

# V&V Reference Report

## L2 ASCDS Version : 8.4.4

Observation 8543 - L2 Version 3  
Chandra X-Ray Center

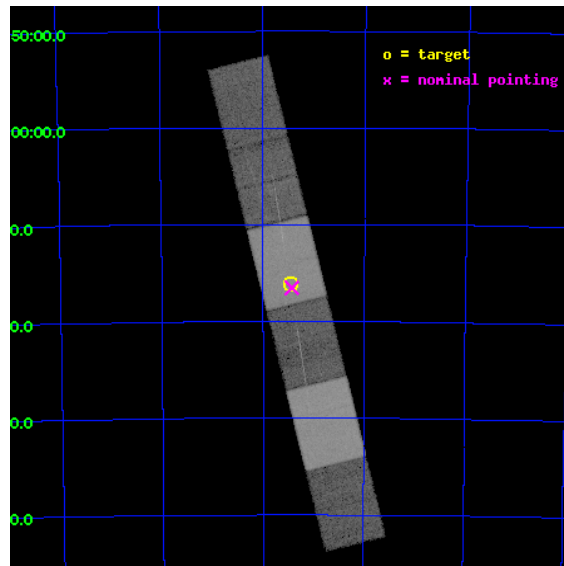
L2 Processing Date : Apr 22 2012

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# 1 Front

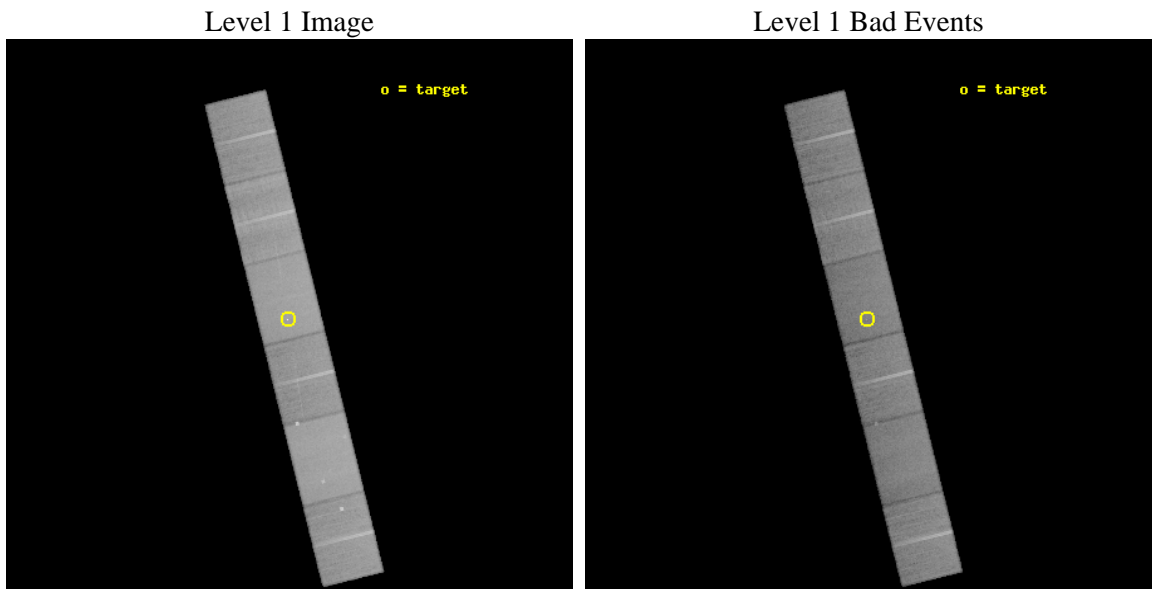
|          |   |   |
|----------|---|---|
| seq_num  | 500720  | Sequence number                             |
| obs_id   | 8543  | Observation id                              |
| title    | High resolution spectral imaging of SN 1987A at 20 years:<br>HETG observation | Proposal title                              |
| observer | Prof Claude Canizares   | Principal investigator                      |
| object   | Sn 1987A  | Source name                                 |
| dtcycle  | 0   | &#160                                       |
| cycle    | P   | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 83.866667   | Observer's specified target RA [deg]        |
| dec_targ | -69.269722  | Observer's specified target Dec [deg]       |
| ra_nom   | 83.857922726871   | Nominal RA [deg]                            |
| dec_nom  | -69.275417263799  | Nominal Dec [deg]                           |
| roll_nom | 256.0484375397  | Nominal Roll [deg]                          |
| revision | 3   | Processing version of data                  |
| ontime   | 31160.0   | Sum of GTIs [s]                             |
| livetime | 30656.738973019   | Livetime [s]                                |
| ontime4  | 31154.917999685   | Sum of GTIs [s]                             |
| ontime5  | 31160.0   | Sum of GTIs [s]                             |
| ontime6  | 31160.0   | Sum of GTIs [s]                             |
| ontime7  | 31160.0   | Sum of GTIs [s]                             |
| ontime8  | 31157.459009767   | Sum of GTIs [s]                             |
| ontime9  | 31157.459009767   | Sum of GTIs [s]                             |
| l2events | 376385  | Number of level 2 events                    |



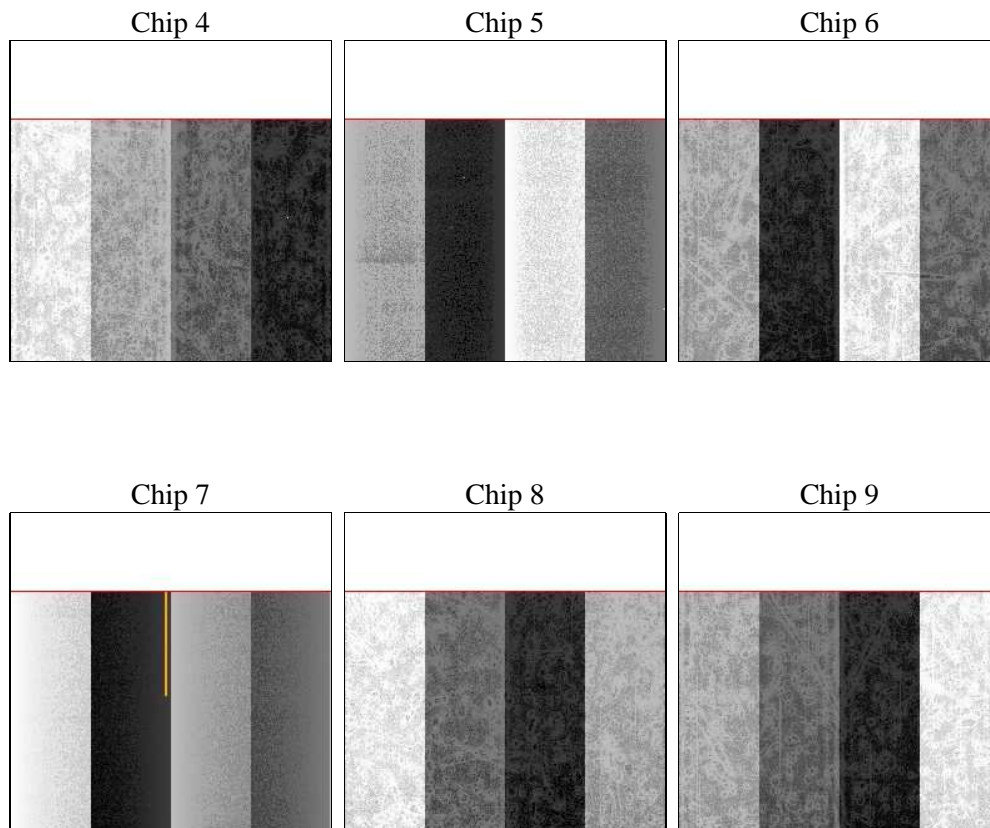
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 31000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 8.4.4               | Processing system revision     | ontime         | 31160.0         | Sum of GTIs [s]                         |
| caldbver | 4.4.9               | &#160                          | ontime4        | 31154.917999685 | Sum of GTIs [s]                         |
| date     | 2012-04-22T05:51:10 | Date and time of file creation | ontime5        | 31160.0         | Sum of GTIs [s]                         |
| revision | 3                   | Processing version of data     | ontime6        | 31160.0         | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 31160.0         | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 31157.459009767 | Sum of GTIs [s]                         |
|          |                     |                                | ontime9        | 31157.459009767 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 1619906         | Number of level 1 events                |

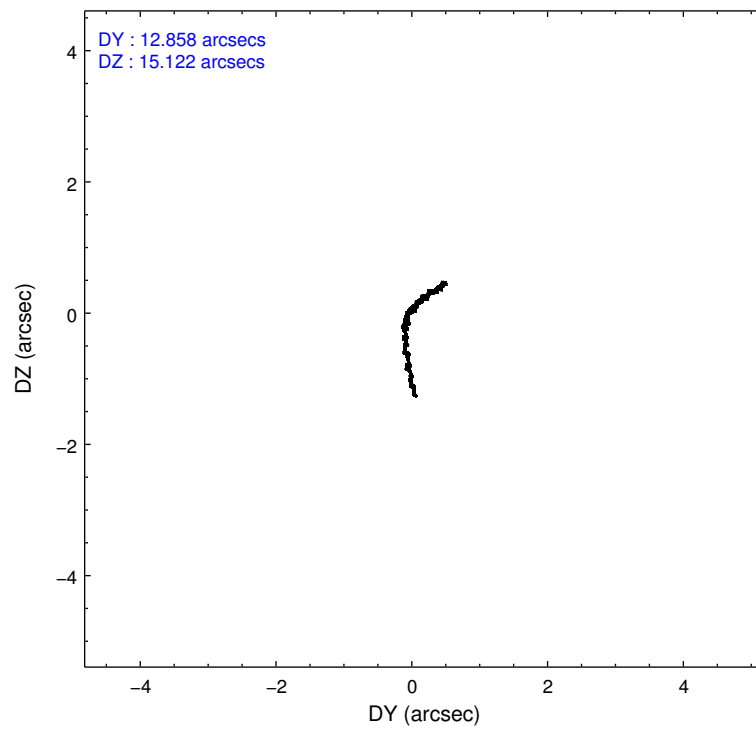
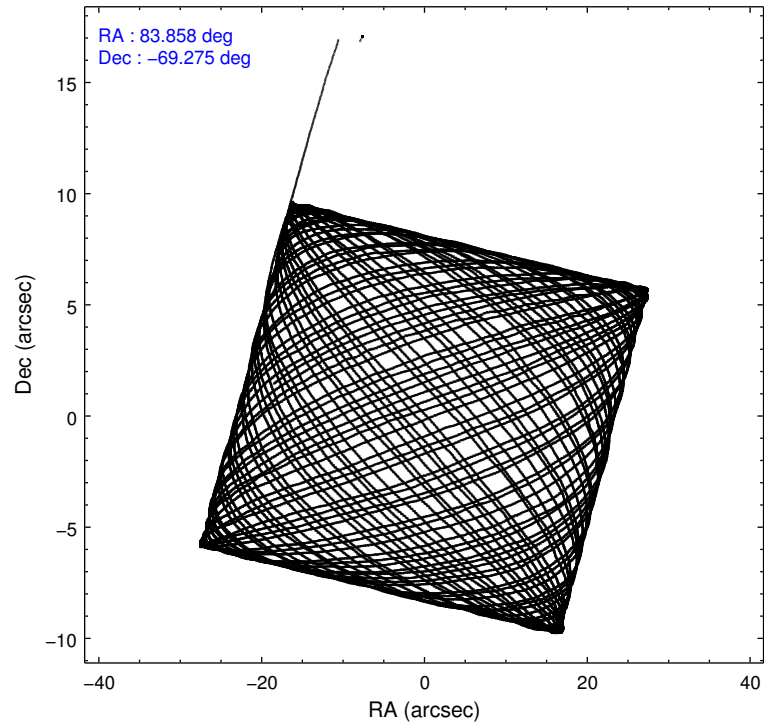
### 2.1.4 Events

