

# V&V Reference Report

## L2 ASCDS Version : 10.6

Observation 20119 - L2 Version 2  
Chandra X-Ray Center

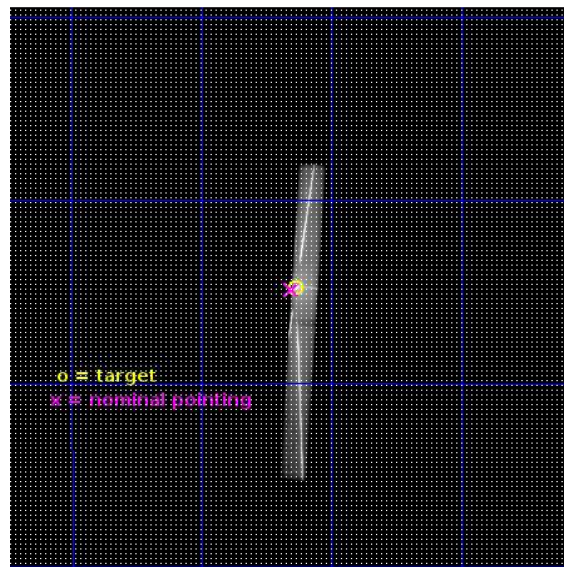
L2 Processing Date : Jul 25 2017

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# 1 Front

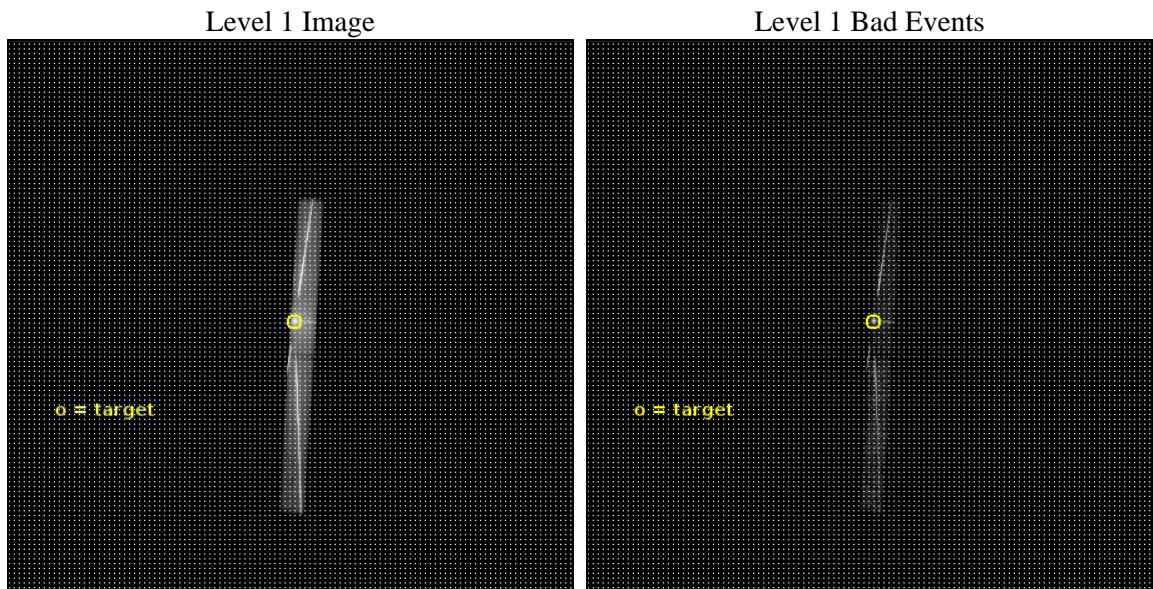
|          |  |   |
|----------|--|---|
| seq_num  | 901347   | Sequence number                             |
| obs_id   | 20119  | Observation id                              |
| title    | THE ATOMIC TO DUST ABUNDANCE RATIO OF SILICON TOWARDS THE GALACTIC BULGE | Proposal title                              |
| observer | Norbert Schulz   | Principal investigator                      |
| object   | GX 5-1   | Source name                                 |
| dtcycle  | 0  | &#160                                       |
| cycle    | P  | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 270.284167   | Observer's specified target RA [deg]        |
| dec_targ | -25.079167   | Observer's specified target Dec [deg]       |
| ra_nom   | 270.28839912984  | Nominal RA [deg]                            |
| dec_nom  | -25.08140664929  | Nominal Dec [deg]                           |
| roll_nom | 273.35843347378  | Nominal Roll [deg]                          |
| revision | 2  | Processing version of data                  |
| ontime   | 13093.34584868   | Sum of GTIs [s]                             |
| livetime | 12100.164358162  | Livetime [s]                                |
| ontime6  | 13093.304808736  | Sum of GTIs [s]                             |
| ontime7  | 13093.34584868   | Sum of GTIs [s]                             |
| l2events | 1321426  | Number of level 2 events                    |



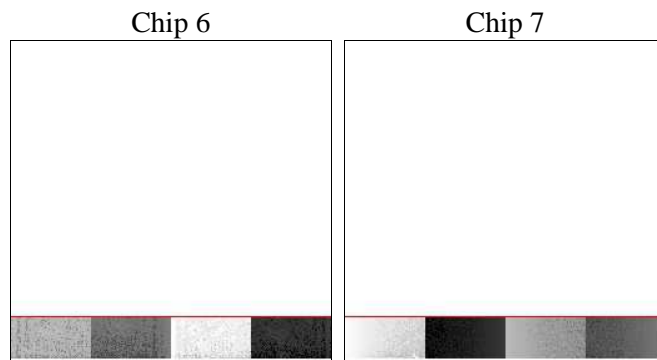
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                    |   |
|----------|---------------------|--------------------------------|----------------|--------------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 13000.000000       | [s] Scheduled observation exposure time |
| ascdsver | 10.6                | Processing system revision     | ontime         | 13093.34584868     | Sum of GTIs [s]                         |
| caldbver | 4.7.5               | &#160                          | ontime6        | 13093.304808736    | Sum of GTIs [s]                         |
| date     | 2017-07-23T13:36:06 | Date and time of file creation | ontime7        | 13093.34584868     | Sum of GTIs [s]                         |
| revision | 1                   | Processing version of data     | l1events       | 1445774            | Number of level 1 events                |
|          |                     |                                | tgmethod       | MANUAL             | Method used to create src1a file        |
|          |                     |                                | zo_pos         | (4124.00, 4117.75) | src1a sky pixel position                |
|          |                     |                                | zo_pos_tgd     | (4124.02, 4117.42) | src1a sky pixel position via tgdetect   |

### 2.1.4 Events

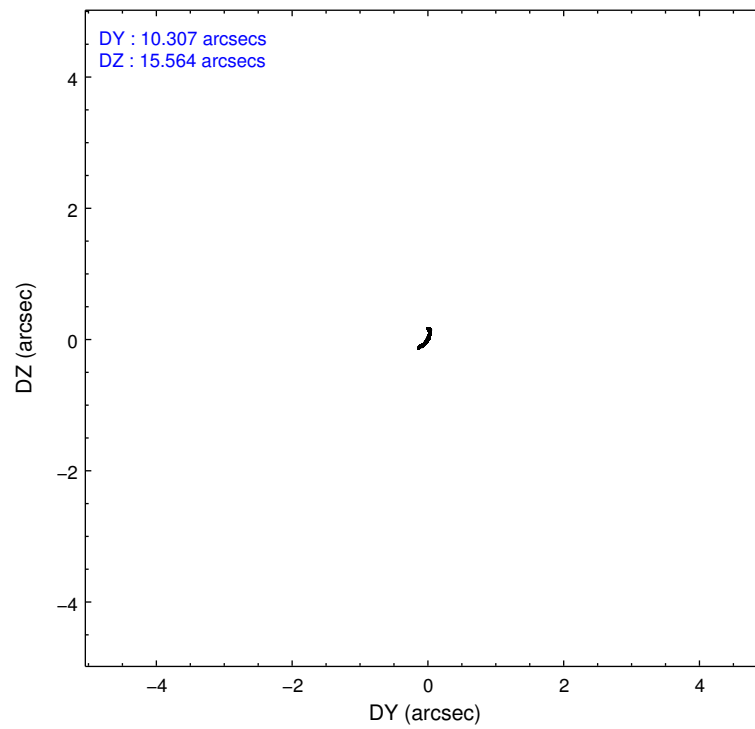
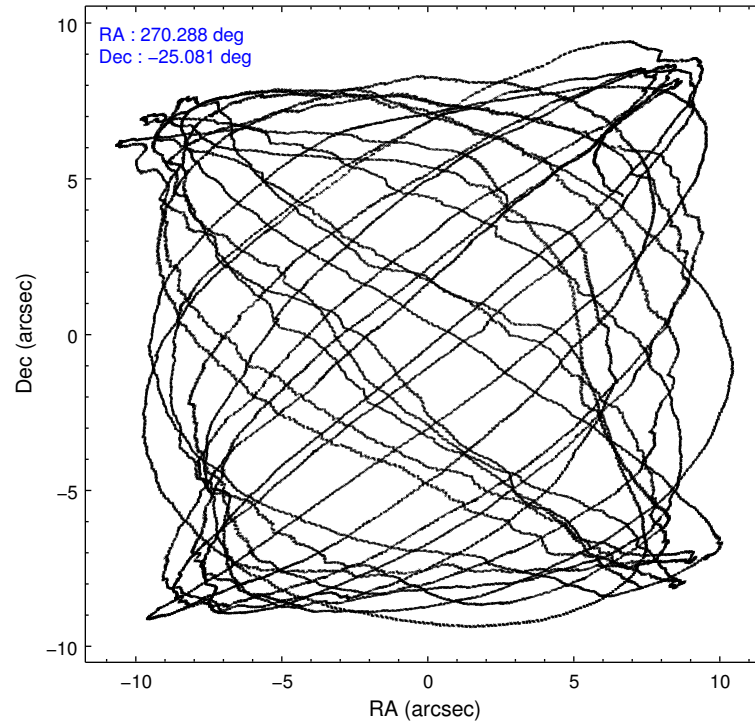
|                 | ccd 6  | ccd 7  |
|-----------------|--------|--------|
| level 1 events  | 534503 | 911271 |
| rejected events | 30491  | 60701  |
| rejected %      | 5%     | 6%     |

