

# V&V Reference Report

## L2 ASCDS Version : 10.5.2

Observation 19310 - L2 Version 1  
Chandra X-Ray Center

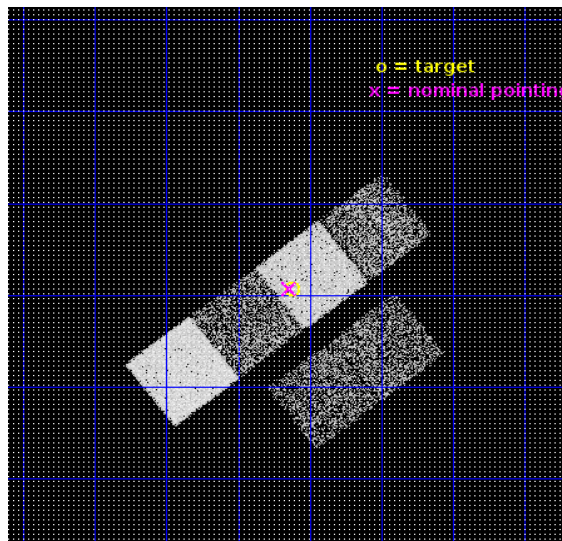
L2 Processing Date : Nov 25 2016

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# 1 Front

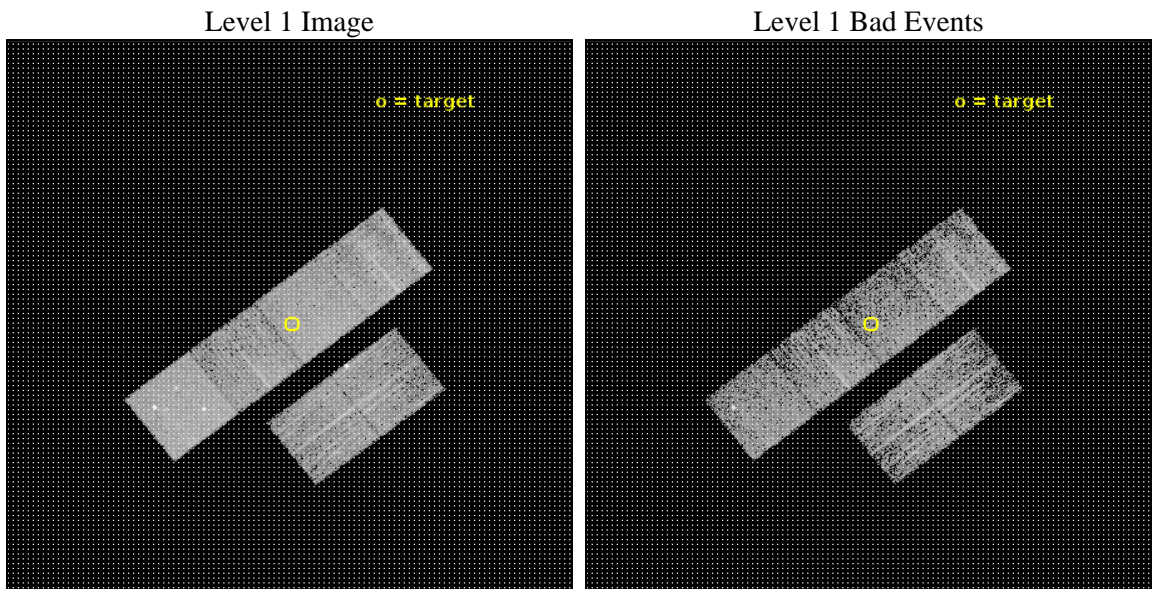
|          |  |   |
|----------|--|---|
| seq_num  | 601267   | Sequence number                             |
| obs_id   | 19310  | Observation id                              |
| title    | A homogeneous view of X-ray halos in massive early-type galaxies | P   |
| observer | Andy Goulding  | Principal investigator                      |
| object   | NGC0936  | Source name                                 |
| dtcycle  | 0  | &#160                                       |
| cycle    | P  | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 36.905833  | Observer's specified target RA [deg]        |
| dec_targ | -1.156389  | Observer's specified target Dec [deg]       |
| ra_nom   | 36.910522427269  | Nominal RA [deg]                            |
| dec_nom  | -1.155204268847  | Nominal Dec [deg]                           |
| roll_nom | 322.15676389007  | Nominal Roll [deg]                          |
| revision | 1  | Processing version of data                  |
| ontime   | 3947.7708950043  | Sum of GTIs [s]                             |
| livetime | 3897.7818428695  | Livetime [s]                                |
| ontime2  | 3947.811934948   | Sum of GTIs [s]                             |
| ontime3  | 3947.6477749348  | Sum of GTIs [s]                             |
| ontime5  | 3947.7298549414  | Sum of GTIs [s]                             |
| ontime6  | 3947.6888149977  | Sum of GTIs [s]                             |
| ontime7  | 3947.7708950043  | Sum of GTIs [s]                             |
| ontime8  | 3947.6067349911  | Sum of GTIs [s]                             |
| l2events | 44650  | Number of level 2 events                    |



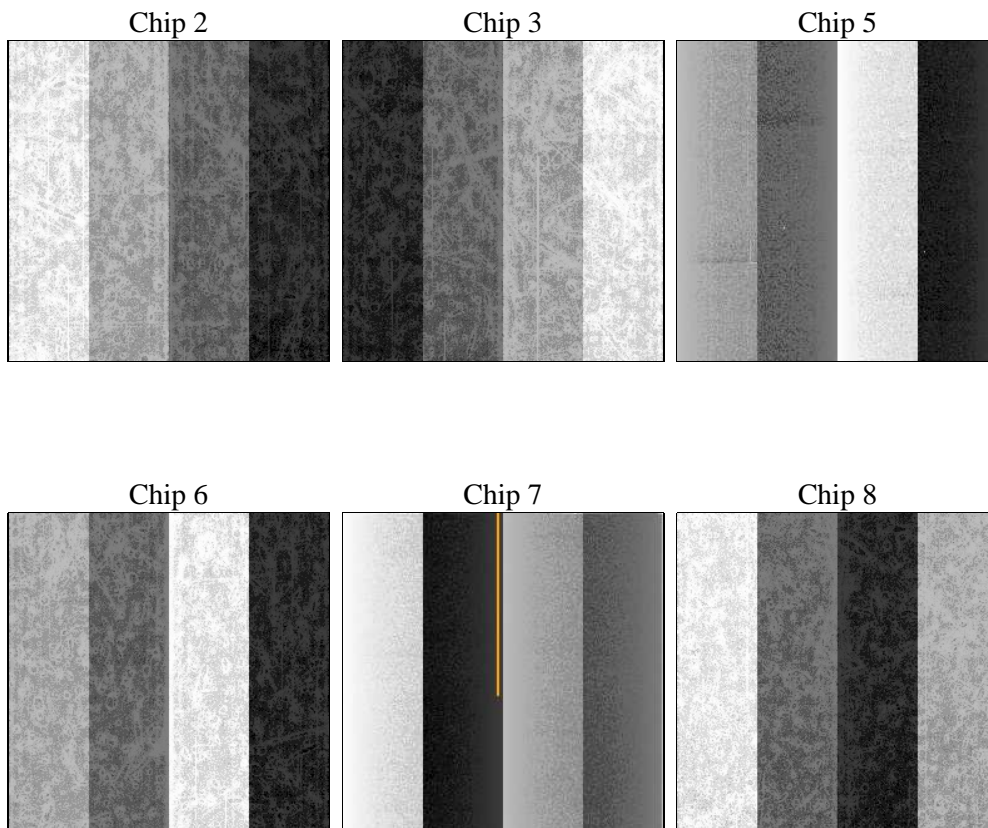
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 1                   | Obi number                     | sched_exp_time | 4000.000000     | [s] Scheduled observation exposure time |
| ascdsver | 10.5.2              | Processing system revision     | ontime         | 3947.7708950043 | Sum of GTIs [s]                         |
| caldbver | 4.7.2               | &#160                          | ontime2        | 3947.811934948  | Sum of GTIs [s]                         |
| date     | 2016-11-26T01:28:17 | Date and time of file creation | ontime3        | 3947.6477749348 | Sum of GTIs [s]                         |
| revision | 1                   | Processing version of data     | ontime5        | 3947.7298549414 | Sum of GTIs [s]                         |
|          |                     |                                | ontime6        | 3947.6888149977 | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 3947.7708950043 | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 3947.6067349911 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 191704          | Number of level 1 events                |