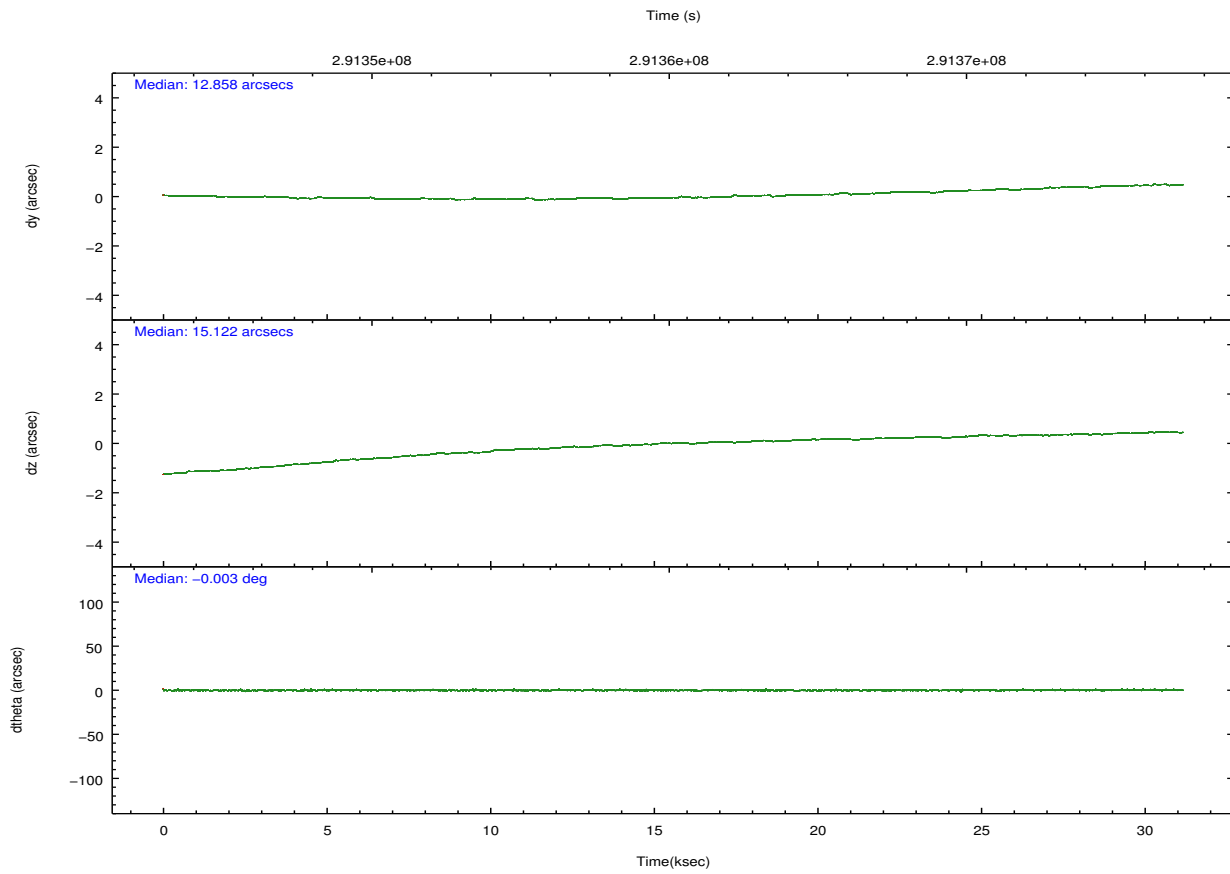
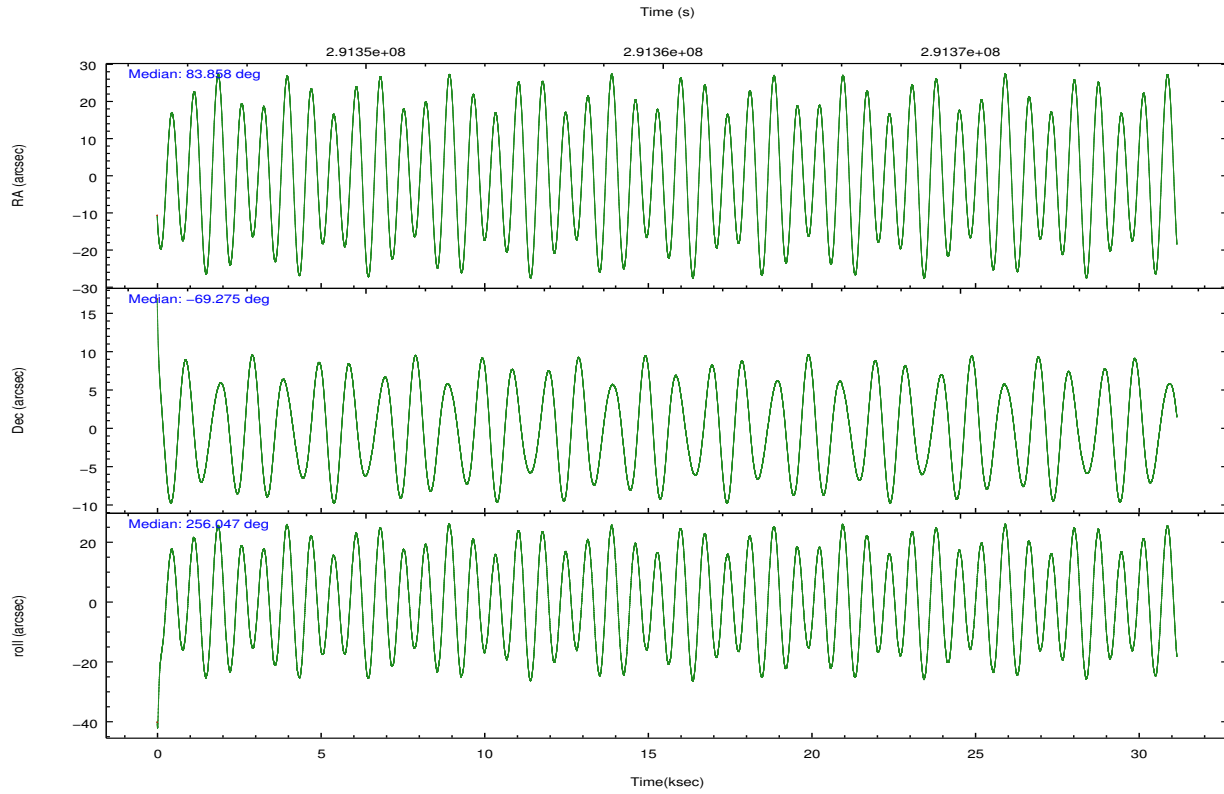
|                 | ccd 4  | ccd 5  | ccd 6  | ccd 7  | ccd 8  | ccd 9  |                | ccd 4  | ccd 5  | ccd 6  | ccd 7  | ccd 8  | ccd 9  |
|-----------------|--------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|
| level 1 events  | 251322 | 333295 | 224912 | 305860 | 282872 | 221645 | grade 0 events | 15663  | 13249  | 11969  | 12115  | 21338  | 11608  |
| rejected events | 219424 | 179619 | 196266 | 174963 | 216810 | 193700 |                | 6%     | 3%     | 5%     | 3%     | 7%     | 5%     |
| rejected %      | 87%    | 53%    | 87%    | 57%    | 76%    | 87%    | grade 1 events | 191    | 638    | 109    | 316    | 193    | 120    |
|                 |        |        |        |        |        |        |                | 0%     | 0%     | 0%     | 0%     | 0%     | 0%     |
|                 |        |        |        |        |        |        | grade 2 events | 6297   | 46081  | 5908   | 27082  | 14288  | 5681   |
|                 |        |        |        |        |        |        |                | 2%     | 13%    | 2%     | 8%     | 5%     | 2%     |
|                 |        |        |        |        |        |        | grade 3 events | 2850   | 7269   | 2853   | 11805  | 7025   | 2855   |
|                 |        |        |        |        |        |        |                | 1%     | 2%     | 1%     | 3%     | 2%     | 1%     |
|                 |        |        |        |        |        |        | grade 4 events | 2726   | 6881   | 2687   | 11650  | 6578   | 2710   |
|                 |        |        |        |        |        |        |                | 1%     | 2%     | 1%     | 3%     | 2%     | 1%     |
|                 |        |        |        |        |        |        | grade 5 events | 9958   | 25623  | 10156  | 28384  | 13494  | 10915  |
|                 |        |        |        |        |        |        |                | 3%     | 7%     | 4%     | 9%     | 4%     | 4%     |
|                 |        |        |        |        |        |        | grade 6 events | 4588   | 81216  | 5420   | 68999  | 17204  | 5252   |
|                 |        |        |        |        |        |        |                | 1%     | 24%    | 2%     | 22%    | 6%     | 2%     |
|                 |        |        |        |        |        |        | grade 7 events | 209049 | 152338 | 185810 | 145509 | 202752 | 182504 |
|                 |        |        |        |        |        |        |                | 83%    | 45%    | 82%    | 47%    | 71%    | 82%    |

## 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               | Number of optional ACIS chips dropped | 0         | 0       |
| Observation mode                  | POINTING            | POINTING             | On-chip summing requested             | N         | N       |
| [deg] Pointing RA                 | 83.835586           | 83.85792272687112    | Subarray requested                    | CUSTOM    | CUSTOM  |
| [deg] Pointing Dec                | -69.249242          | -69.2754172637993    | Subarray start row                    | 1         | 1       |
| [deg] Pointing Roll               | 255.870938          | 256.0484375396996    | Subarray row count                    | 774       | 774     |
| [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  | 2.5     |
| [mm] SIM translation stage pos    | -187.132523         | -187.1228876879999   |                                       |           |         |
| [mm] SIM translation stage offset | -3                  | -3.009634895007935   |                                       |           |         |
| [s] Observation start time (MET)  | 291344697.184000    | 291343594.35393      |                                       |           |         |
| Observation start date            | 2007-03-27T01:03:52 | 2007-03-27T00:46:34  |                                       |           |         |
| [s] Observation end time (MET)    | 291375697.184000    | 291376447.6555       |                                       |           |         |
| Observation end date              | 2007-03-27T09:40:32 | 2007-03-27T09:54:07  |                                       |           |         |
| Read mode                         | TIMED               | TIMED                |                                       |           |         |

