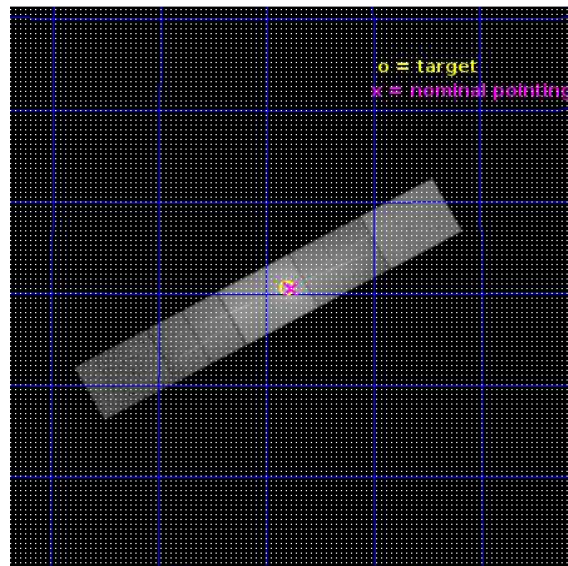
L2 Processing Date : Nov 5 2017

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# 1 Front

|          |                                      |                                             |
|----------|--------------------------------------|---------------------------------------------|
| seq_num  | 703554                               | Sequence number                             |
| obs_id   | 20840                                | Observation id                              |
| title    | Chandra/HETG Observations of NGC1275 | Proposal title                              |
| observer | Christopher Reynolds                 | Principal investigator                      |
| object   | NGC1275                              | Source name                                 |
| dtcycle  | 0                                    | &#160                                       |
| cycle    | P                                    | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 49.950417                            | Observer's specified target RA [deg]        |
| dec_targ | 41.511667                            | Observer's specified target Dec [deg]       |
| ra_nom   | 49.941340846882                      | Nominal RA [deg]                            |
| dec_nom  | 41.509795424175                      | Nominal Dec [deg]                           |
| roll_nom | 151.16264676351                      | Nominal Roll [deg]                          |
| revision | 1                                    | Processing version of data                  |
| ontime   | 21084.545994639                      | Sum of GTIs [s]                             |
| livetime | 20744.012288905                      | Livetime [s]                                |
| ontime5  | 21084.504954696                      | Sum of GTIs [s]                             |
| ontime6  | 21081.922864318                      | Sum of GTIs [s]                             |
| ontime7  | 21084.545994639                      | Sum of GTIs [s]                             |
| ontime8  | 21084.422874689                      | Sum of GTIs [s]                             |
| ontime9  | 21084.381834626                      | Sum of GTIs [s]                             |
| l2events | 622139                               | Number of level 2 events                    |

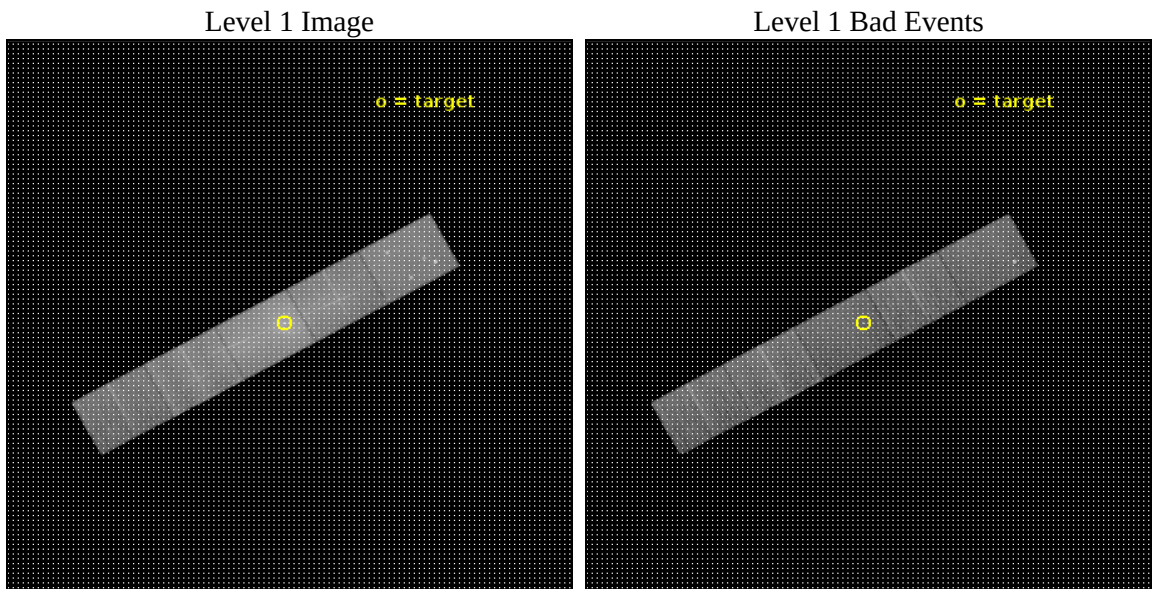




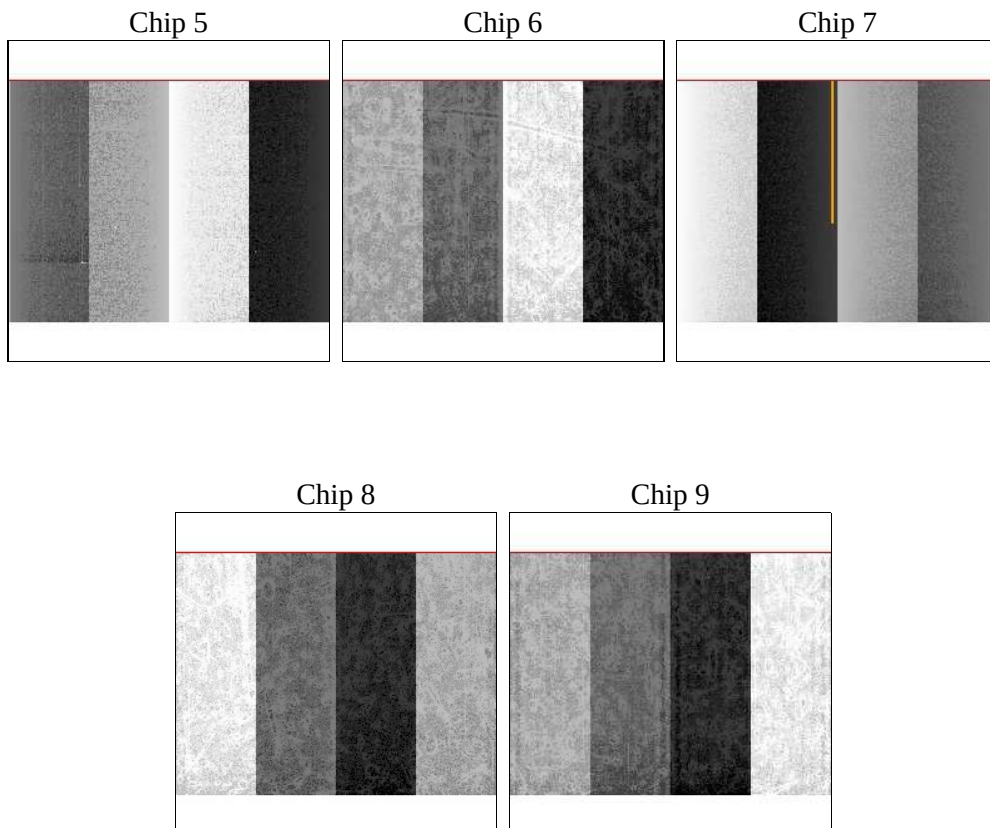
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                    |                                         |
|----------|---------------------|--------------------------------|----------------|--------------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 21000.000000       | [s] Scheduled observation exposure time |
| ascdsver | 10.6                | Processing system revision     | ontime         | 21084.545994639    | Sum of GTIs [s]                         |
| caldsver | 4.7.6               | &#160                          | ontime5        | 21084.504954696    | Sum of GTIs [s]                         |
| date     | 2017-11-05T16:49:46 | Date and time of file creation | ontime6        | 21081.922864318    | Sum of GTIs [s]                         |
| revision | 1                   | Processing version of data     | ontime7        | 21084.545994639    | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 21084.422874689    | Sum of GTIs [s]                         |
|          |                     |                                | ontime9        | 21084.381834626    | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 1173053            | Number of level 1 events                |
|          |                     |                                | tgmethod       | TGDETECT           | Method used to create src1a file        |
|          |                     |                                | zo_pos         | (4044.87, 4110.64) | src1a sky pixel position                |

### 2.1.4 Events

|                 | ccd 5  | ccd 6  | ccd 7  | ccd 8  | ccd 9  |
|-----------------|--------|--------|--------|--------|--------|
| level 1 events  | 220059 | 236808 | 375634 | 212148 | 128404 |
| rejected events | 95826  | 103266 | 83896  | 112876 | 99213  |
| rejected %      | 43%    | 43%    | 22%    | 53%    | 77%    |