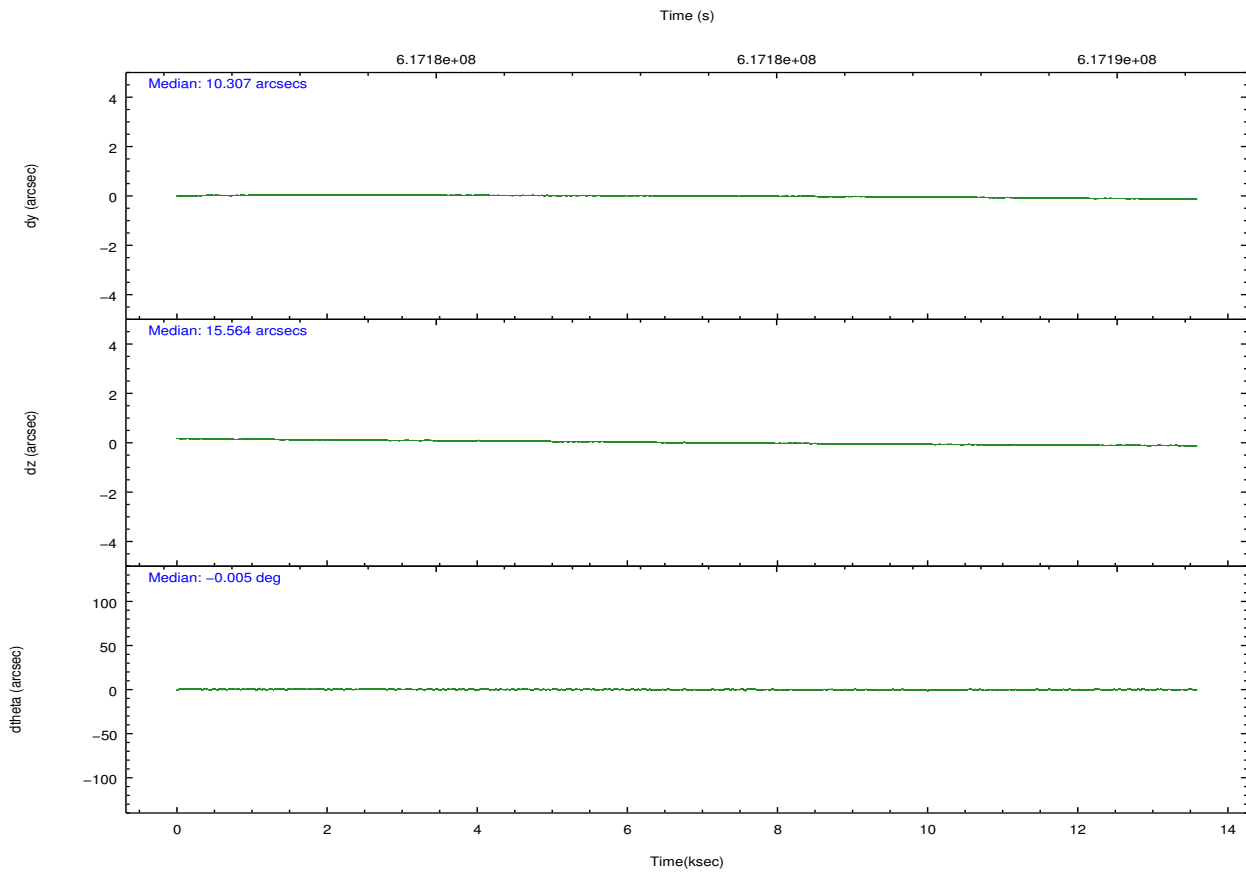
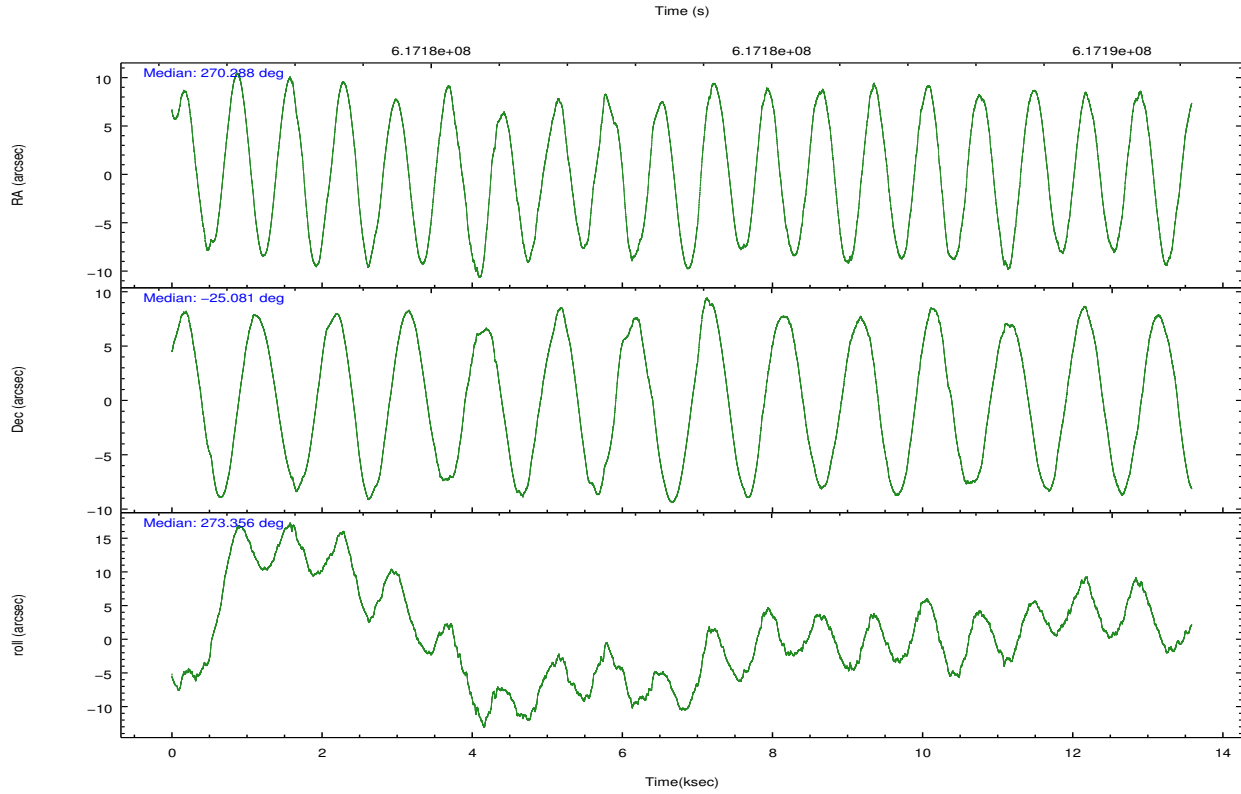
|                | ccd 6  | ccd 7  |
|----------------|--------|--------|
| grade 0 events | 328153 | 145628 |
|                | 61%    | 15%    |
| grade 1 events | 4326   | 3880   |
|                | 0%     | 0%     |
| grade 2 events | 74433  | 199057 |
|                | 13%    | 21%    |
| grade 3 events | 26918  | 89728  |
|                | 5%     | 9%     |
| grade 4 events | 26419  | 89067  |
|                | 4%     | 9%     |
| grade 5 events | 5467   | 19849  |
|                | 1%     | 2%     |
| grade 6 events | 48138  | 327159 |
|                | 9%     | 35%    |
| grade 7 events | 20649  | 36903  |
|                | 3%     | 4%     |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar format version number          | 7         | 7       |
| Detector                          | ACIS-67             | ACIS-67              | 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                 | 270.271381          | 270.2883991298391    | Subarray requested                    | CUSTOM    | CUSTOM  |
| [deg] Pointing Dec                | -25.058718          | -25.08140664929029   | Subarray start row                    | 10        | 10      |
| [deg] Pointing Roll               | 273.194582          | 273.3584334737816    | Subarray row count                    | 134       | 134     |
| [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  | 0.5     |
| [mm] SIM translation stage pos    | -178.032523         | -178.0336378728605   |                                       |           |         |
| [mm] SIM translation stage offset | -12.1               | -12.09888471014733   |                                       |           |         |
| [s] Observation start time (MET)  | 617177463.184000    | 617176501.7209001    |                                       |           |         |
| Observation start date            | 2017-07-23T06:09:54 | 2017-07-23T05:55:01  |                                       |           |         |
| [s] Observation end time (MET)    | 617190463.184000    | 617191262.74676      |                                       |           |         |
| Observation end date              | 2017-07-23T09:46:34 | 2017-07-23T10:01:02  |                                       |           |         |
| Read mode                         | TIMED               | TIMED                |                                       |           |         |

## 2.3 Aspect





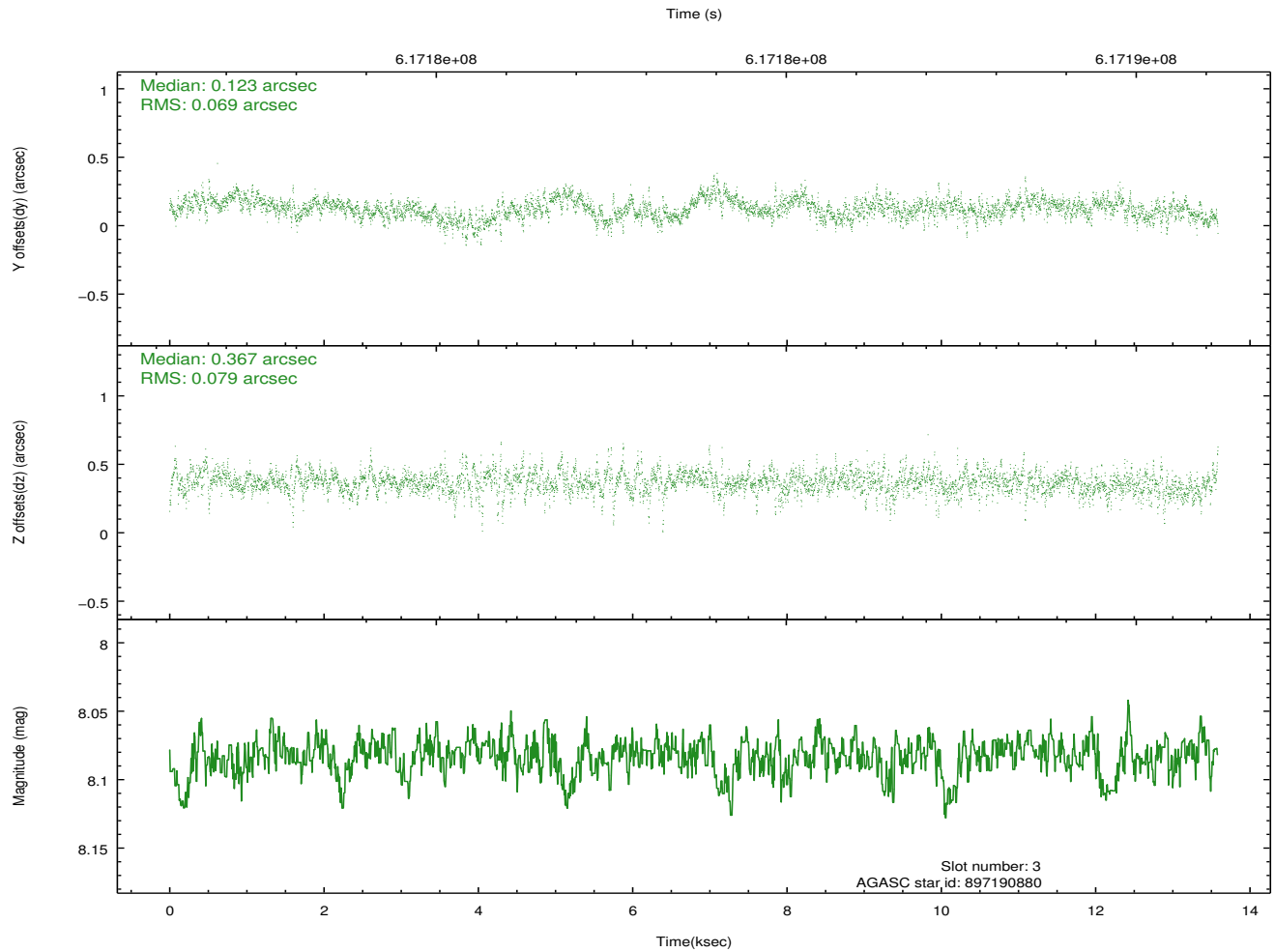
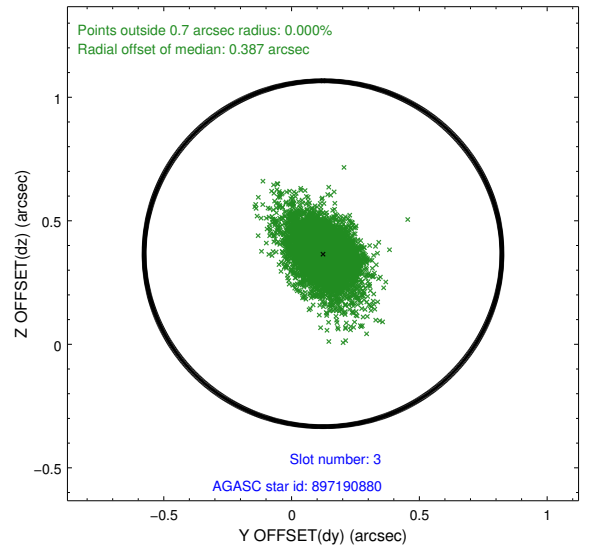
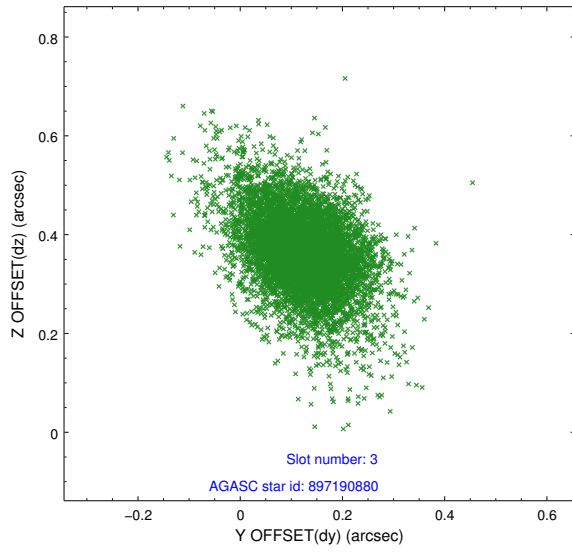
### Slot Statistics