## 2.3 Aspect



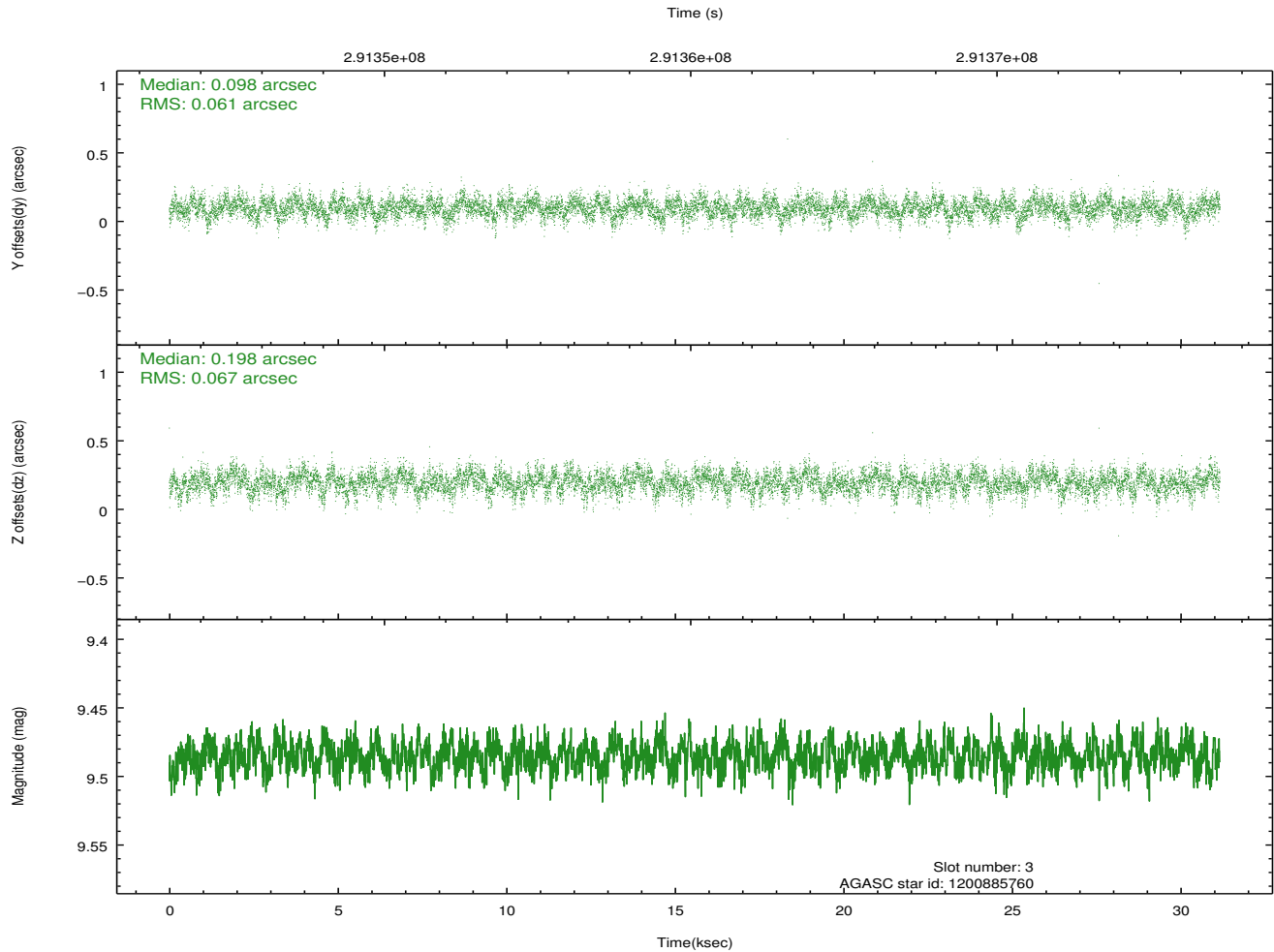
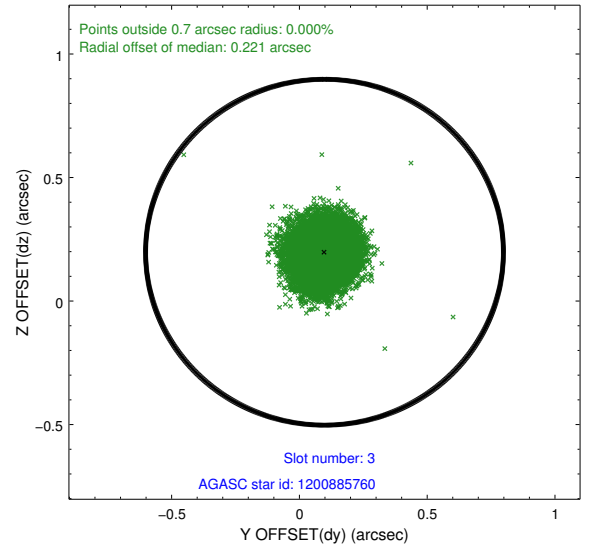
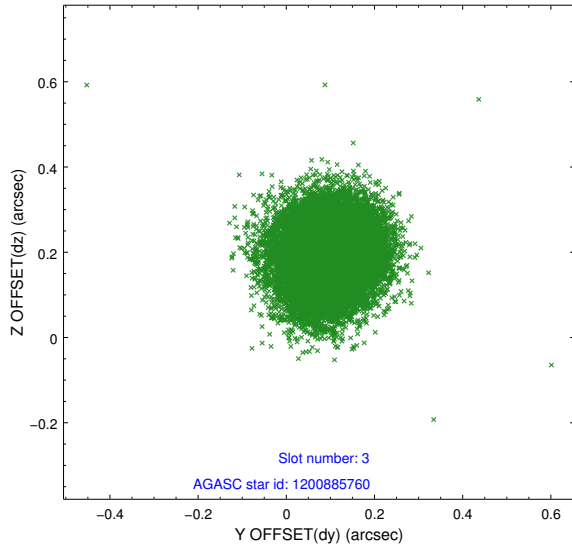


### Slot Statistics

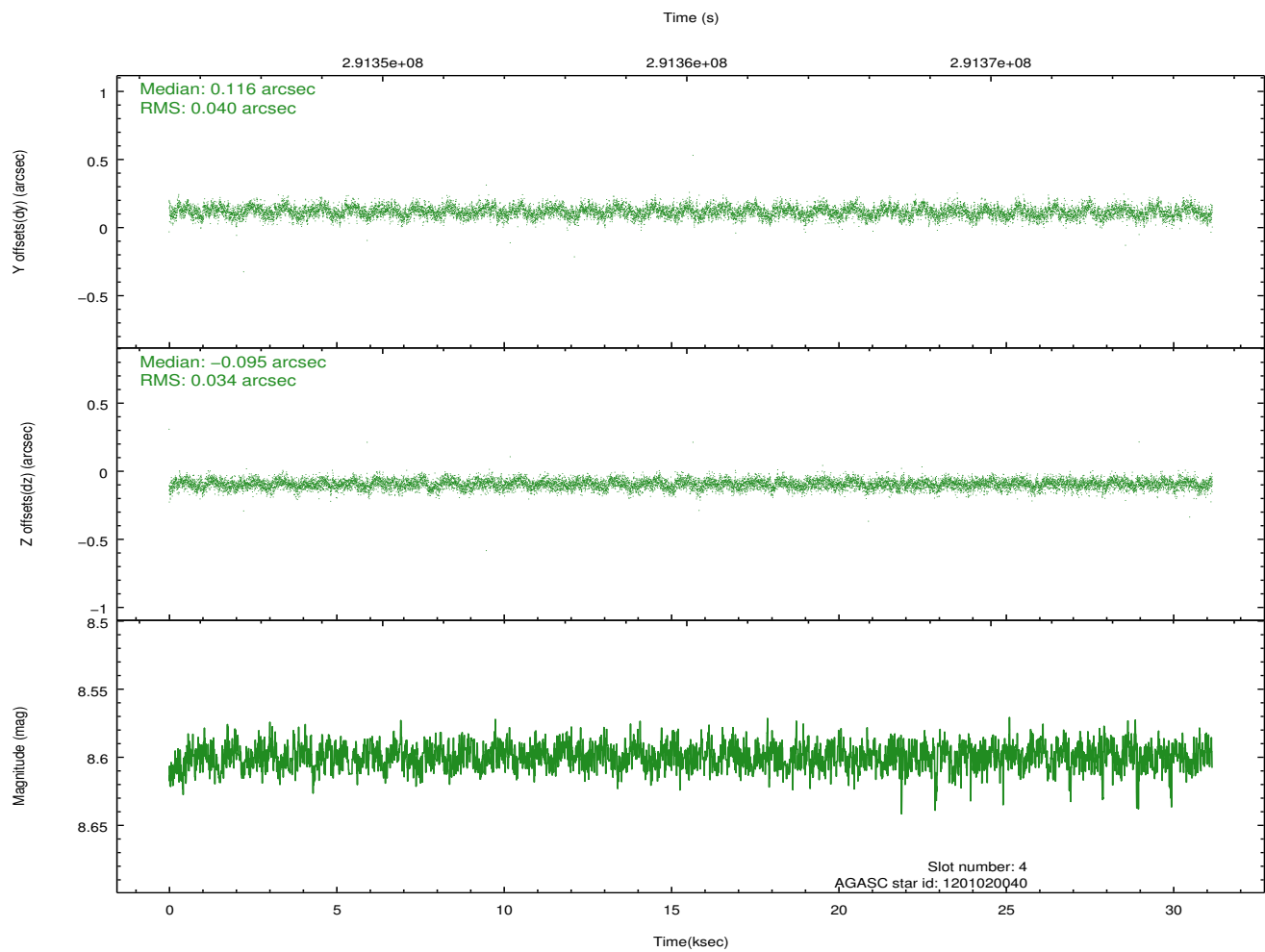
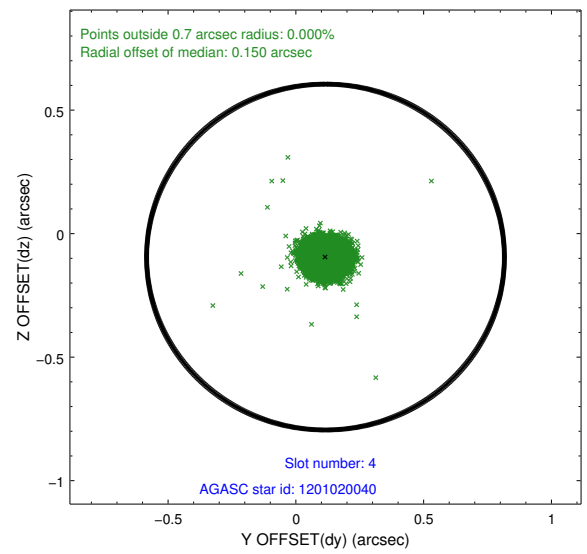
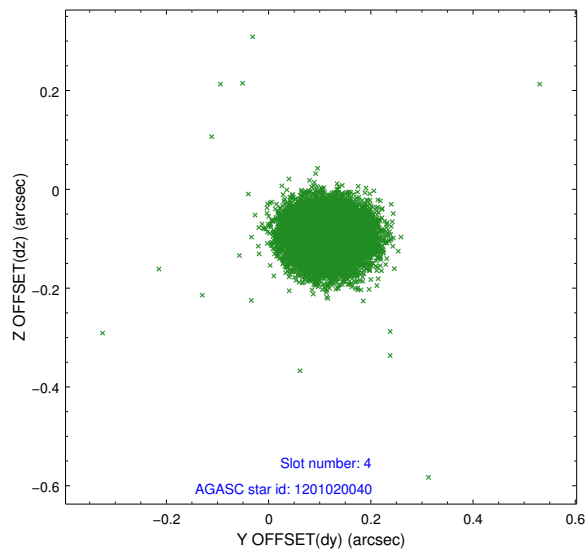
| slot | status | id         | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec        | mean_y   | mean_z   |
|------|--------|------------|------|-------|--------|--------|-------|-------|-----------|------------|----------|----------|
| 0    | FID    | ACIS-S-2   | 7.08 | 7600  | -0.131 | -0.105 | 0.009 | 0.017 | 0.000000  | 0.000000   | -765.78  | -1798.58 |
| 1    | FID    | ACIS-S-4   | 7.18 | 7602  | 0.136  | 0.061  | 0.007 | 0.013 | 0.000000  | 0.000000   | 2147.75  | 109.96   |
| 2    | FID    | ACIS-S-6   | 7.36 | 7601  | -0.032 | 0.052  | 0.008 | 0.015 | 0.000000  | 0.000000   | 396.40   | 747.43   |
| 3    | GUIDE  | 1200885760 | 9.49 | 15192 | 0.098  | 0.198  | 0.097 | 0.155 | 83.723637 | -68.777667 | -1610.30 | -555.38  |
| 4    | GUIDE  | 1201020040 | 8.60 | 15189 | 0.116  | -0.095 | 0.055 | 0.089 | 85.379163 | -68.879396 | -1755.43 | 1622.81  |
| 5    | GUIDE  | 1201410616 | 9.33 | 15185 | -0.037 | 0.030  | 0.106 | 0.169 | 82.516808 | -69.784406 | 2285.88  | -1115.83 |
| 6    | GUIDE  | 1201542672 | 8.20 | 15196 | -0.077 | -0.064 | 0.056 | 0.089 | 84.492488 | -69.957531 | 2277.97  | 1409.76  |
| 7    | GUIDE  | 1201019672 | 6.82 | 15201 | -0.096 | -0.068 | 0.058 | 0.094 | 85.312192 | -68.770187 | -2119.73 | 1451.45  |