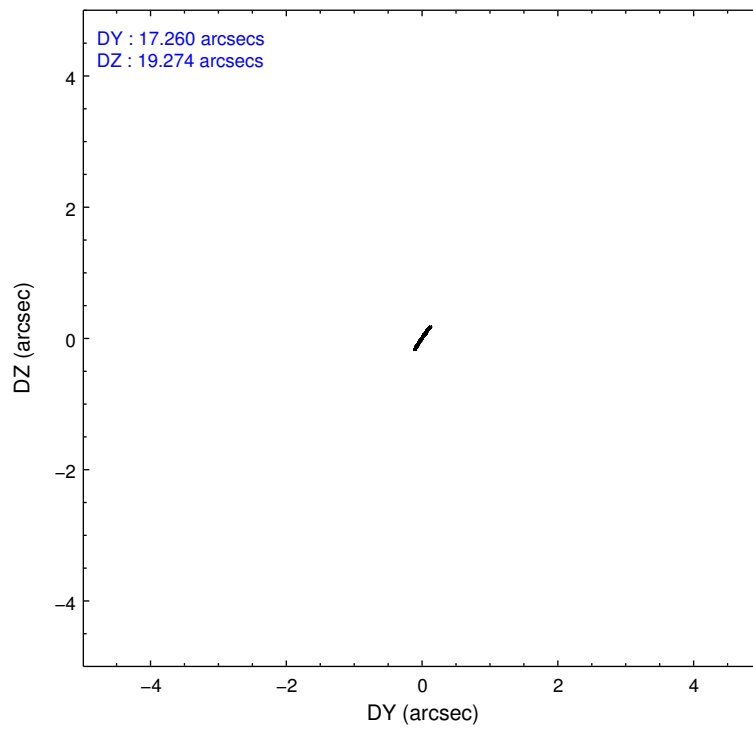
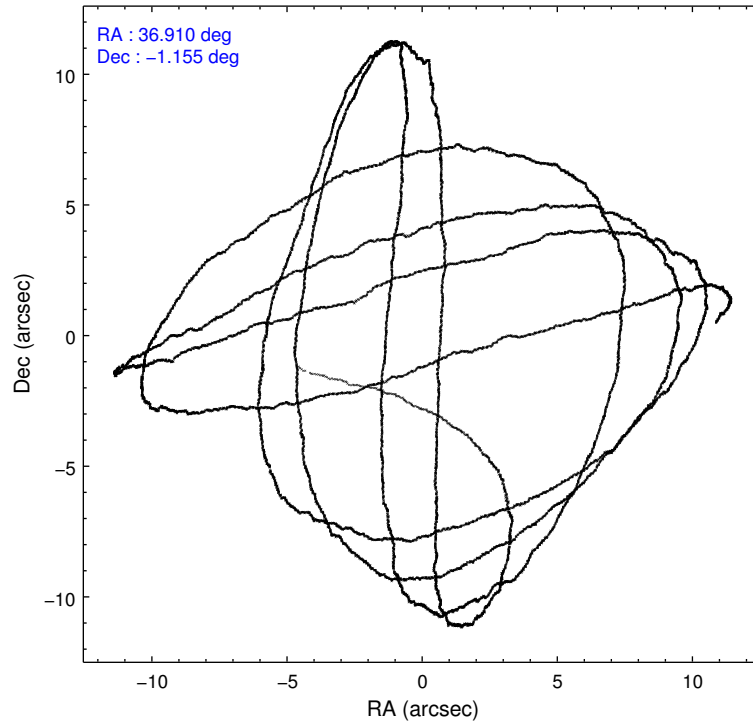
### 2.1.4 Events

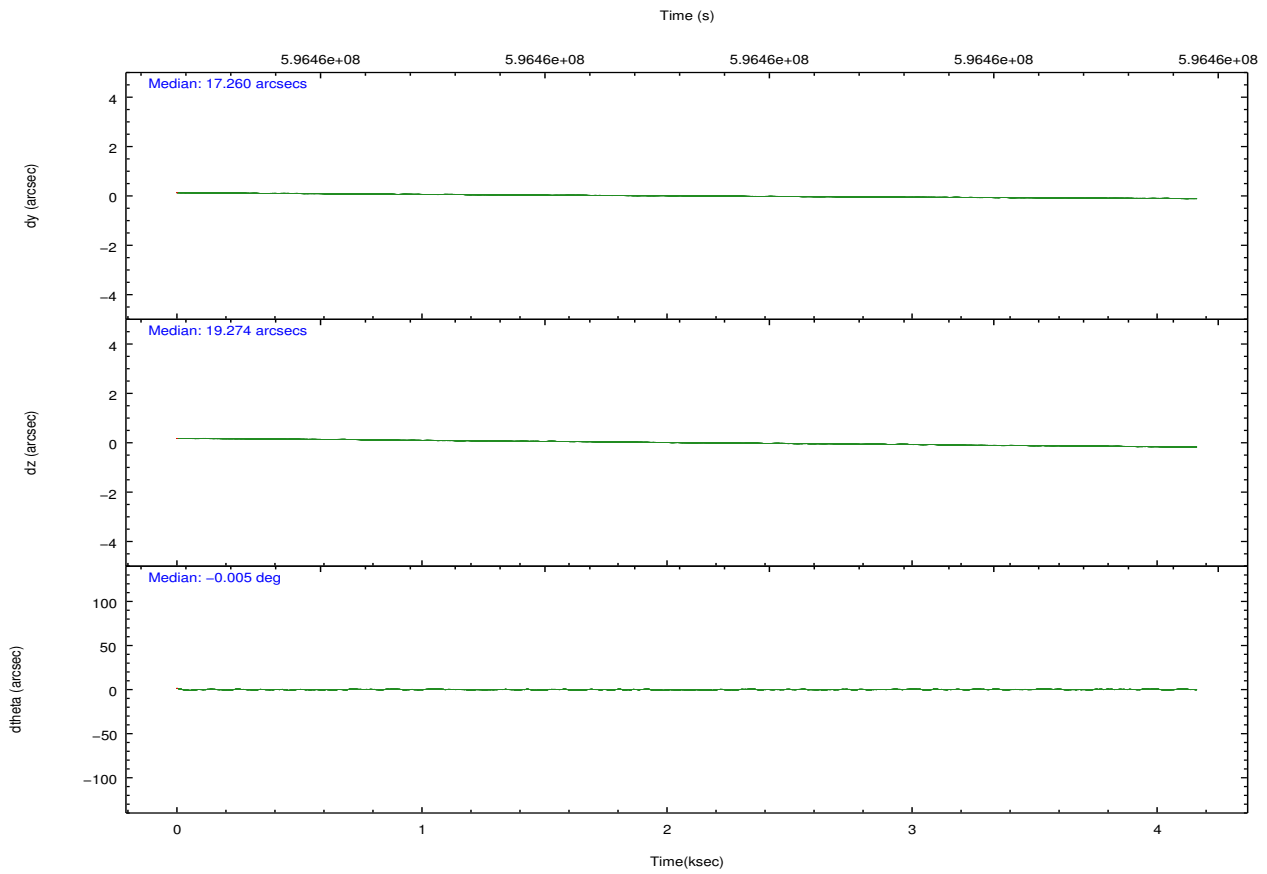
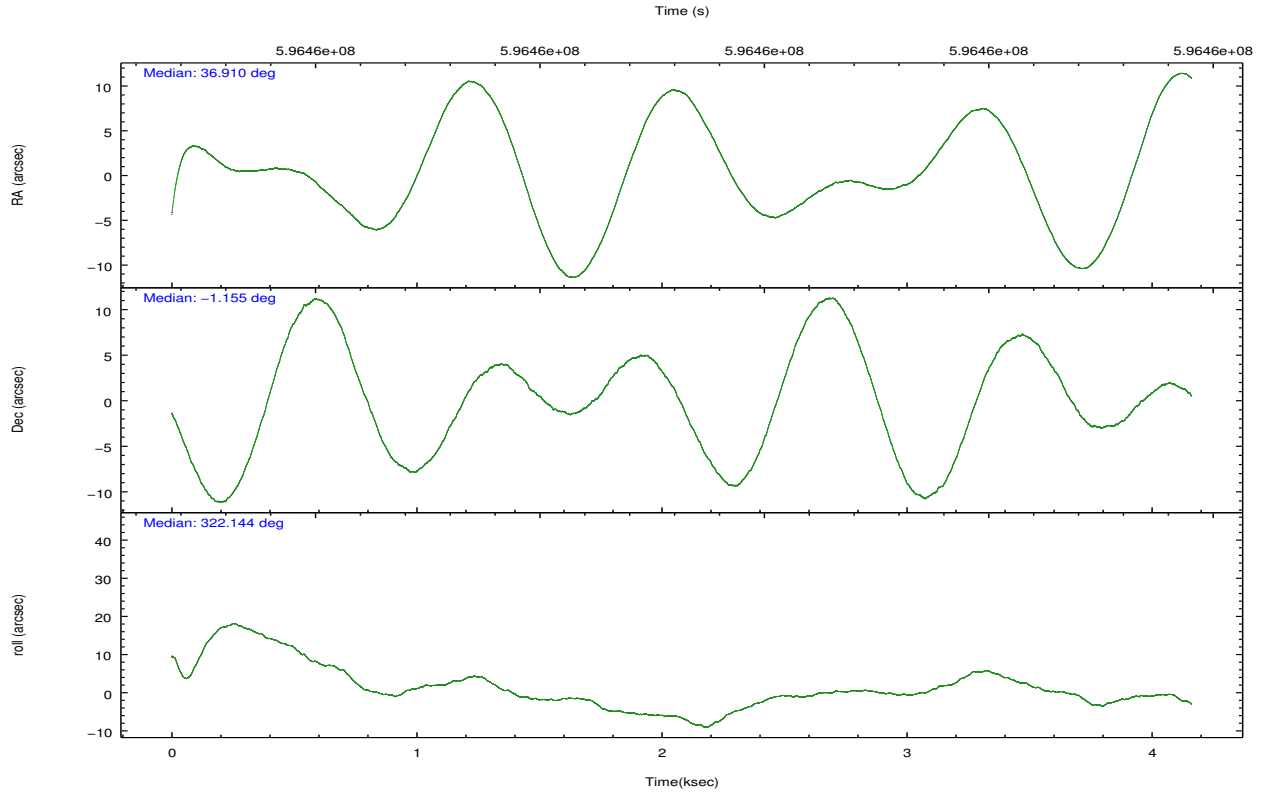
|                 | ccd 2 | ccd 3 | ccd 5 | ccd 6 | ccd 7 | ccd 8 |                | ccd 2 | ccd 3 | ccd 5 | ccd 6 | ccd 7 | ccd 8 |
|-----------------|-------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|
| level 1 events  | 26394 | 25994 | 43769 | 26853 | 34499 | 34195 | grade 0 events | 973   | 923   | 2586  | 1153  | 1376  | 2313  |
| rejected events | 23612 | 22225 | 22170 | 23636 | 19353 | 25420 |                | 3%    | 3%    | 5%    | 4%    | 3%    | 6%    |
| rejected %      | 89%   | 85%   | 50%   | 88%   | 56%   | 74%   | grade 1 events | 18    | 17    | 122   | 15    | 54    | 21    |
|                 |       |       |       |       |       |       |                | 0%    | 0%    | 0%    | 0%    | 0%    | 0%    |
|                 |       |       |       |       |       |       | grade 2 events | 704   | 1731  | 6705  | 701   | 3185  | 2323  |
|                 |       |       |       |       |       |       |                | 2%    | 6%    | 15%   | 2%    | 9%    | 6%    |
|                 |       |       |       |       |       |       | grade 3 events | 259   | 271   | 709   | 317   | 1278  | 870   |
|                 |       |       |       |       |       |       |                | 0%    | 1%    | 1%    | 1%    | 3%    | 2%    |
|                 |       |       |       |       |       |       | grade 4 events | 286   | 268   | 621   | 303   | 1235  | 815   |
|                 |       |       |       |       |       |       |                | 1%    | 1%    | 1%    | 1%    | 3%    | 2%    |
|                 |       |       |       |       |       |       | grade 5 events | 1079  | 1295  | 3204  | 1284  | 3417  | 1865  |
|                 |       |       |       |       |       |       |                | 4%    | 4%    | 7%    | 4%    | 9%    | 5%    |
|                 |       |       |       |       |       |       | grade 6 events | 564   | 580   | 11018 | 745   | 8086  | 2458  |
|                 |       |       |       |       |       |       |                | 2%    | 2%    | 25%   | 2%    | 23%   | 7%    |
|                 |       |       |       |       |       |       | grade 7 events | 22511 | 20909 | 18804 | 22335 | 15868 | 23530 |
|                 |       |       |       |       |       |       |                | 85%   | 80%   | 42%   | 83%   | 45%   | 68%   |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar format version number          | 7         | 7       |
| Detector                          | ACIS-235678         | ACIS-235678          | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                           | NONE                | NONE                 | 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                 | 36.883237           | 36.91052242726924    | CCD I2 on                             | O1        | Y       |
| [deg] Pointing Dec                | -1.151774           | -1.155204268846959   | CCD I3 on                             | O2        | Y       |
| [deg] Pointing Roll               | 321.999548          | 322.1567638900721    | CCD S0 on                             | N         | N       |
| [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         | -190.1400660498719   | CCD S3 on                             | Y         | Y       |
| [mm] SIM translation stage offset | 0                   | 0.00754346686406393  | CCD S4 on                             | Y         | Y       |
| [s] Observation start time (MET)  | 596455717.184000    | 596454460.40563      | CCD S5 on                             | N         | N       |
| Observation start date            | 2016-11-25T10:07:29 | 2016-11-25T09:47:40  | Number of optional ACIS chips dropped | 0         | 0       |
| [s] Observation end time (MET)    | 596459717.184000    | 596460538.65598      | On-chip summing requested             | N         | N       |
| Observation end date              | 2016-11-25T11:14:09 | 2016-11-25T11:28:58  | Subarray requested                    | NONE      | NONE    |
| Read mode                         | TIMED               | TIMED                | Alternating exposures requested       | N         | N       |
|                                   |                     |                      | [s] Primary exposure time             | 0.000000  | 3.2     |