| slot | status | used | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec        | mean_y   | mean_z   |
|------|--------|------|-----------|------|-------|--------|--------|-------|-------|------------|------------|----------|----------|
| 0    | FID    |      | ACIS-S-2  | 7.00 | 3314  | -0.238 | -0.471 | 0.007 | 0.013 | 0.000000   | 0.000000   | -762.44  | -1986.49 |
| 1    | FID    |      | ACIS-S-4  | 7.07 | 3314  | 0.462  | 0.240  | 0.006 | 0.011 | 0.000000   | 0.000000   | 2151.35  | -77.71   |
| 2    | FID    |      | ACIS-S-5  | 7.14 | 3314  | -0.256 | 0.238  | 0.007 | 0.012 | 0.000000   | 0.000000   | -1814.87 | -83.70   |
| 3    | GUIDE  | used | 897190880 | 8.08 | 6626  | 0.123  | 0.367  | 0.105 | 0.194 | 269.584058 | -25.142408 | 182.26   | -2253.17 |
| 4    | GUIDE  | used | 897323472 | 8.47 | 6558  | -0.190 | -0.207 | 0.110 | 0.210 | 270.860121 | -25.266503 | 858.17   | 1871.35  |
| 5    | GUIDE  | used | 897324960 | 7.61 | 6628  | -0.008 | -0.024 | 0.099 | 0.190 | 270.333871 | -24.632185 | -1521.22 | 289.96   |
| 6    | GUIDE  | used | 897325464 | 8.16 | 6624  | -0.081 | -0.015 | 0.097 | 0.179 | 270.454899 | -24.555059 | -1776.14 | 700.77   |
| 7    | GUIDE  | used | 897322760 | 8.53 | 6625  | 0.151  | -0.125 | 0.121 | 0.223 | 270.988015 | -25.669699 | 2334.17  | 2197.92  |

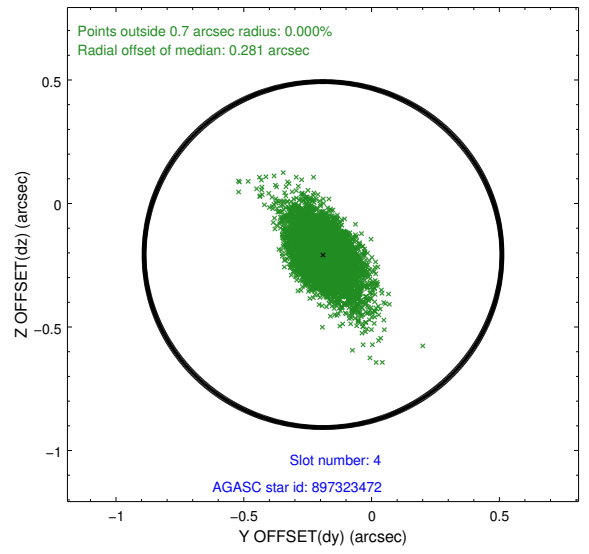
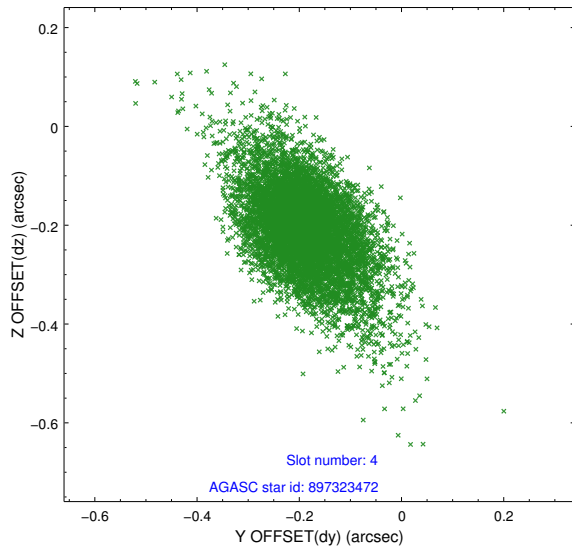
∞