## 2.4 Star Slots

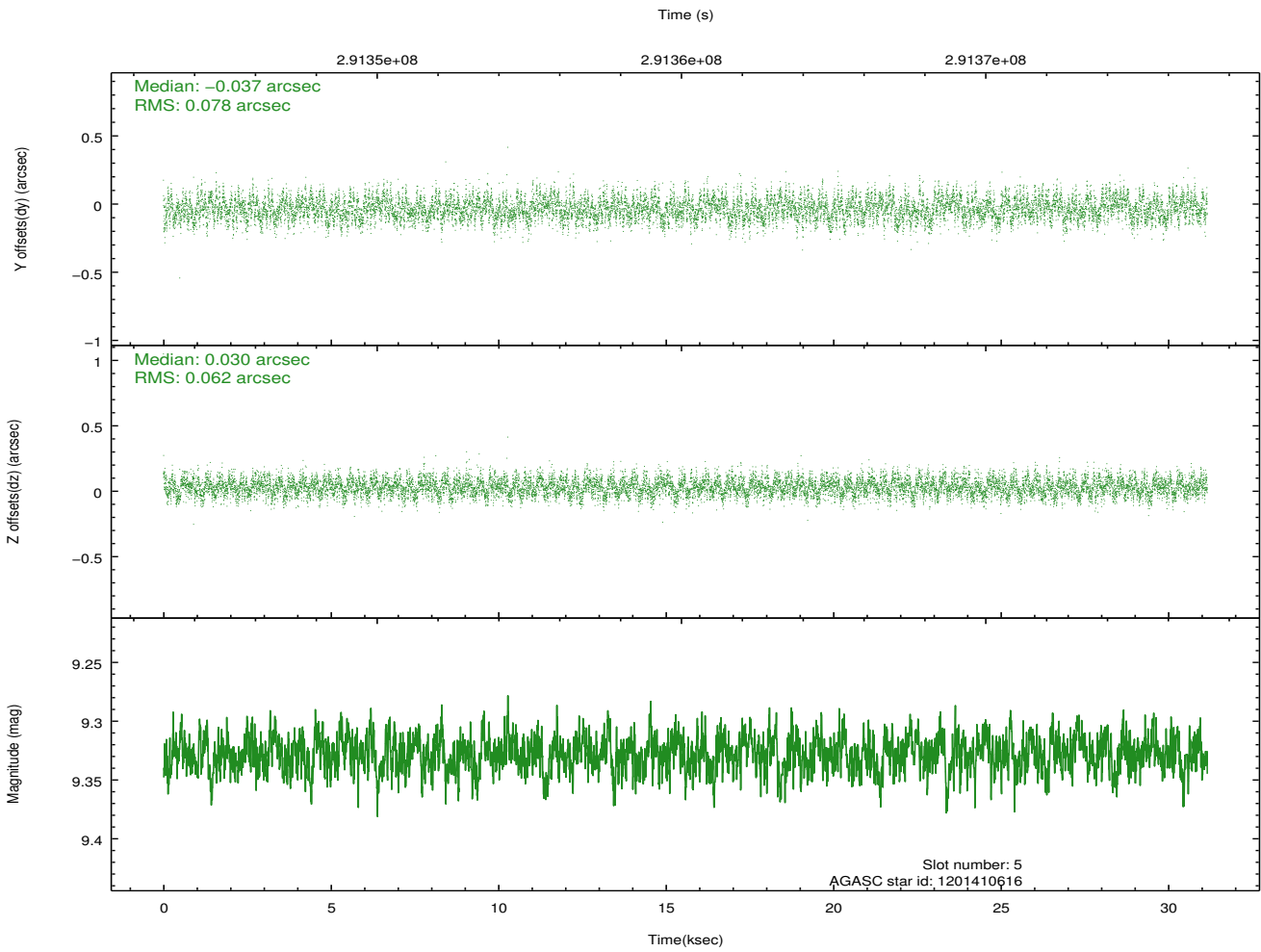
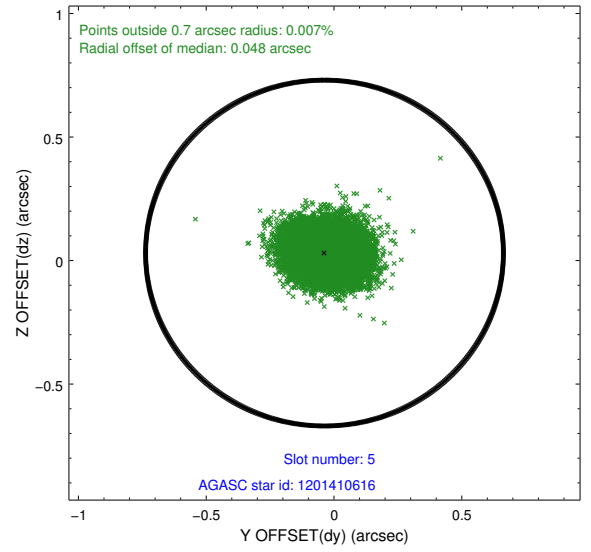
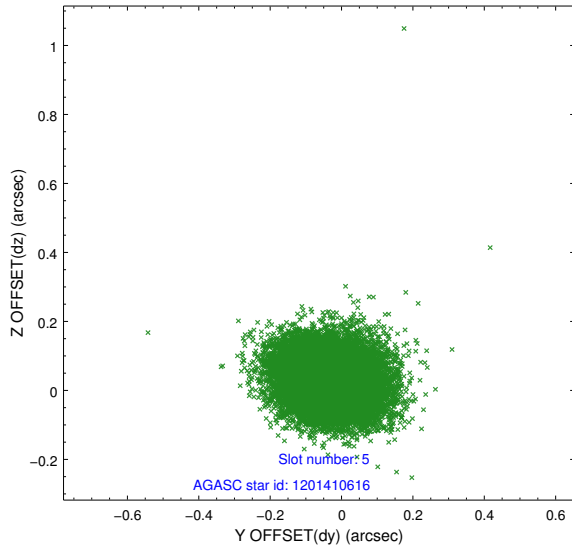
### 2.4.1 Slot 3



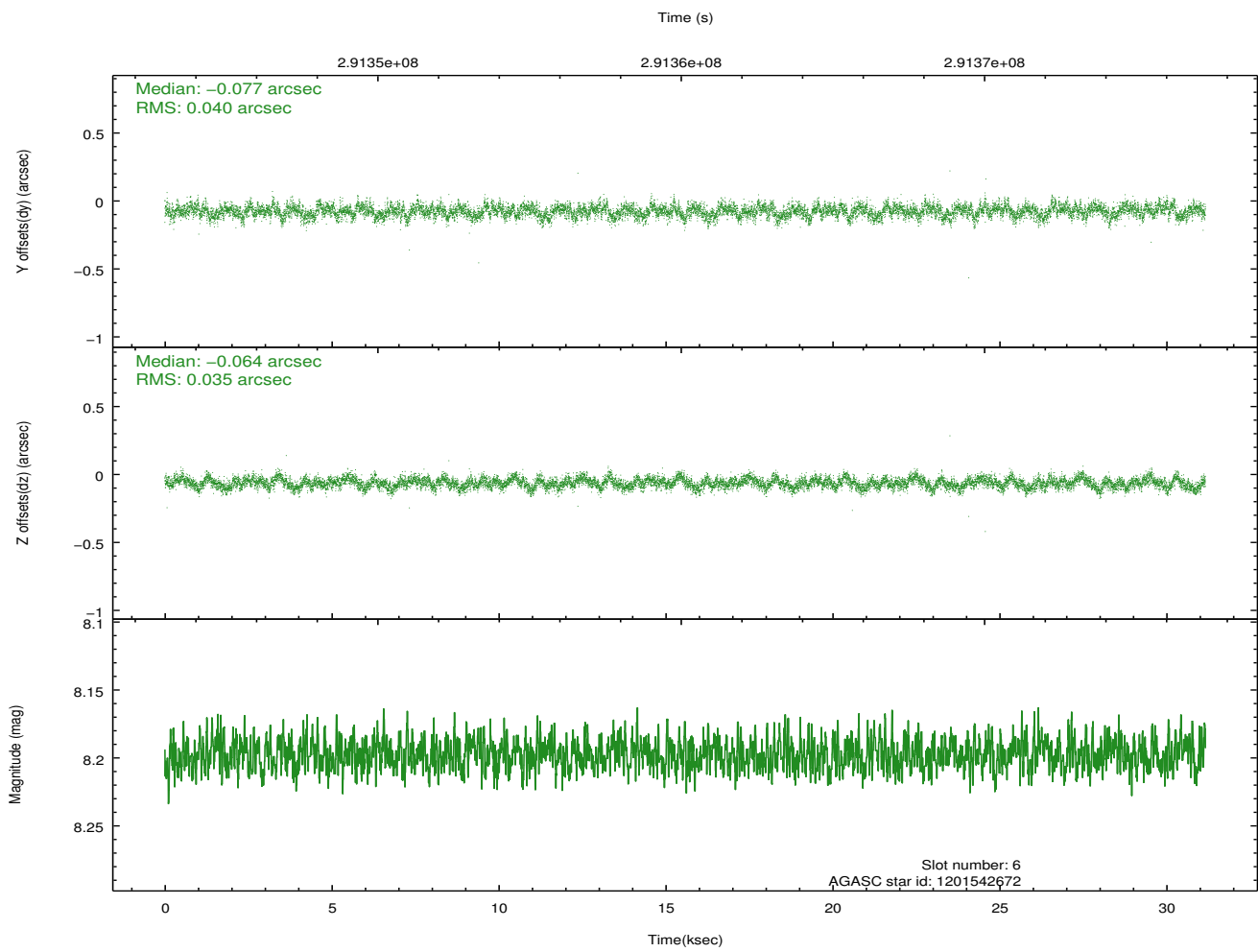
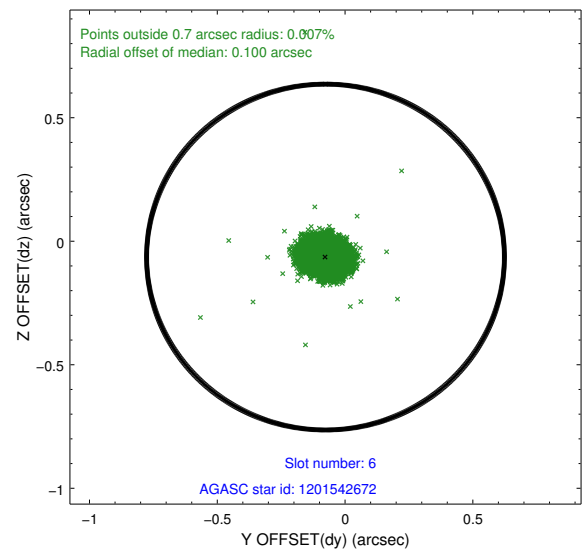
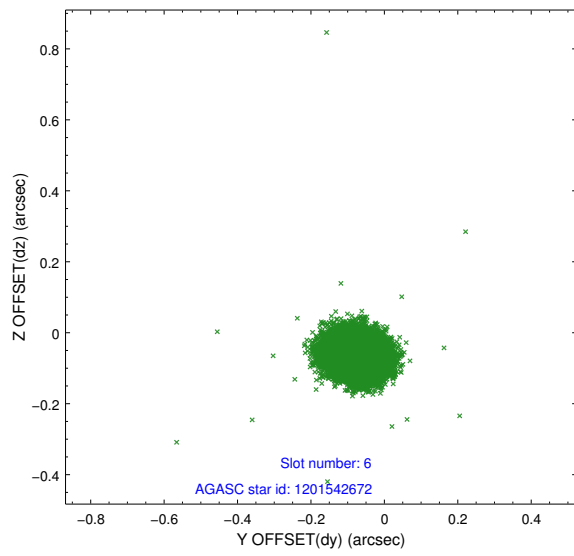
## 2.4.2 Slot 4