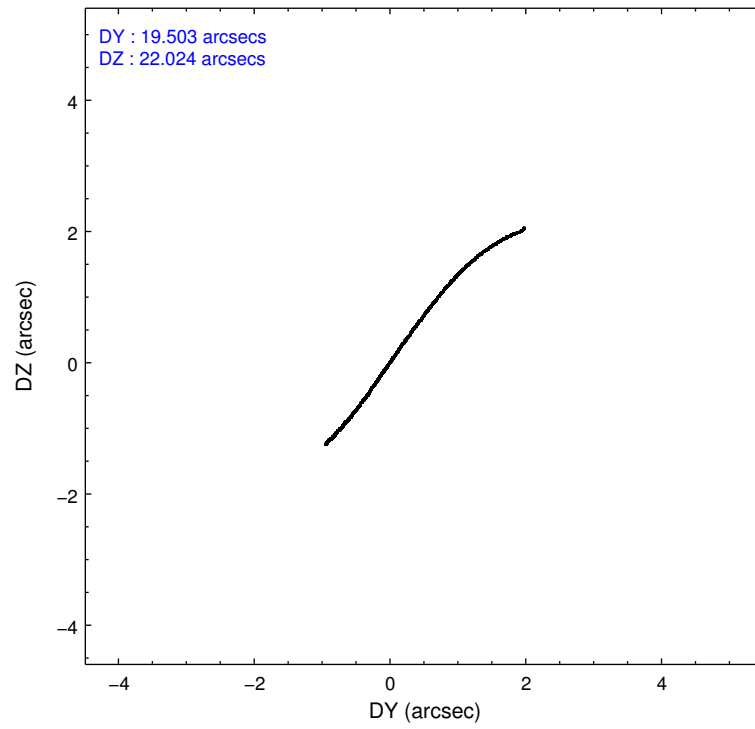
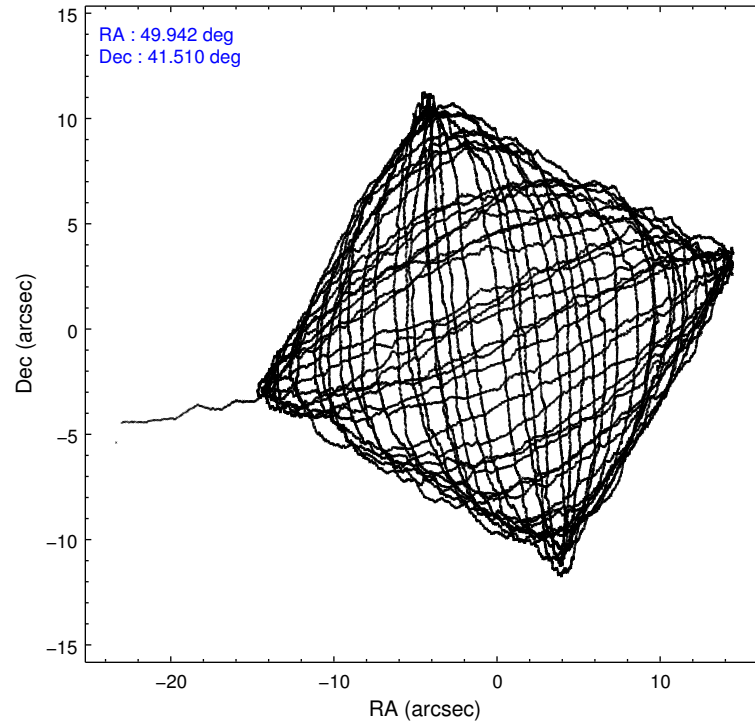
|                | ccd 5 | ccd 6 | ccd 7  | ccd 8  | ccd 9 |
|----------------|-------|-------|--------|--------|-------|
| grade 0 events | 22743 | 96460 | 58002  | 58708  | 17089 |
|                | 10%   | 40%   | 15%    | 27%    | 13%   |
| grade 1 events | 420   | 404   | 344    | 244    | 104   |
|                | 0%    | 0%    | 0%     | 0%     | 0%    |
| grade 2 events | 38629 | 17798 | 72370  | 15999  | 4722  |
|                | 17%   | 7%    | 19%    | 7%     | 3%    |
| grade 3 events | 5686  | 5674  | 30687  | 6104   | 1989  |
|                | 2%    | 2%    | 8%     | 2%     | 1%    |
| grade 4 events | 5410  | 5629  | 30320  | 5799   | 1977  |
|                | 2%    | 2%    | 8%     | 2%     | 1%    |
| grade 5 events | 13408 | 5825  | 16877  | 8306   | 6043  |
|                | 6%    | 2%    | 4%     | 3%     | 4%    |
| grade 6 events | 51789 | 8001  | 100391 | 12672  | 3416  |
|                | 23%   | 3%    | 26%    | 5%     | 2%    |
| grade 7 events | 81974 | 97017 | 66643  | 104316 | 93064 |
|                | 37%   | 40%   | 17%    | 49%    | 72%   |

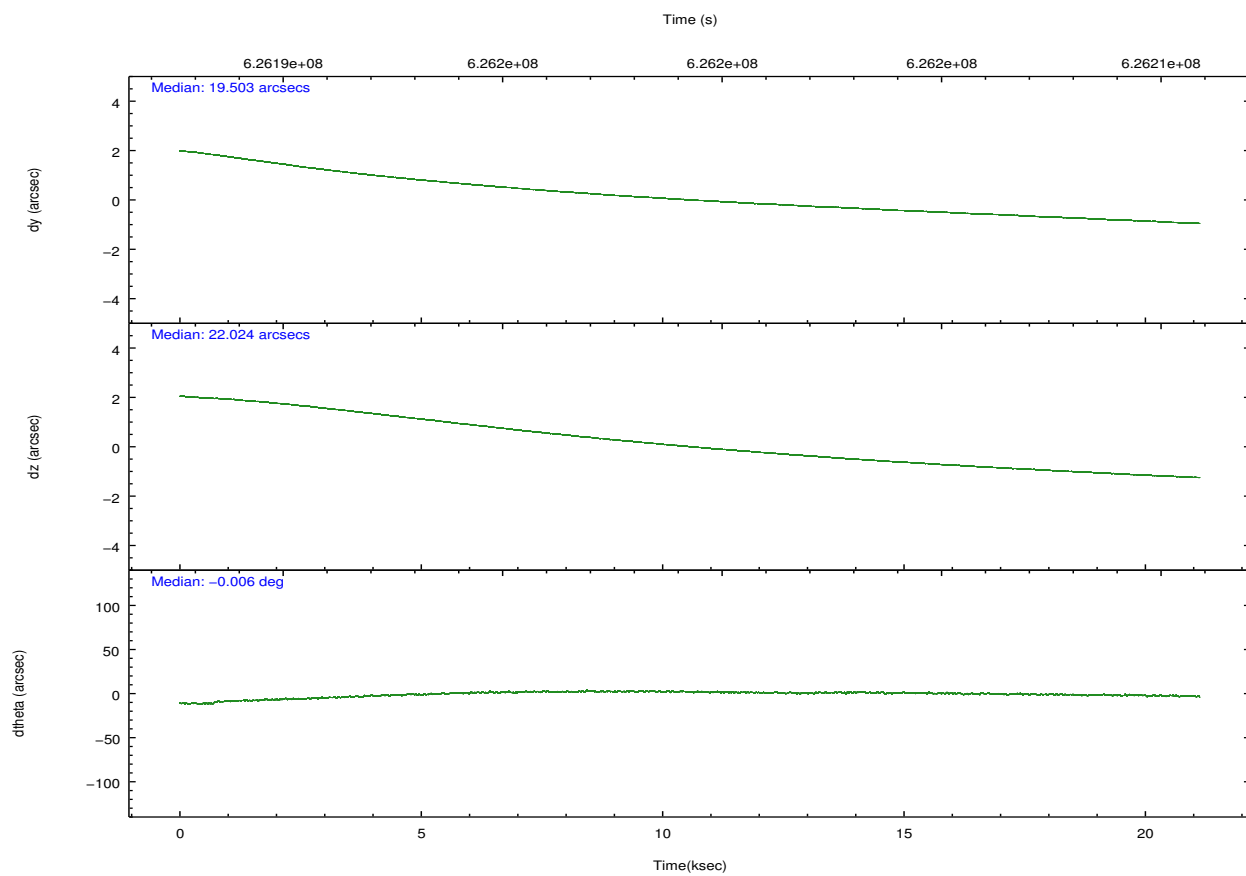
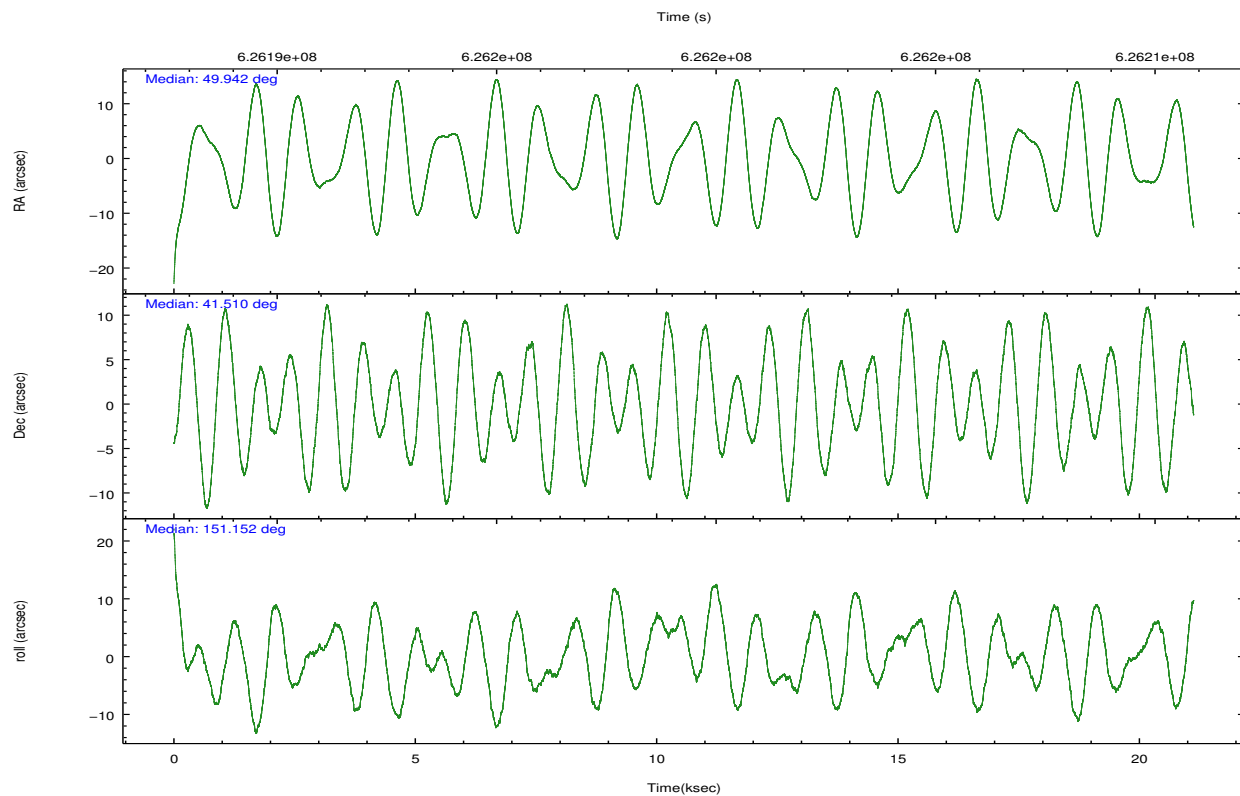
## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               |
|-----------------------------------|---------------------|----------------------|
| Instrument                        | ACIS                | ACIS                 |
| Detector                          | ACIS-56789          | ACIS-56789           |
| Grating                           | HETG                | HETG                 |
| Data mode                         | FAINT               | FAINT                |
| Observation mode                  | POINTING            | POINTING             |
| [deg] Pointing RA                 | 49.977977           | 49.94134084688172    |
| [deg] Pointing Dec                | 41.510709           | 41.50979542417468    |
| [deg] Pointing Roll               | 150.981736          | 151.1626467635113    |
| [mm] SIM focus pos                | -0.684267           | -0.6828225247311905  |
| [mm] SIM defocus                  | 0                   | 0.001444936568705701 |
| [mm] SIM translation stage pos    | -190.132523         | -190.1400660498719   |
| [mm] SIM translation stage offset | 0                   | 0.00754346686406393  |
| [s] Observation start time (MET)  | 626188799.184000    | 626187485.83552      |
| Observation start date            | 2017-11-04T13:18:50 | 2017-11-04T12:58:05  |
| [s] Observation end time (MET)    | 626209799.184000    | 626210464.7993701    |
| Observation end date              | 2017-11-04T19:08:50 | 2017-11-04T19:21:04  |
| Read mode                         | TIMED               | TIMED                |

| Parameter                             | Planned   | Actual  |
|---------------------------------------|-----------|---------|
| Obspar format version number          | 7         | 7       |
| Obspar file type                      | PREDICTED | ACTUAL  |
| Obspar update status                  | NONE      | UPDATED |
| CCD I0 on                             | N         | N       |
| CCD I1 on                             | N         | N       |
| CCD I2 on                             | N         | N       |
| CCD I3 on                             | N         | N       |
| CCD S0 on                             | O1        | N       |
| CCD S1 on                             | Y         | Y       |
| CCD S2 on                             | Y         | Y       |
| CCD S3 on                             | Y         | Y       |
| CCD S4 on                             | Y         | Y       |
| CCD S5 on                             | O2        | Y       |
| Number of optional ACIS chips dropped | 1         | 1       |
| On-chip summing requested             | N         | N       |
| Subarray requested                    | CUSTOM    | CUSTOM  |
| Subarray start row                    | 125       | 125     |
| Subarray row count                    | 774       | 774     |
| Alternating exposures requested       | N         | N       |
| [s] Primary exposure time             | 0.000000  | 2.5     |

