

# V&V Reference Report

## L2 ASCDS Version : 10.8

Observation 21235 - L2 Version 1  
Chandra X-Ray Center

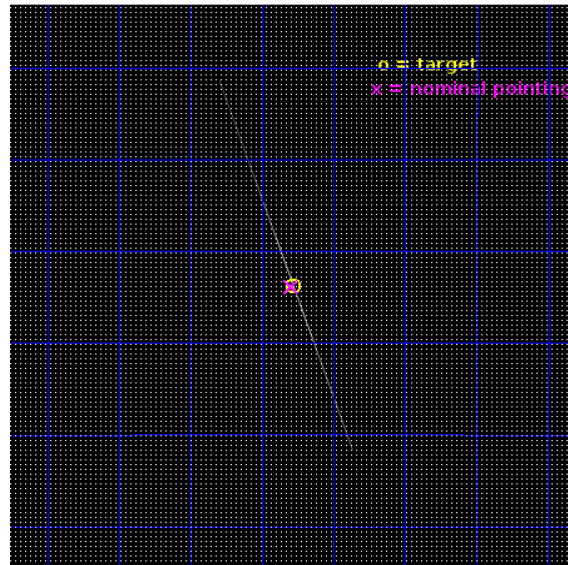
L2 Processing Date : Aug 13 2019

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# 1 Front

|          |                                                              |                                       |
|----------|--------------------------------------------------------------|---------------------------------------|
| seq_num  | 402067                                                       | Sequence number                       |
| obs_id   | 21235                                                        | Observation id                        |
| title    | An Integrated Approach to Winds, Jets, and State Transitions | Propo                                 |
| observer | Joey Neilsen                                                 | Principal investigator                |
| object   | EXO 1846-031                                                 | Source name                           |
| ra_targ  | 282.3213                                                     | Observer's specified target RA [deg]  |
| dec_targ | -3.0622                                                      | Observer's specified target Dec [deg] |
| ra_nom   | 282.32398206709                                              | Nominal RA [deg]                      |
| dec_nom  | -3.0644294758728                                             | Nominal Dec [deg]                     |
| roll_nom | 250.86110101245                                              | Nominal Roll [deg]                    |
| revision | 1                                                            | Processing version of data            |
| ontime   | 28103.0                                                      | Sum of GTIs [s]                       |
| livetime | 27993.22265625                                               | Livetime [s]                          |
| ontime5  | 28103.0                                                      | Sum of GTIs [s]                       |
| ontime6  | 28103.0                                                      | Sum of GTIs [s]                       |
| ontime7  | 28103.0                                                      | Sum of GTIs [s]                       |
| ontime8  | 28103.0                                                      | Sum of GTIs [s]                       |
| ontime9  | 28103.0                                                      | Sum of GTIs [s]                       |
| l2events | 4198322                                                      | Number of level 2 events              |

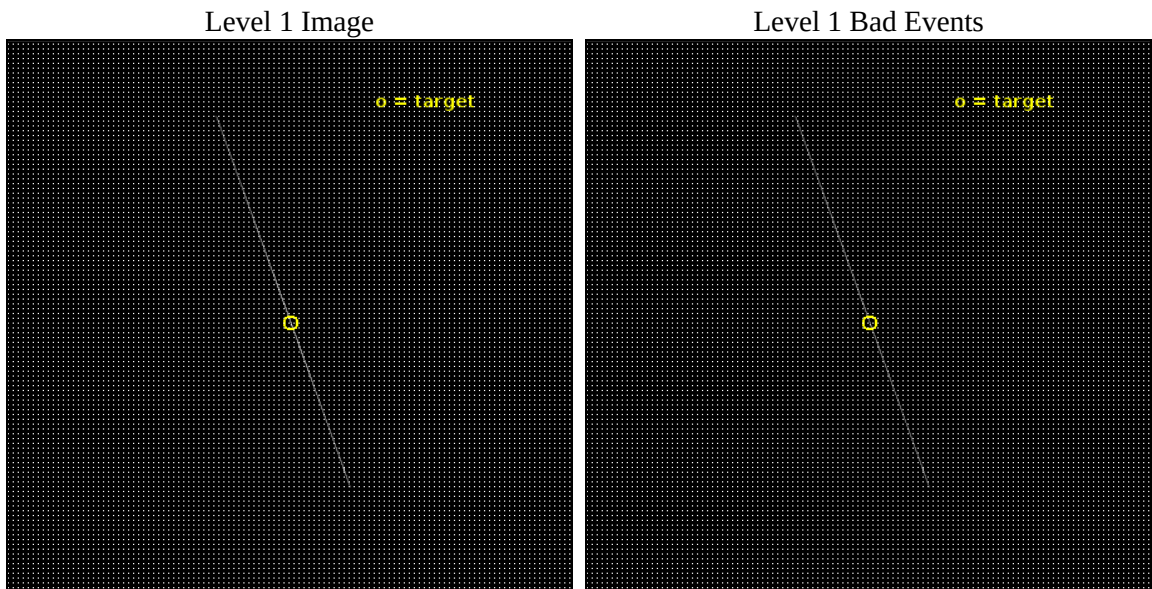




## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



### 2.1.2 Parameters

|          |                     |                                |                |                    |                                         |
|----------|---------------------|--------------------------------|----------------|--------------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 28000.000000       | [s] Scheduled observation exposure time |
| ascdsver | 10.8                | Processing system revision     | ontime         | 28103.0            | Sum of GTIs [s]                         |
| caldsver | 4.8.3.1             | &#160                          | ontime5        | 28103.0            | Sum of GTIs [s]                         |
| date     | 2019-08-13T21:18:32 | Date and time of file creation | ontime6        | 28103.0            | Sum of GTIs [s]                         |
| revision | 1                   | Processing version of data     | ontime7        | 28103.0            | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 28103.0            | Sum of GTIs [s]                         |
|          |                     |                                | ontime9        | 28103.0            | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 9073448            | Number of level 1 events                |
|          |                     |                                | tgmethod       | TGDETECT           | Method used to create src1a file        |
|          |                     |                                | zo_pos         | (4123.68, 4090.66) | src1a sky pixel position                |

### 2.1.3 Events

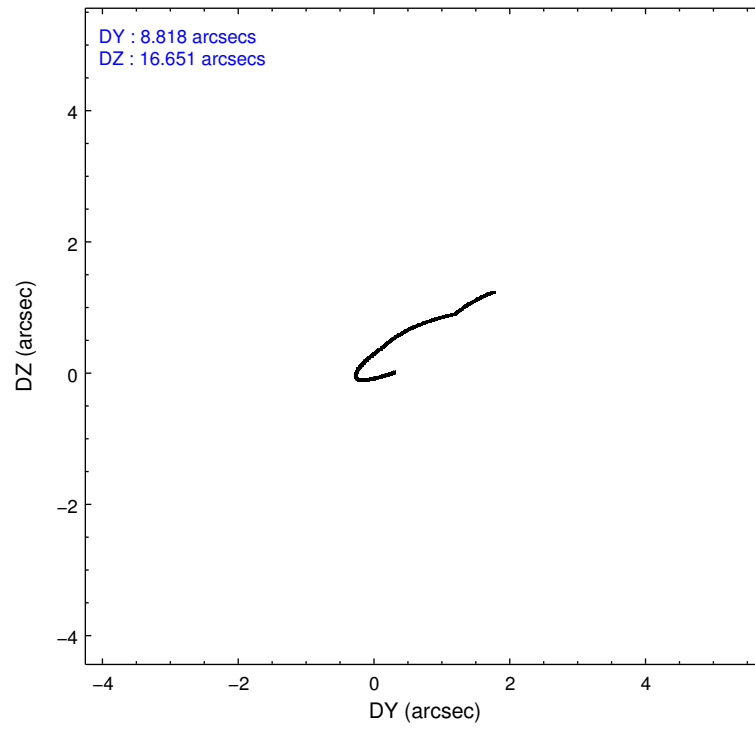
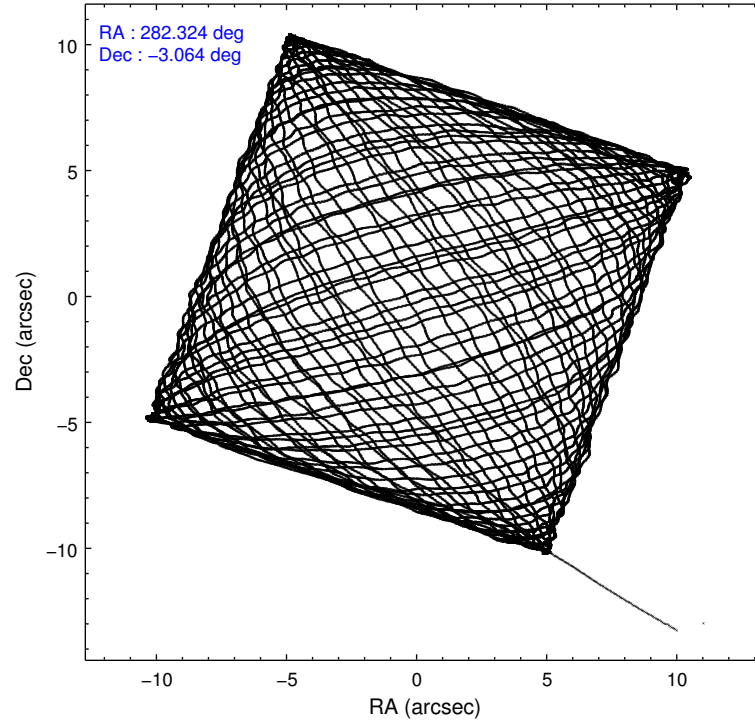
|                 | ccd 5   | ccd 6   | ccd 7   | ccd 8  | ccd 9  |                | ccd 5   | ccd 6  | ccd 7   | ccd 8  | ccd 9  |
|-----------------|---------|---------|---------|--------|--------|----------------|---------|--------|---------|--------|--------|
| level 1 events  | 2359717 | 1559664 | 3851000 | 848420 | 454647 | grade 0 events | 396179  | 11226  | 194509  | 28631  | 4582   |
| rejected events | 1044939 | 450532  | 1220661 | 538187 | 375104 |                | 16%     | 0%     | 5%      | 3%     | 1%     |
| rejected %      | 44%     | 28%     | 31%     | 63%    | 82%    | grade 1 events | 848     | 188    | 12926   | 386    | 164    |
|                 |         |         |         |        |        |                | 0%      | 0%     | 0%      | 0%     | 0%     |
|                 |         |         |         |        |        | grade 2 events | 760339  | 957977 | 990840  | 217421 | 51401  |
|                 |         |         |         |        |        |                | 32%     | 61%    | 25%     | 25%    | 11%    |
|                 |         |         |         |        |        | grade 3 events | 5953    | 4861   | 107999  | 9799   | 4093   |
|                 |         |         |         |        |        |                | 0%      | 0%     | 2%      | 1%     | 0%     |
|                 |         |         |         |        |        | grade 4 events | 5622    | 4430   | 109143  | 9387   | 4394   |
|                 |         |         |         |        |        |                | 0%      | 0%     | 2%      | 1%     | 0%     |
|                 |         |         |         |        |        | grade 5 events | 19961   | 15321  | 128917  | 16593  | 10984  |
|                 |         |         |         |        |        |                | 0%      | 0%     | 3%      | 1%     | 2%     |
|                 |         |         |         |        |        | grade 6 events | 146776  | 130733 | 1228120 | 45014  | 15077  |
|                 |         |         |         |        |        |                | 6%      | 8%     | 31%     | 5%     | 3%     |
|                 |         |         |         |        |        | grade 7 events | 1024039 | 434928 | 1078546 | 521189 | 363952 |
|                 |         |         |         |        |        |                | 43%     | 27%    | 28%     | 61%    | 80%    |