## 2.3 Aspect





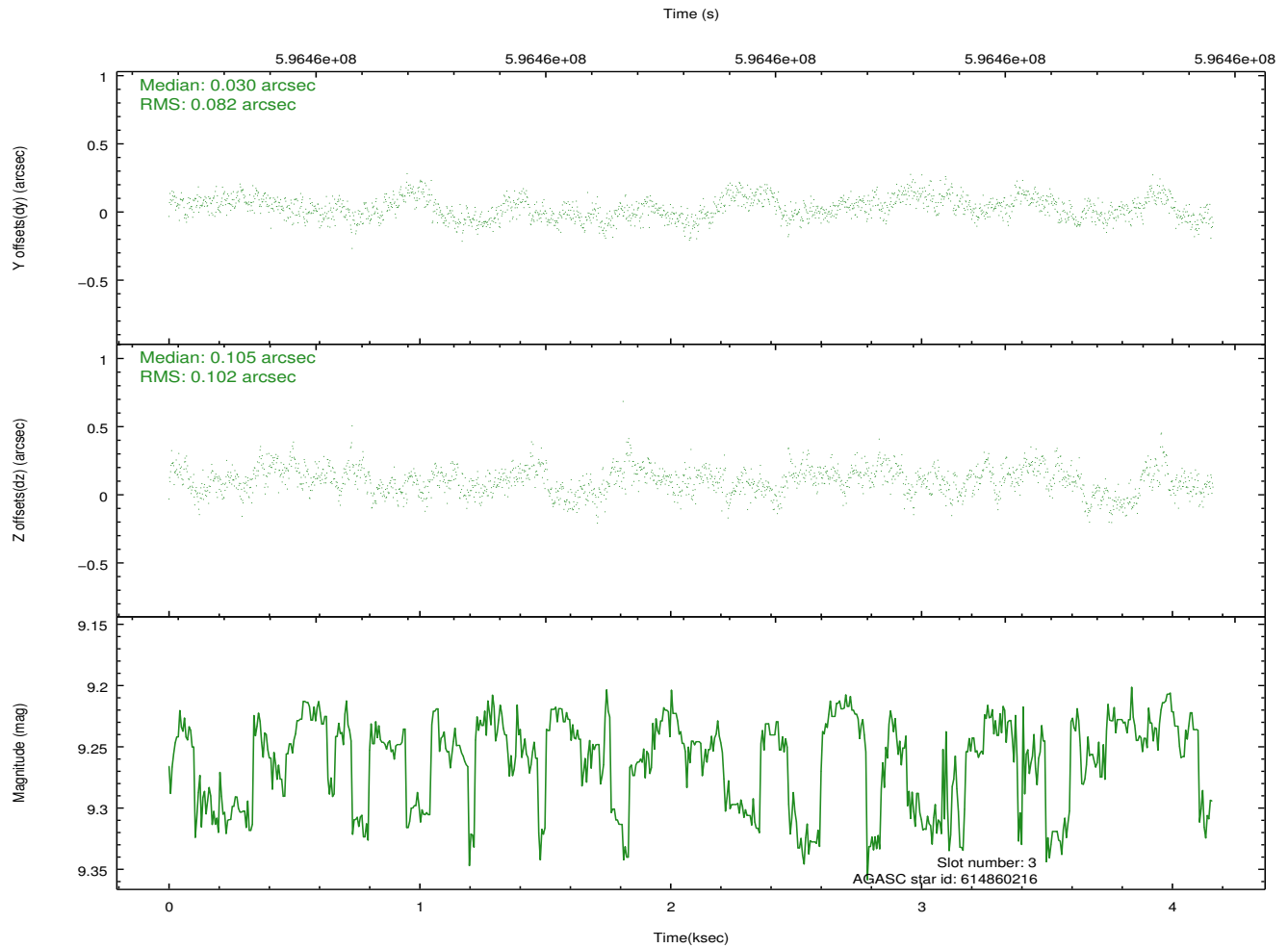
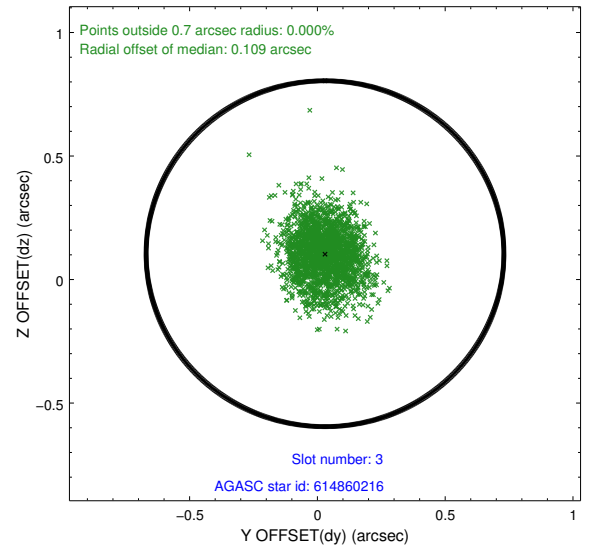
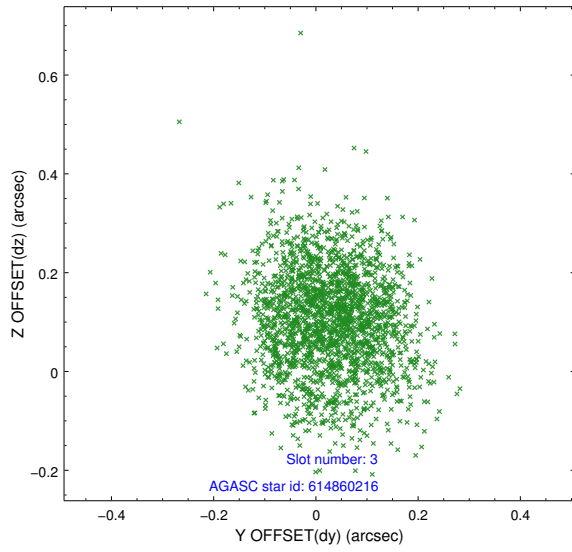
### Slot Statistics