## 2.3 Aspect



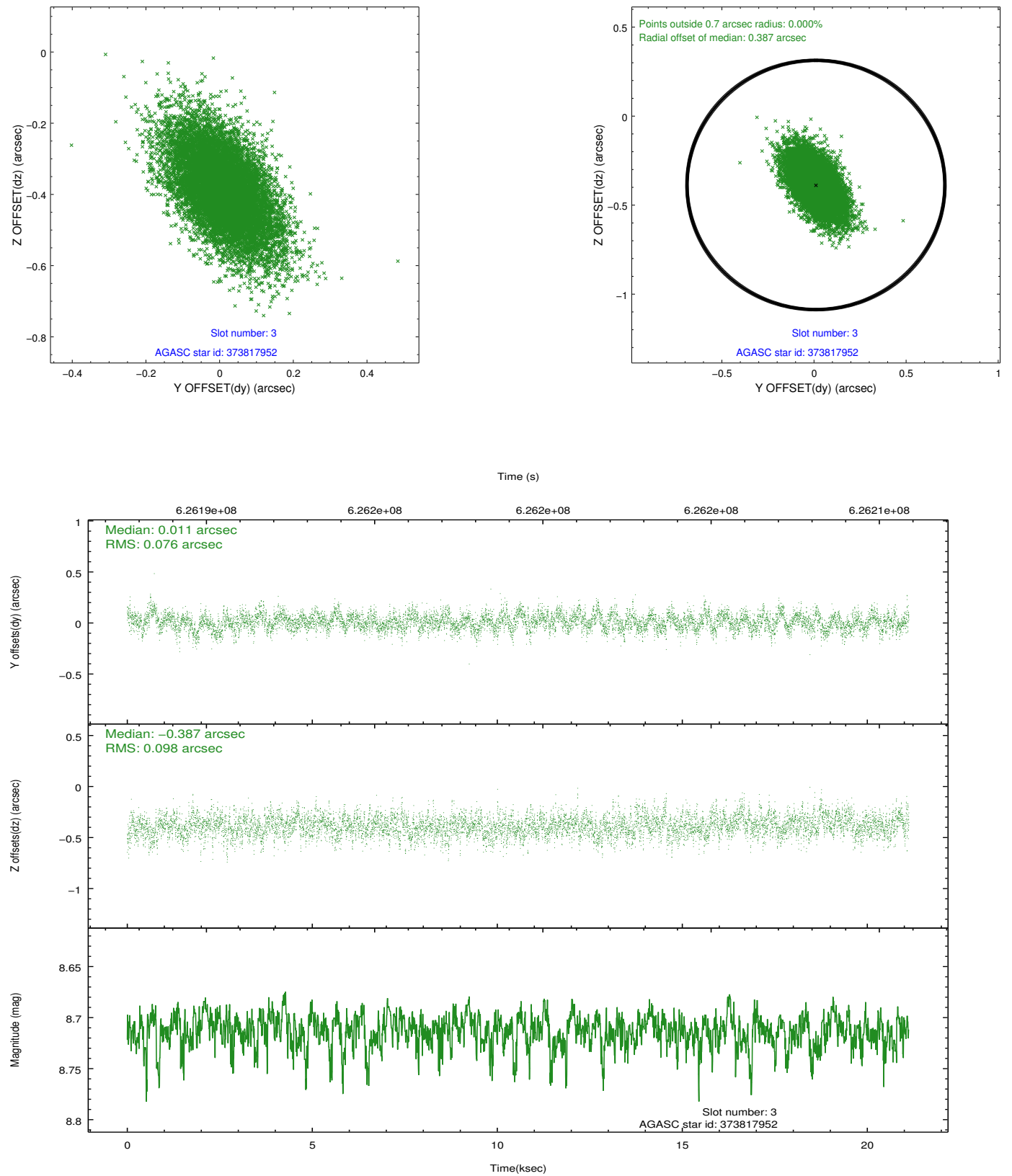


# Slot Statistics

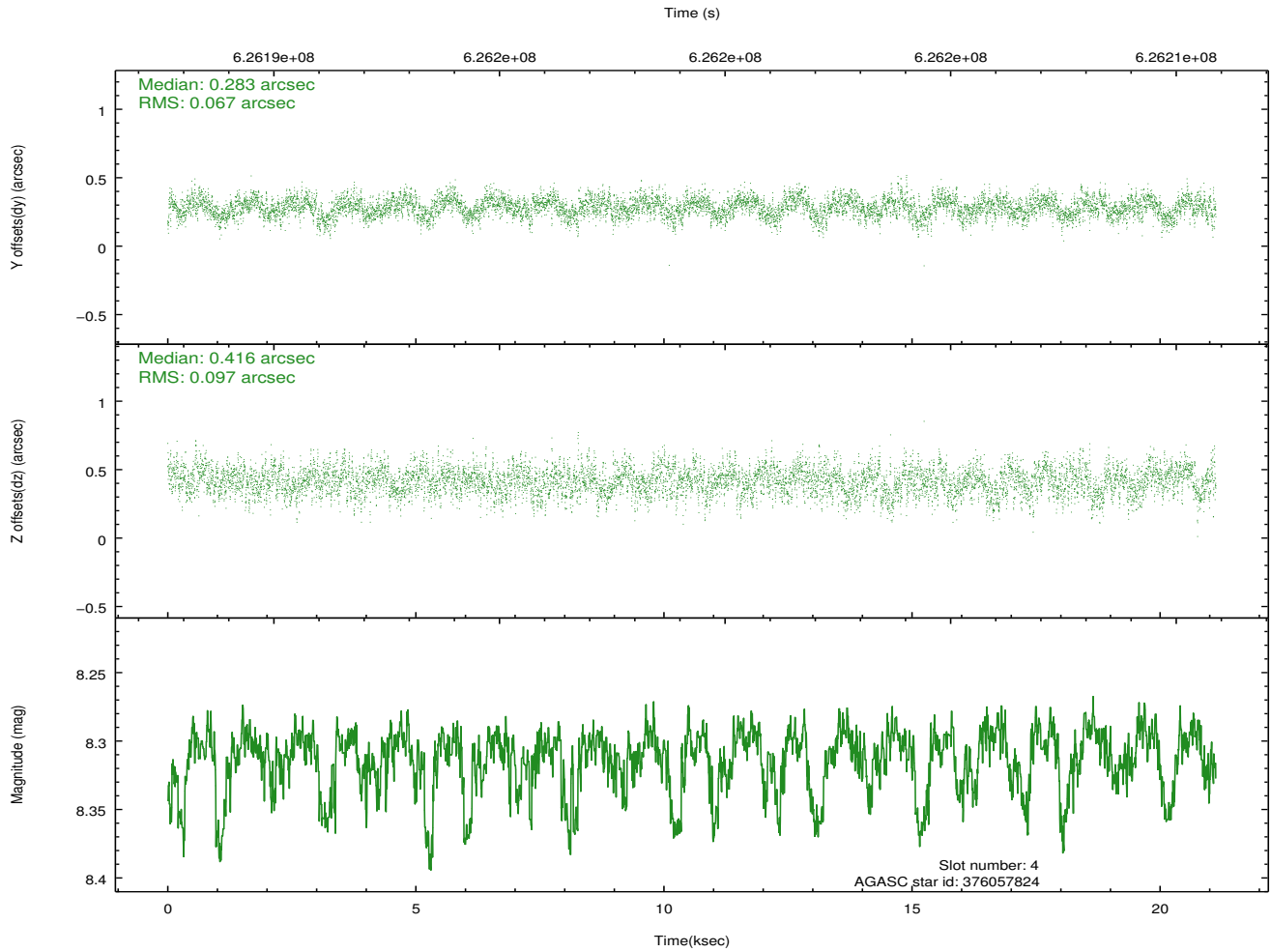
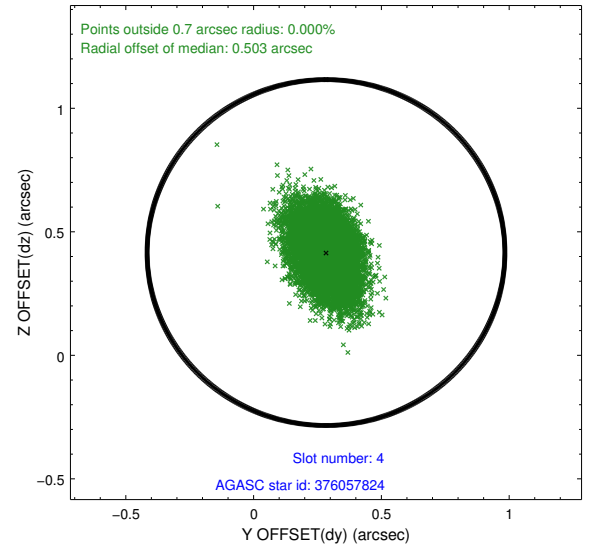
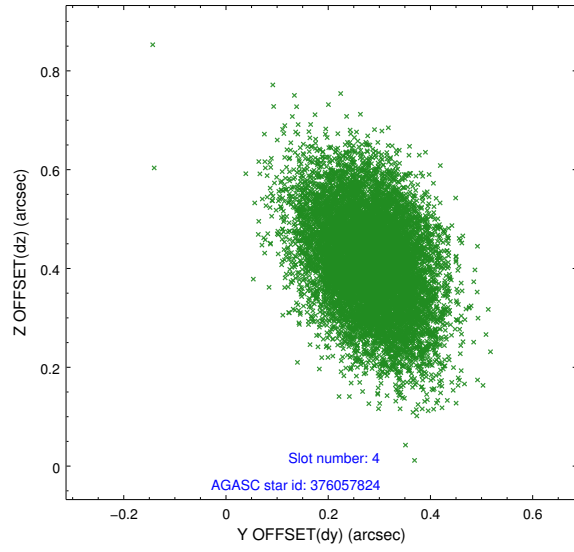
| slot | status | used | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec       | mean_y   | mean_z   |
|------|--------|------|-----------|------|-------|--------|--------|-------|-------|-----------|-----------|----------|----------|
| 0    | FID    |      | ACIS-S-4  | 7.15 | 5152  | 0.375  | 0.014  | 0.018 | 0.026 | 0.000000  | 0.000000  | 2140.95  | 164.95   |
| 1    | FID    |      | ACIS-S-5  | 7.16 | 5153  | -0.440 | -0.002 | 0.020 | 0.034 | 0.000000  | 0.000000  | -1825.85 | 158.32   |
| 2    | FID    |      | ACIS-S-6  | 7.32 | 5152  | 0.040  | 0.001  | 0.014 | 0.022 | 0.000000  | 0.000000  | 388.67   | 802.12   |
| 3    | GUIDE  | used | 373817952 | 8.71 | 10293 | 0.011  | -0.387 | 0.126 | 0.226 | 49.913424 | 40.978510 | -776.12  | 1760.35  |
| 4    | GUIDE  | used | 376057824 | 8.31 | 10300 | 0.283  | 0.416  | 0.123 | 0.209 | 50.665569 | 41.926280 | -880.96  | -2206.94 |
| 5    | GUIDE  | used | 376070040 | 8.37 | 10299 | -0.047 | -0.086 | 0.133 | 0.227 | 50.072031 | 41.897206 | 454.80   | -1338.86 |
| 6    | GUIDE  | used | 374357808 | 8.64 | 10295 | -0.154 | 0.043  | 0.145 | 0.245 | 49.921429 | 42.176083 | 1294.23  | -2021.10 |
| 7    | GUIDE  | used | 374352808 | 8.73 | 10296 | -0.086 | 0.013  | 0.148 | 0.260 | 49.969955 | 42.208621 | 1238.12  | -2186.28 |