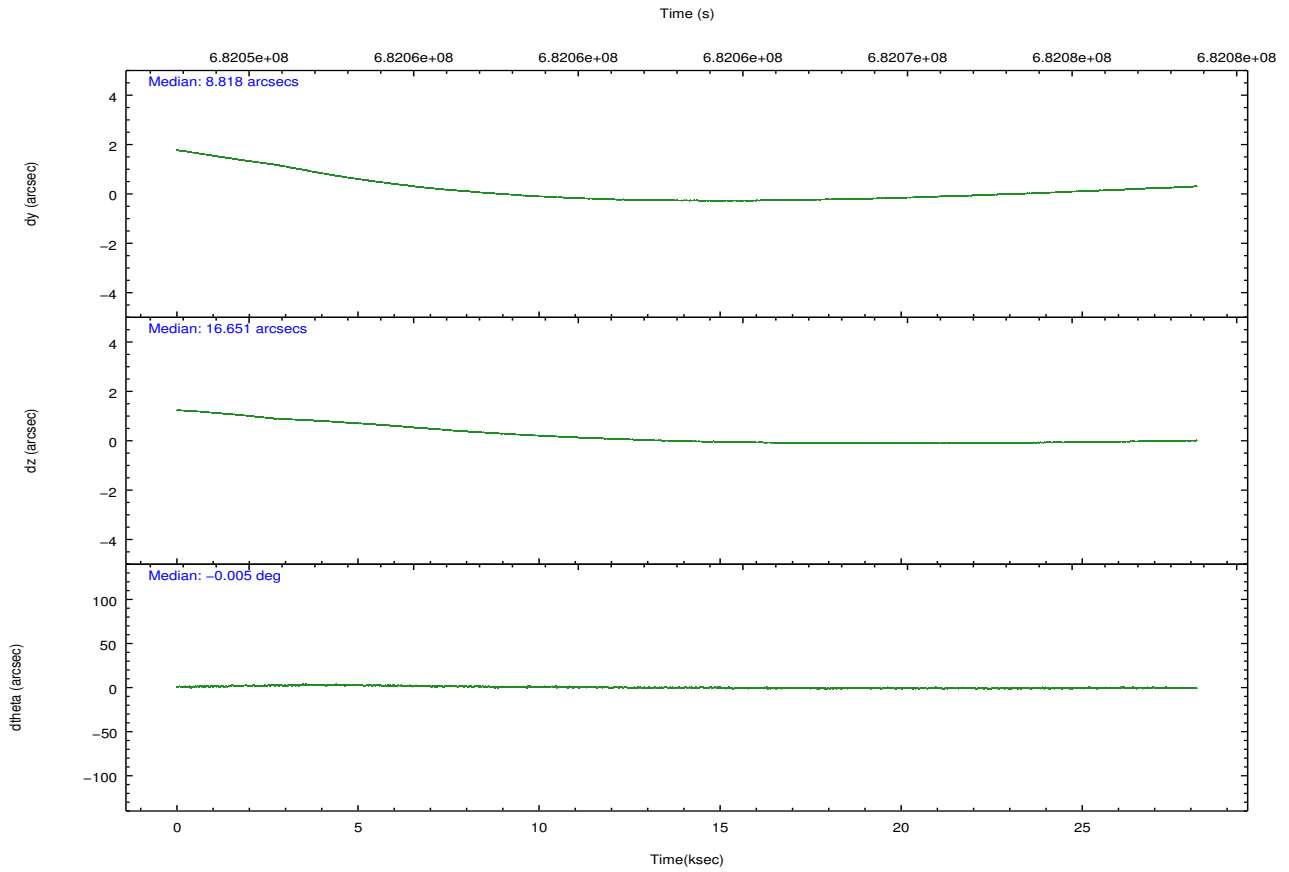
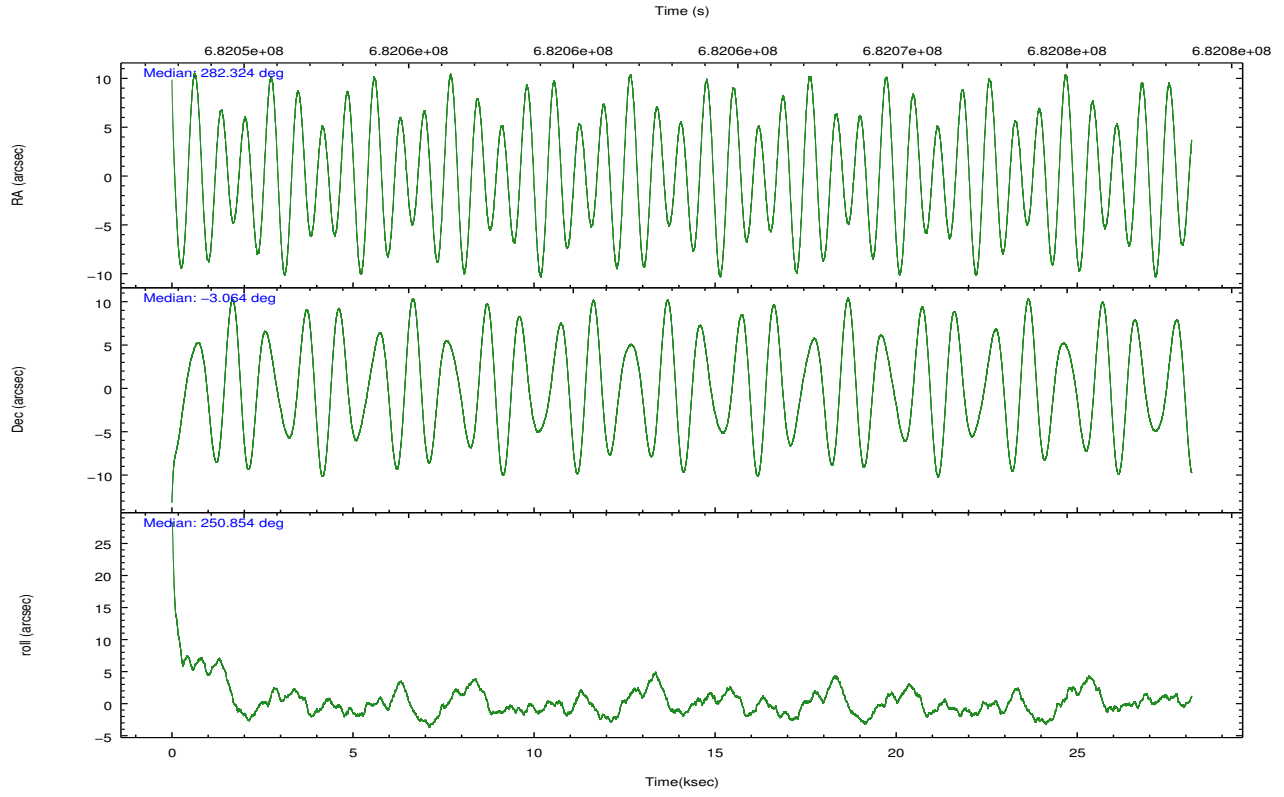
## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               |
|-----------------------------------|---------------------|----------------------|
| Instrument                        | ACIS                | ACIS                 |
| Detector                          | ACIS-56789          | ACIS-56789           |
| Grating                           | HETG                | HETG                 |
| Data mode                         | CC33_GRADED         | CC33_GRADED          |
| Observation mode                  | POINTING            | POINTING             |
| [deg] Pointing RA                 | 282.318457          | 282.3239820670877    |
| [deg] Pointing Dec                | -3.037540           | -3.064429475872845   |
| [deg] Pointing Roll               | 250.704175          | 250.8611010124484    |
| [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)  | 682049350.184000    | 682048282.6091501    |
| Observation start date            | 2019-08-13T02:08:01 | 2019-08-13T01:51:22  |
| [s] Observation end time (MET)    | 682077350.184000    | 682078383.27346      |
| Observation end date              | 2019-08-13T09:54:41 | 2019-08-13T10:13:03  |
| Read mode                         | CONTINUOUS          | CONTINUOUS           |

| 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                    | NONE      | NONE    |
| Alternating exposures requested       | N         | N       |
| [s] Primary exposure time             | 0.000000  | 0       |