## 2.4 Star Slots

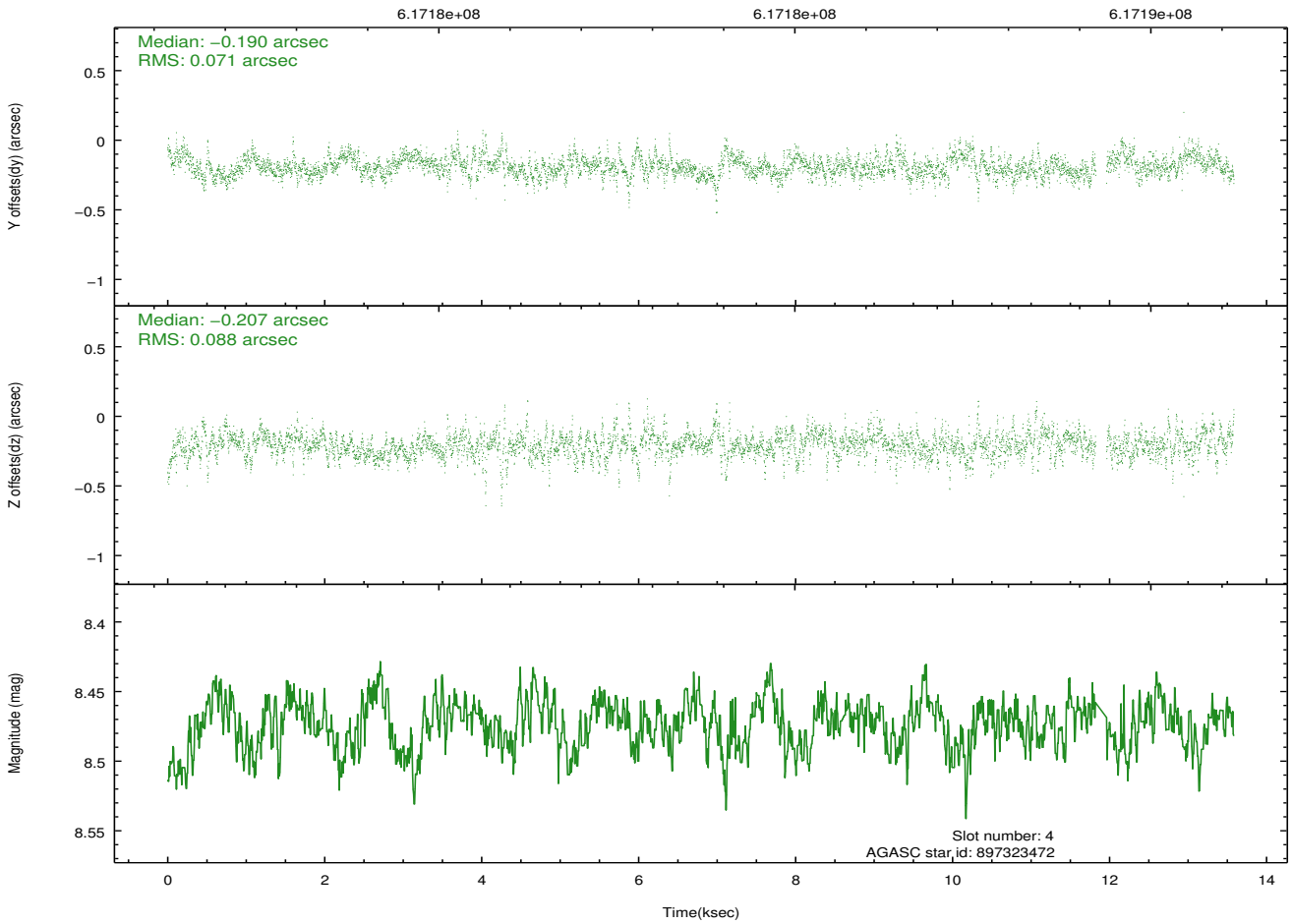
### 2.4.1 Slot 3



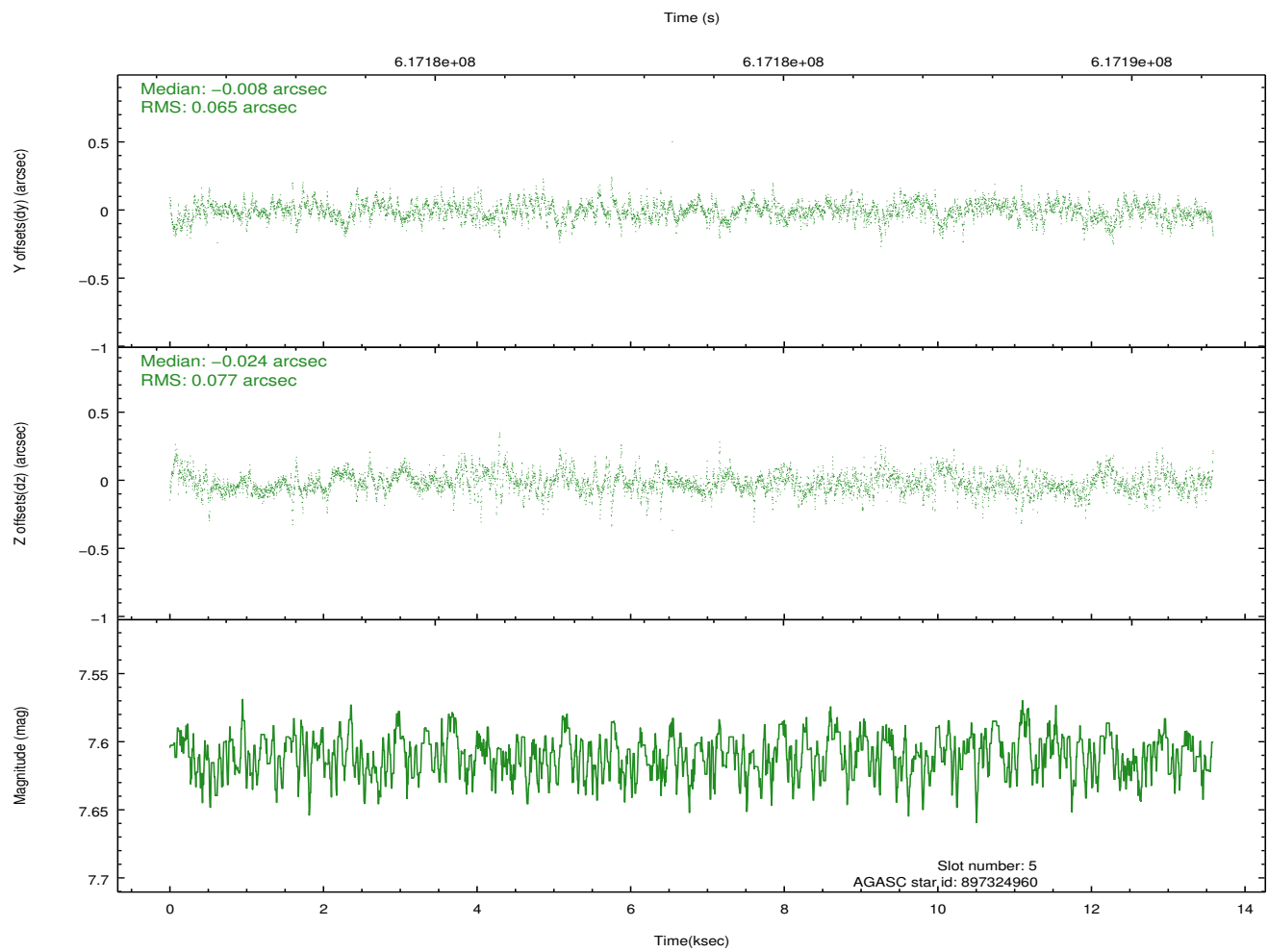
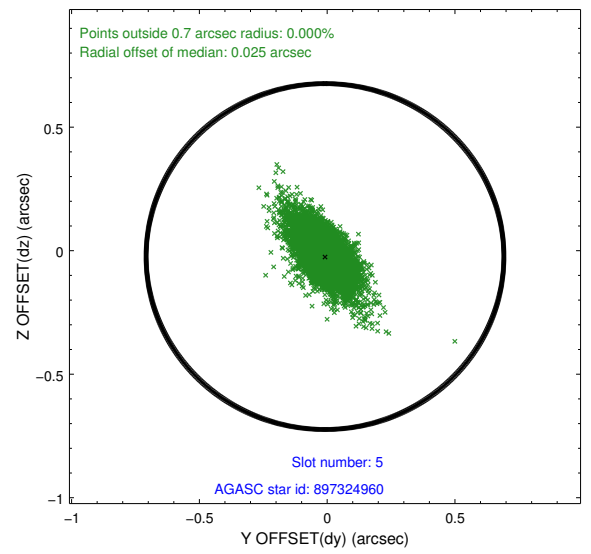
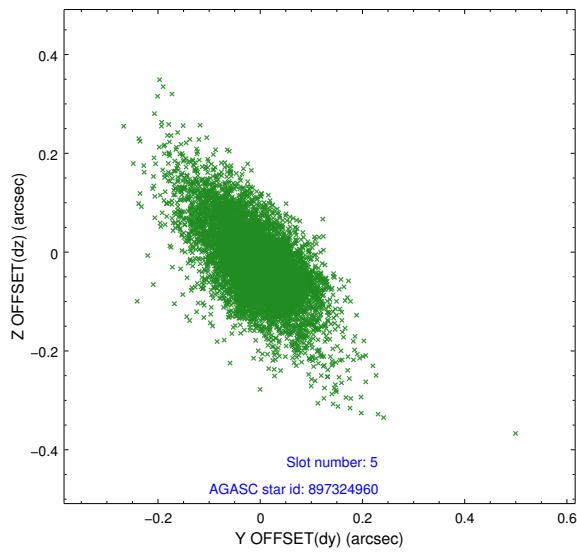
### 2.4.2 Slot 4



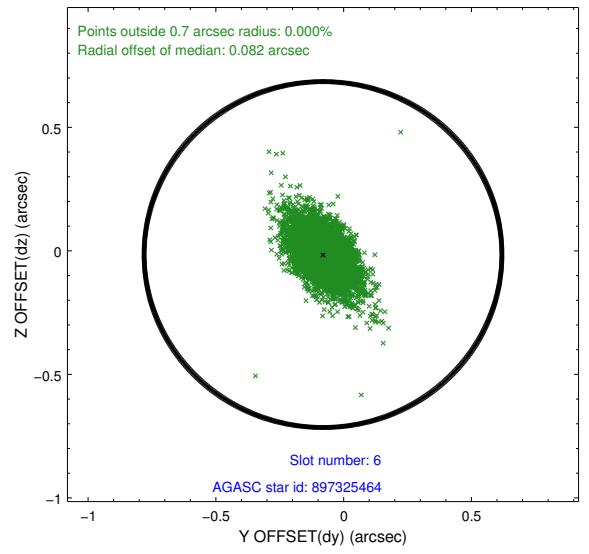
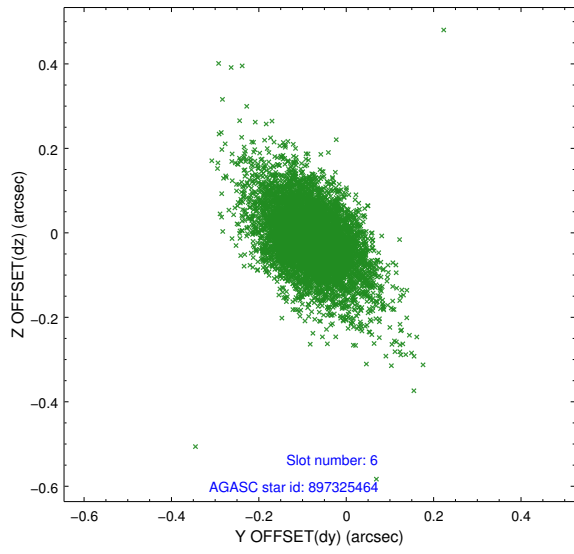
Time (s)



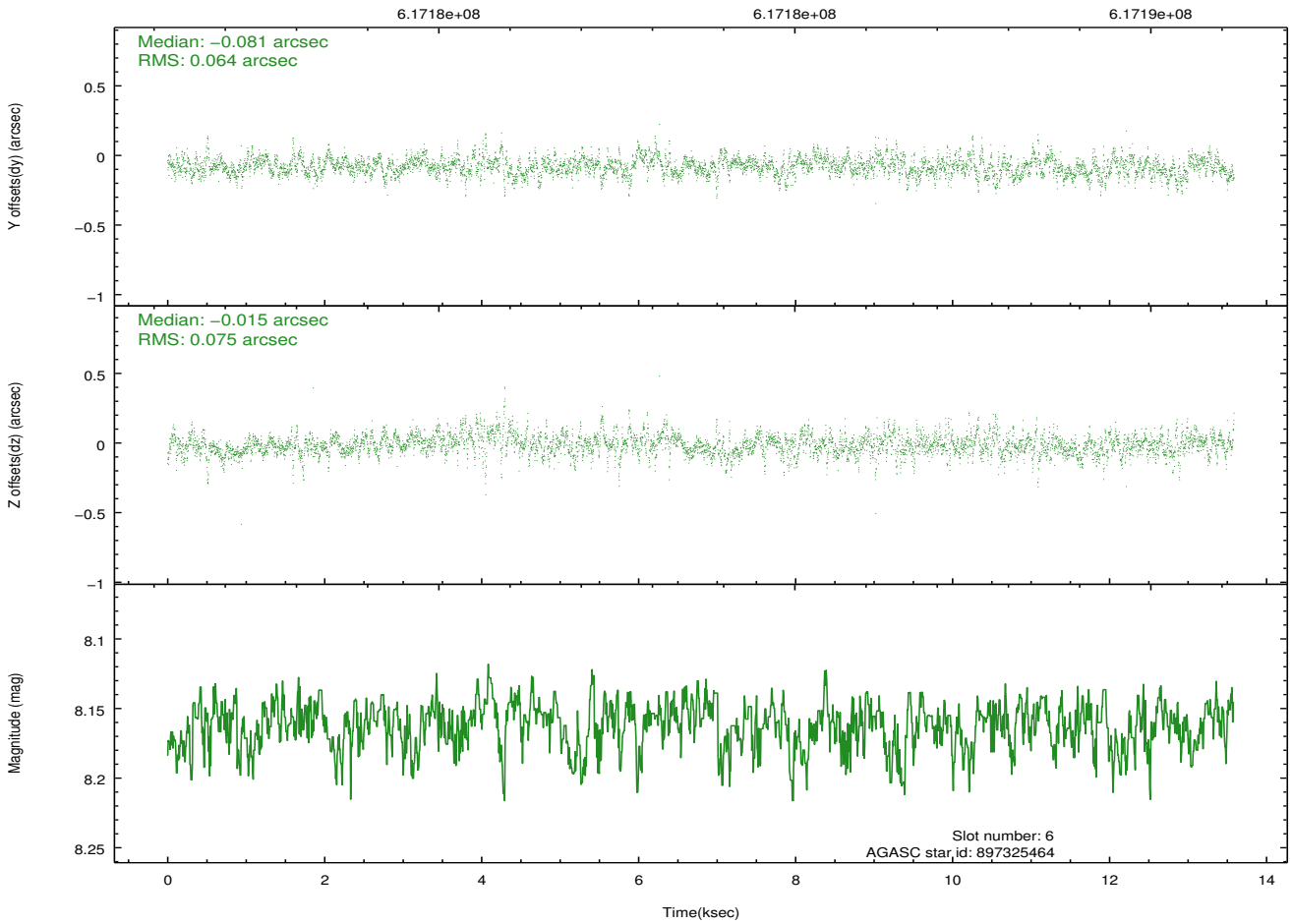
### 2.4.3 Slot 5



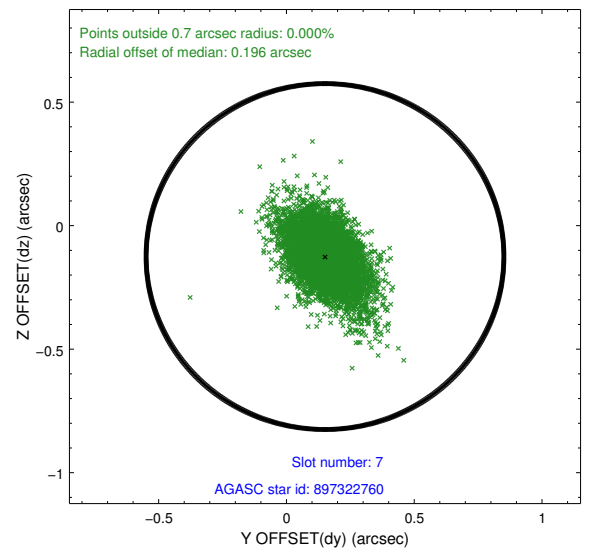
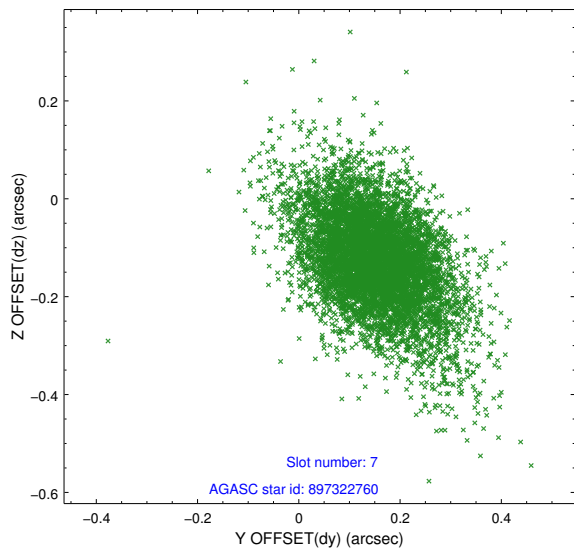
### 2.4.4 Slot 6