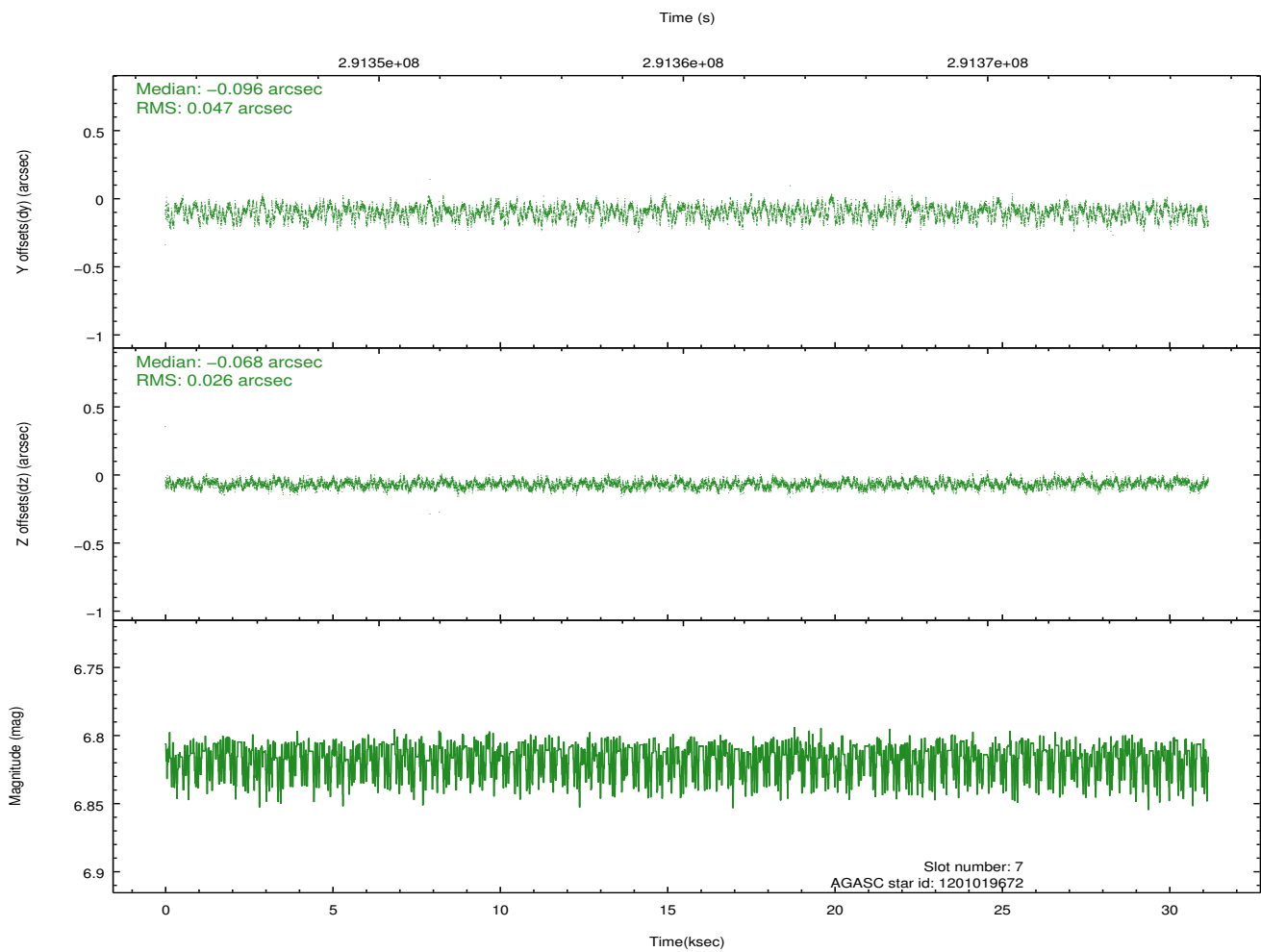
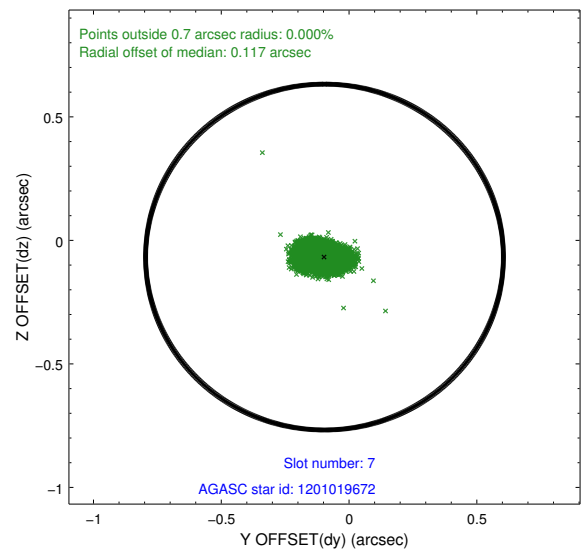
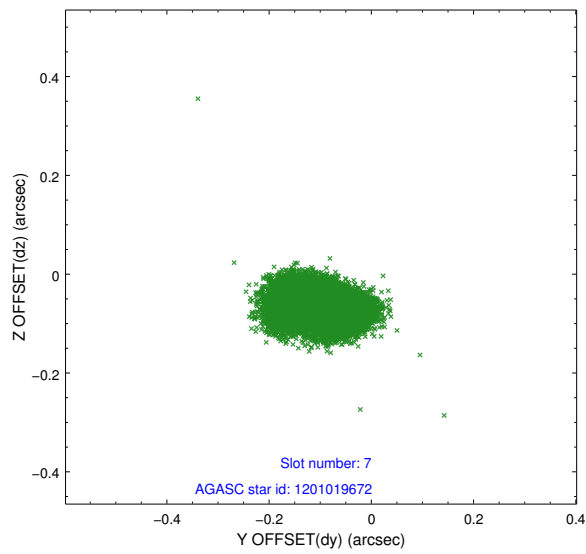
### 2.4.3 Slot 5



## 2.4.4 Slot 6

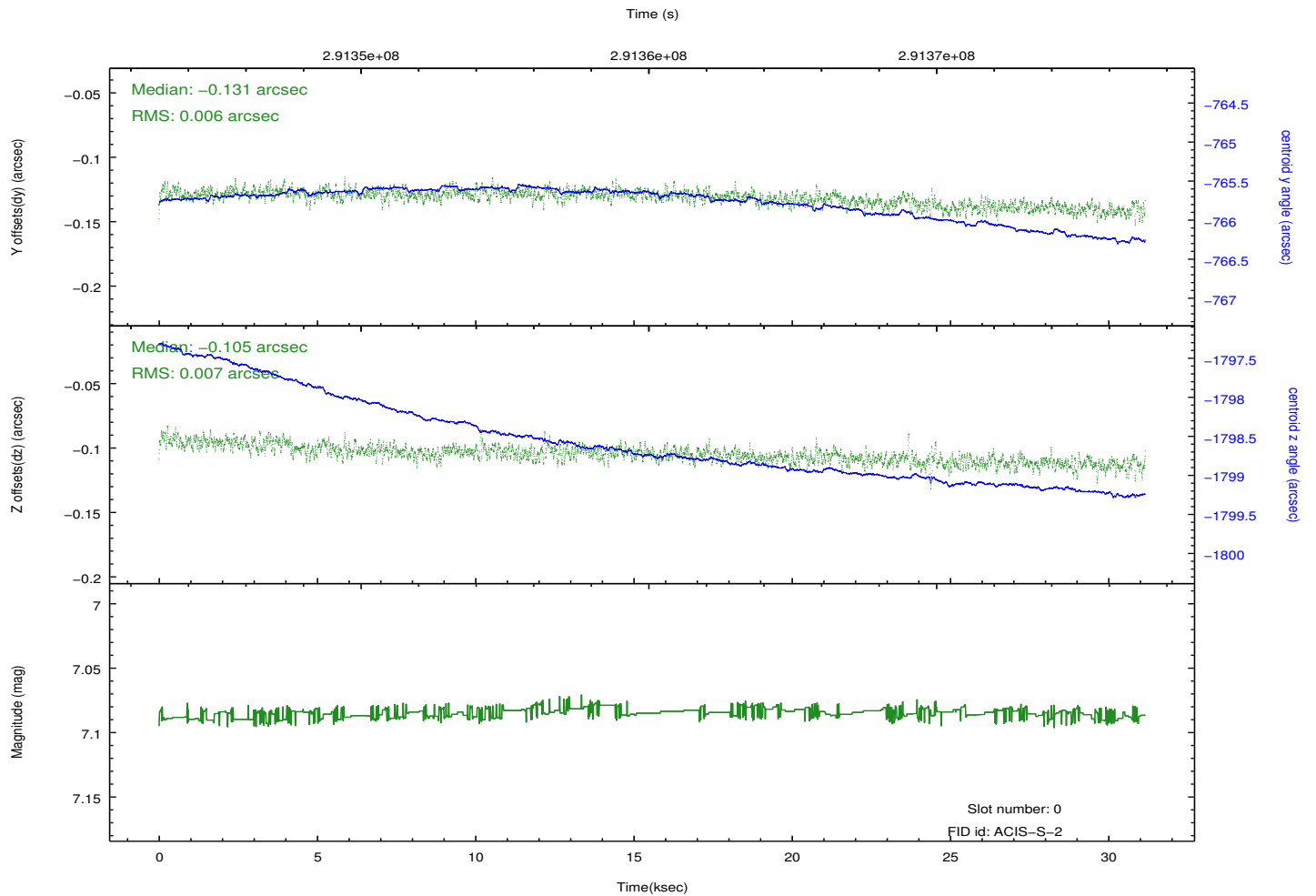
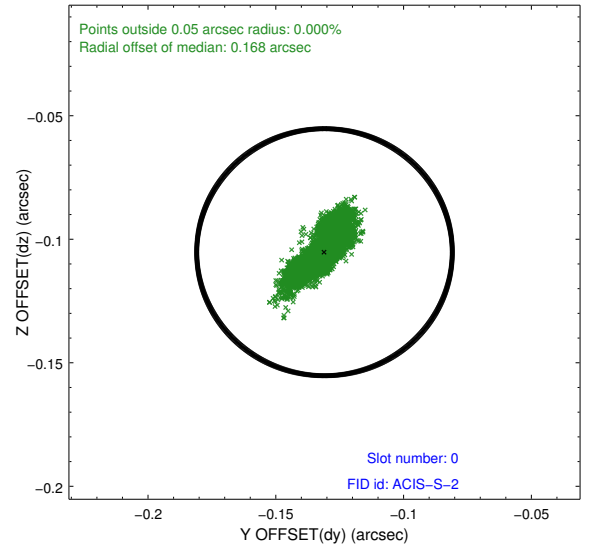
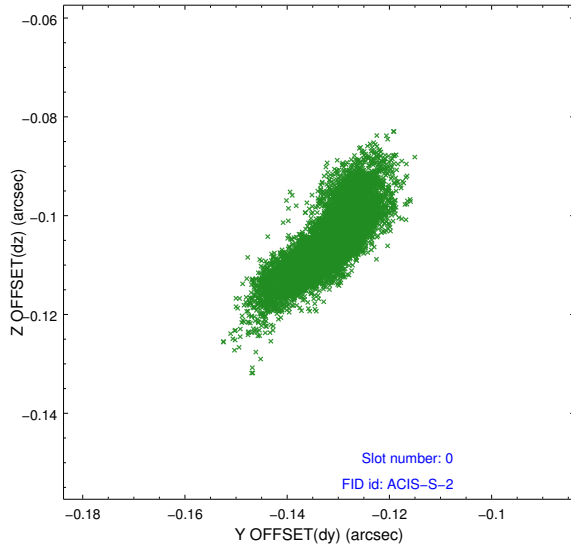