## 2.3 Aspect



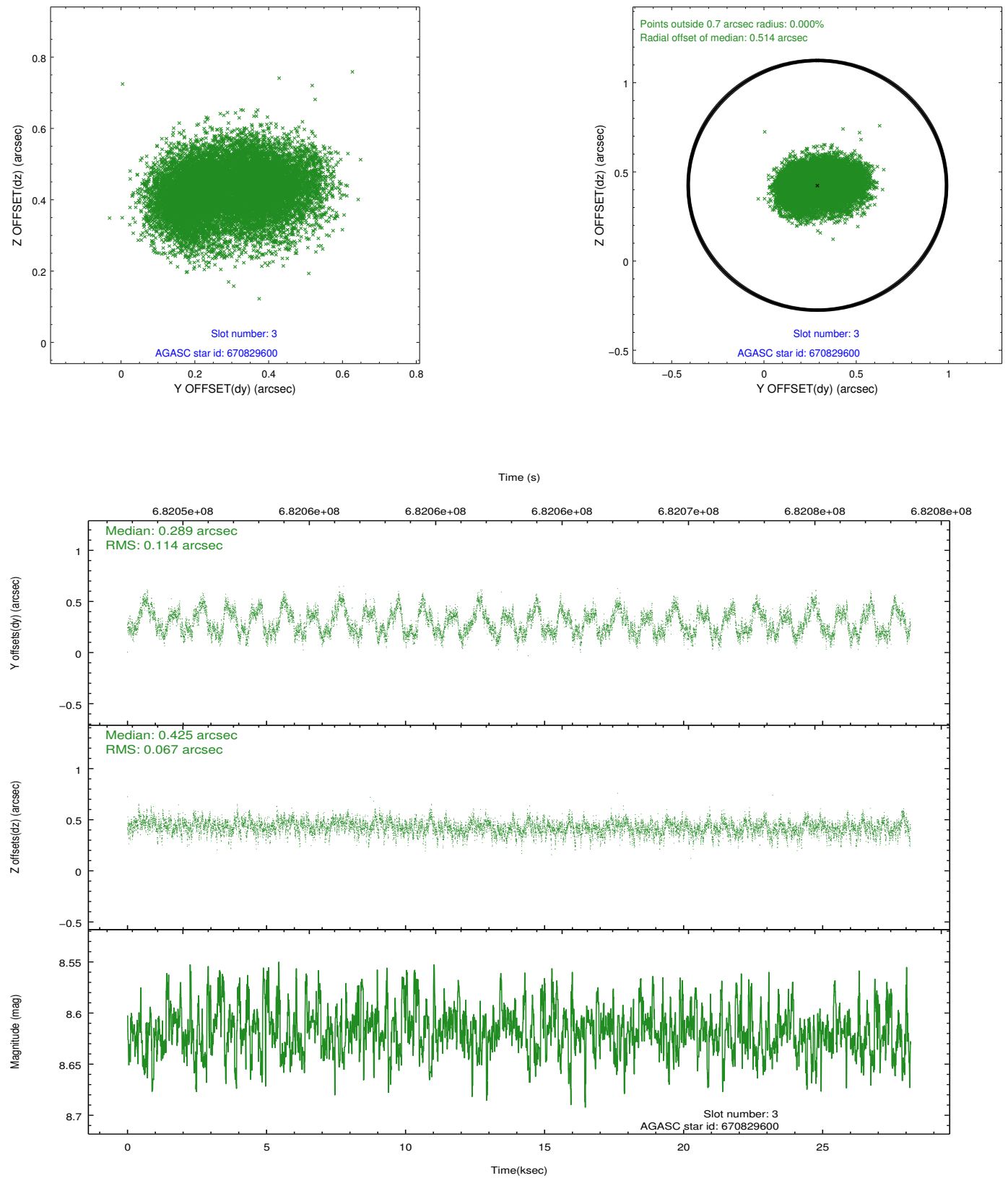


# Slot Statistics

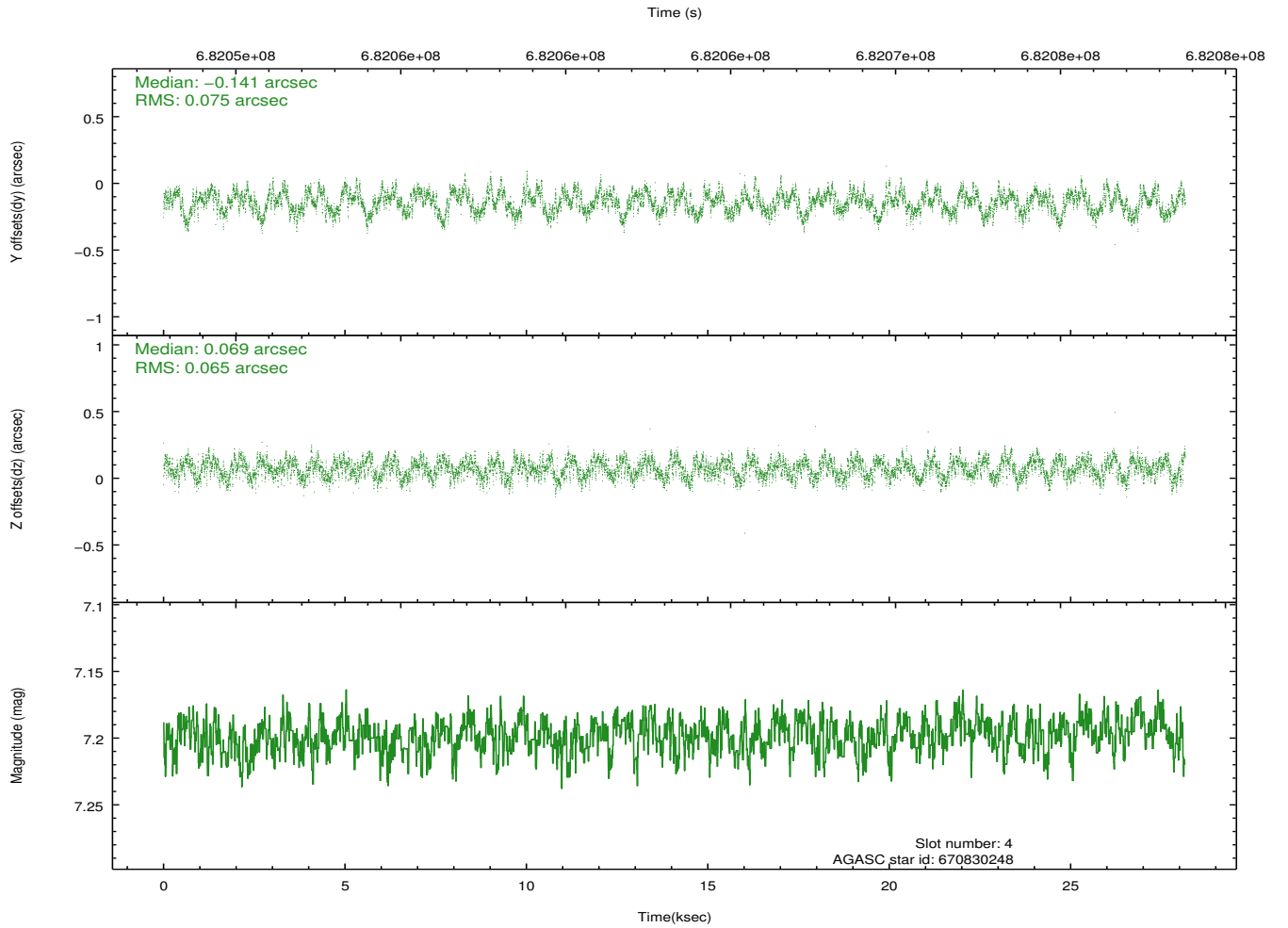
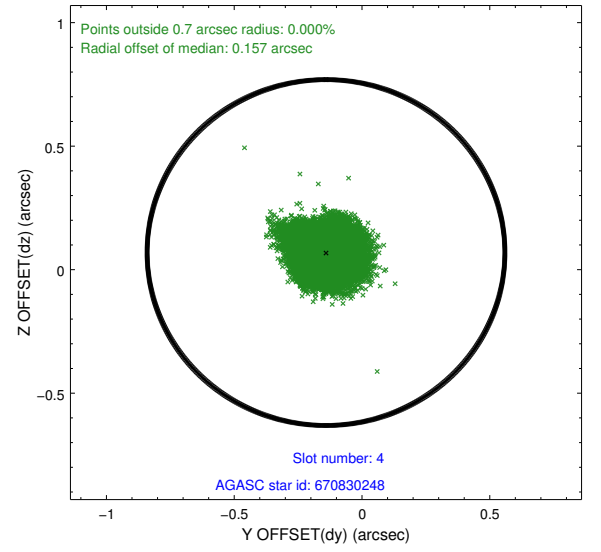
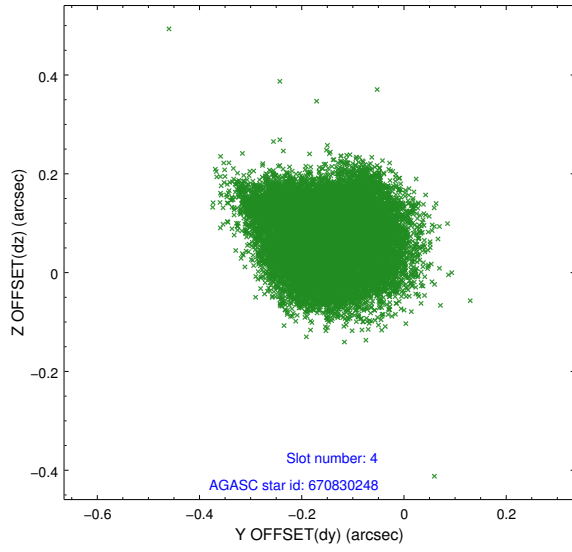
| pt | status | used | id        | mag  | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec       | mean_y   | mea   |
|----|--------|------|-----------|------|-------|----------|--------|--------|-------|-------|------------|-----------|----------|-------|
| 0  | FID    |      | ACIS-S-2  | 7.09 | 6869  | 1.000    | -0.238 | -0.151 | 0.015 | 0.050 | 0.000000   | 0.000000  | -762.02  | -1738 |
| 1  | FID    |      | ACIS-S-4  | 7.22 | 6868  | 1.000    | 0.636  | 0.155  | 0.016 | 0.057 | 0.000000   | 0.000000  | 2152.07  | 170   |
| 2  | FID    |      | ACIS-S-5  | 7.19 | 6869  | 1.000    | -0.430 | 0.005  | 0.013 | 0.032 | 0.000000   | 0.000000  | -1814.98 | 163   |
| 3  | GUIDE  | used | 670829600 | 8.62 | 13729 | 1.000    | 0.289  | 0.425  | 0.142 | 0.222 | 282.227270 | -3.031765 | 89.25    | -315  |
| 4  | GUIDE  | used | 670830248 | 7.20 | 13737 | 1.000    | -0.141 | 0.069  | 0.108 | 0.162 | 282.772544 | -3.261134 | 221.97   | 1805  |
| 5  | GUIDE  | used | 670830256 | 8.20 | 13730 | 1.000    | 0.058  | -0.213 | 0.086 | 0.145 | 282.680944 | -3.575346 | 1397.27  | 1869  |
| 6  | GUIDE  | used | 670830552 | 6.36 | 13738 | 1.000    | -0.050 | -0.235 | 0.065 | 0.099 | 282.536849 | -3.622664 | 1730.26  | 1437  |
| 7  | GUIDE  | used | 670830160 | 6.38 | 13737 | 1.000    | -0.162 | -0.051 | 0.085 | 0.136 | 282.842323 | -3.317856 | 331.07   | 2110  |