## 2.4 Star Slots

### 2.4.1 Slot 3

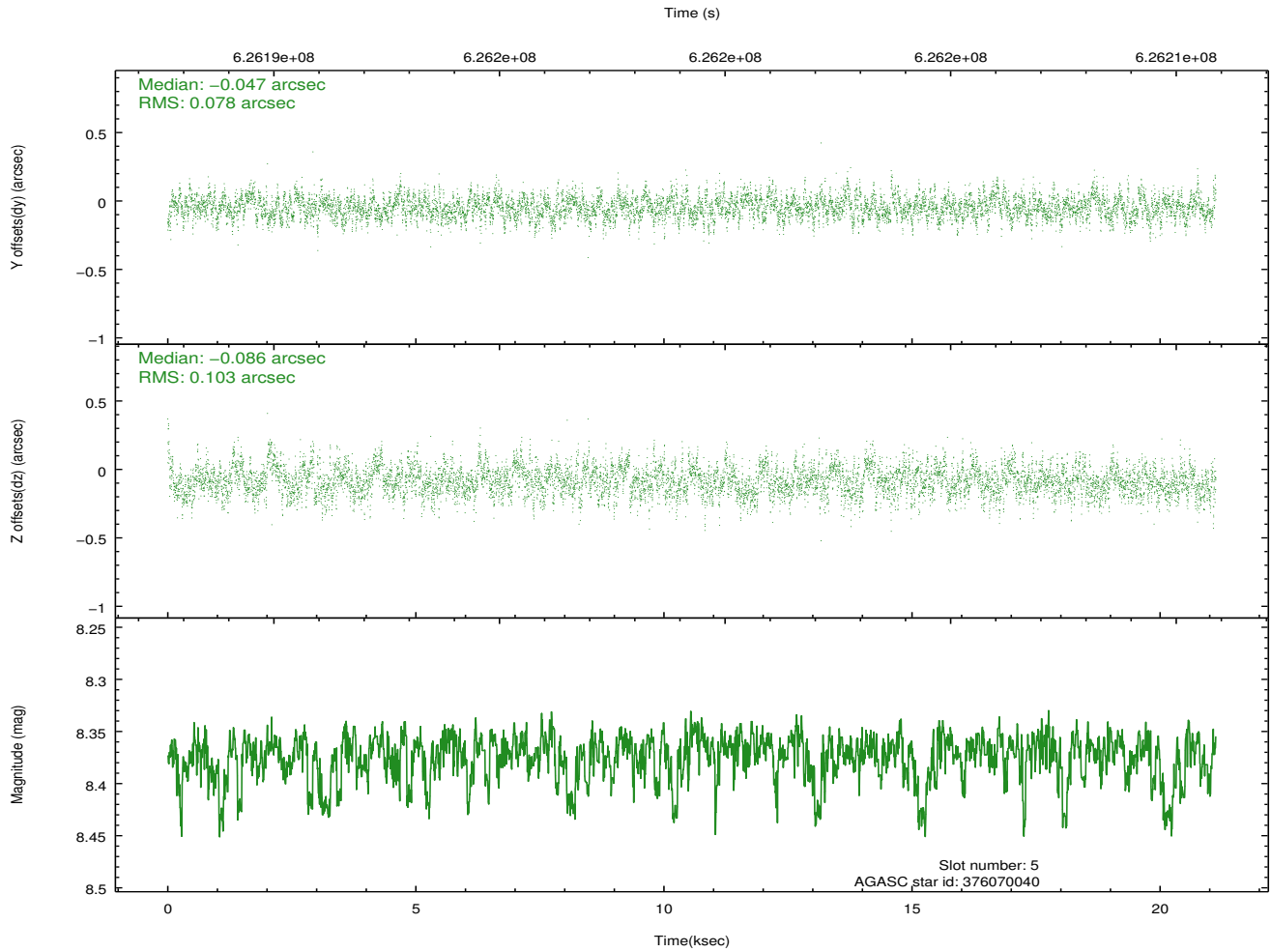
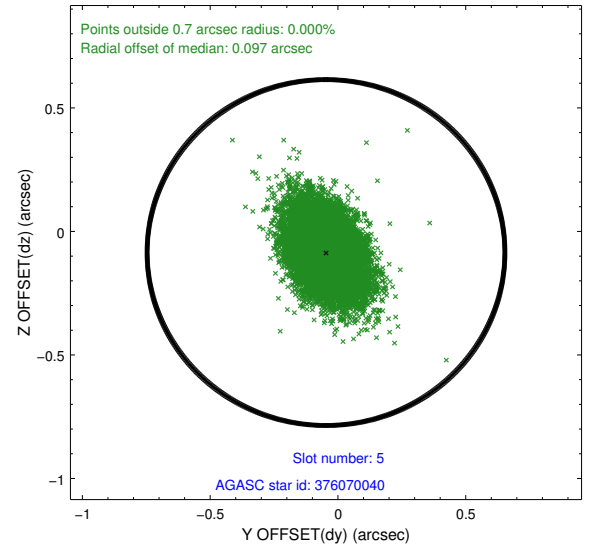
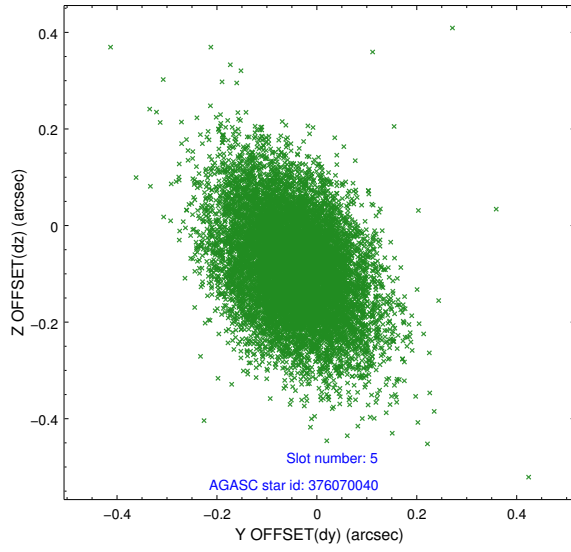


## 2.4.2 Slot 4

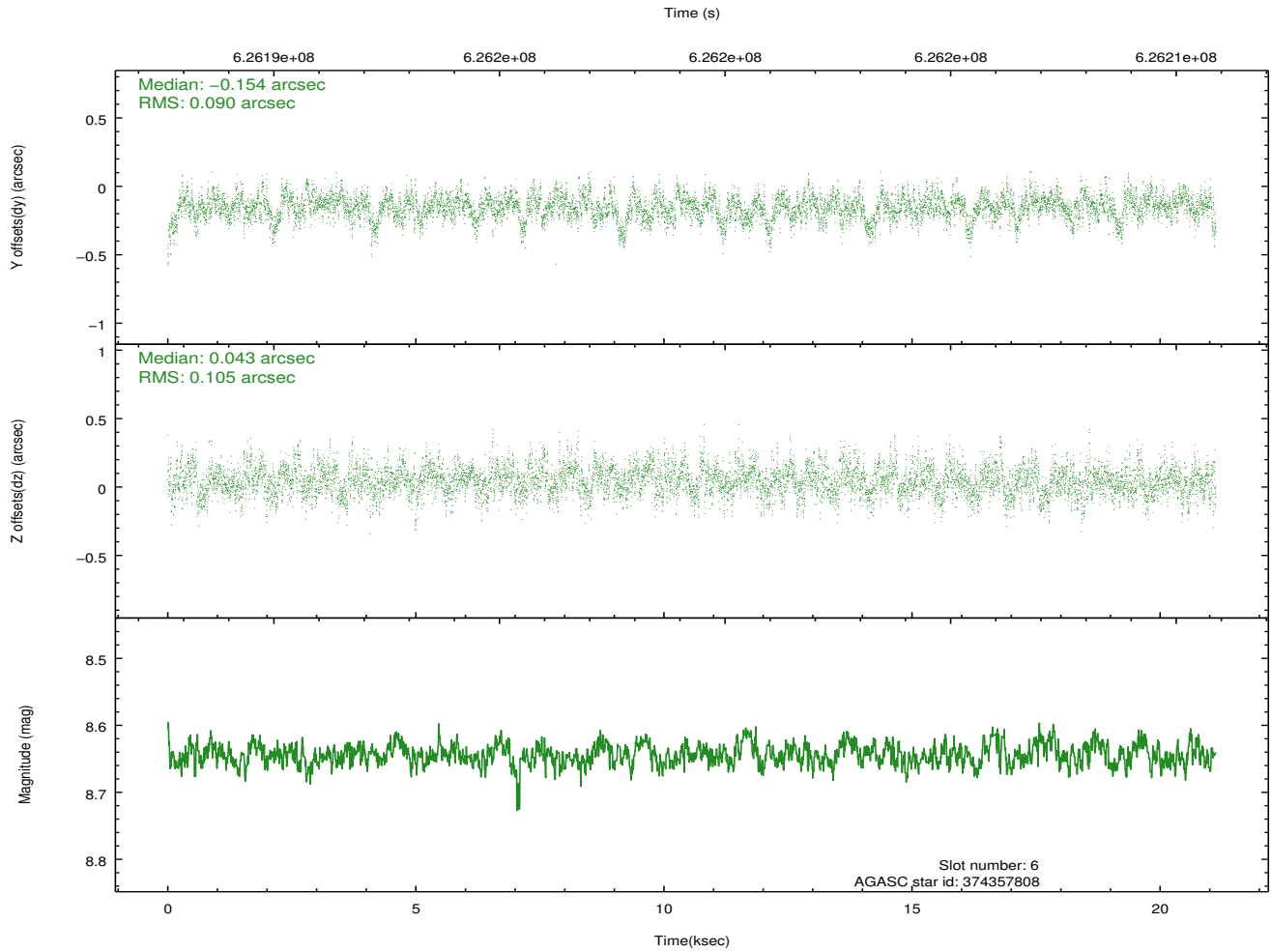
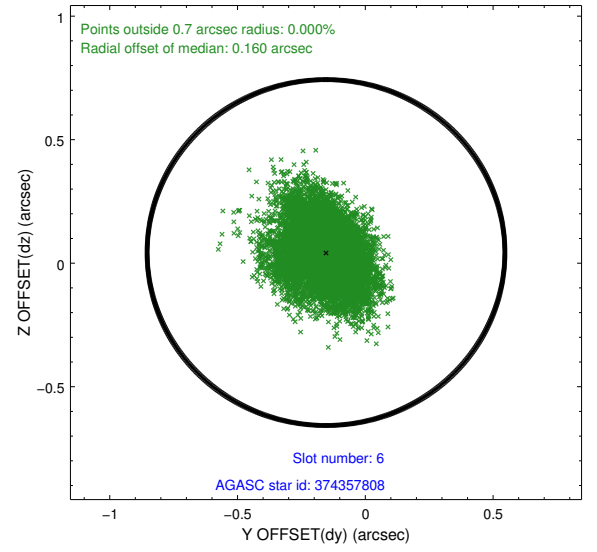
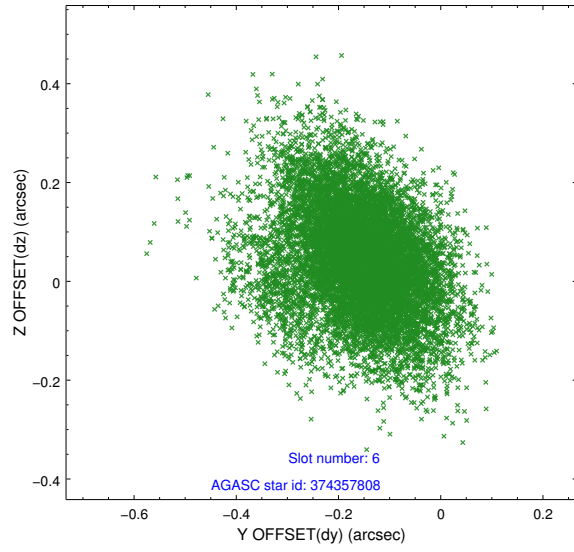