## 2.4.5 Slot 7

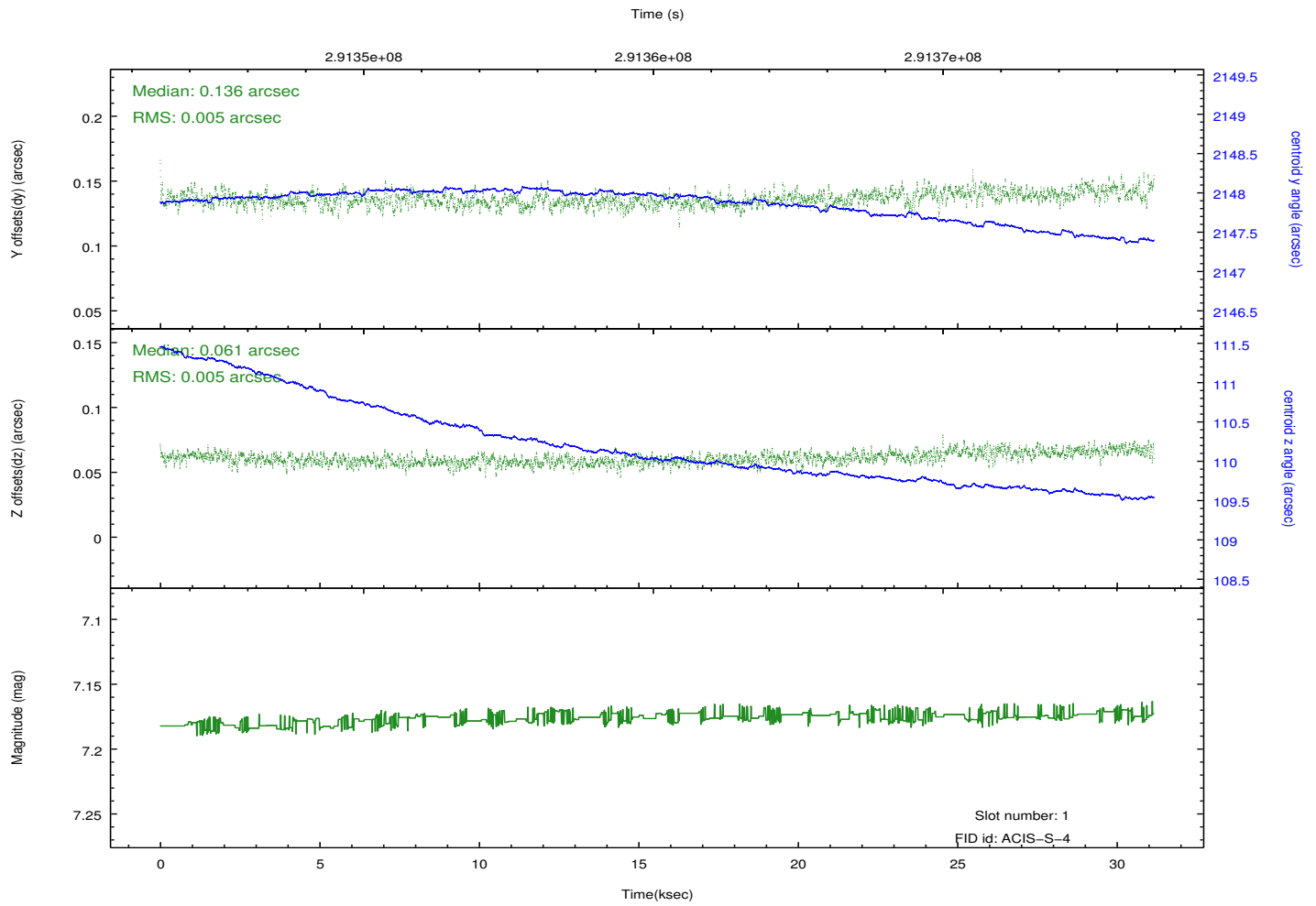
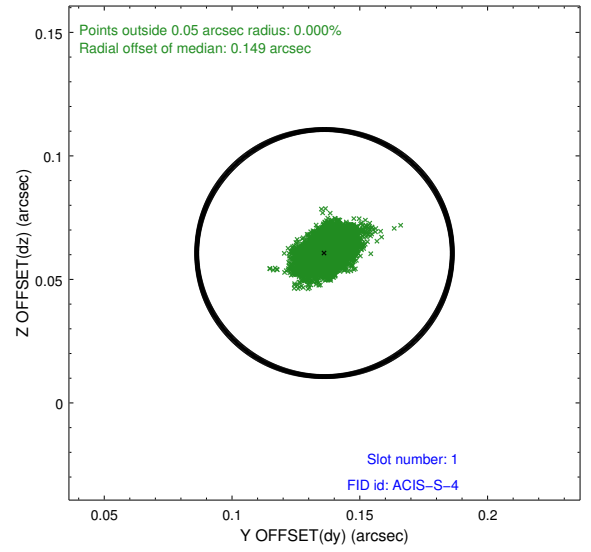
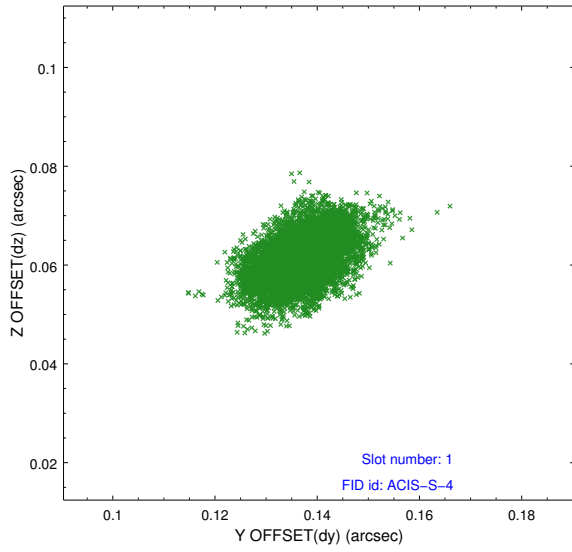


## 2.5 FID Slots

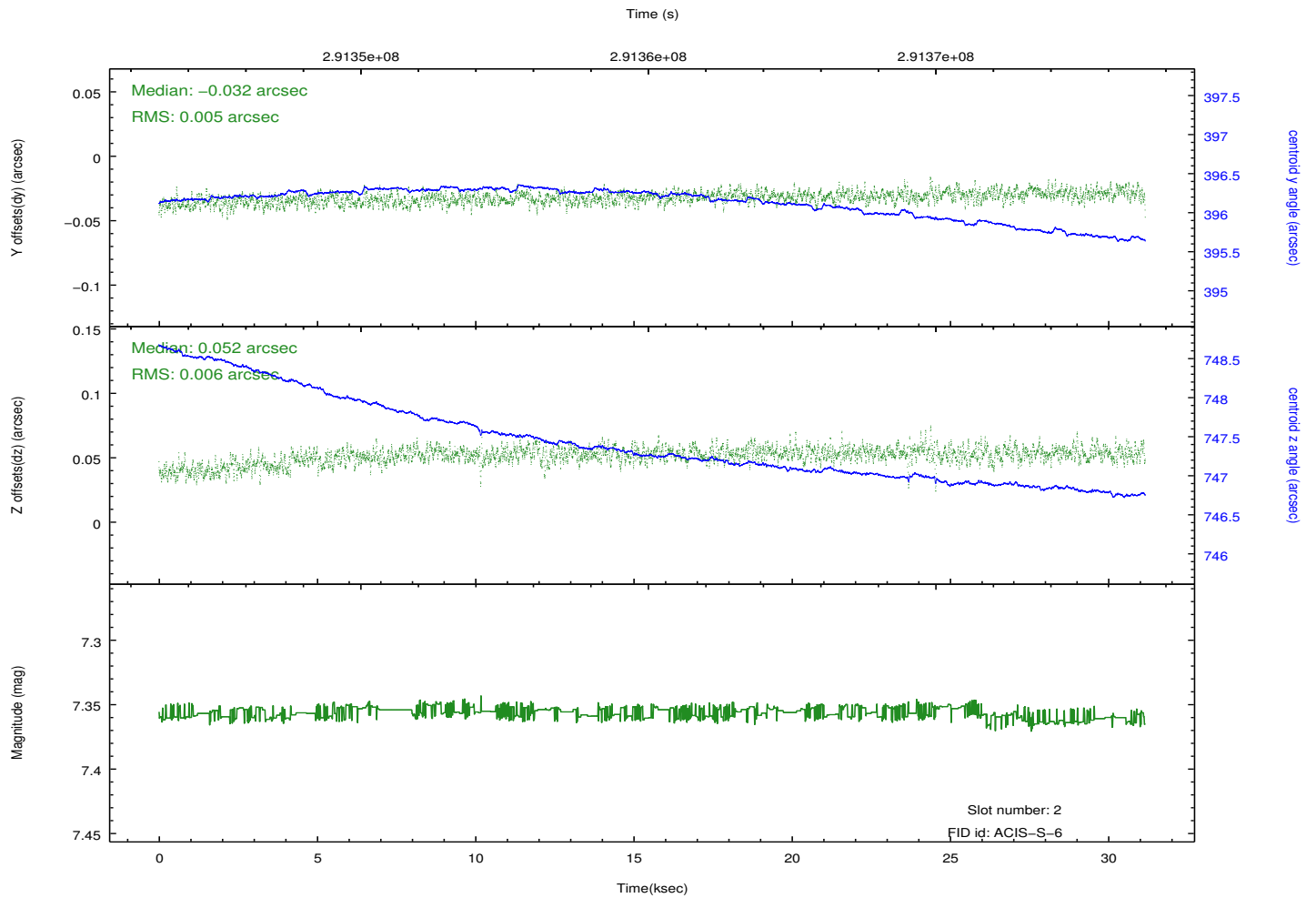
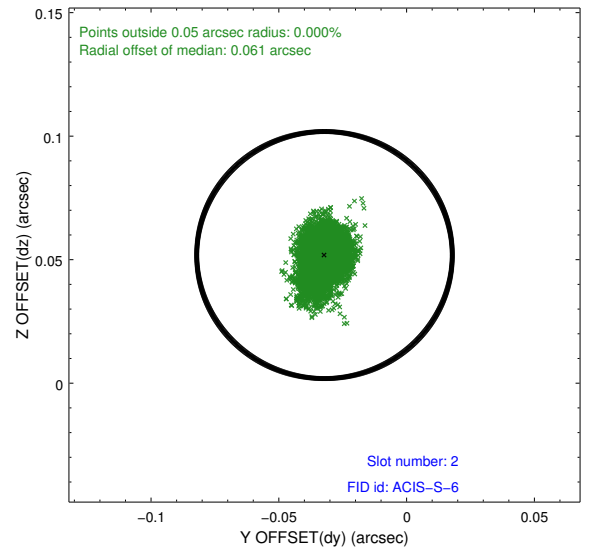
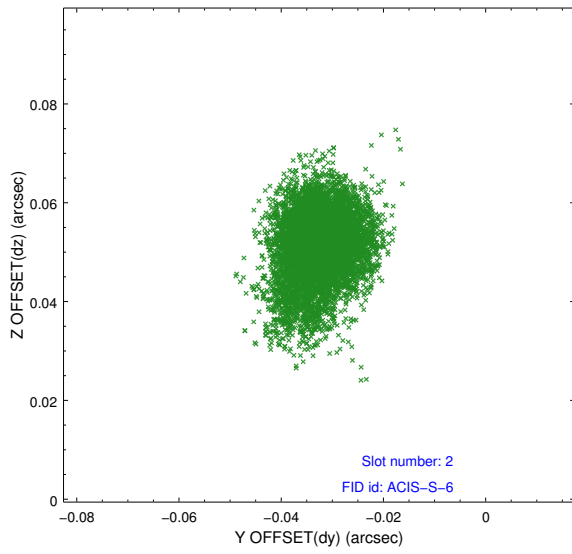
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2