## 2.4 Star Slots

### 2.4.1 Slot 3

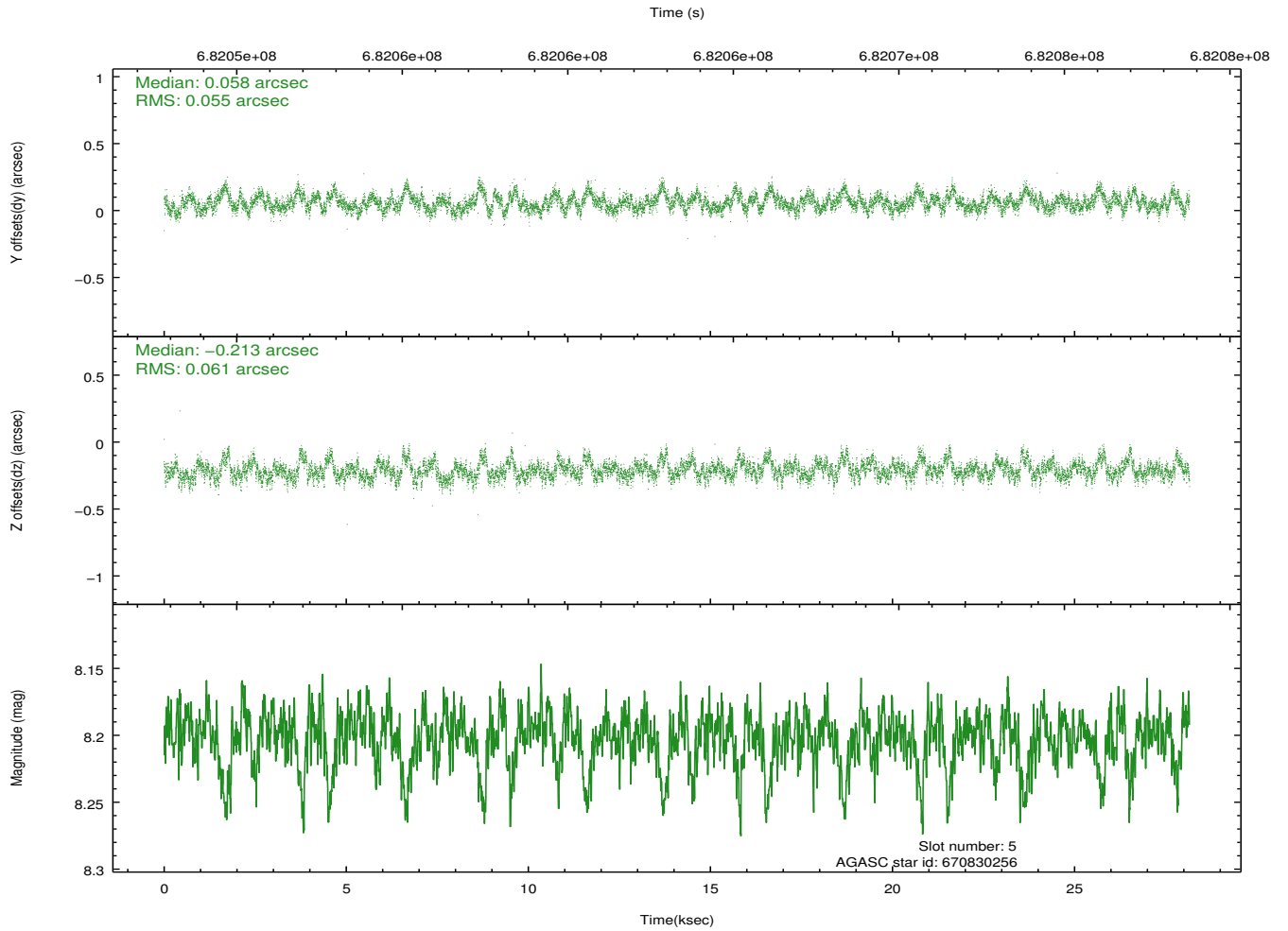
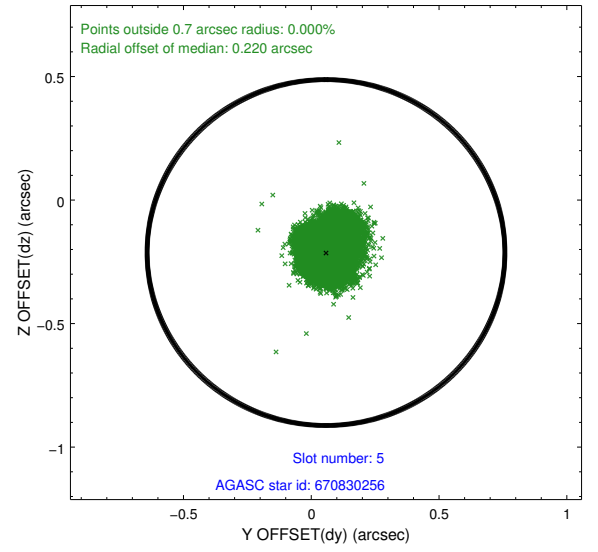
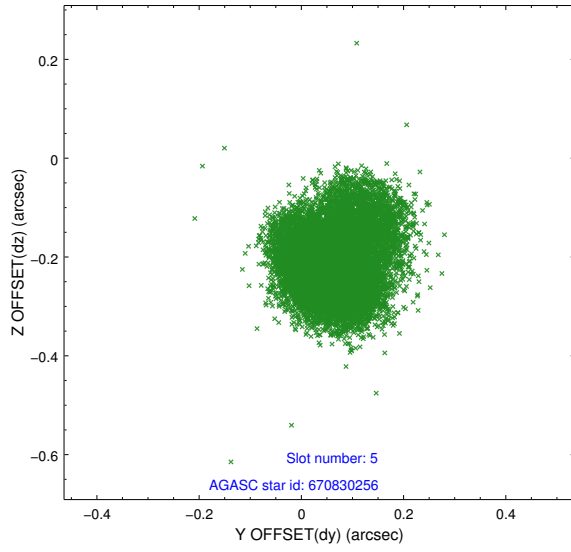