| slot | status | used | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec       | mean_y   | mean_z   |
|------|--------|------|-----------|------|-------|--------|--------|-------|-------|-----------|-----------|----------|----------|
| 0    | FID    |      | ACIS-S-2  | 6.97 | 1016  | -0.201 | -0.108 | 0.007 | 0.013 | 0.000000  | 0.000000  | -770.46  | -1740.89 |
| 1    | FID    |      | ACIS-S-4  | 7.08 | 1016  | 0.466  | 0.126  | 0.006 | 0.011 | 0.000000  | 0.000000  | 2142.76  | 166.32   |
| 2    | FID    |      | ACIS-S-5  | 7.07 | 1016  | -0.297 | -0.009 | 0.008 | 0.012 | 0.000000  | 0.000000  | -1821.52 | 161.49   |
| 3    | GUIDE  | used | 614860216 | 9.25 | 2028  | 0.030  | 0.105  | 0.138 | 0.221 | 37.043248 | -0.716912 | -510.08  | 1588.42  |
| 4    | GUIDE  | used | 614861392 | 9.11 | 2026  | -0.054 | 0.243  | 0.123 | 0.213 | 36.963354 | -0.789504 | -575.76  | 1207.49  |
| 5    | GUIDE  | used | 614861536 | 9.19 | 2027  | 0.150  | -0.070 | 0.182 | 0.322 | 36.909511 | -2.017196 | 1996.31  | -2395.23 |
| 6    | GUIDE  | used | 614862104 | 9.48 | 2028  | -0.156 | -0.189 | 0.153 | 0.260 | 36.842535 | -1.024236 | -397.19  | 270.33   |
| 7    | GUIDE  | used | 614863240 | 9.75 | 2018  | 0.024  | -0.090 | 0.187 | 0.310 | 37.213216 | -1.606236 | 1943.12  | -557.62  |

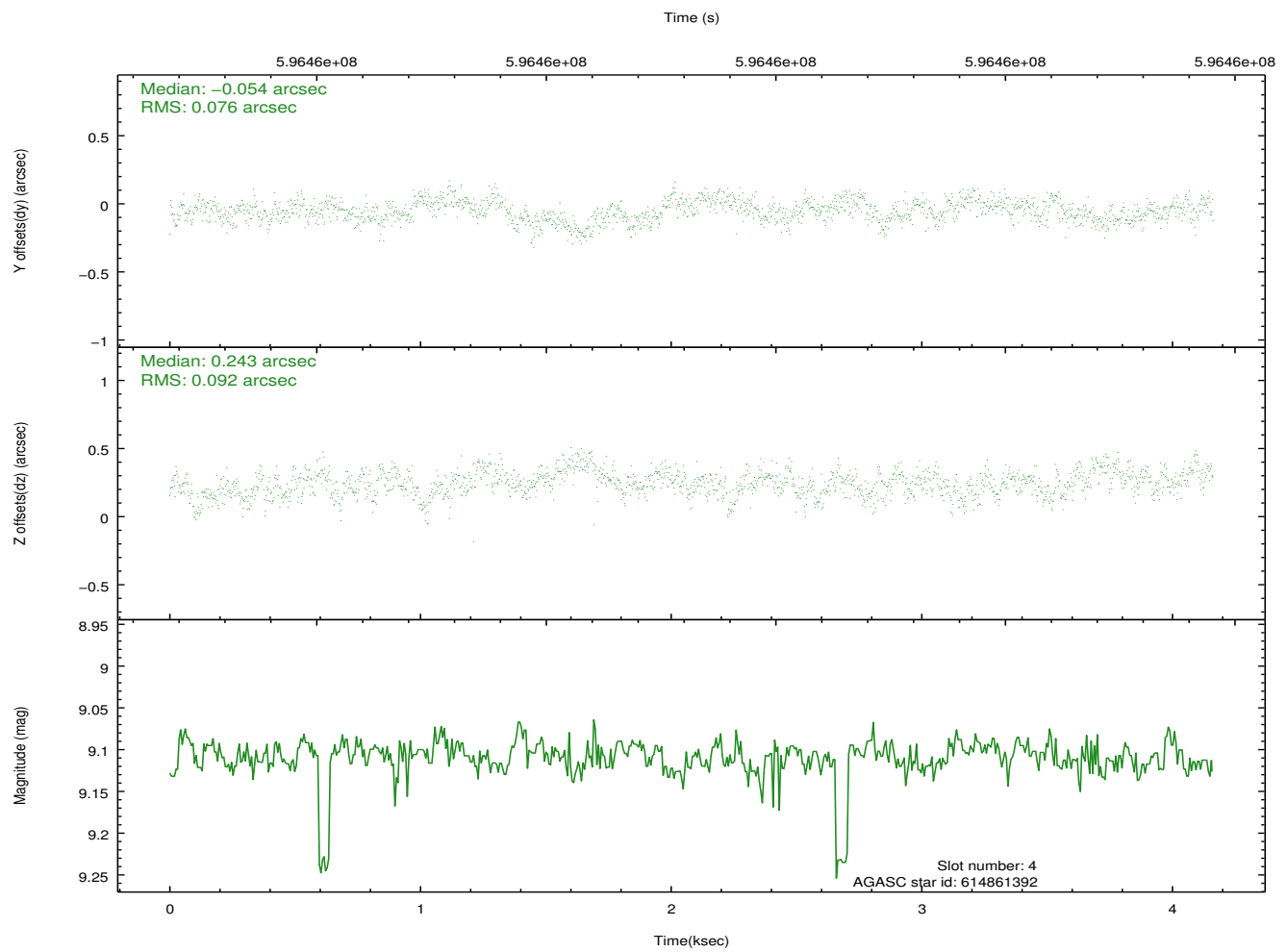
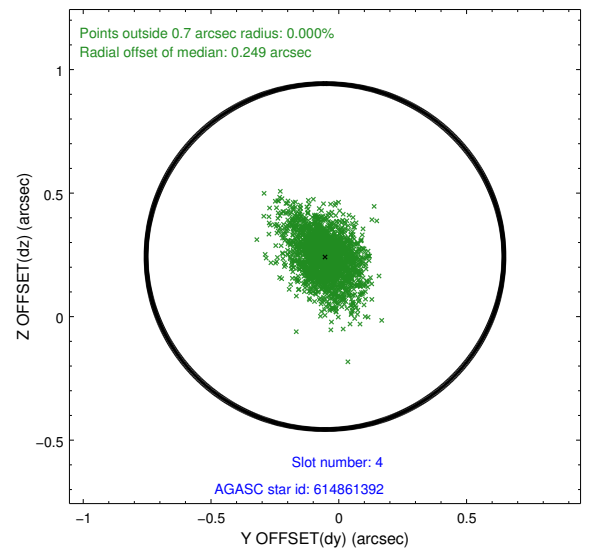
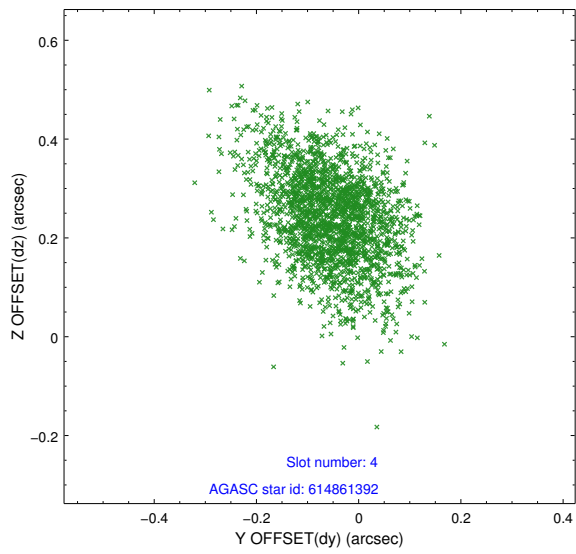
∞