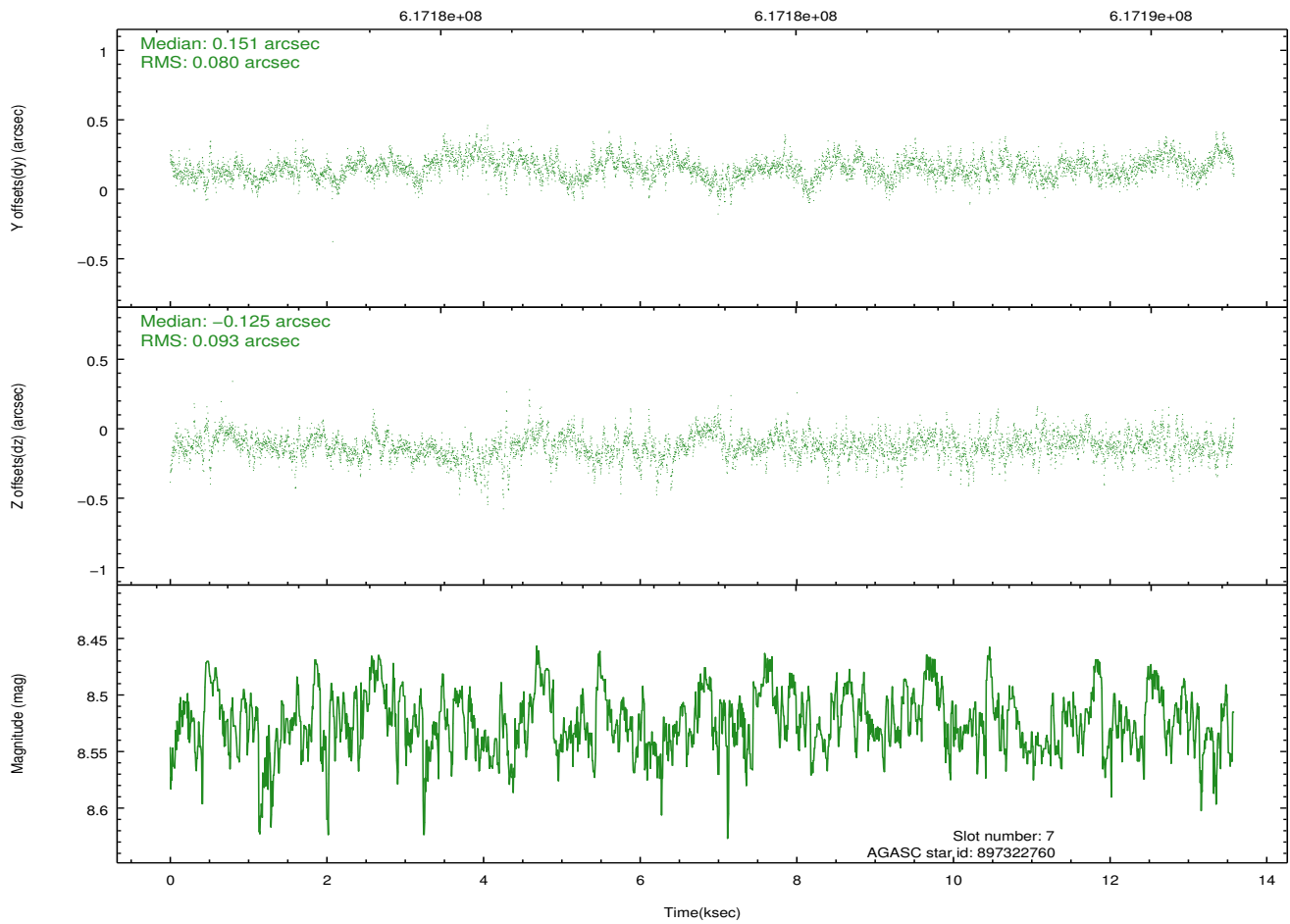
Time (s)



## 2.4.5 Slot 7

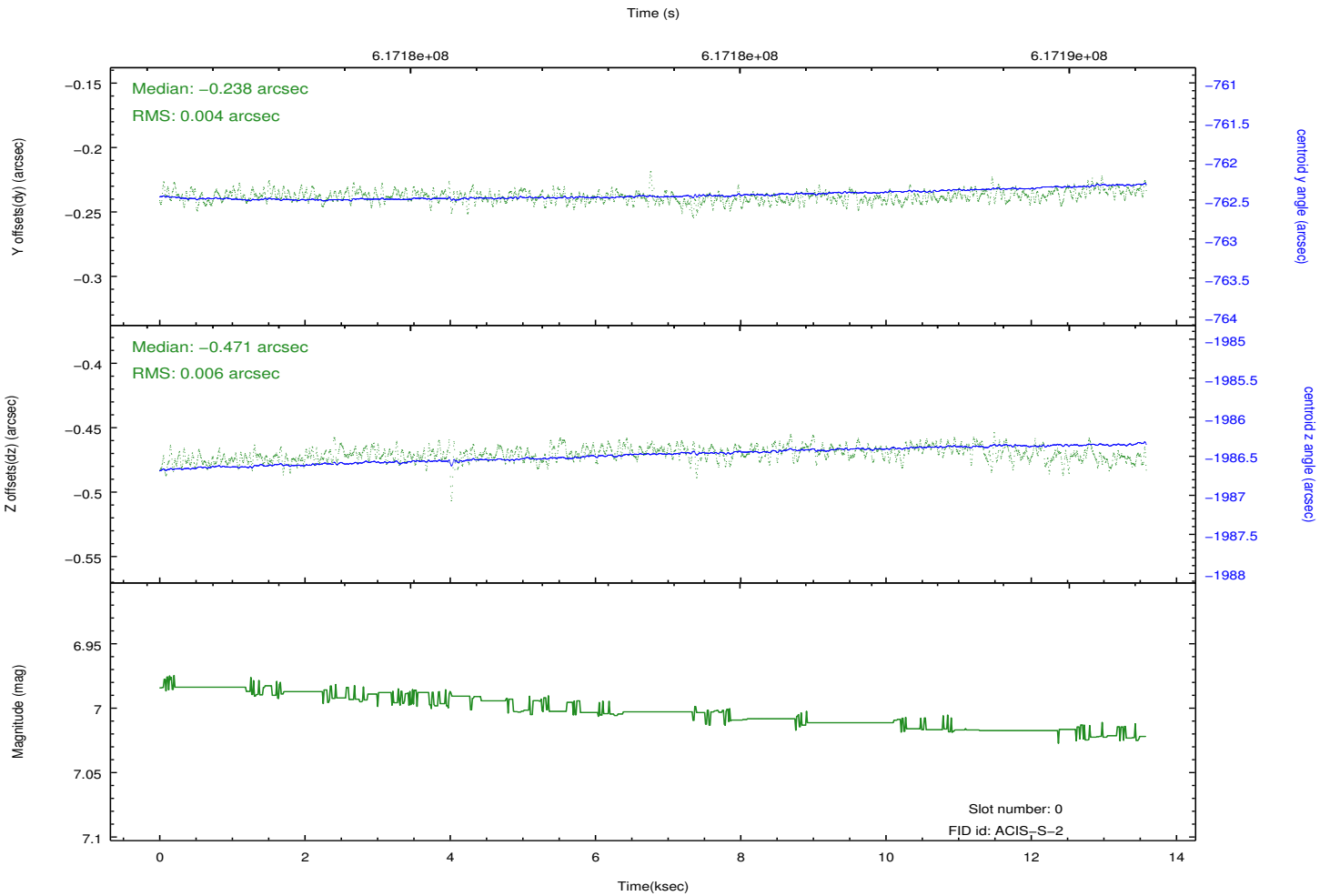
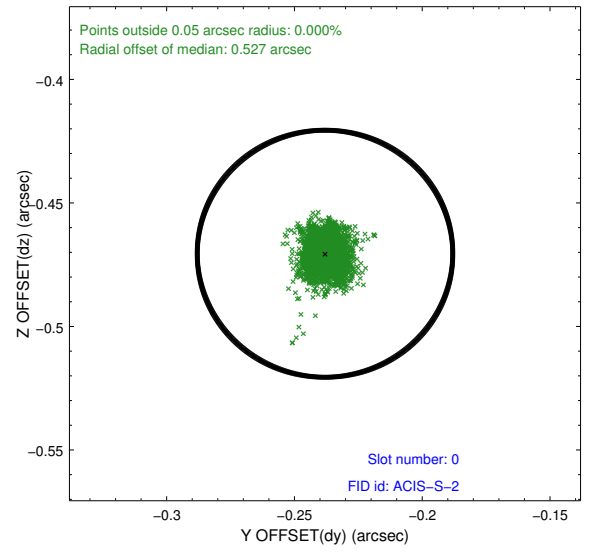
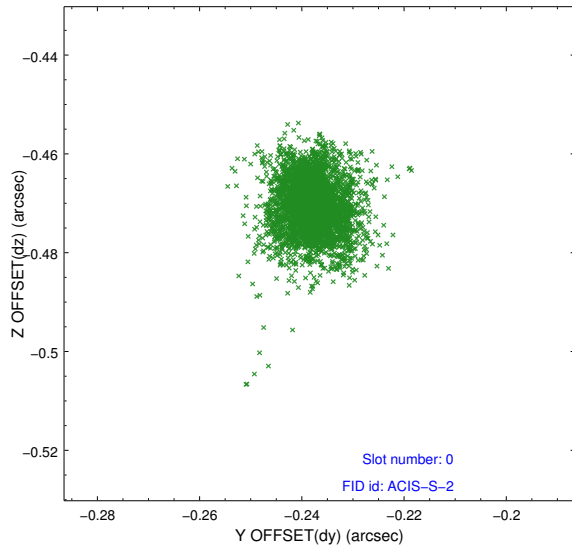


Time (s)

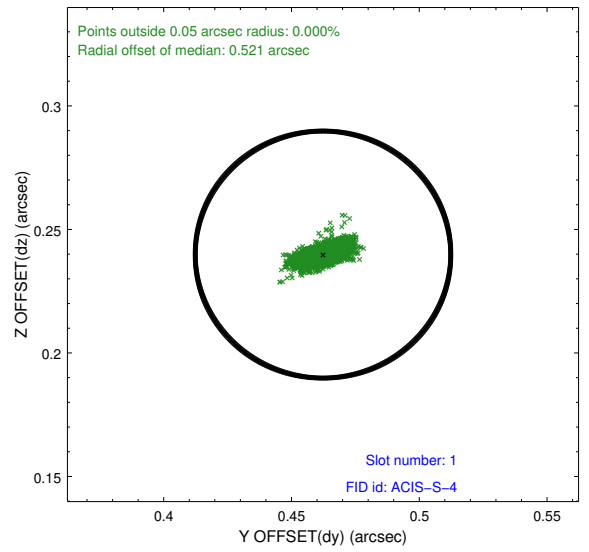
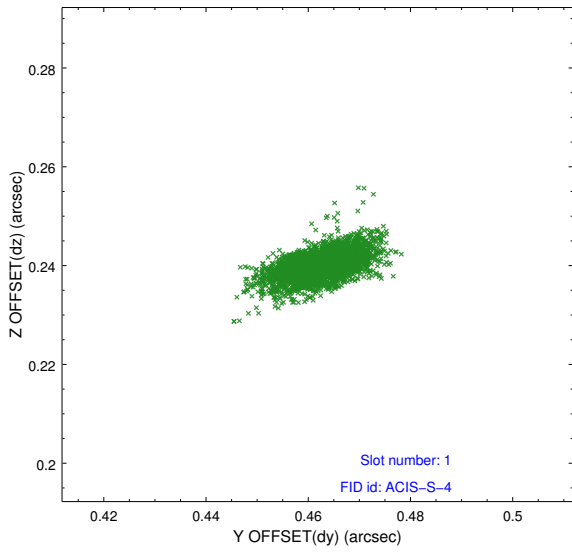