## 2.4.2 Slot 4

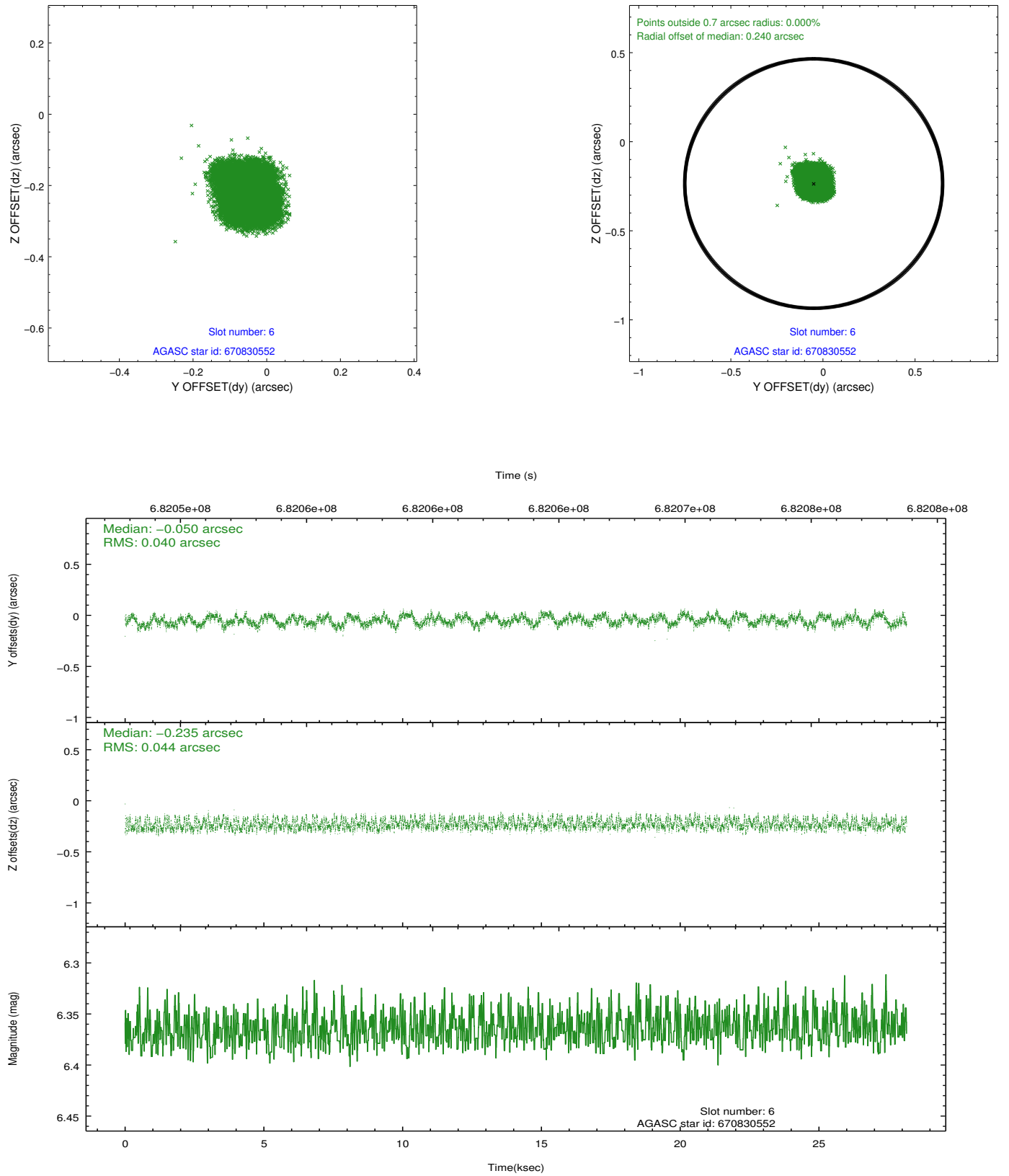




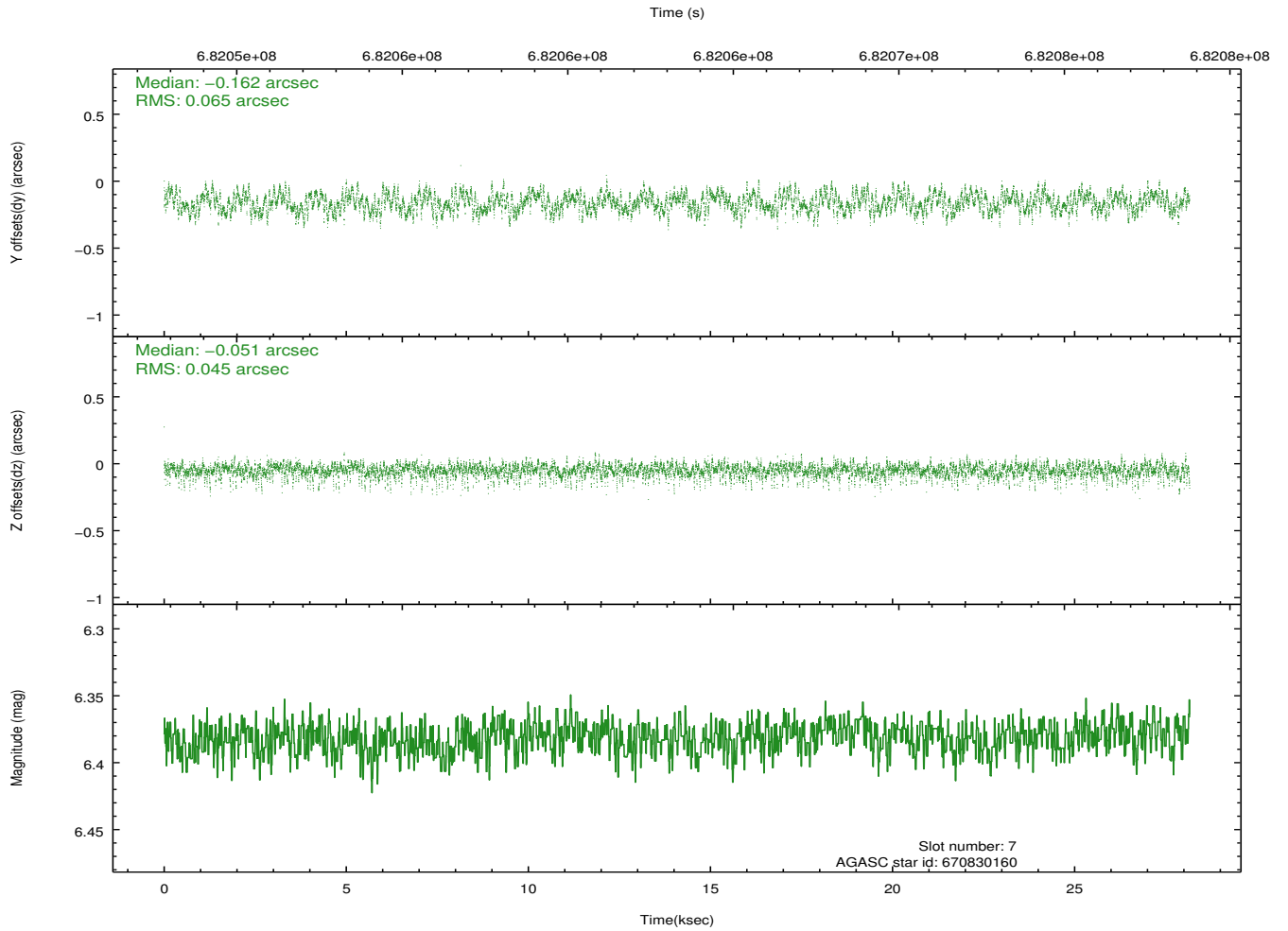
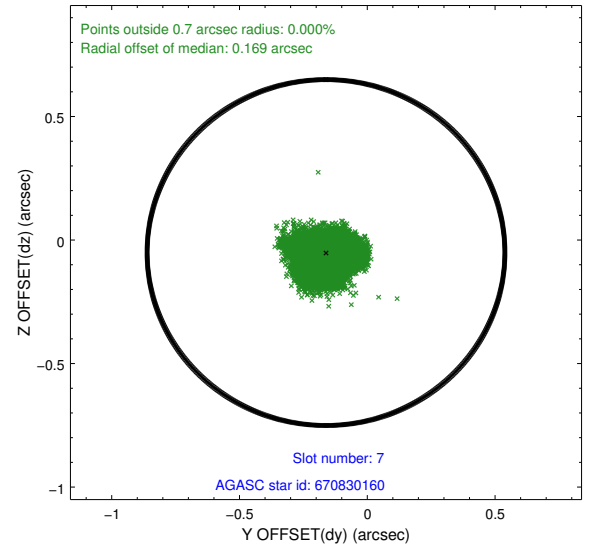
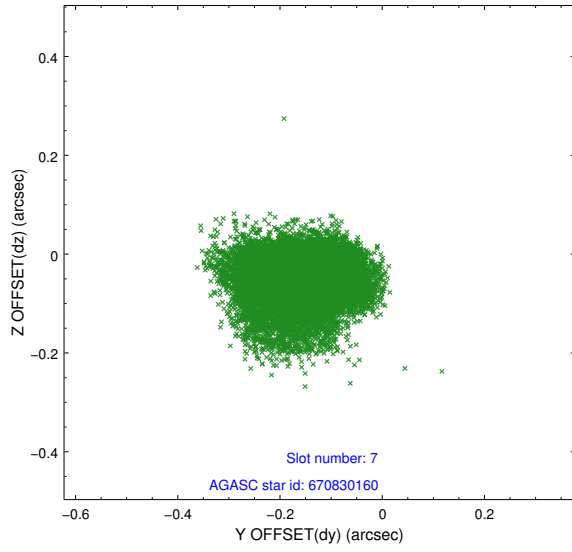
### 2.4.3 Slot 5