## 2.4 Star Slots

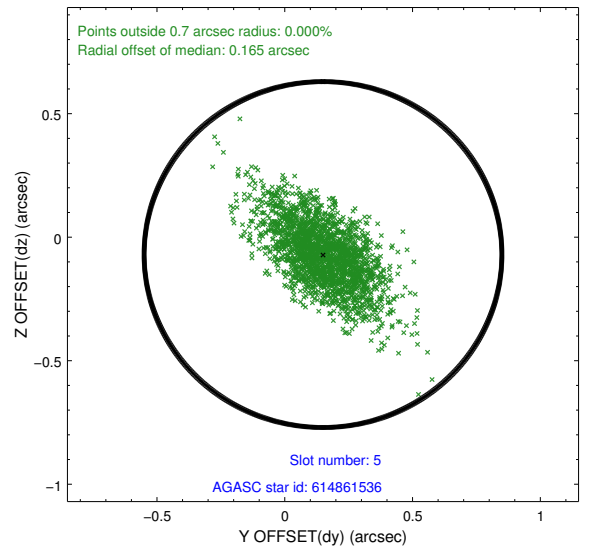
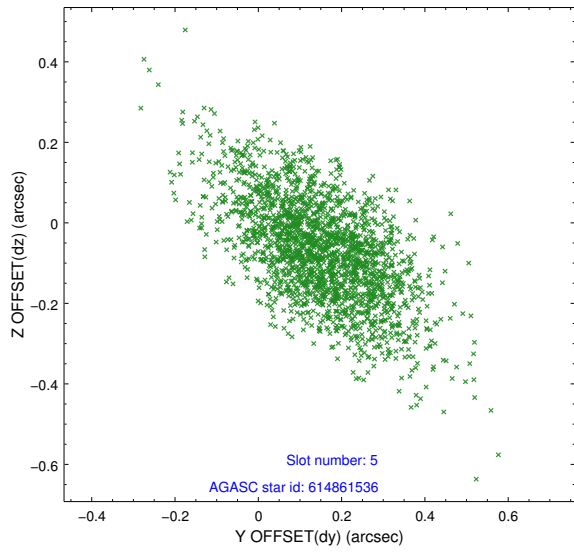
### 2.4.1 Slot 3