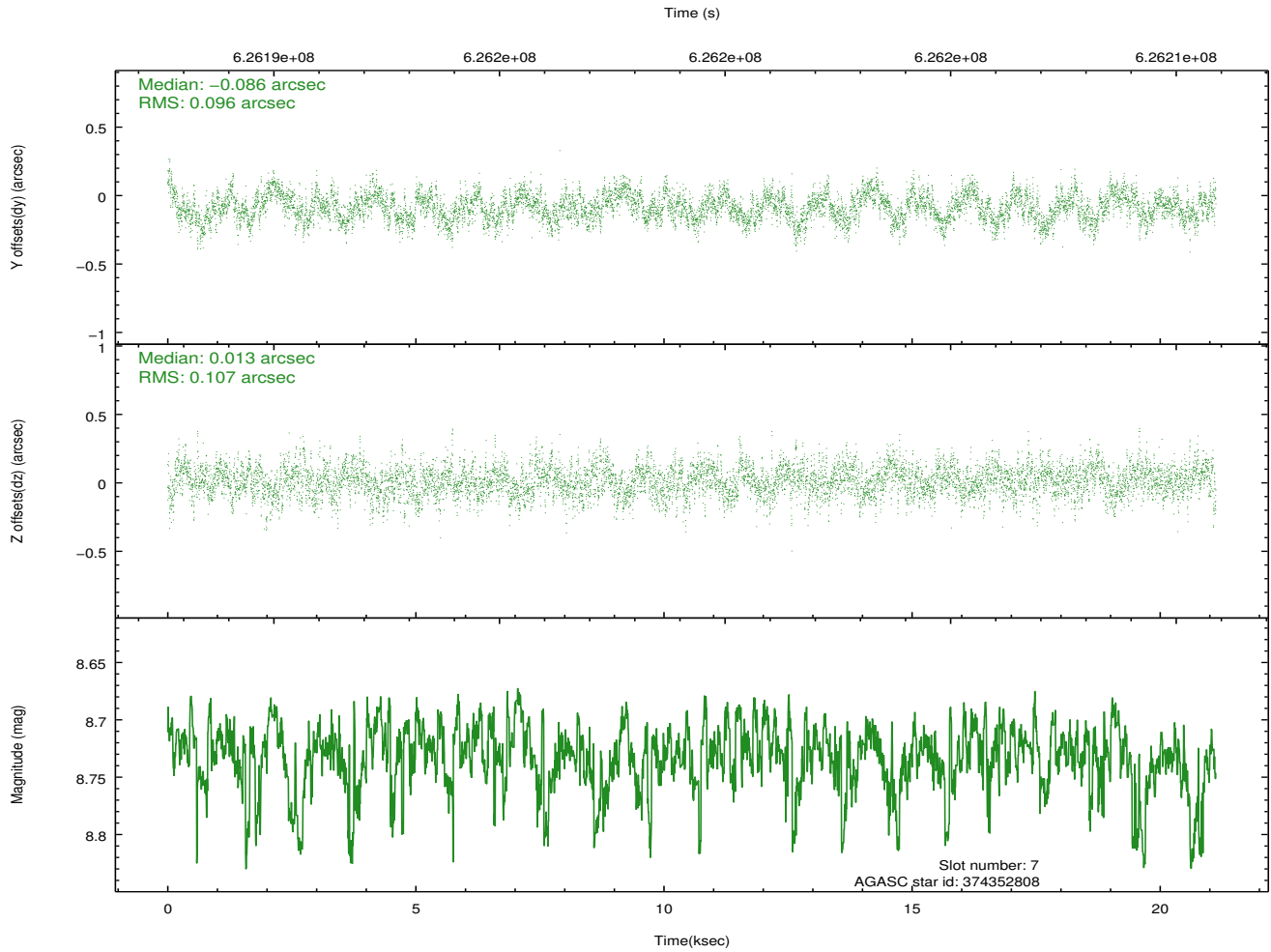
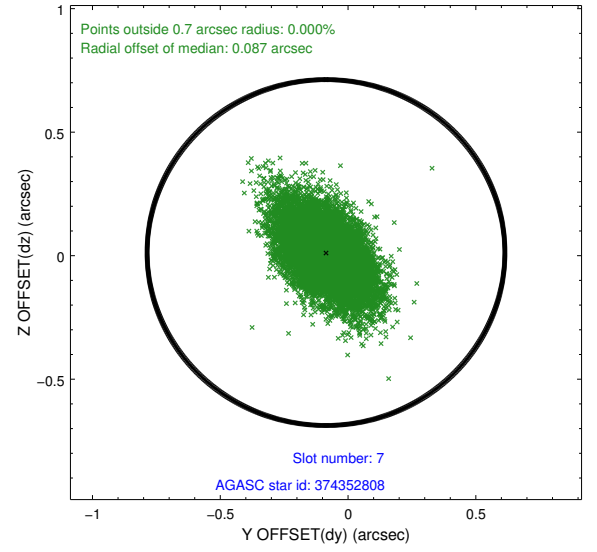
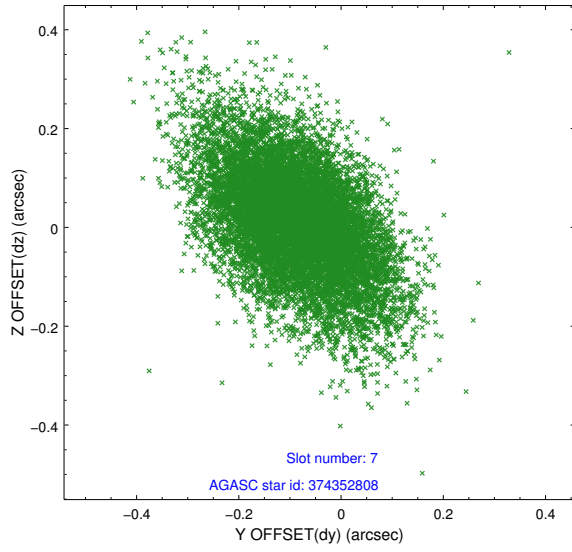
### 2.4.3 Slot 5