## 2.4.4 Slot 6

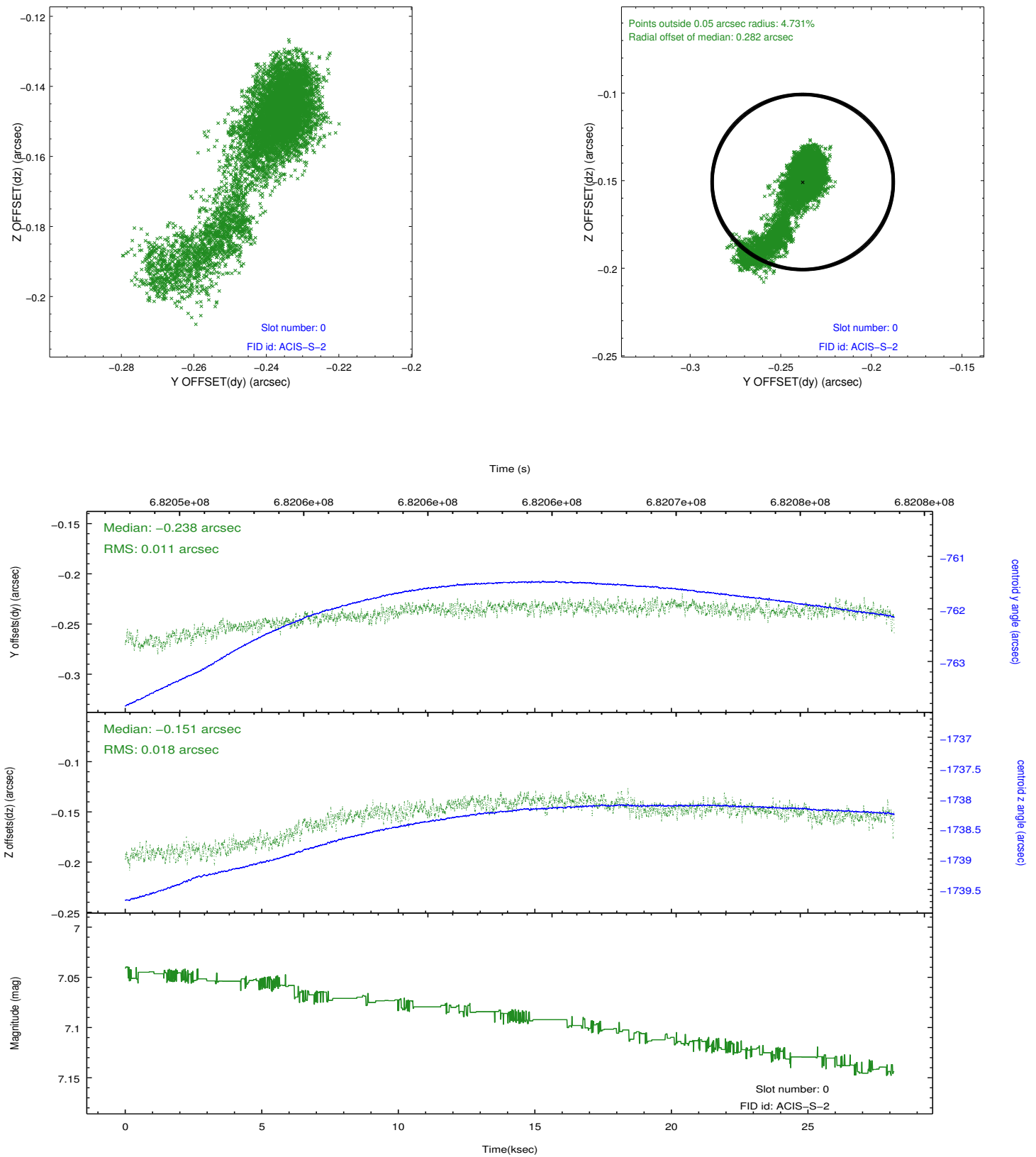


## 2.4.5 Slot 7

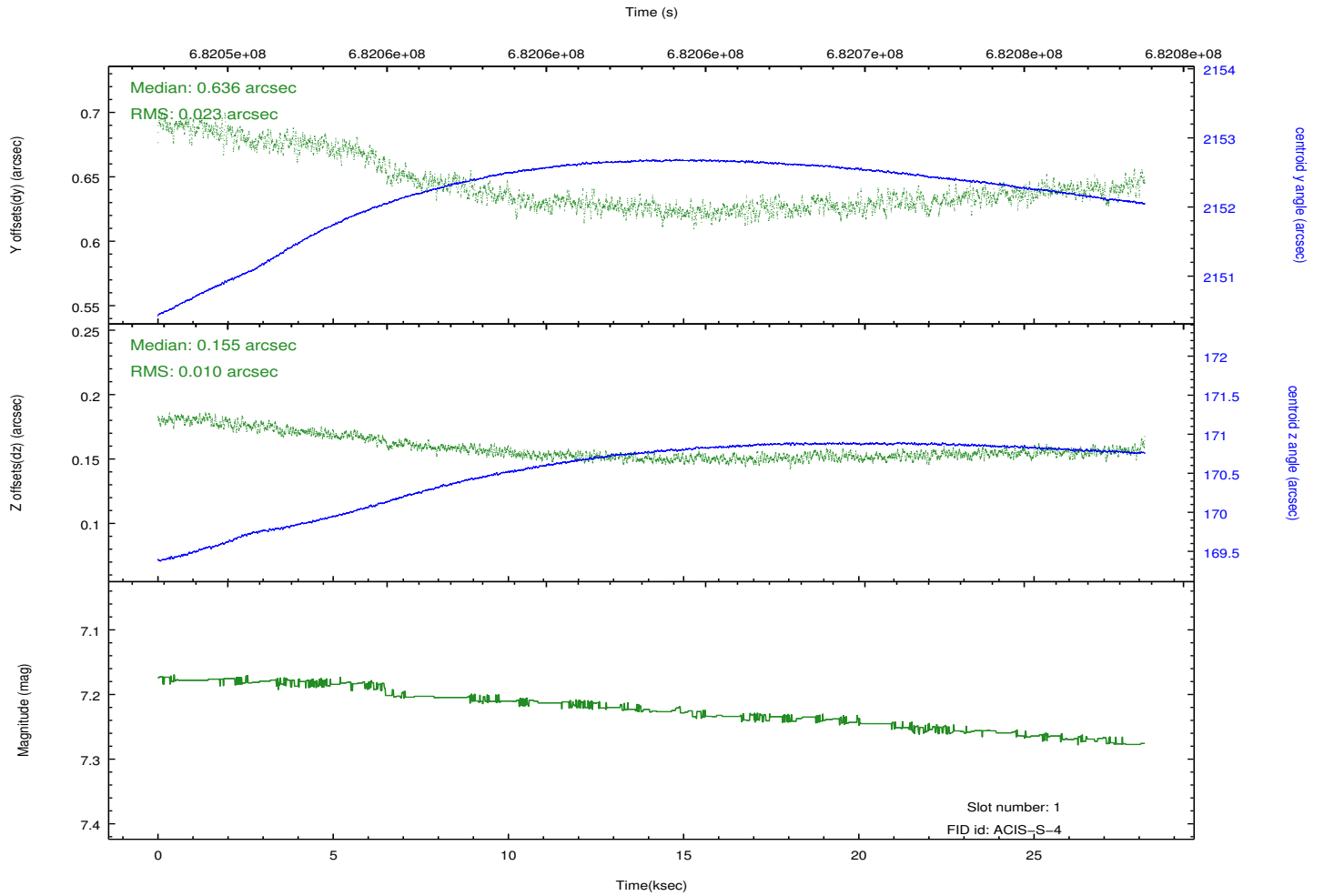
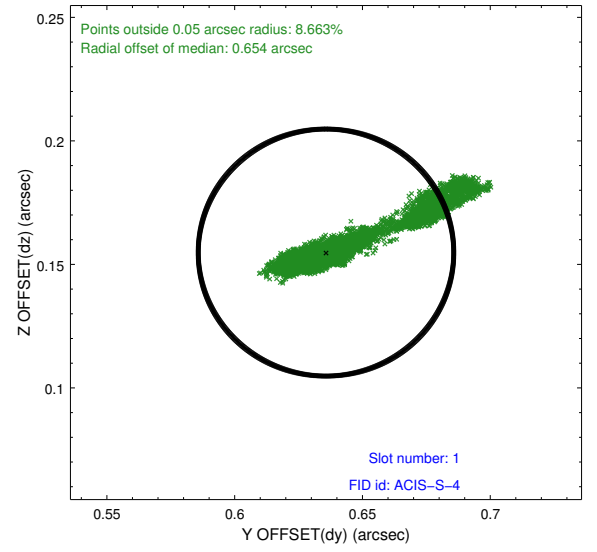
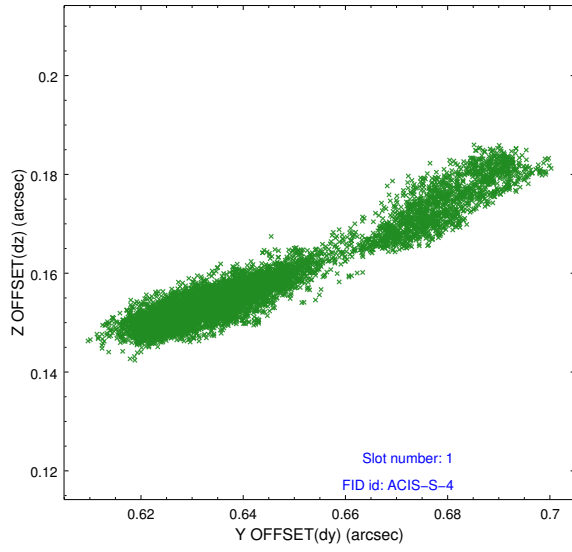