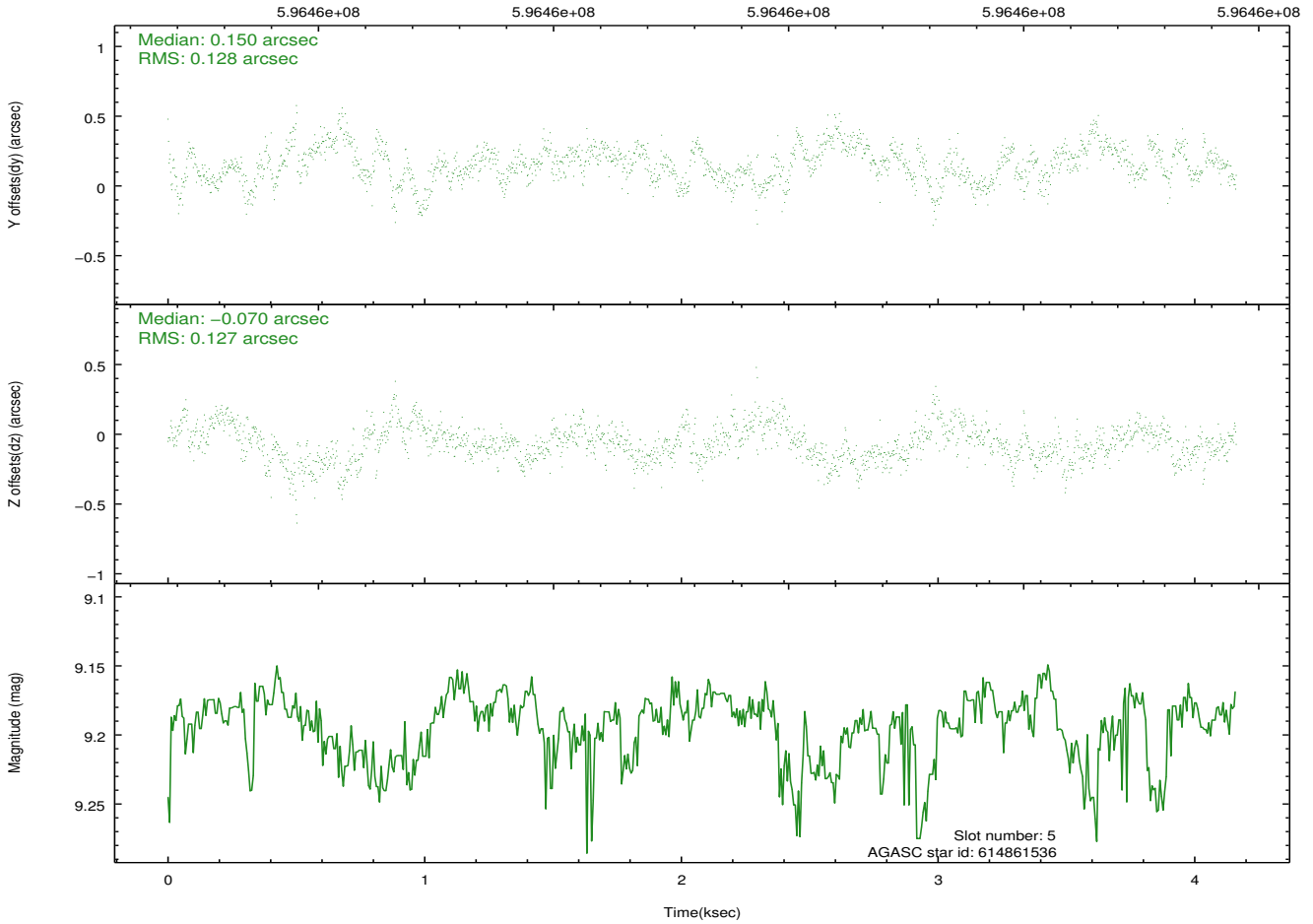
## 2.4.2 Slot 4



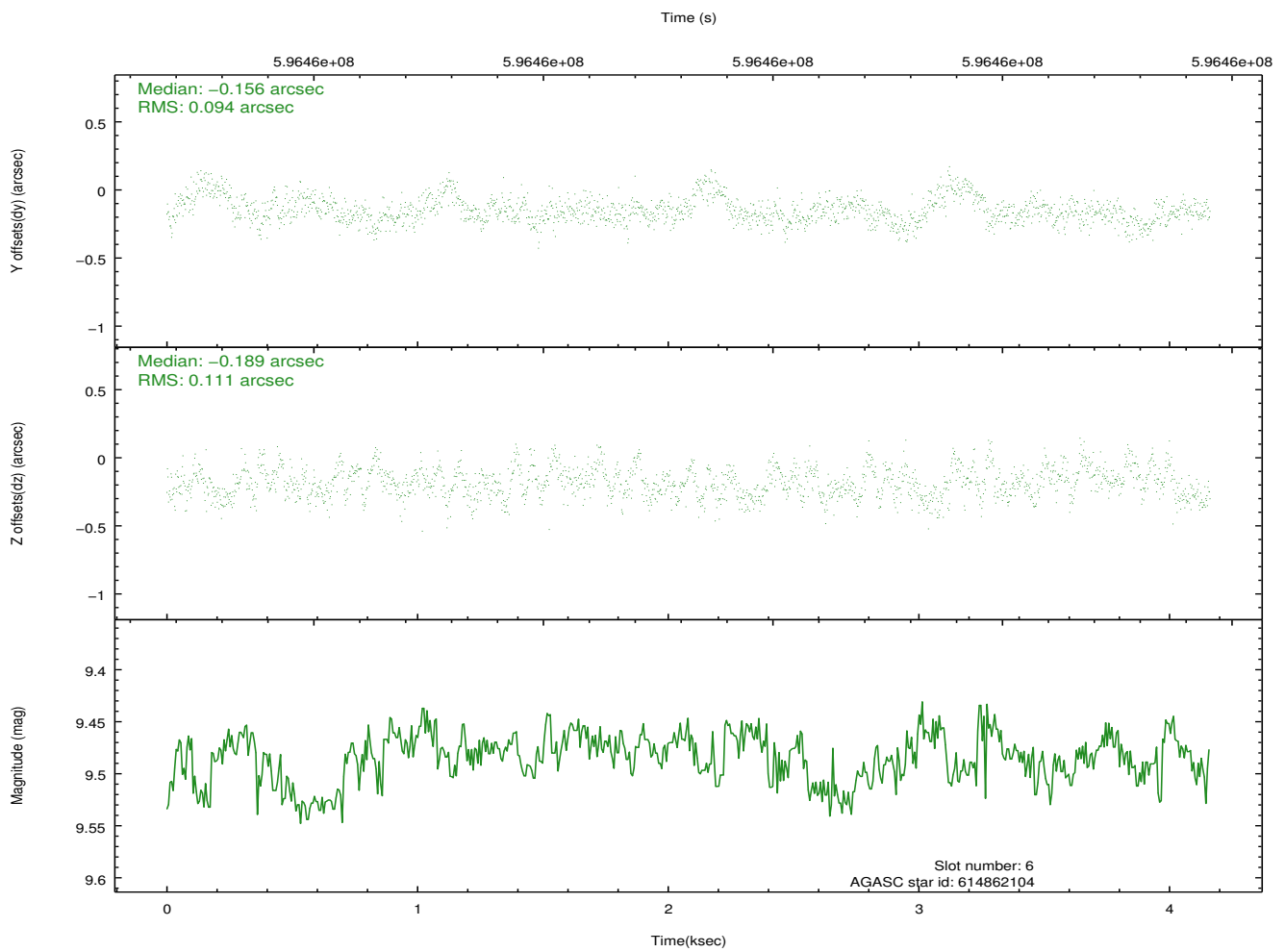
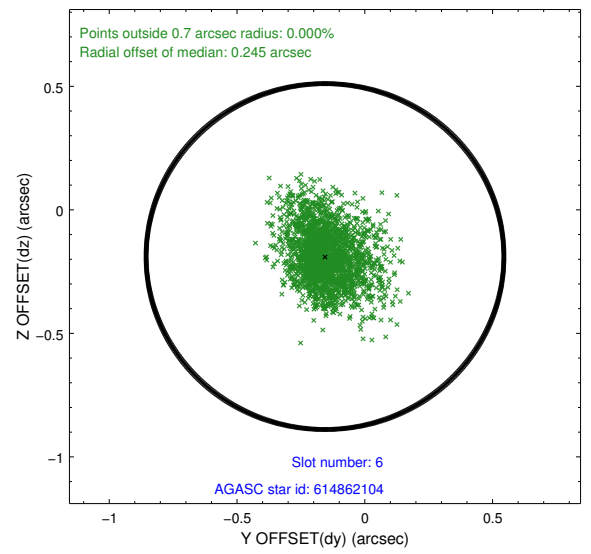
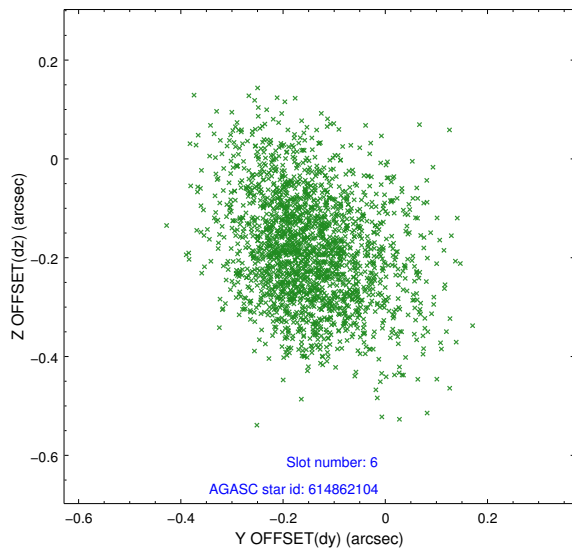
### 2.4.3 Slot 5



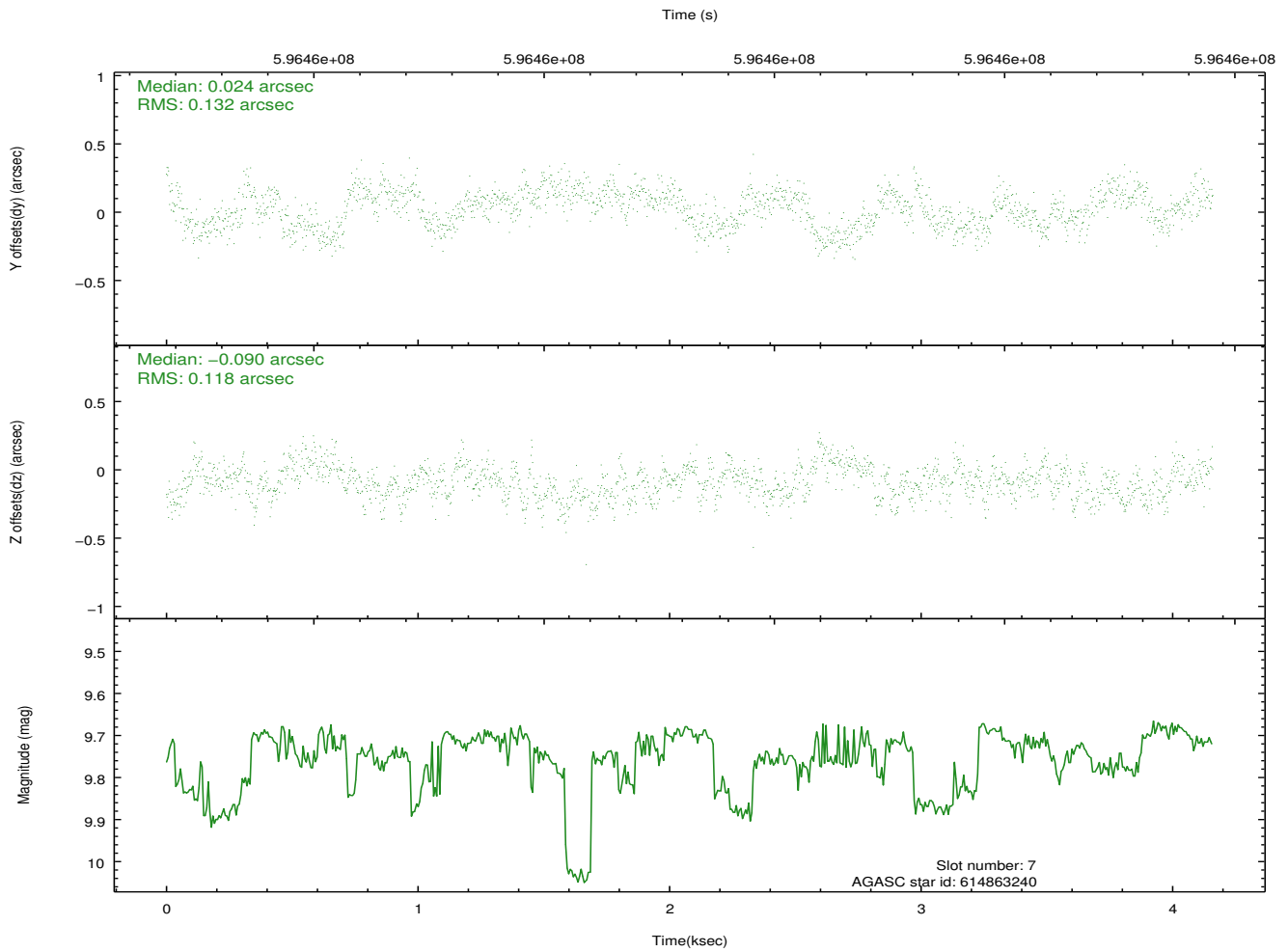
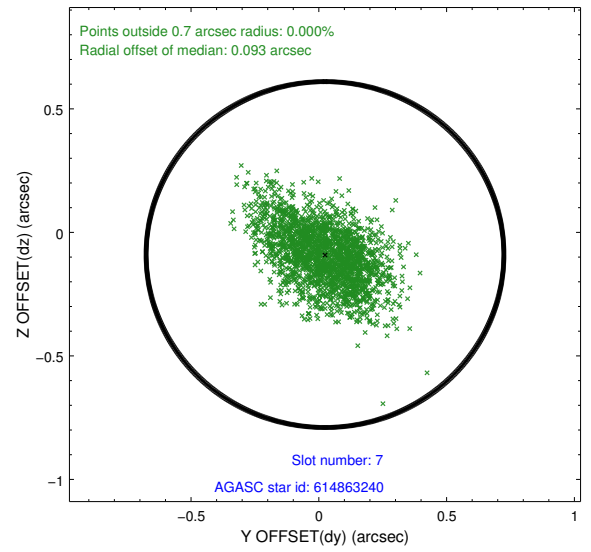
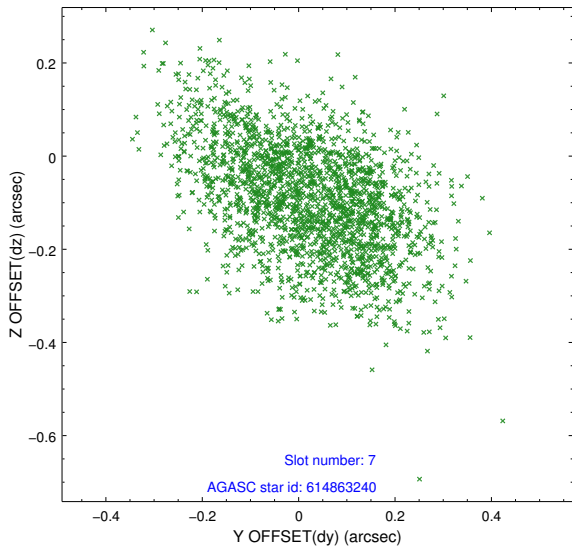
Time (s)