## 2.5 FID Slots

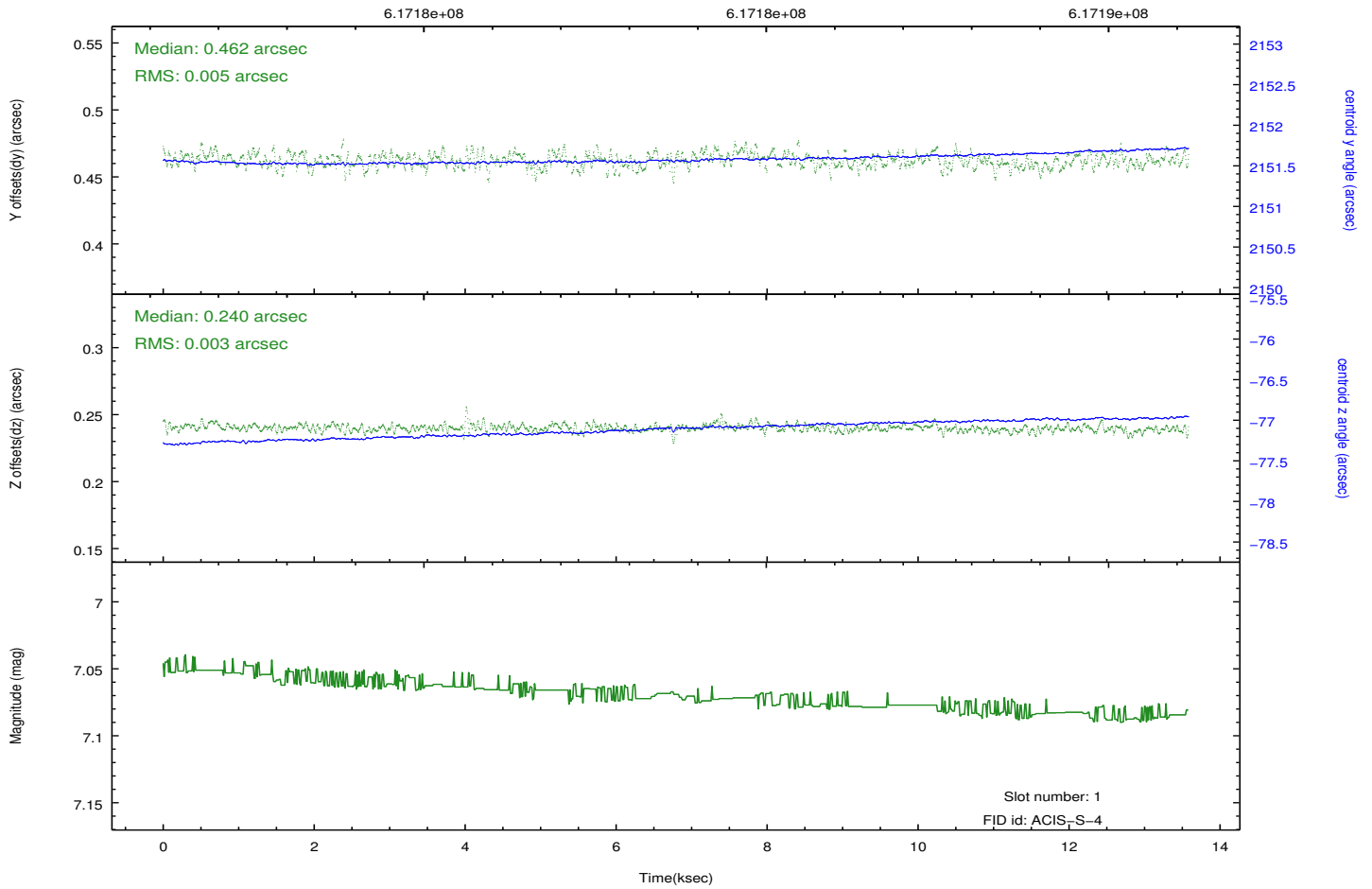
### 2.5.1 Slot 0



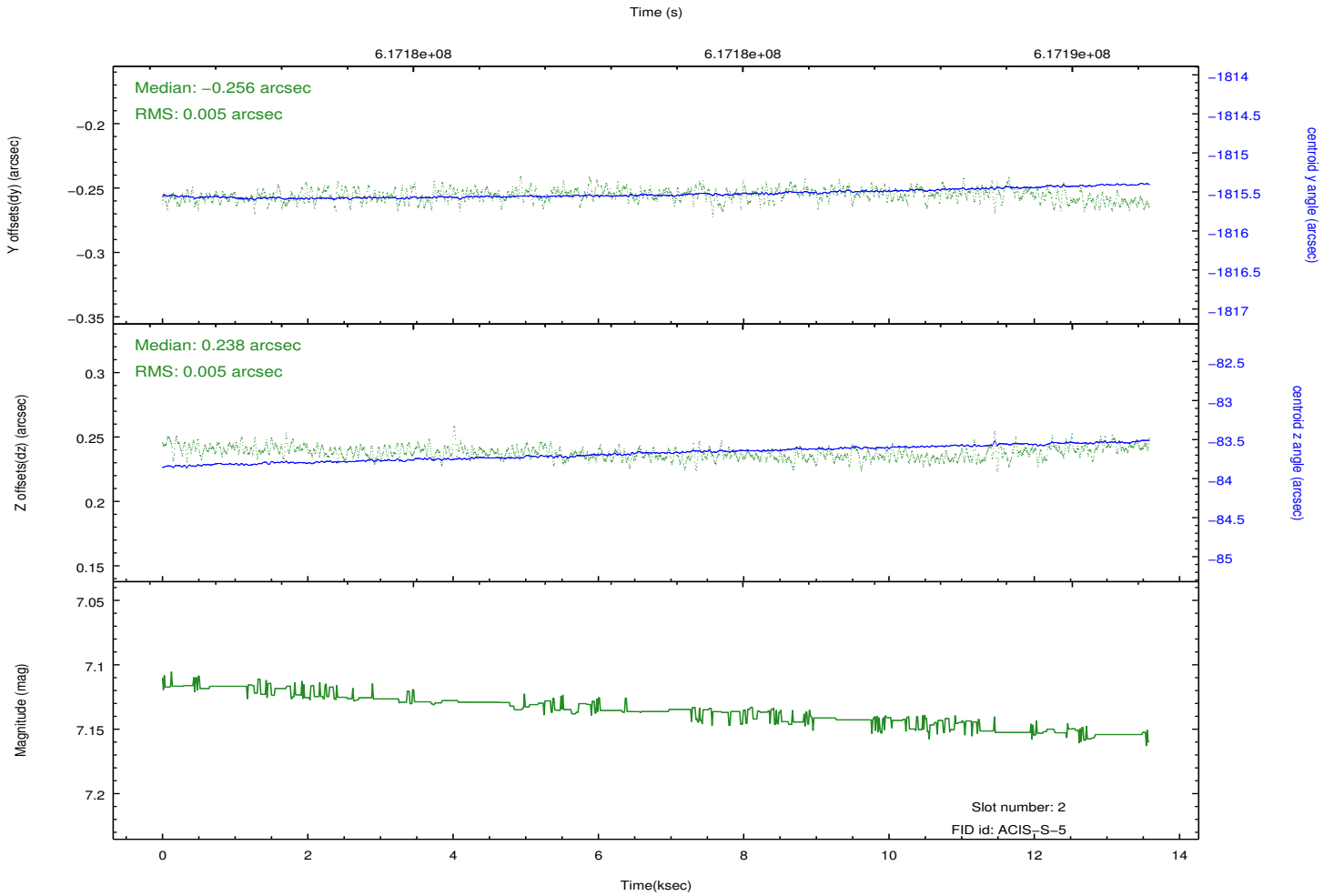
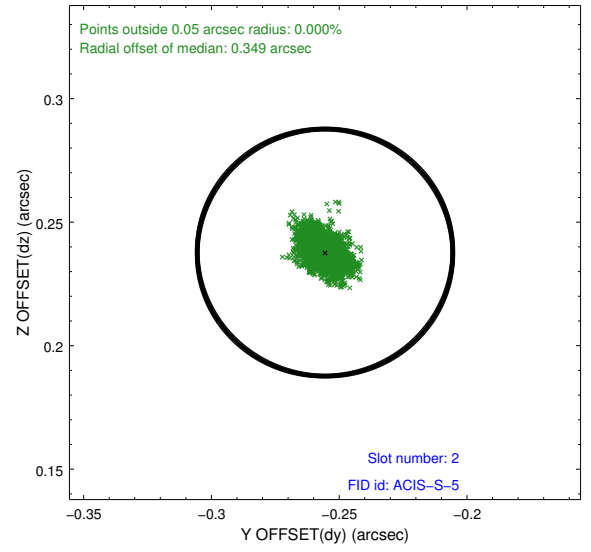
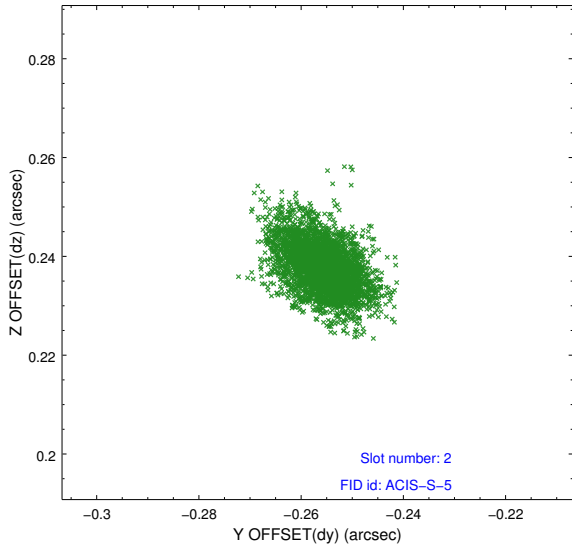
## 2.5.2 Slot 1



Time (s)