## 2.5 FID Slots

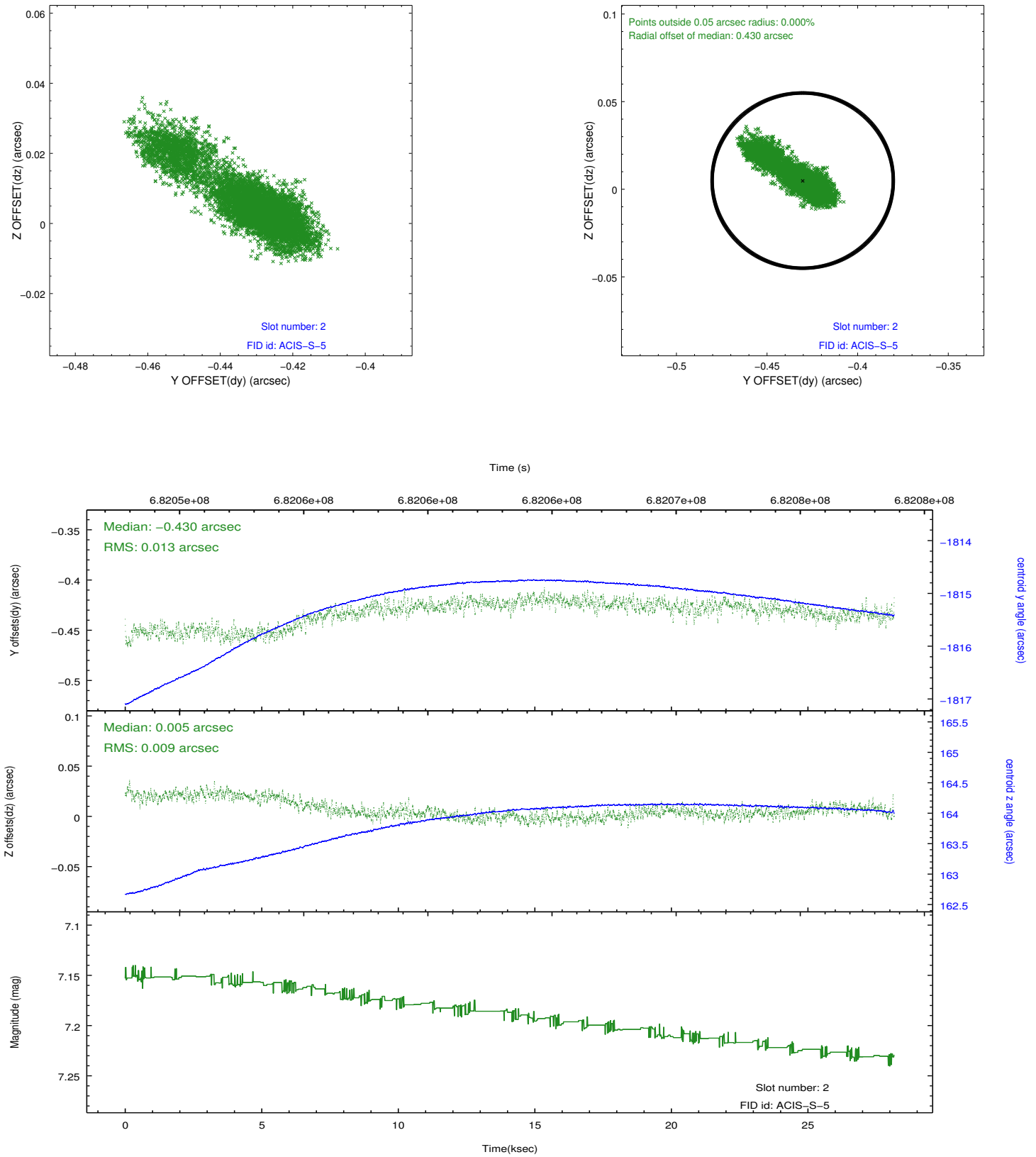
### 2.5.1 Slot 0



## 2.5.2 Slot 1

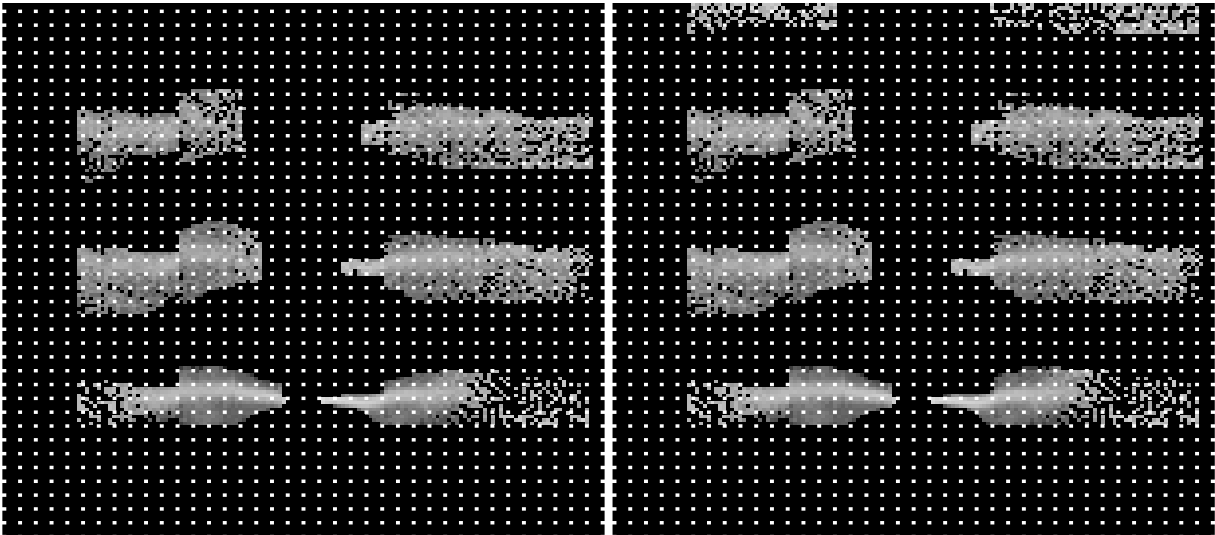


### 2.5.3 Slot 2



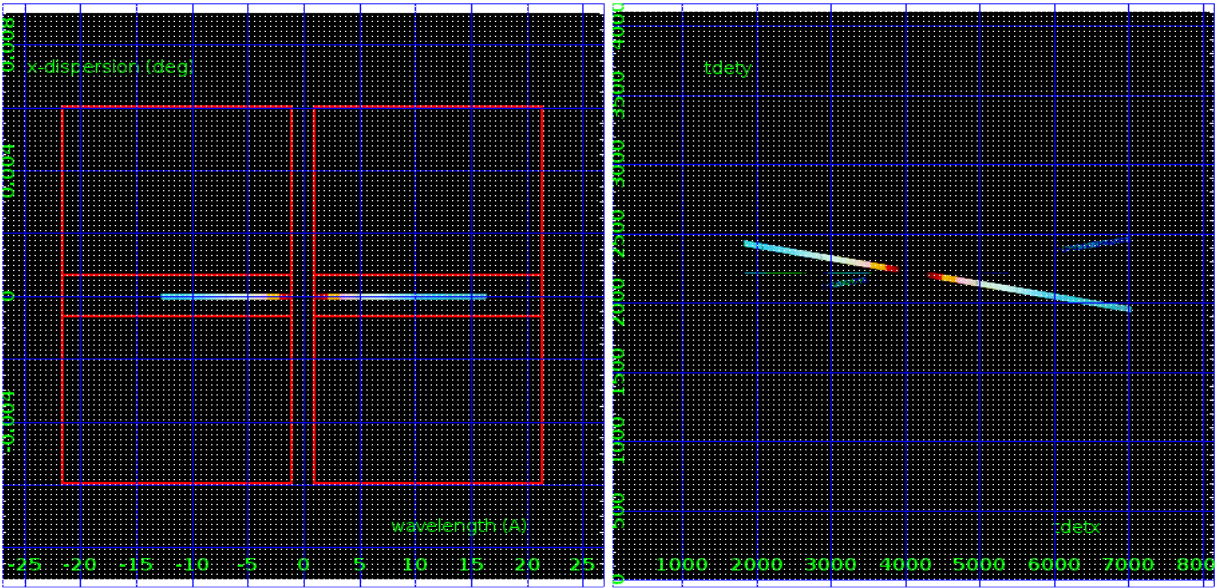
# 3 Gratings

## 3.1 HEG Arm



HEG Order Sort 123

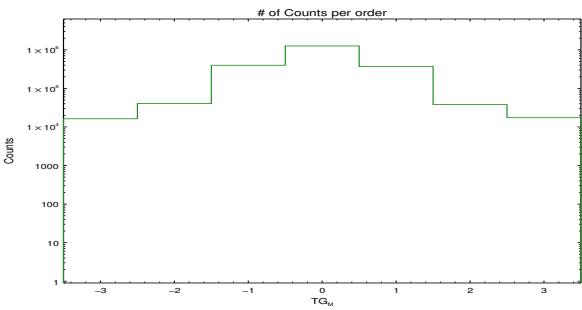
HEG Order Sort ALL

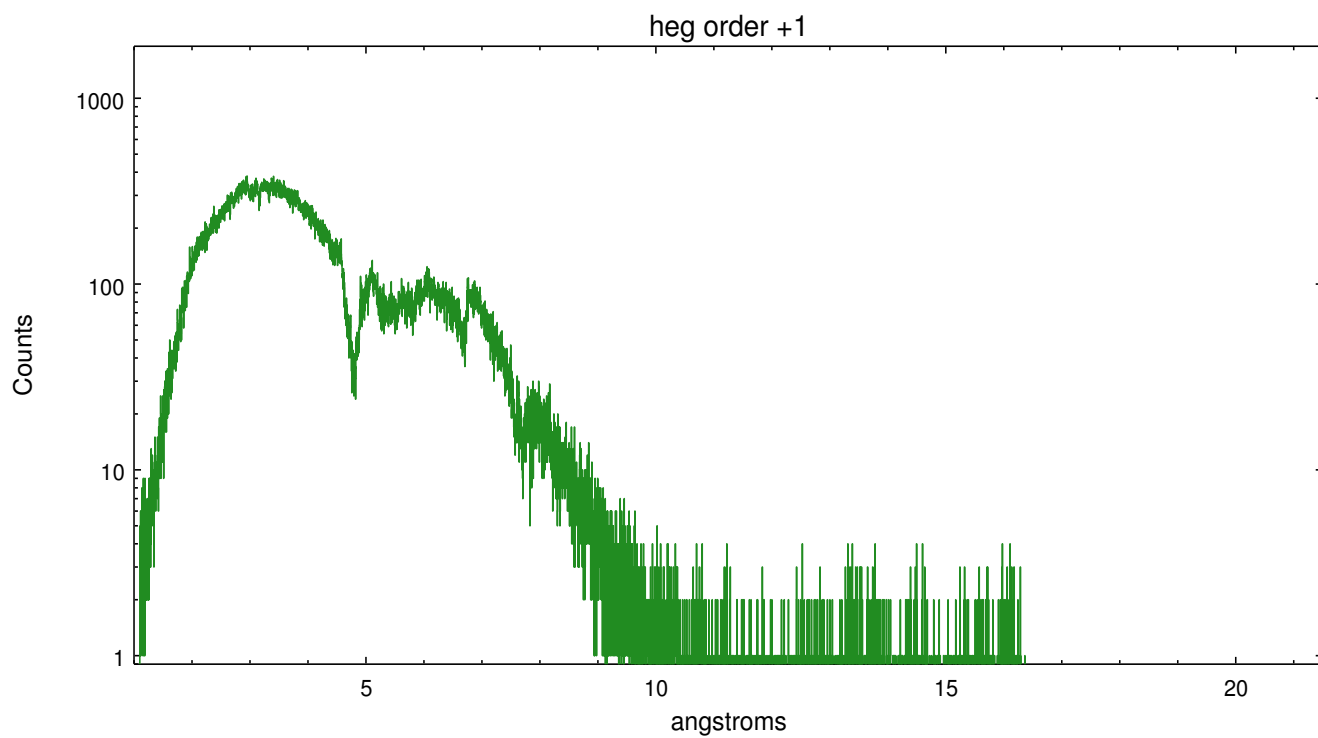
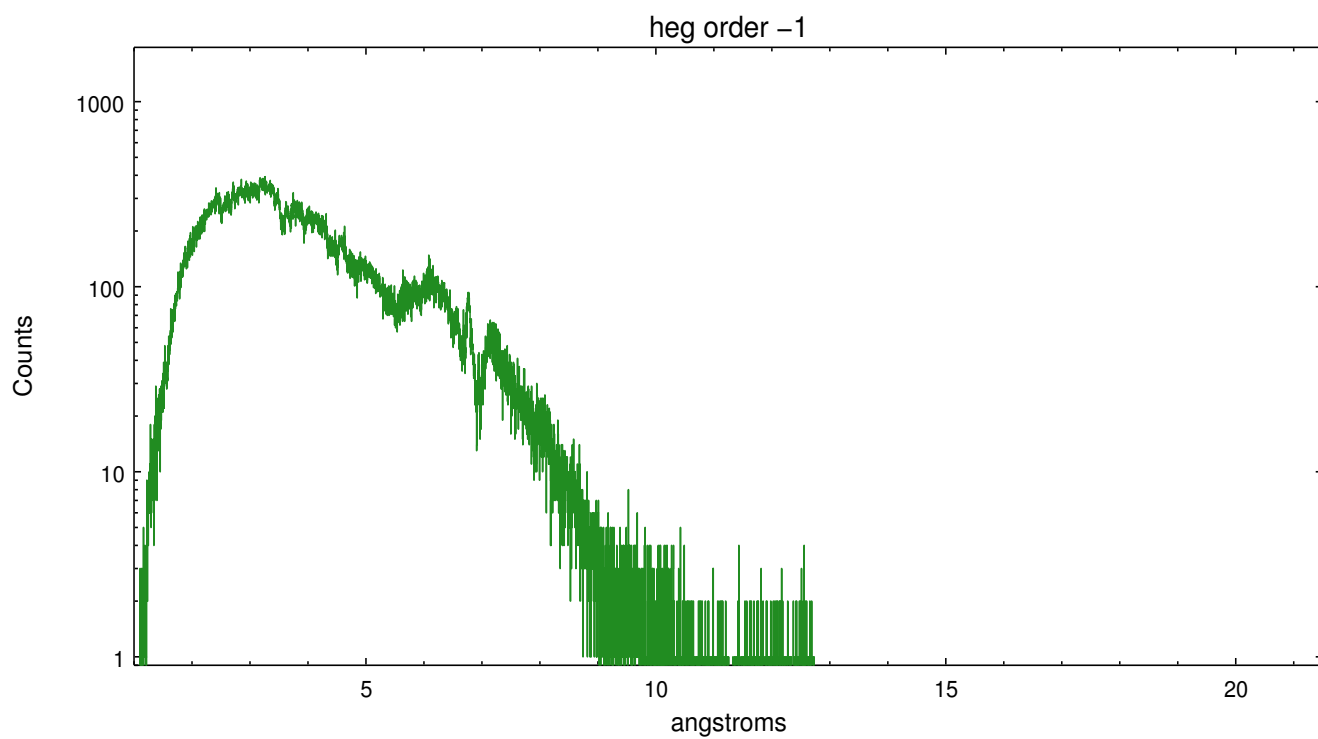


Spot Image HEG

Full Detector HEG

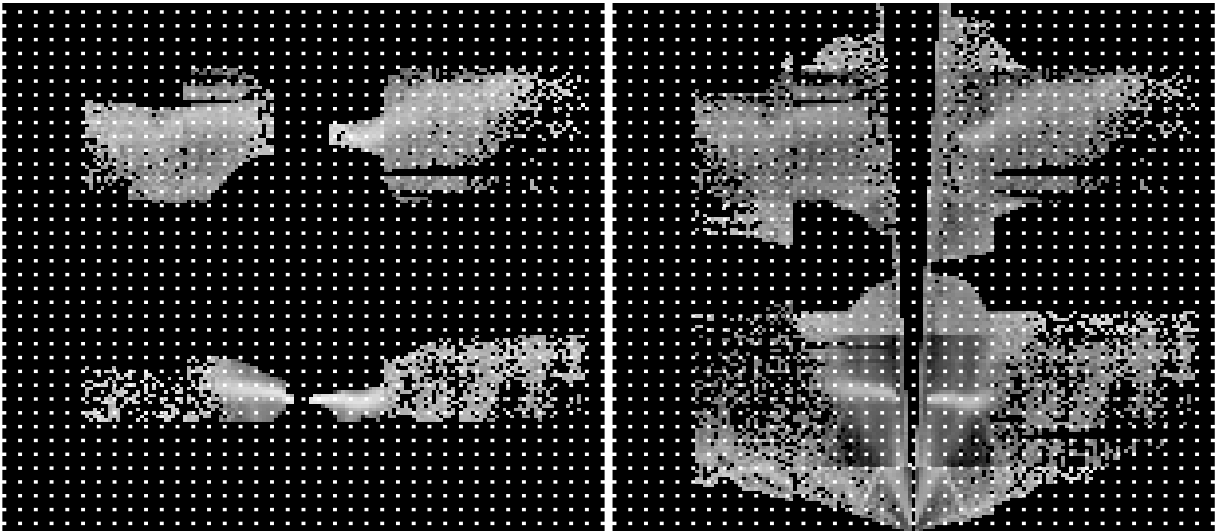
|        | order<br>-3 | order<br>-2 | order<br>-1 | order 0 | order 1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|---------|---------|------------|------------|
| Events | 16317       | 40337       | 397664      | 1260303 | 370202  | 37941      | 17392      |