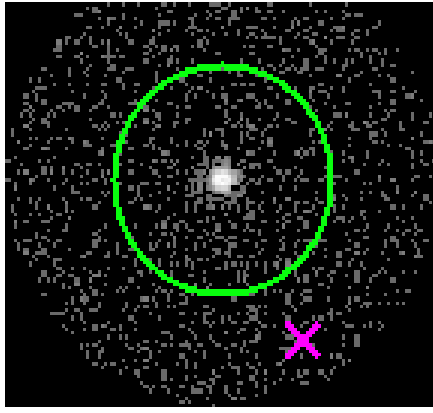


### 3 Gratings

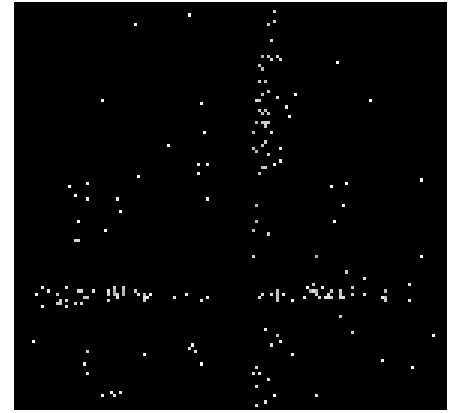
#### 3.1 HEG Arm



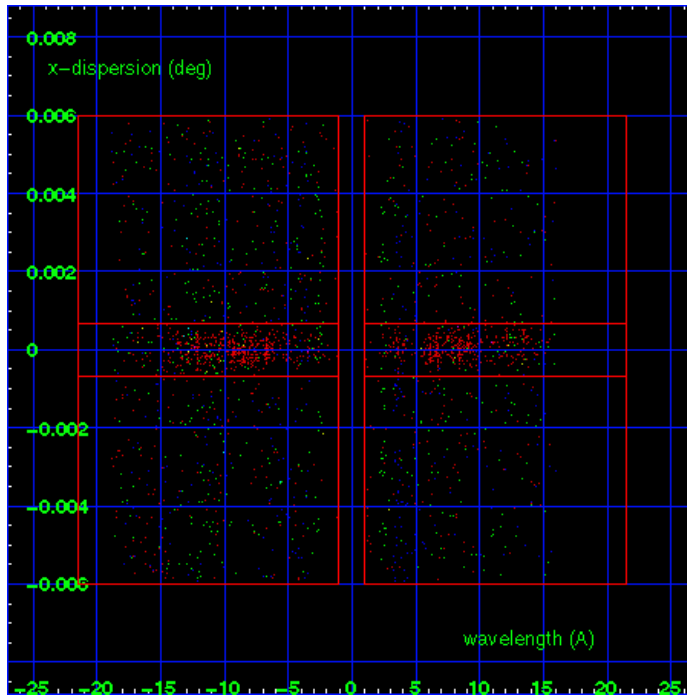
HEG Order Sort 123



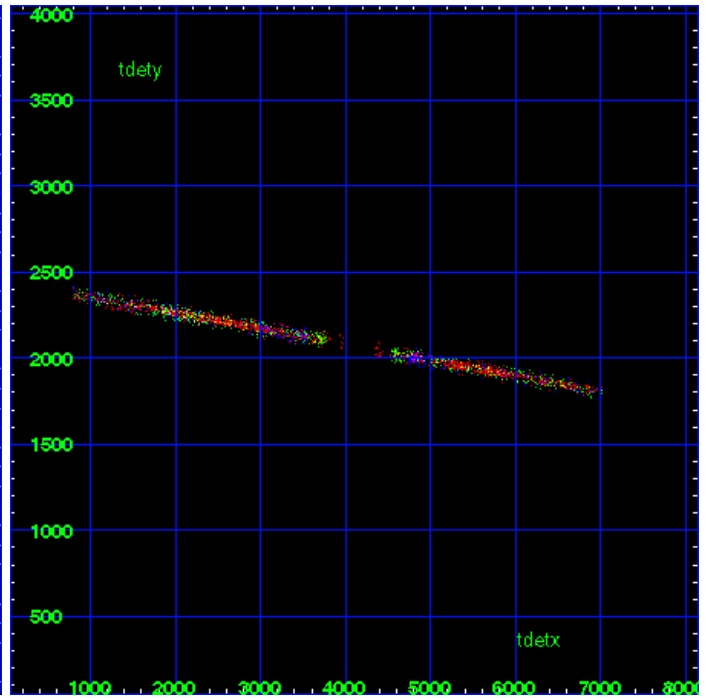
HEG Zero Order



HEG Order Sort ALL

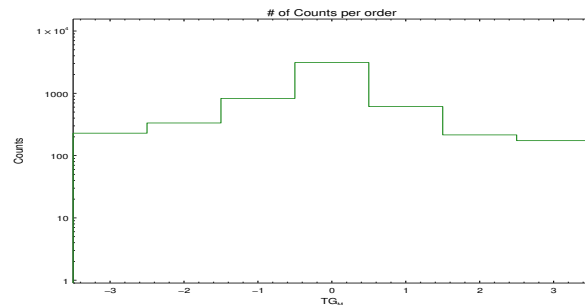


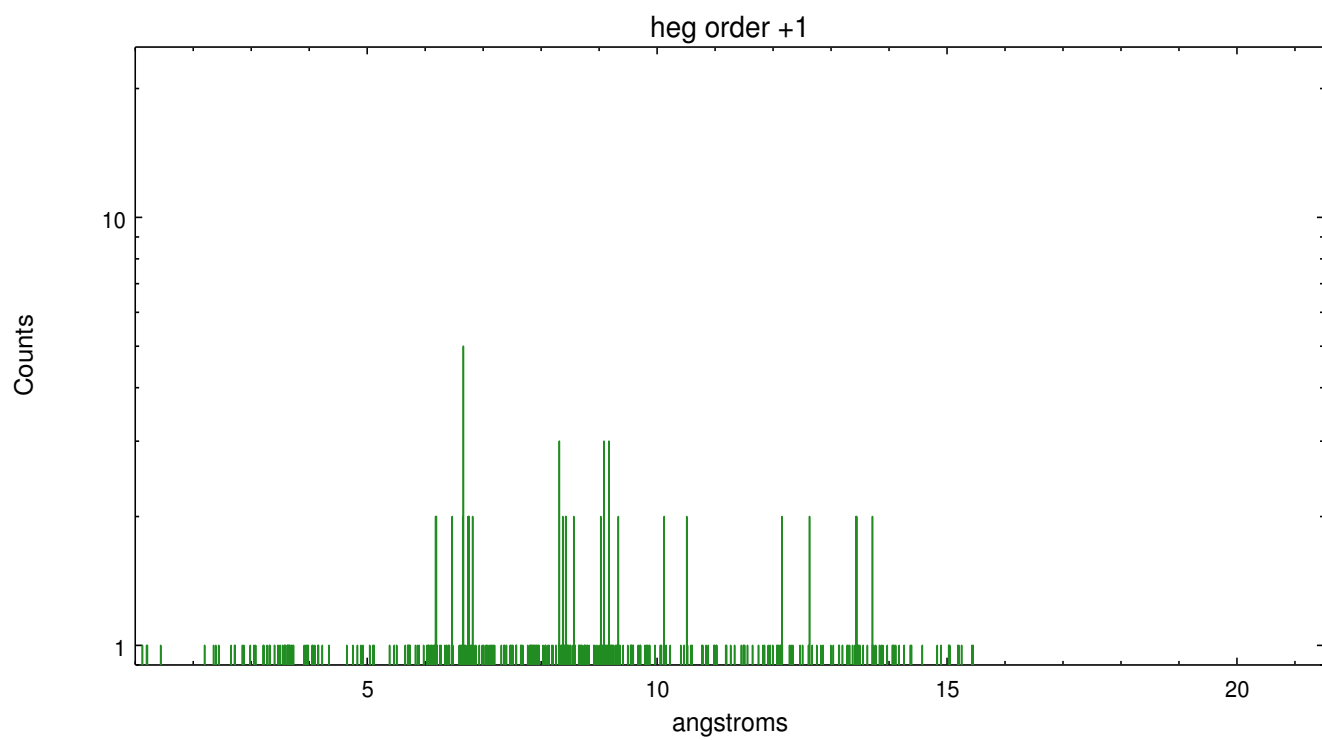
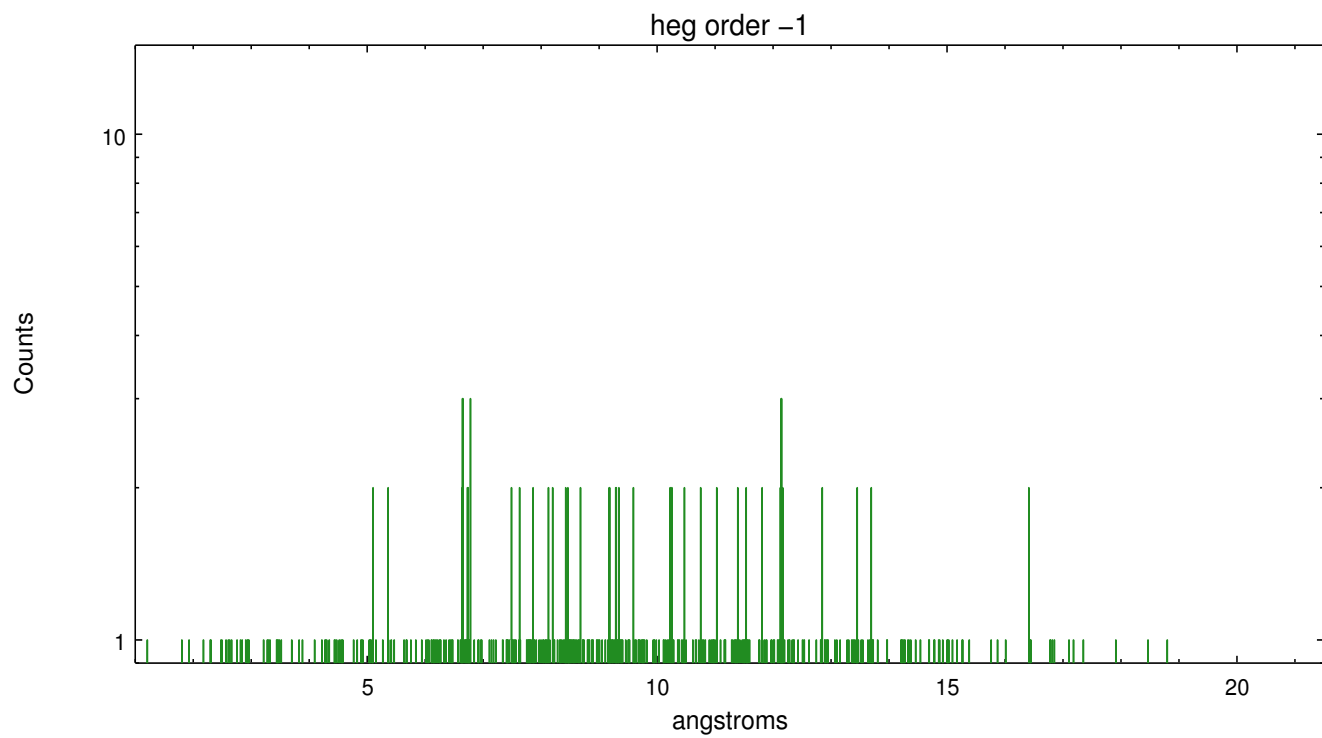
Spot Image HEG



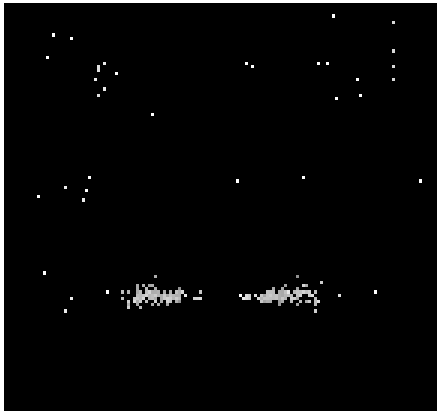
Full Detector HEG

|        | order<br>-3 | order<br>-2 | order<br>-1 | order<br>0 | order<br>1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 229         | 334         | 828         | 3113       | 612        | 215        | 174        |