## 2.4.4 Slot 6

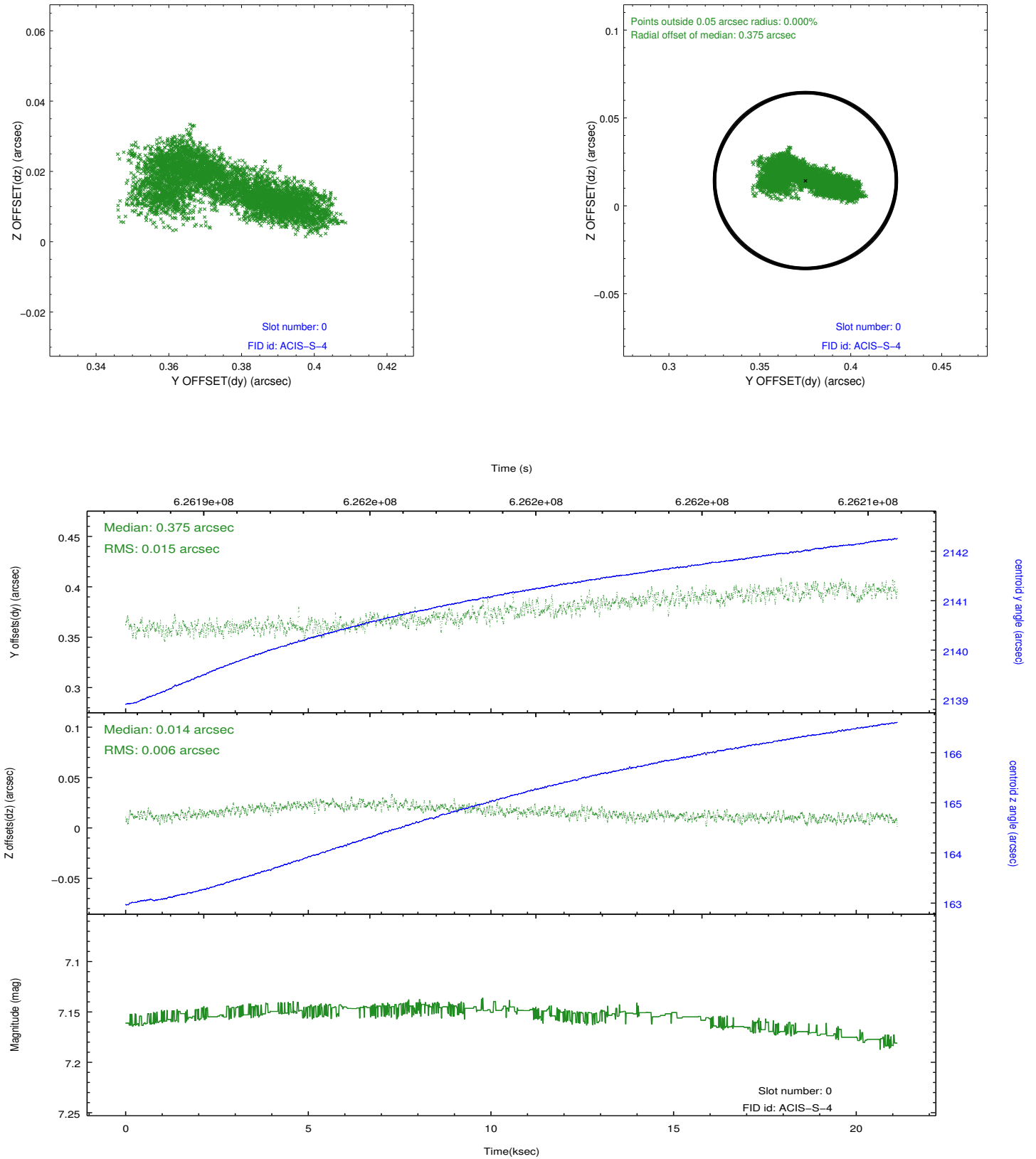


## 2.4.5 Slot 7

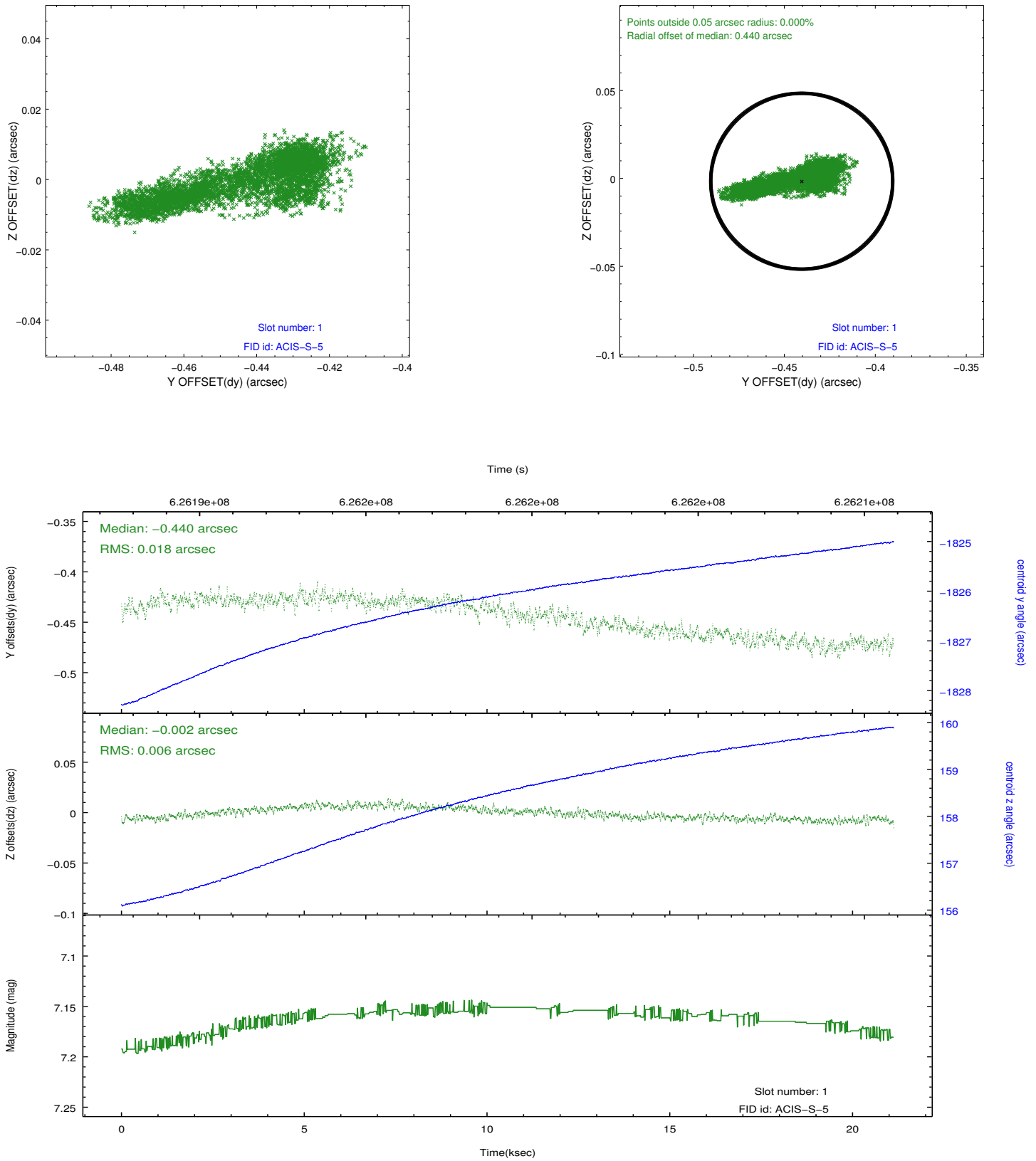


## 2.5 FID Slots

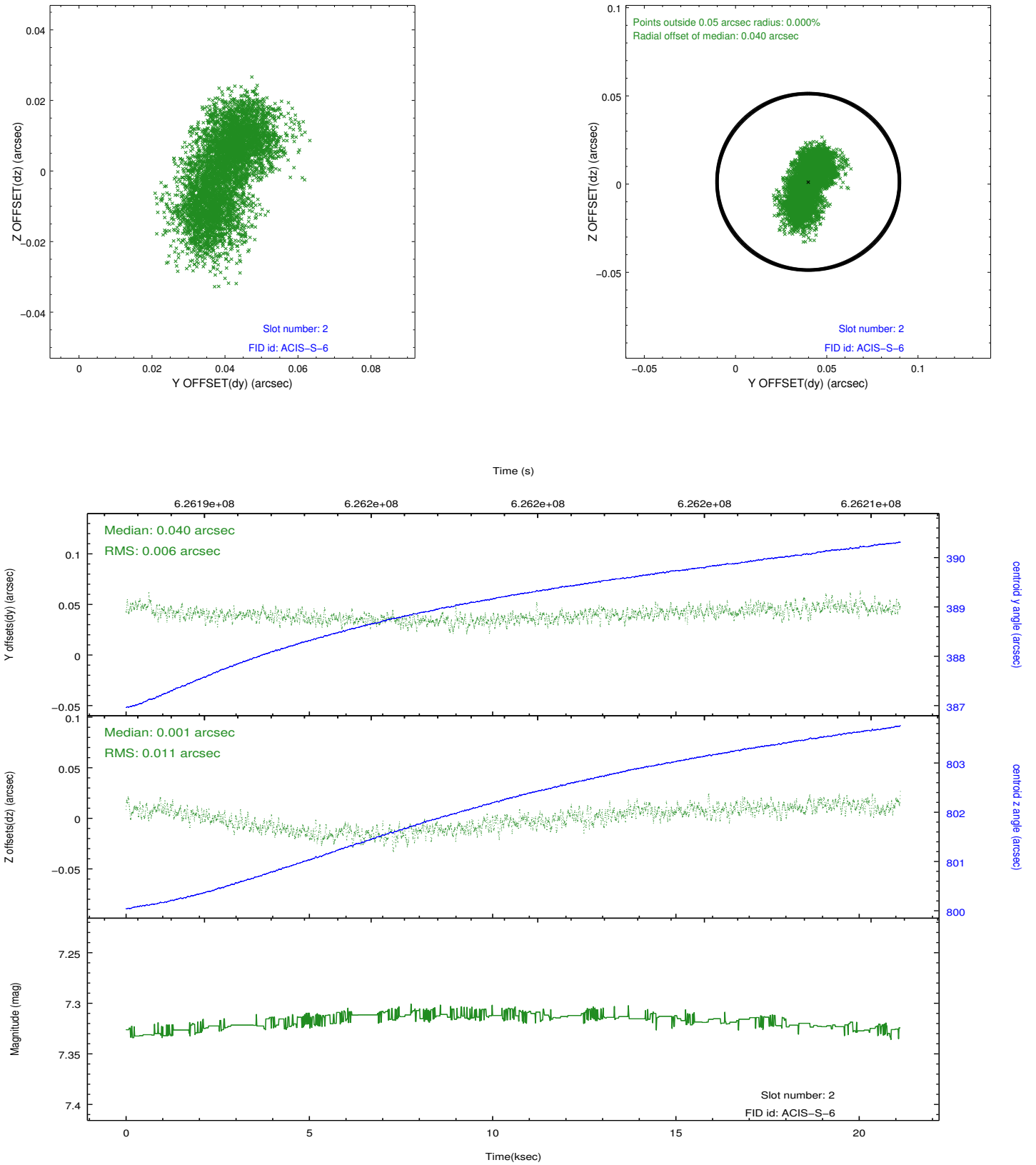
### 2.5.1 Slot 0



## 2.5.2 Slot 1

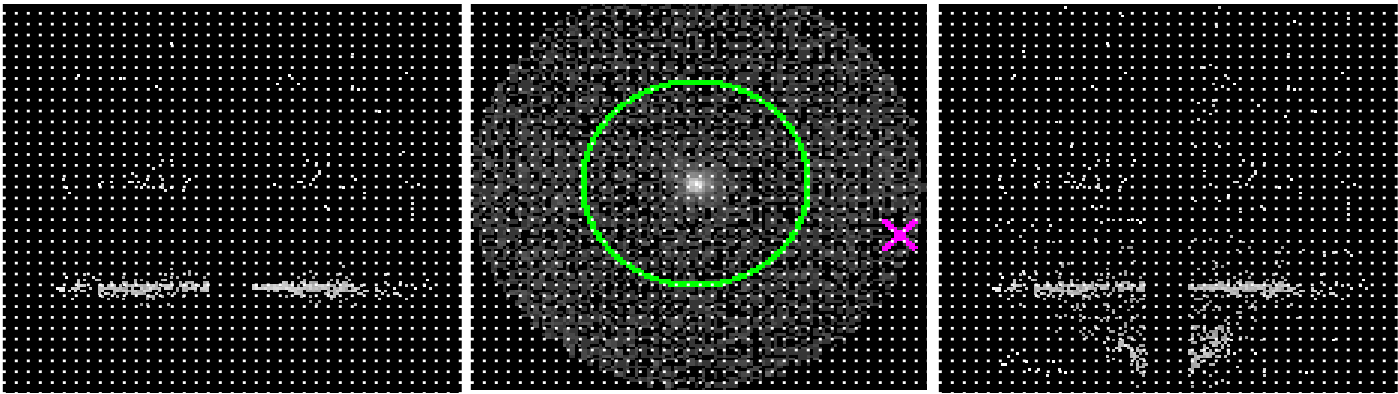


### 2.5.3 Slot 2



# 3 Gratings

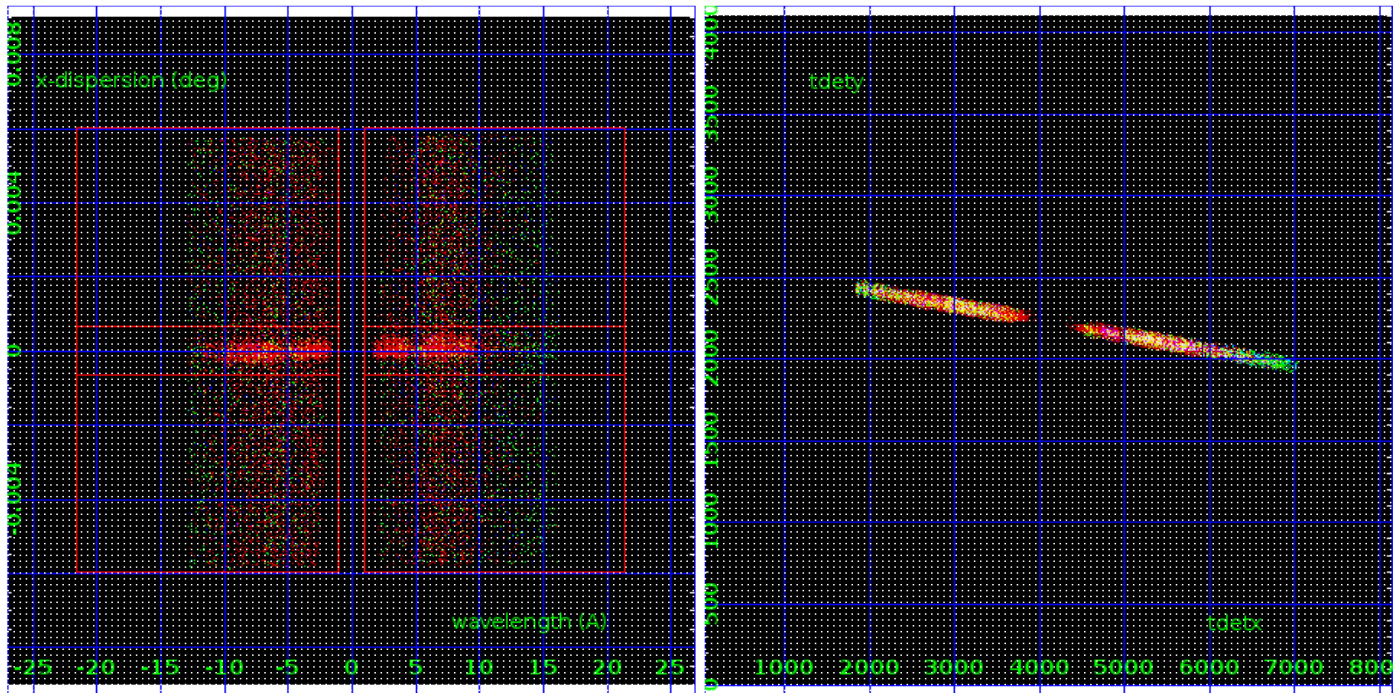
## 3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

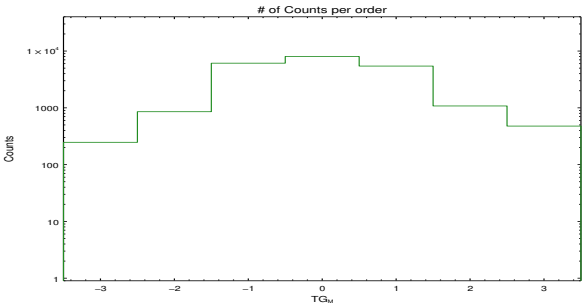