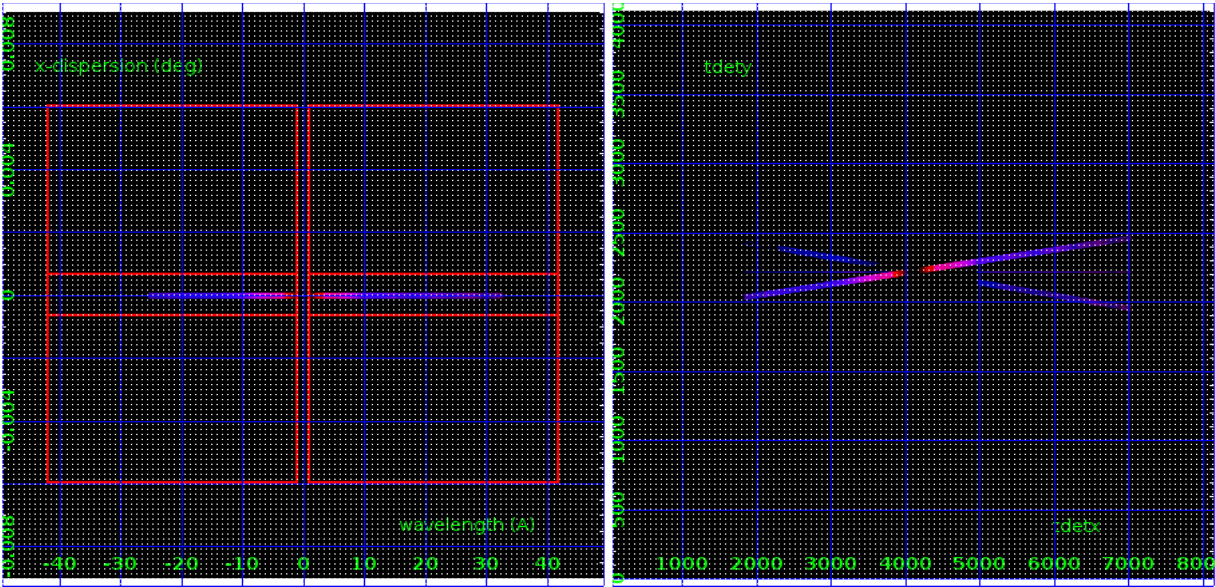


3.2 MEG Arm



MEG Order Sort 123

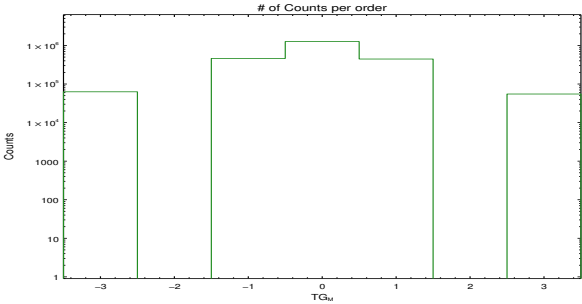
MEG Order Sort ALL

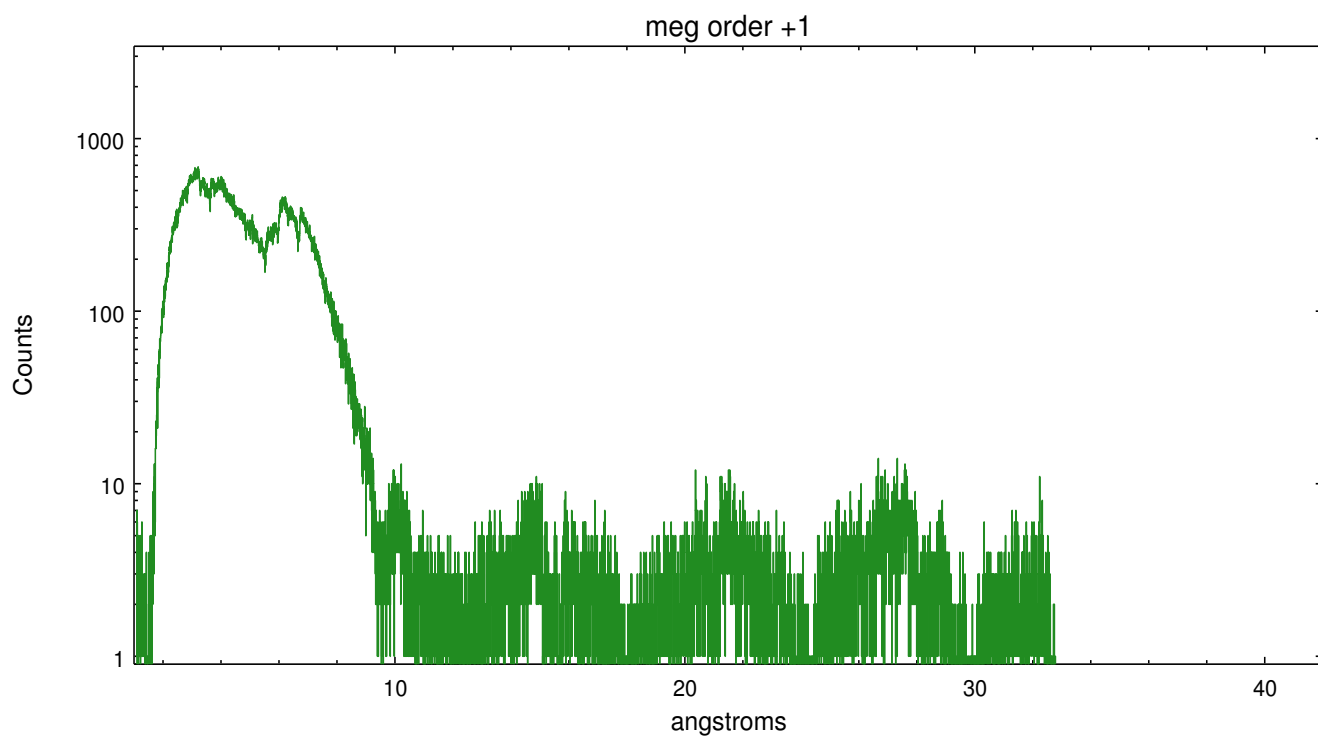
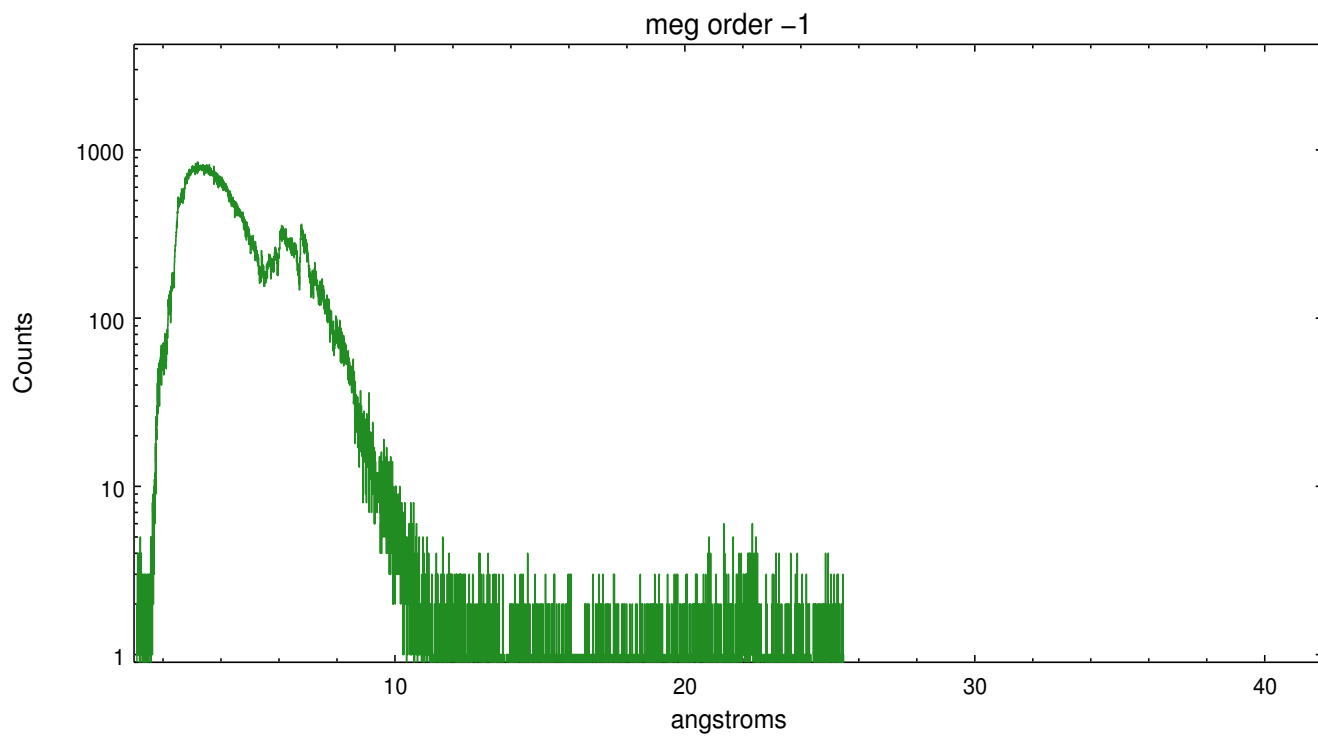


Spot Image MEG

Full Detector MEG

|        | order<br>-3 | order<br>-2 | order<br>-1 | order 0 | order 1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|---------|---------|------------|------------|
| Events | 62922       | 0           | 460349      | 1260303 | 444684  | 0          | 55057      |





# A Summary

## A.1 Status

|                            |                |
|----------------------------|----------------|
| V&V Scientist              | David Principe |
| V&V Date (YYYY-MM-DD)      | 2019.08.14     |
| V&V Edition                | 1              |
| V&V Disposition and Status | OK             |
| V&V Charge Time            | 28.103         |

## A.2 Comments

Faint grating spectra can be seen in an image of bad events. This is probably due to pileup in the spectrum, causing migration to bad grades. This should be considered in analysis.