## 2.4.4 Slot 6

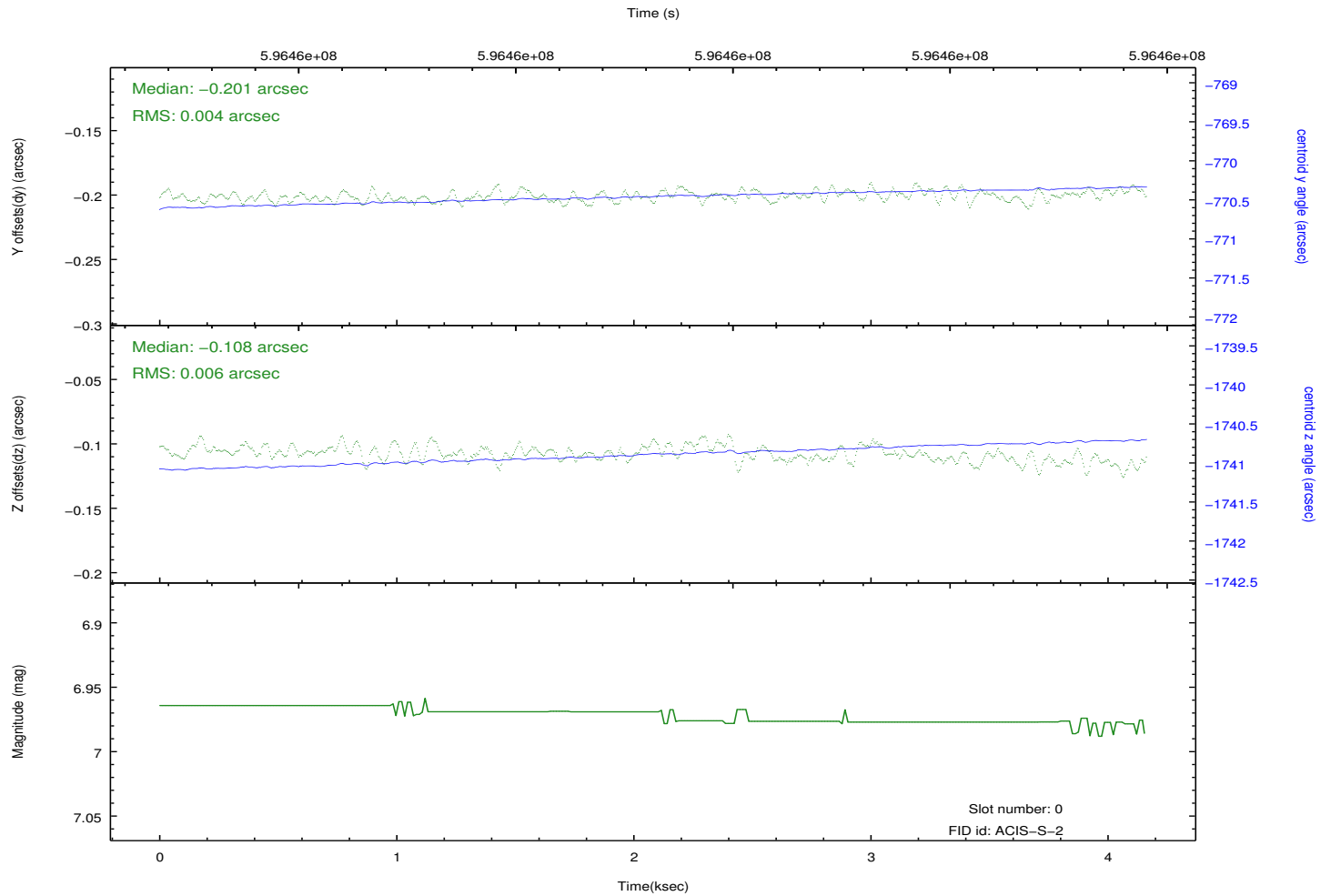
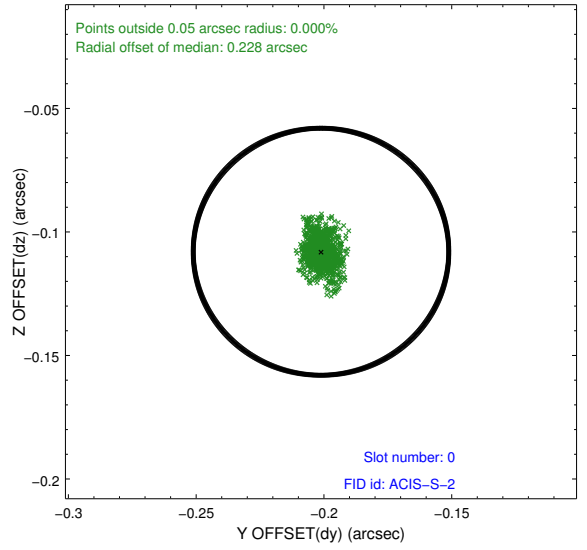
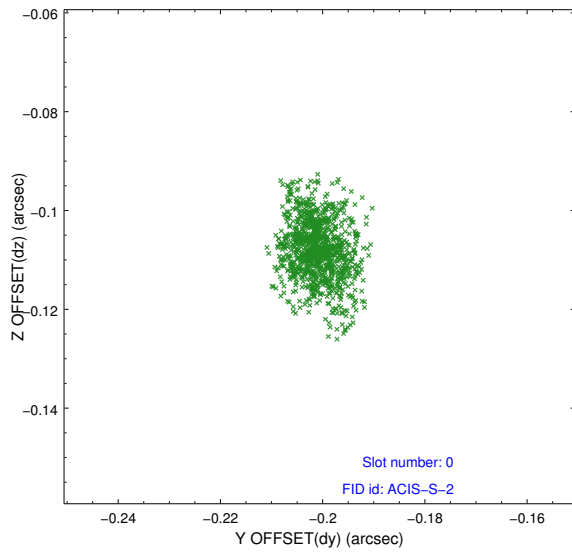


### 2.4.5 Slot 7

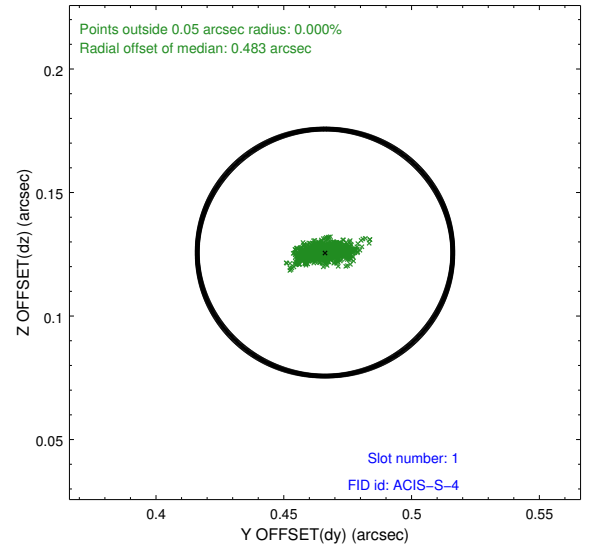
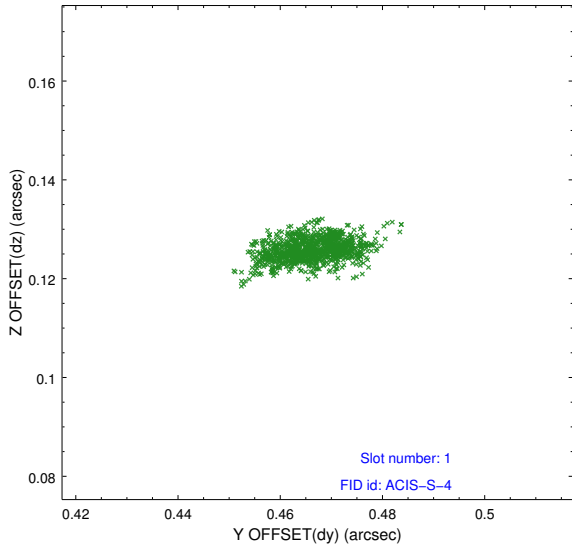