HEG Order Sort ALL

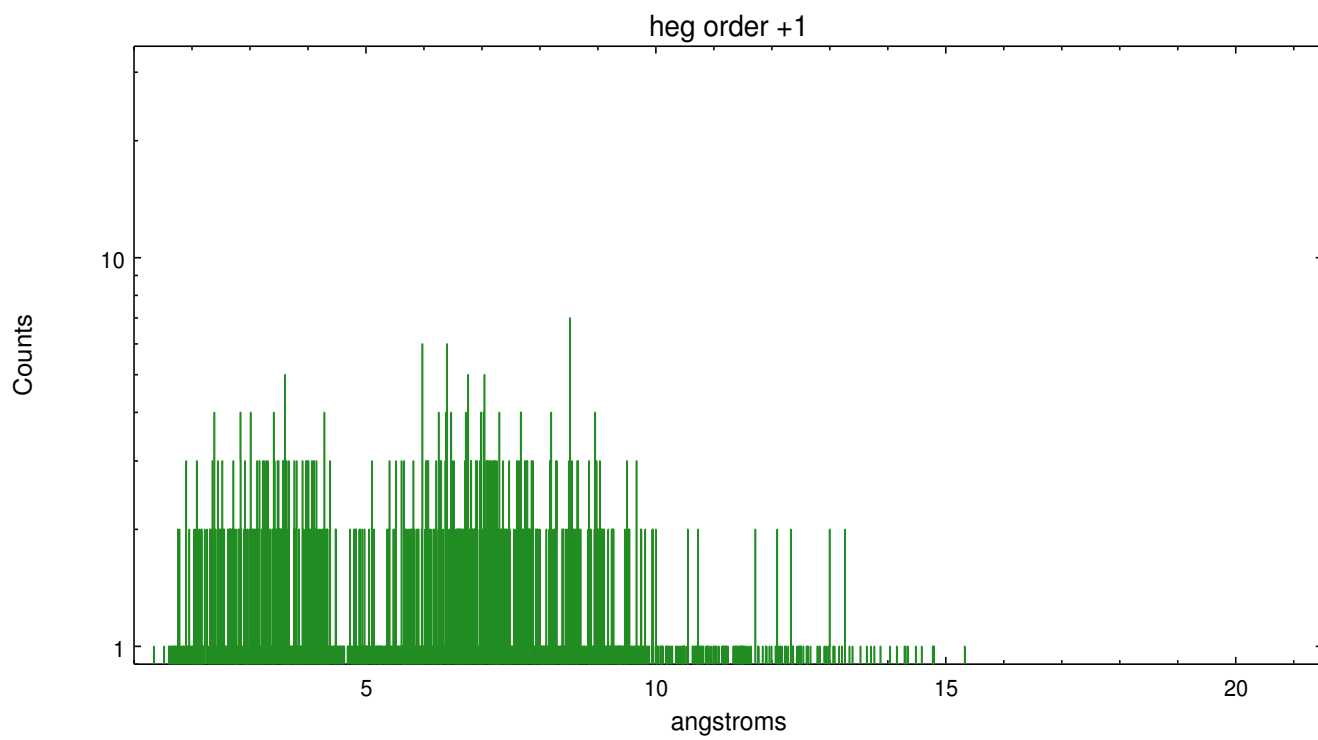
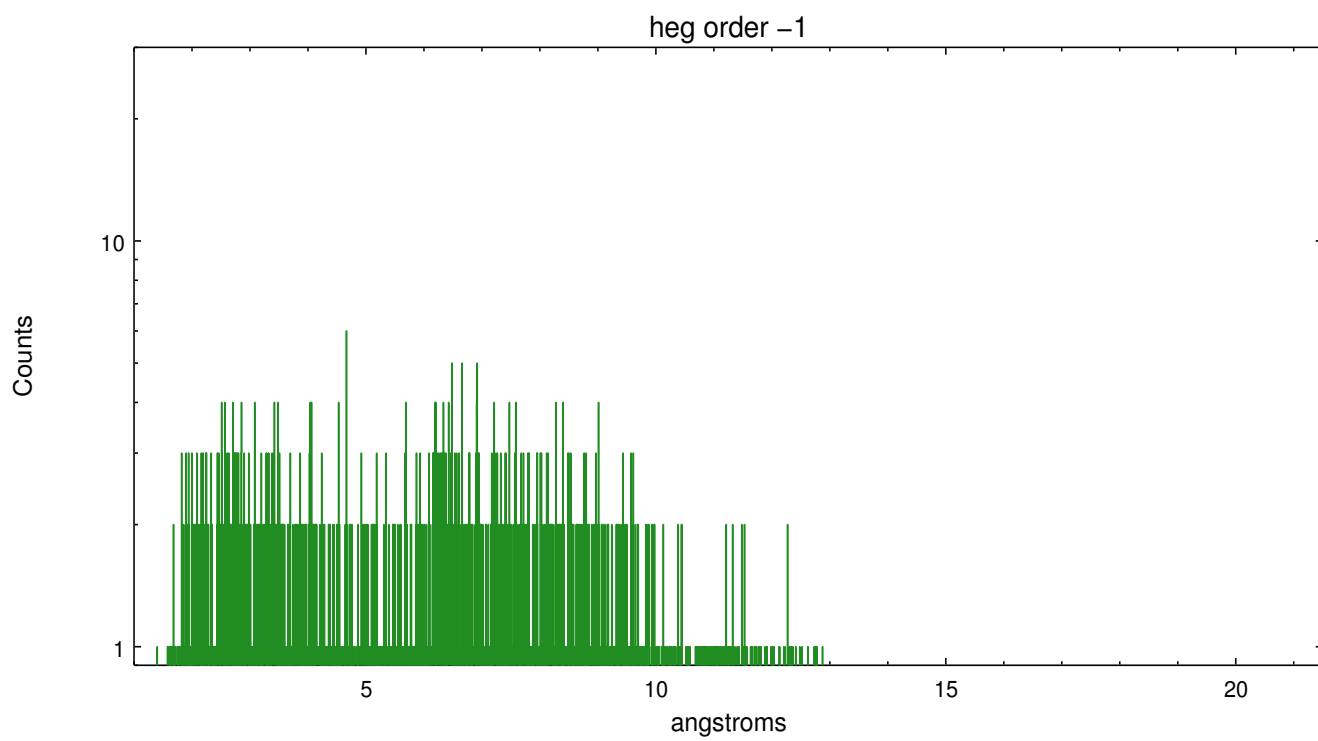


Spot Image HEG

Full Detector HEG

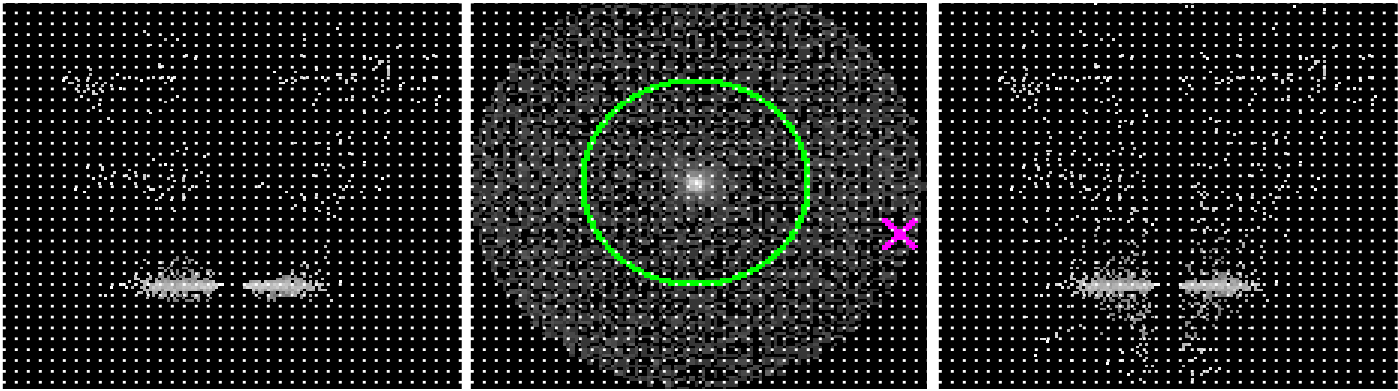
|        | order<br>-3 | order<br>-2 | order<br>-1 | order<br>0 | order<br>1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 247         | 855         | 6113        | 8024       | 5436       | 1079       | 477        |