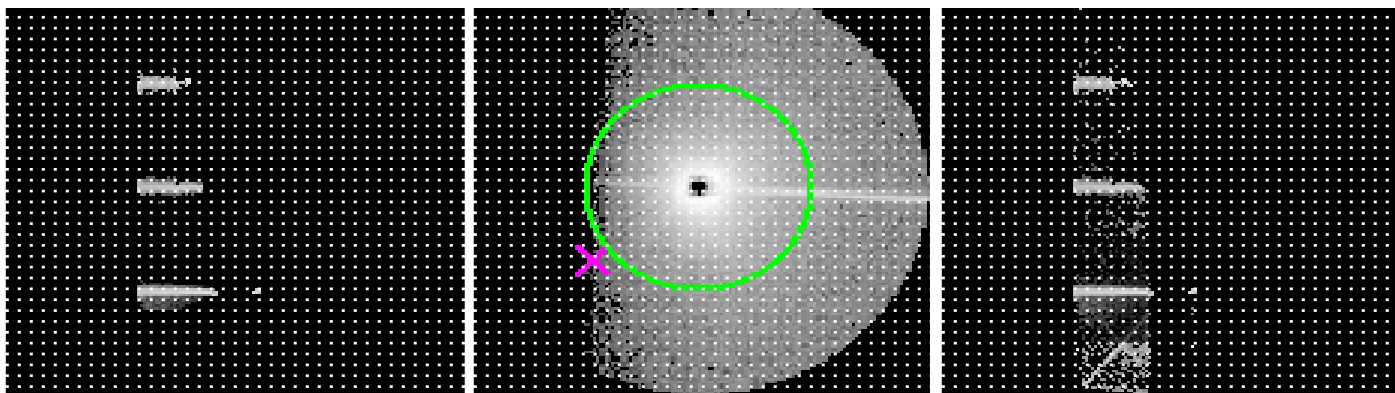


### 2.5.3 Slot 2



### 3 Gratings

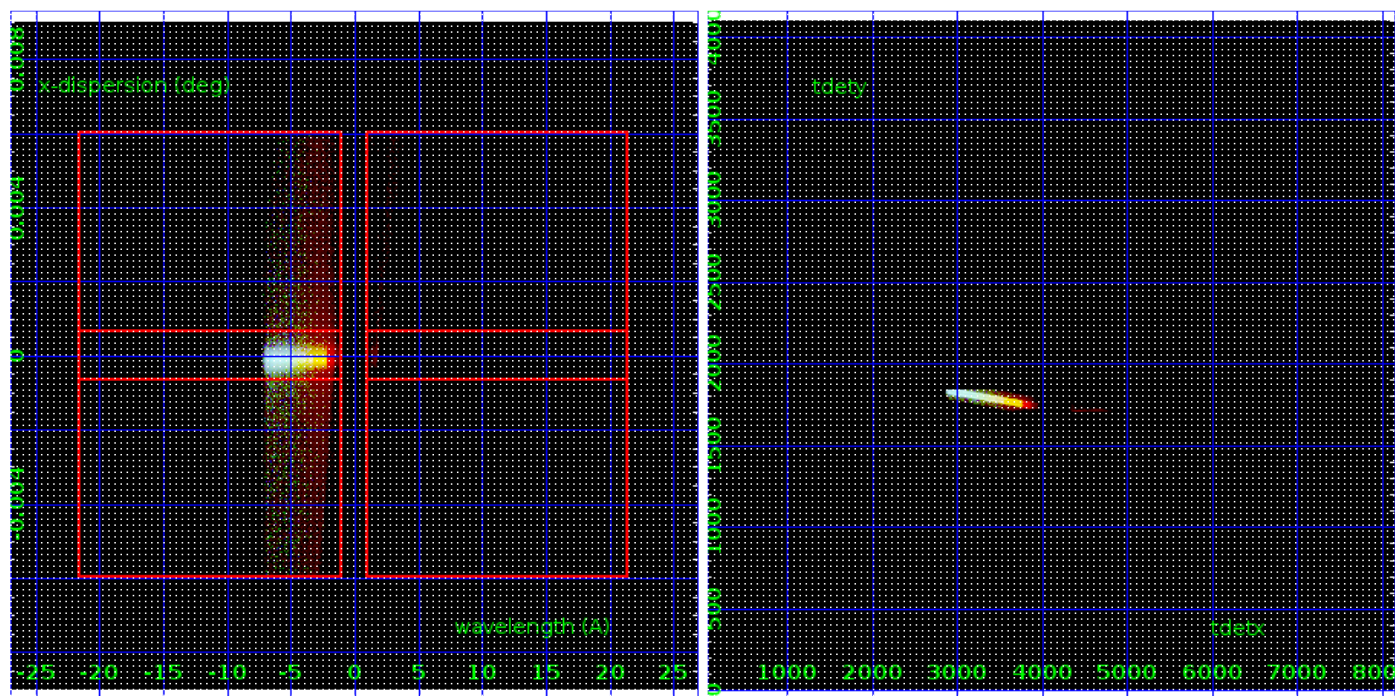
#### 3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

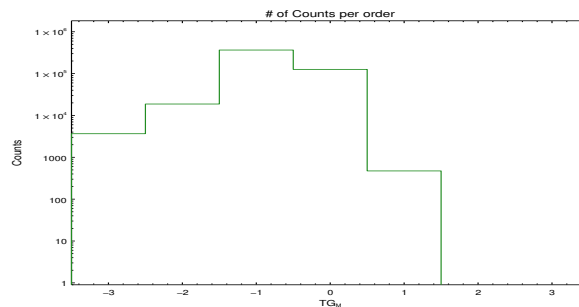
HEG Order Sort ALL

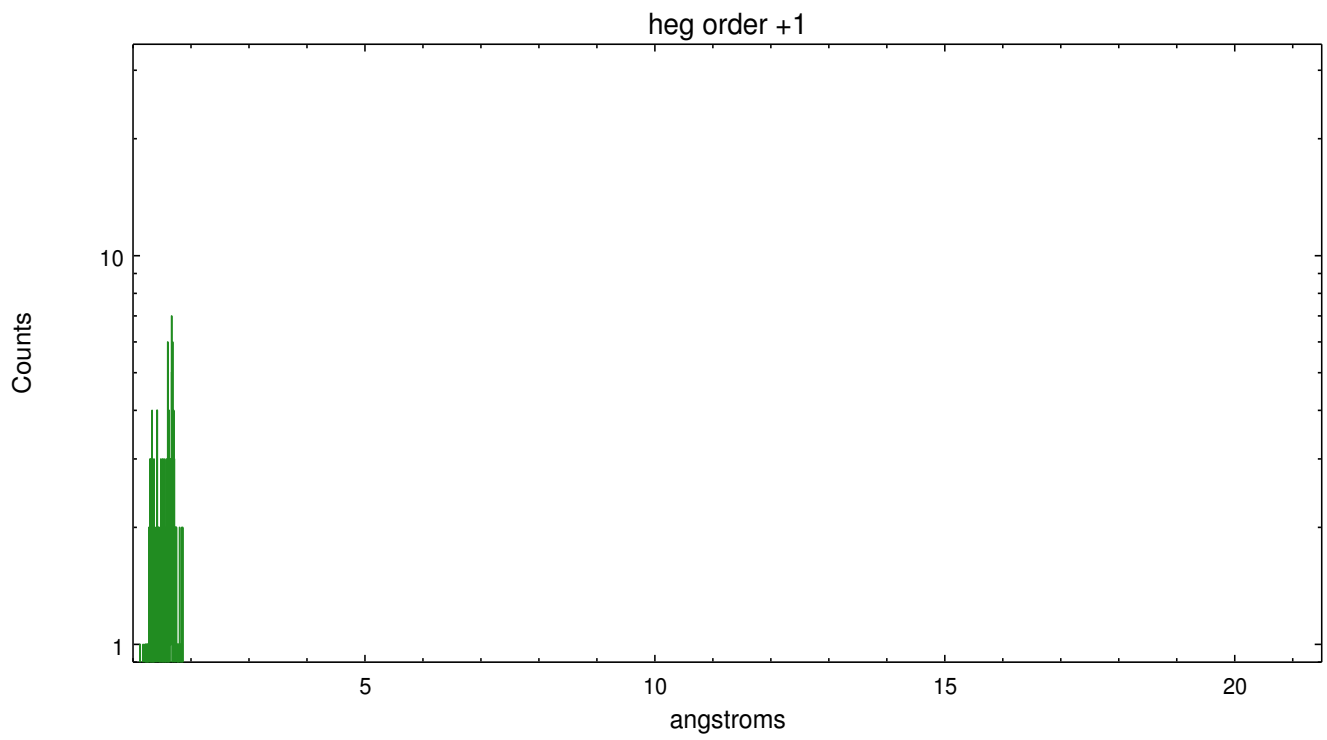
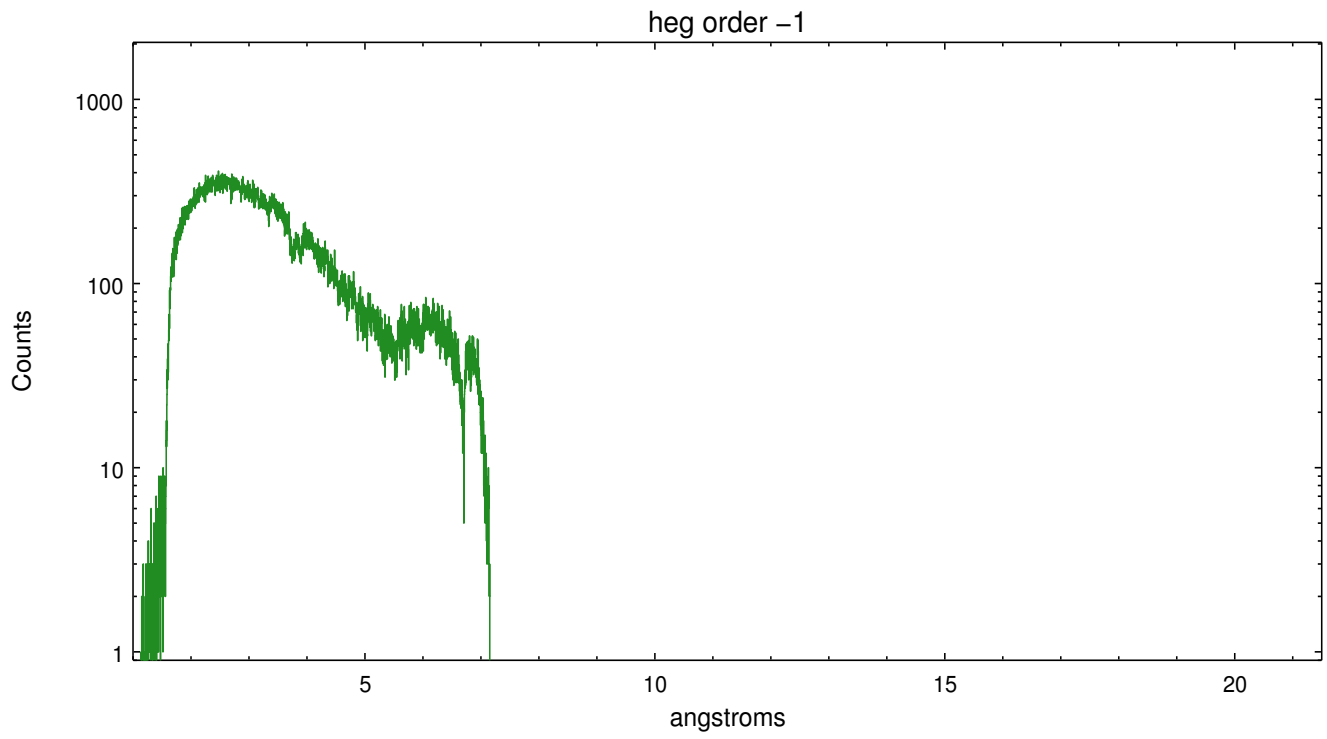


Spot Image HEG

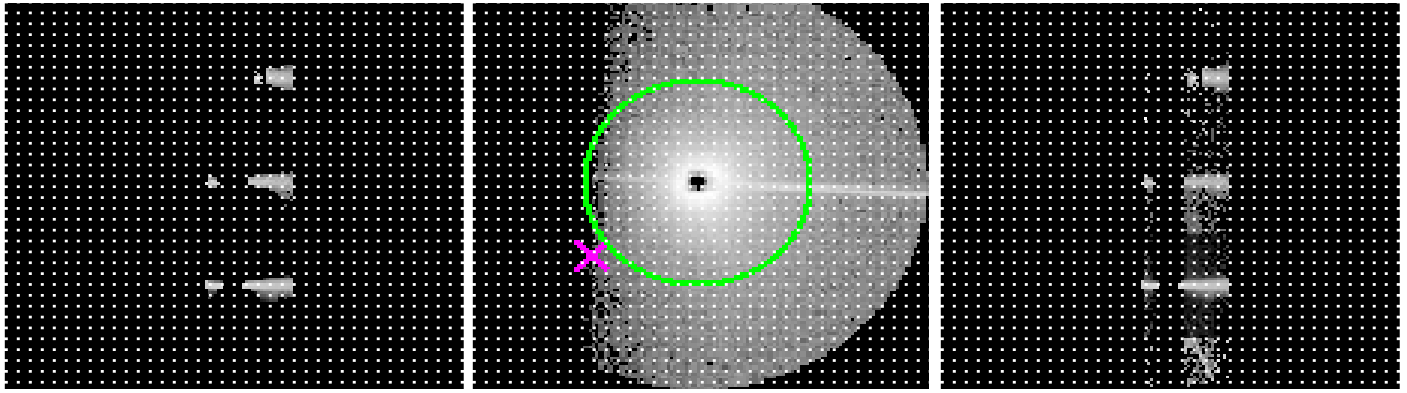
Full Detector HEG

|        | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|----------|----------|----------|---------|---------|---------|---------|
| Events | 3665     | 18761    | 365588   | 126056  | 473     | 0       | 0       |