## 2.5 FID Slots

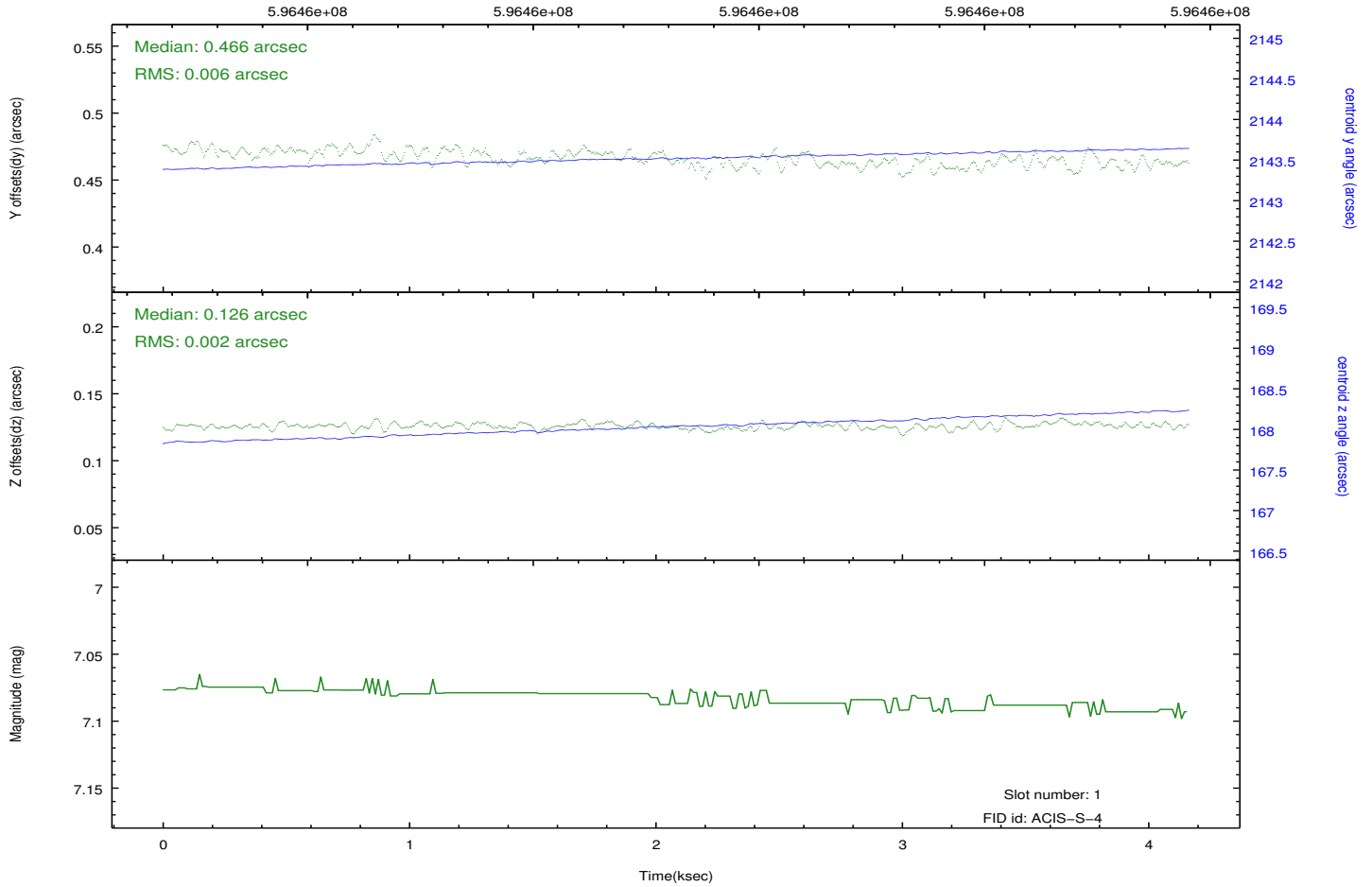
### 2.5.1 Slot 0



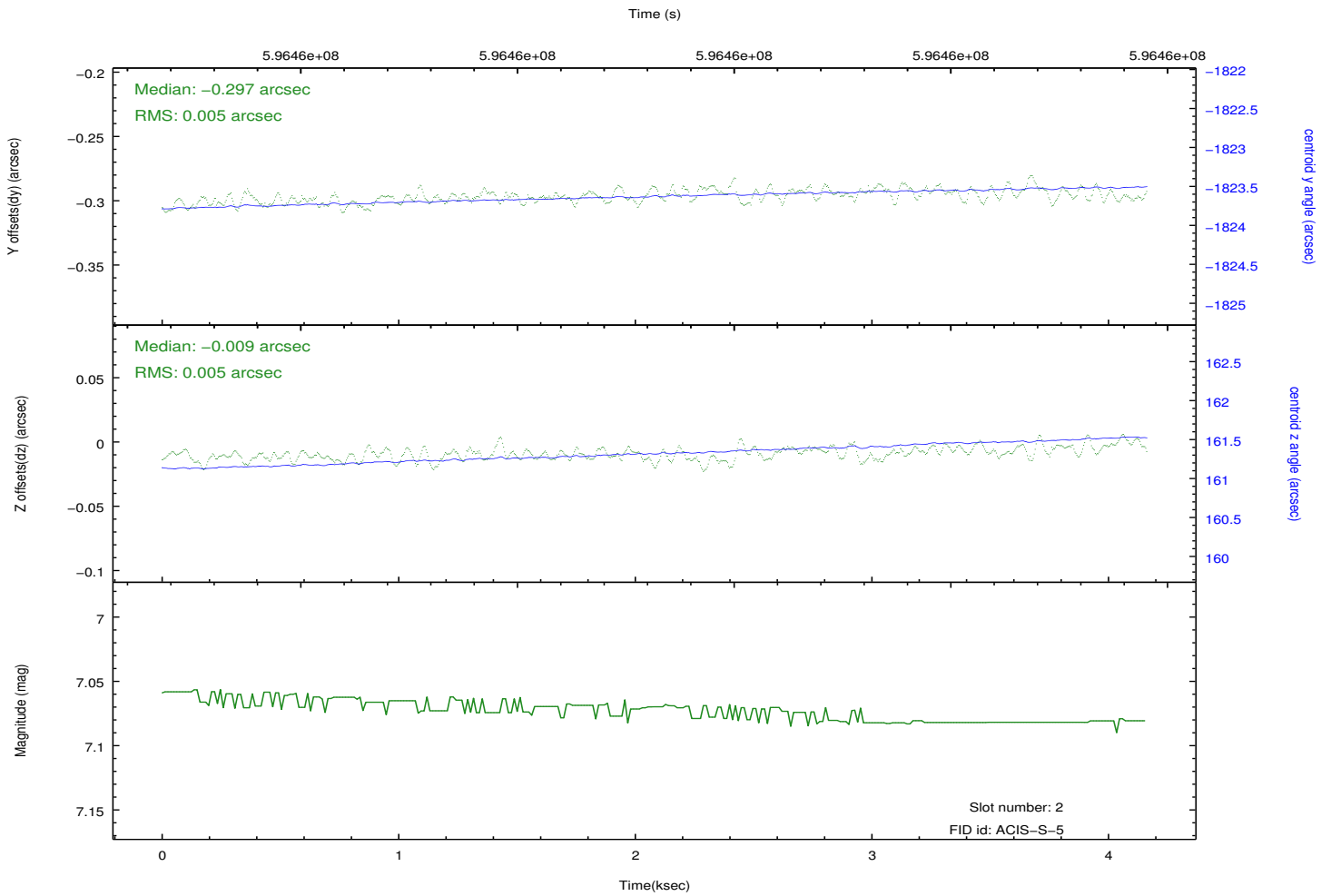
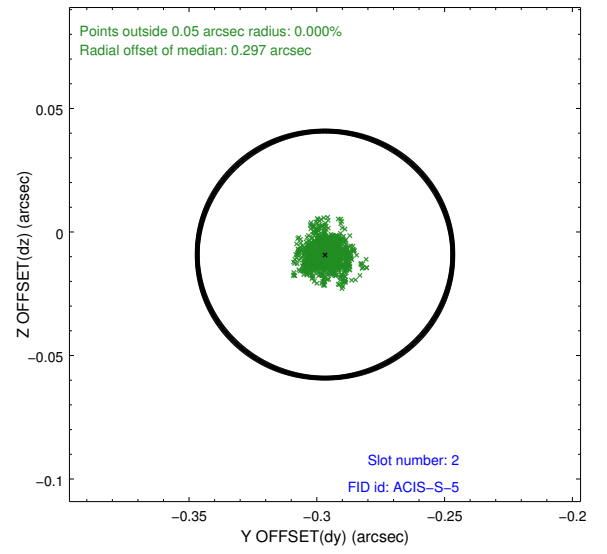
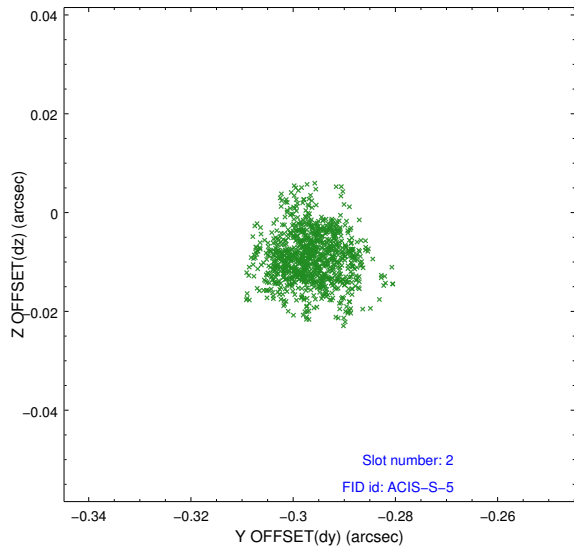
## 2.5.2 Slot 1



Time (s)



### 2.5.3 Slot 2



## A Summary

### A.1 Status

|                            |                 |
|----------------------------|-----------------|
| V&V Scientist              | Beth Sundheim   |
| V&V Date (YYYY-MM-DD)      | 2016.11.27      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 3.9477708950043 |

### A.2 Comments