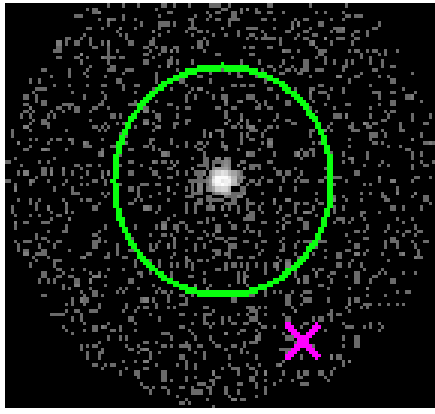




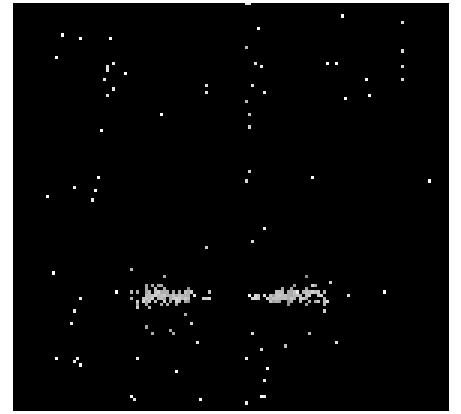
### 3.2 MEG Arm



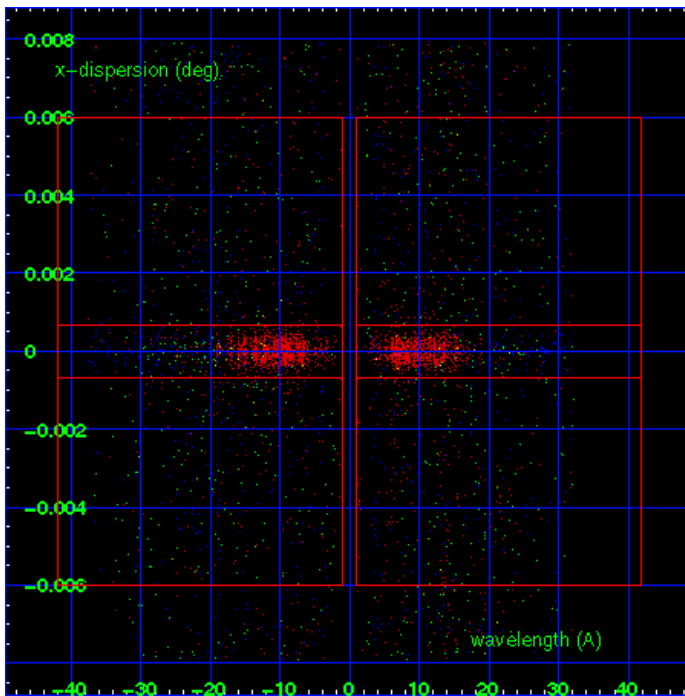
MEG Order Sort 123



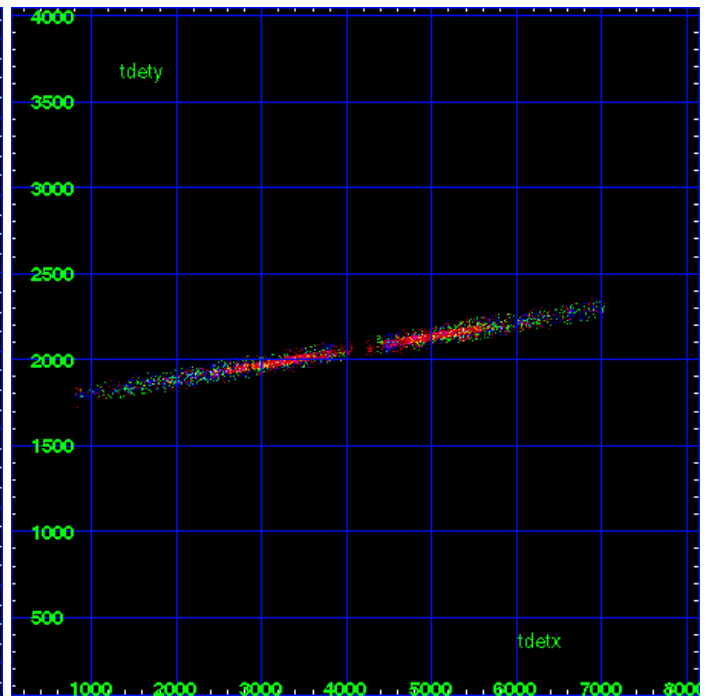
MEG Zero Order



MEG Order Sort ALL

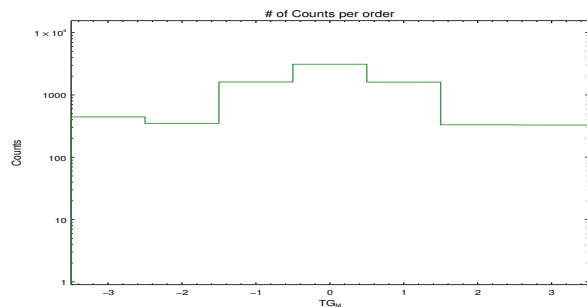


Spot Image MEG

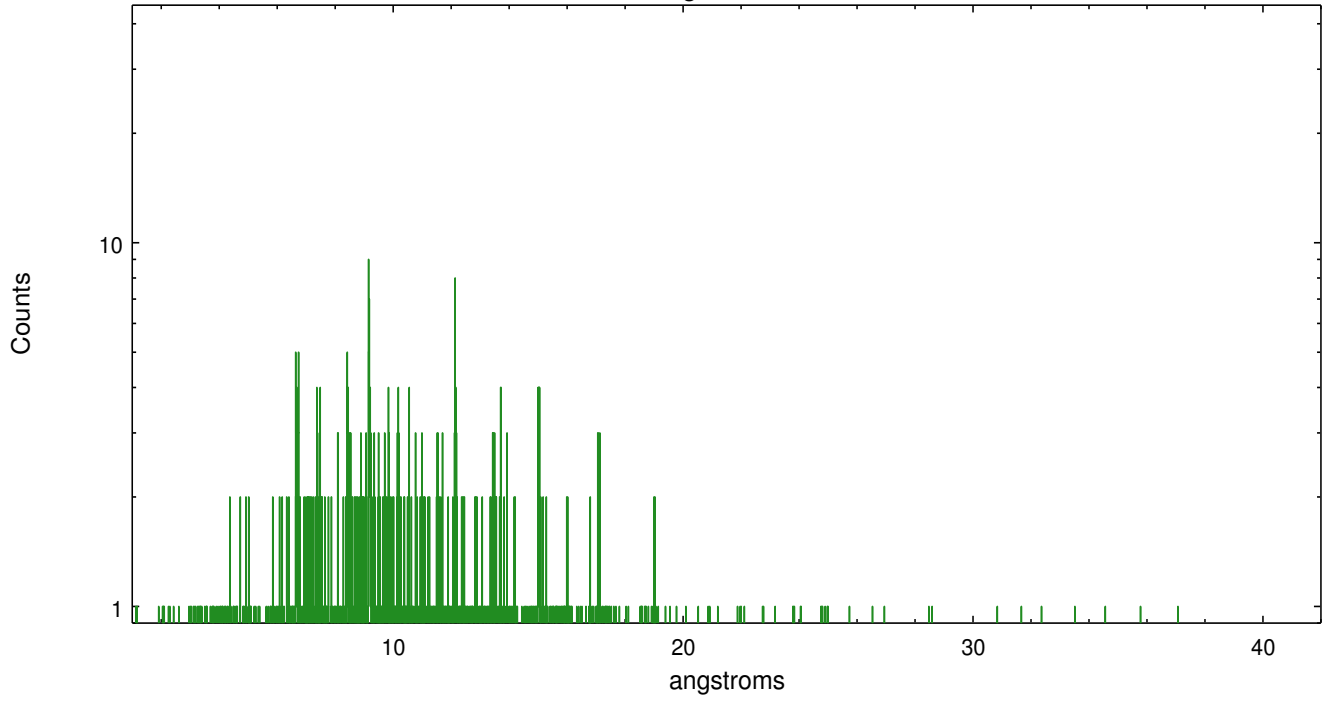


Full Detector MEG

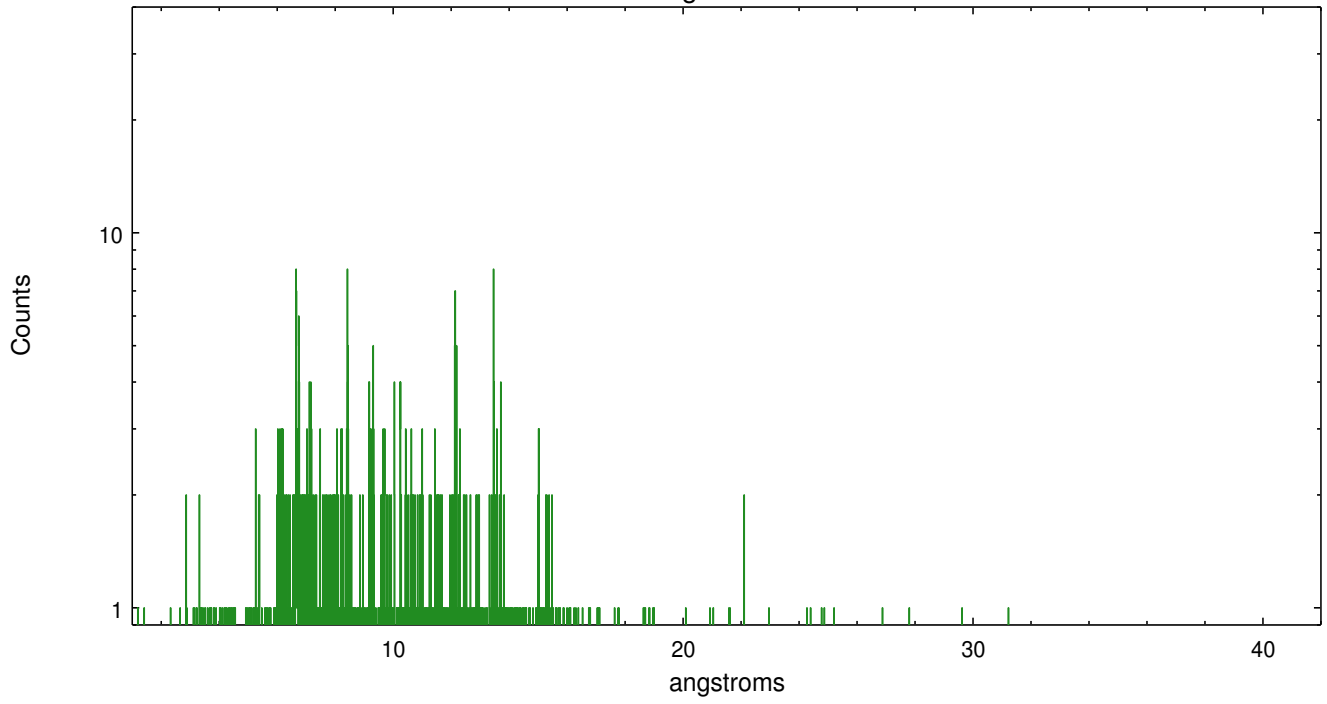
|        | order<br>-3 | order<br>-2 | order<br>-1 | order<br>0 | order<br>1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 444         | 350         | 1614        | 3113       | 1607       | 332        | 329        |



meg order -1



meg order +1



# A Summary

## A.1 Status

|                            |                    |
|----------------------------|--------------------|
| V&V Scientist              | David Huenemoerder |
| V&V Date (YYYY-MM-DD)      | 2012.04.30         |
| V&V Edition                | 1                  |
| V&V Disposition and Status | OK                 |
| V&V Charge Time            | 31.16              |

## A.2 Comments