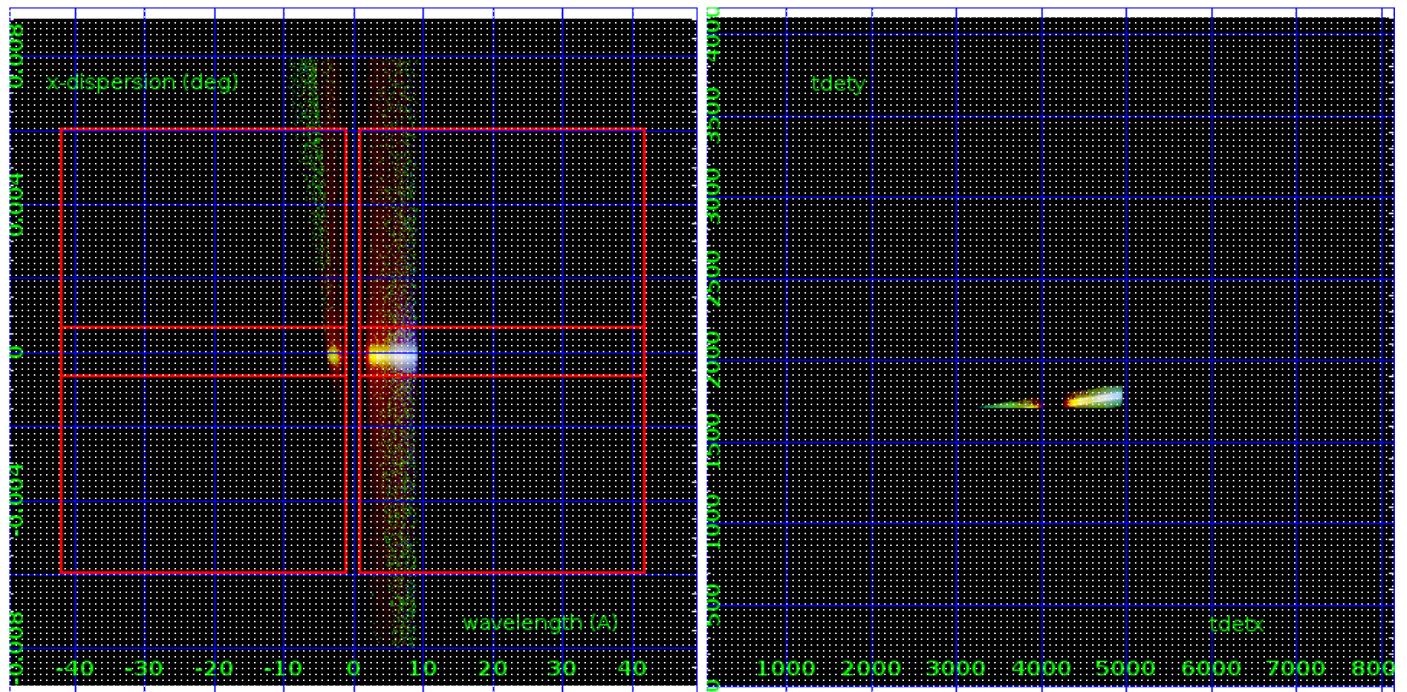
### 3.2 MEG Arm



MEG Order Sort 123

MEG Zero Order

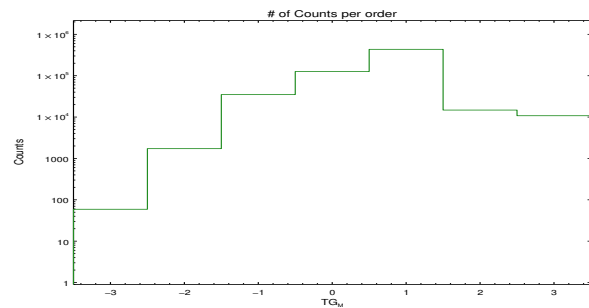
MEG Order Sort ALL



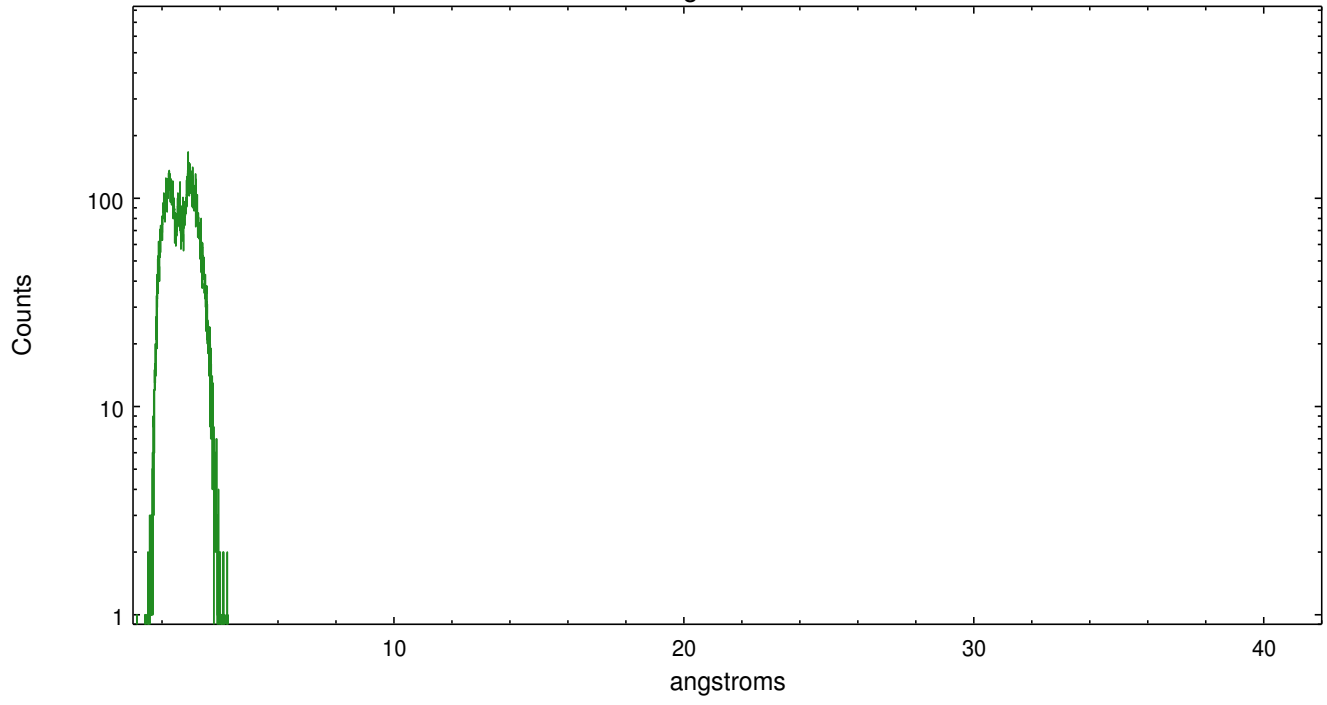
Spot Image MEG

Full Detector MEG

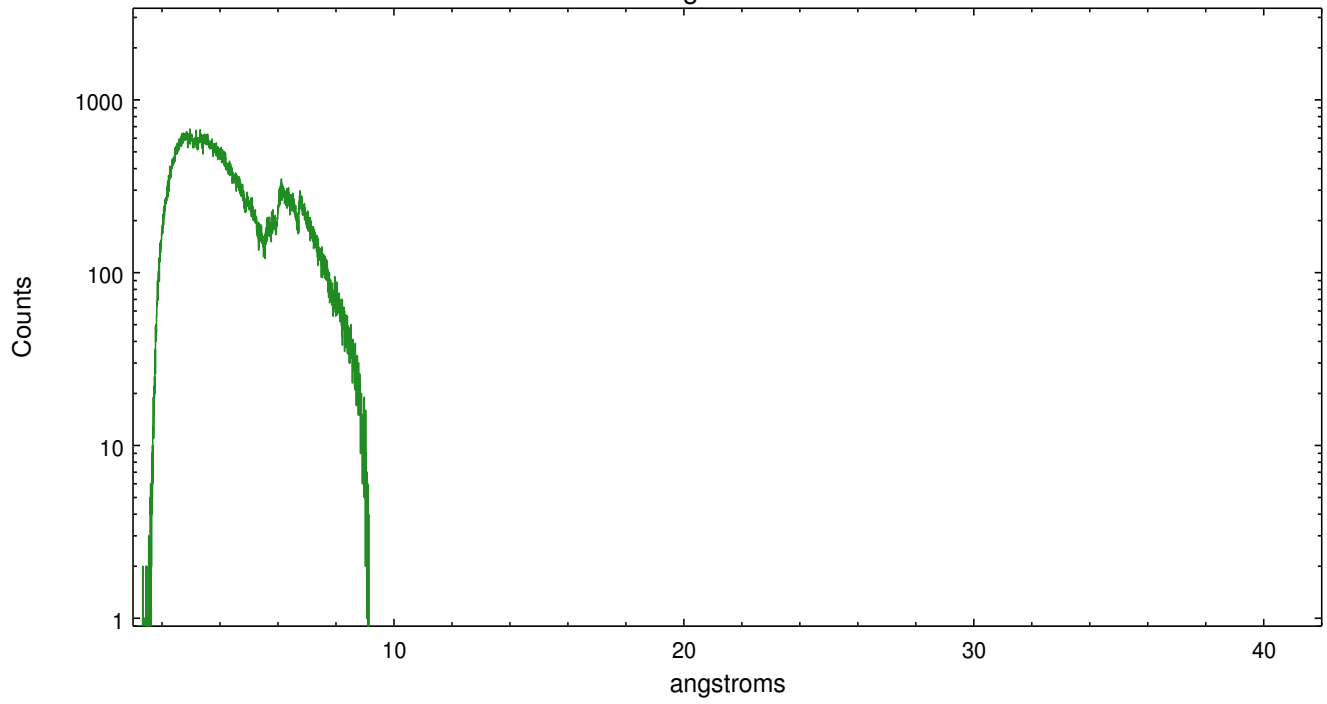
|        | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|----------|----------|----------|---------|---------|---------|---------|
| Events | 59       | 1726     | 34925    | 126056  | 433917  | 14761   | 10790   |



meg order -1



meg order +1



# A Summary

## A.1 Status

|                            |                |
|----------------------------|----------------|
| V&V Scientist              | Joy Nichols    |
| V&V Date (YYYY-MM-DD)      | 2017.07.26     |
| V&V Edition                | 1              |
| V&V Disposition and Status | OK             |
| V&V Charge Time            | 13.09334584868 |

## A.2 Comments

1) findzo position is on the rim of the crater.

Findzo failed. Zeroth order position was estimated manually by eye in ds9.

2) For such bright sources, you can also set the ds9 binning to 0.1 pixel (on the "Bin -> Binning Parameters..." menu, X,Y bin fields, and get a more accurate eyeball value.=== 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.

===

WARNING:

The bias file appears to be slightly contaminated at the position of the zeroth order and in a small trajectory from the chip edge to the zeroth order position. The difference in adu due to this possible contamination is very small, about 5-6 adu, and is probably insignificant since the source is piled up. But consideration should be made of replacing the anomalous bias values using a known technique.