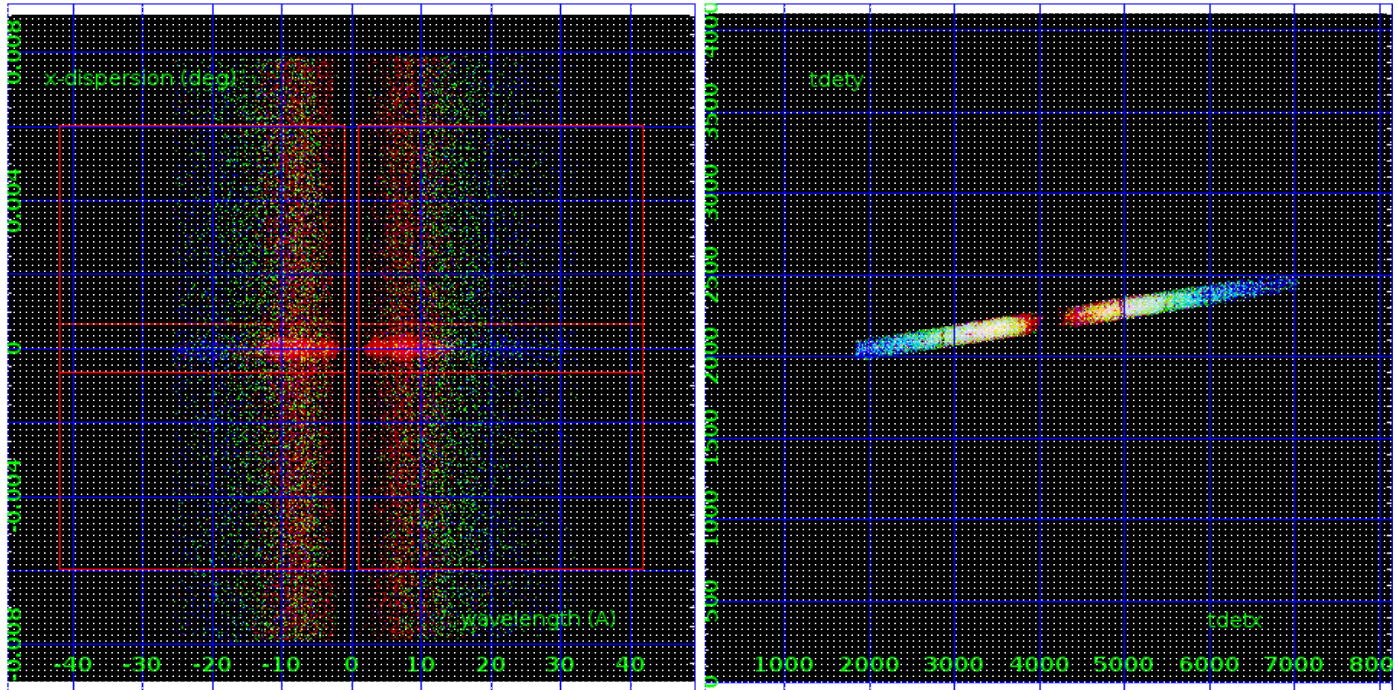
3.2 MEG Arm



MEG Order Sort 123

MEG Zero Order

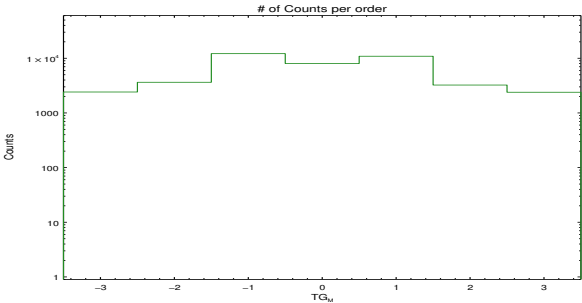
MEG Order Sort ALL

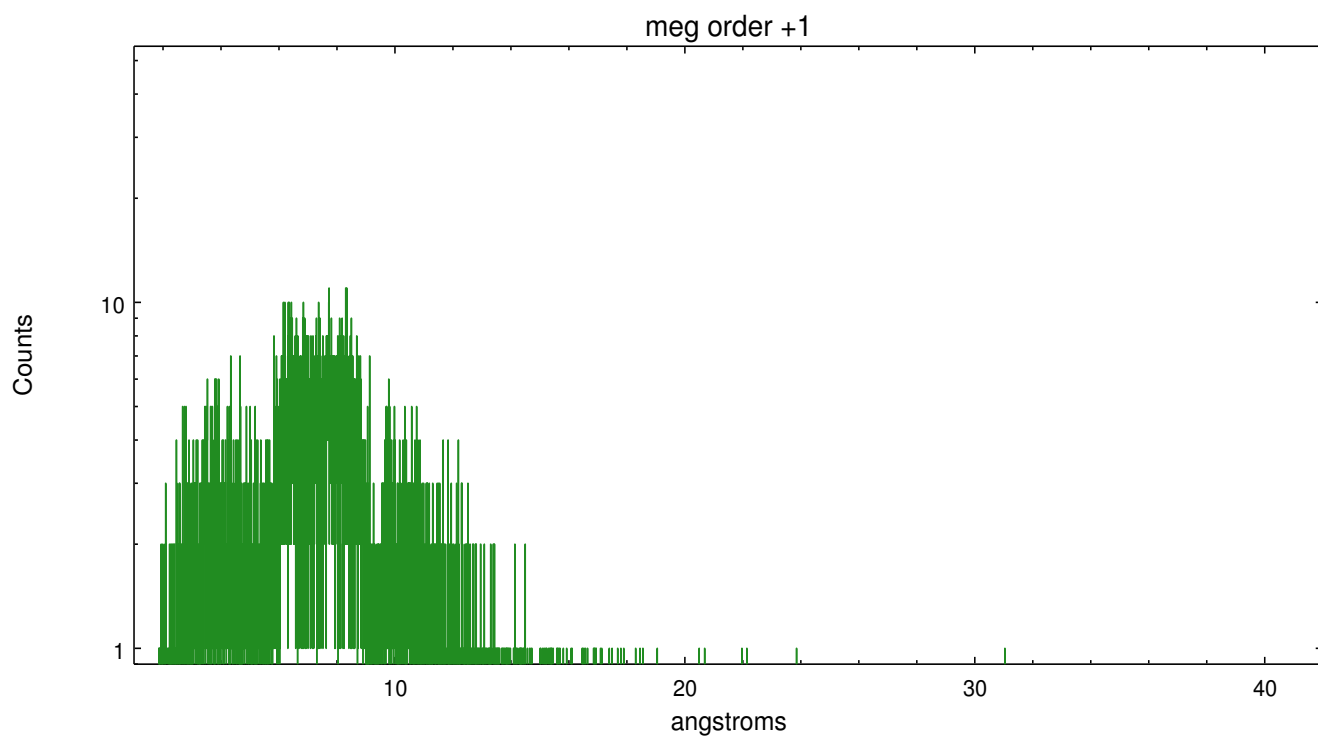
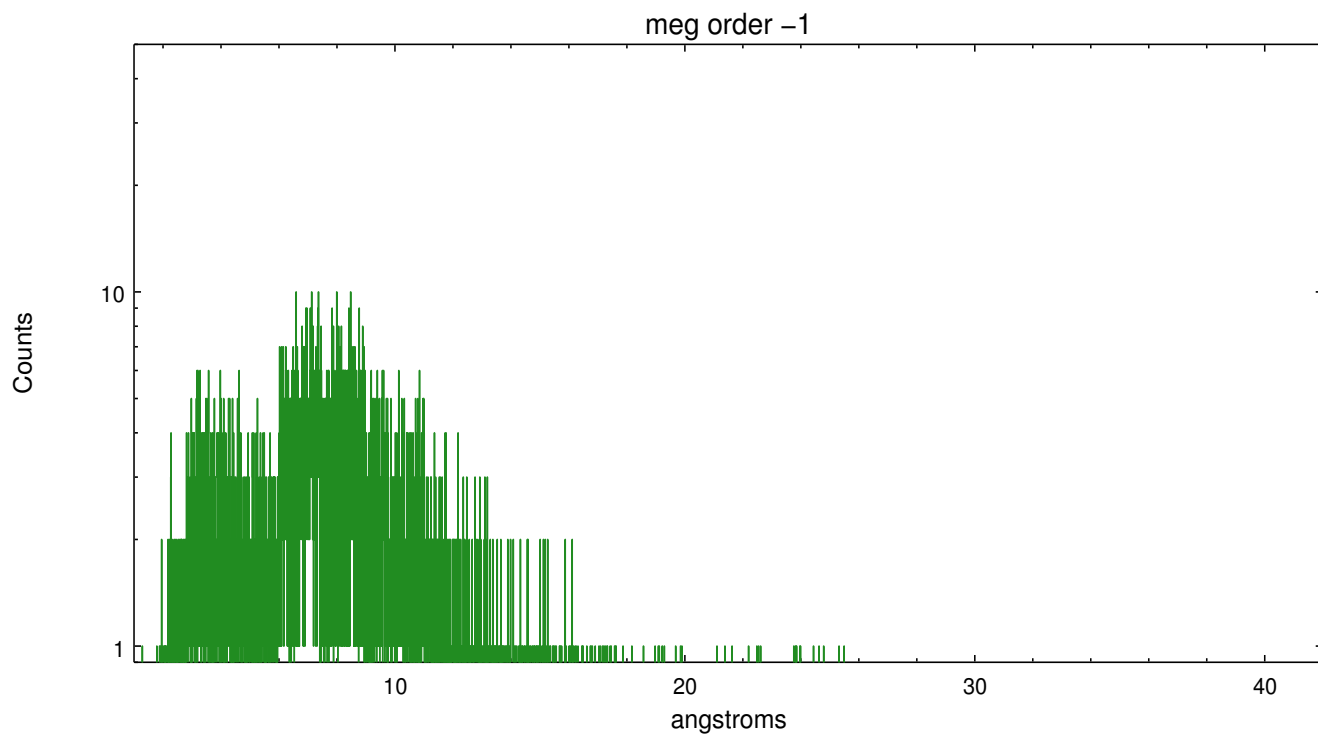


Spot Image MEG

Full Detector MEG

|        | order | order | order | order | order | order | order |
|--------|-------|-------|-------|-------|-------|-------|-------|
|        | -3    | -2    | -1    | 0     | 1     | 2     | 3     |
| Events | 2415  | 3636  | 12157 | 8024  | 10890 | 3237  | 2389  |





## A Summary

### A.1 Status

|                            |                    |
|----------------------------|--------------------|
| V&V Scientist              | David Huenemoerder |
| V&V Date (YYYY-MM-DD)      | 2017.11.07         |
| V&V Edition                | 2                  |
| V&V Disposition and Status | OK                 |
| V&V Charge Time            | 21.0845            |

### A.2 Comments