

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 13155 - L2 Version 3  
Chandra X-Ray Center

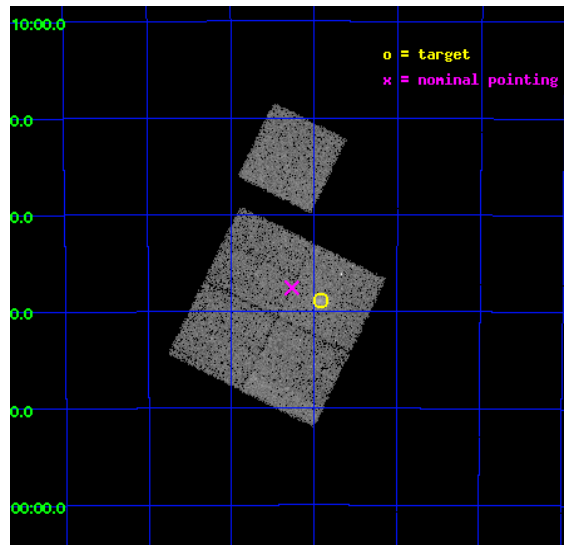
L2 Processing Date : Jul 5 2012

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# 1 Front

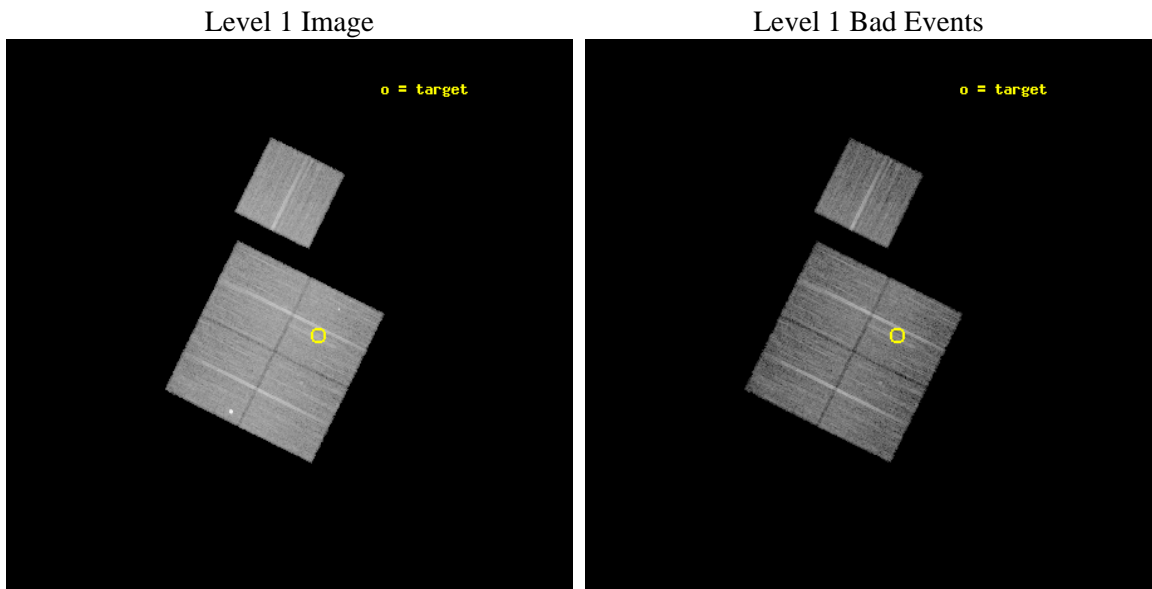
|          |  |   |
|----------|--|---|
| seq_num  | 800989   | Sequence number                             |
| obs_id   | 13155  | Observation id                              |
| title    | Chandra Observations of the ACT Sample of SZE-Selected Galaxy Clusters | Proposal title                              |
| observer | Prof. John Hughes  | Principal investigator                      |
| object   | ACT J0346-5438   | Source name                                 |
| dtcycle  | 0  | &#160                                       |
| cycle    | P  | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 56.73125   | Observer's specified target RA [deg]        |
| dec_targ | -54.648556   | Observer's specified target Dec [deg]       |
| ra_nom   | 56.816942998657  | Nominal RA [deg]                            |
| dec_nom  | -54.626228988601   | Nominal Dec [deg]                           |
| roll_nom | 26.278549315107  | Nominal Roll [deg]                          |
| revision | 3  | Processing version of data                  |
| ontime   | 16555.950728238  | Sum of GTIs [s]                             |
| livetime | 16339.63504366   | Livetime [s]                                |
| ontime0  | 16552.686597884  | Sum of GTIs [s]                             |
| ontime1  | 16555.868648231  | Sum of GTIs [s]                             |
| ontime2  | 16552.76867795   | Sum of GTIs [s]                             |
| ontime3  | 16555.950728238  | Sum of GTIs [s]                             |
| ontime6  | 16555.786568224  | Sum of GTIs [s]                             |
| l2events | 57754  | Number of level 2 events                    |



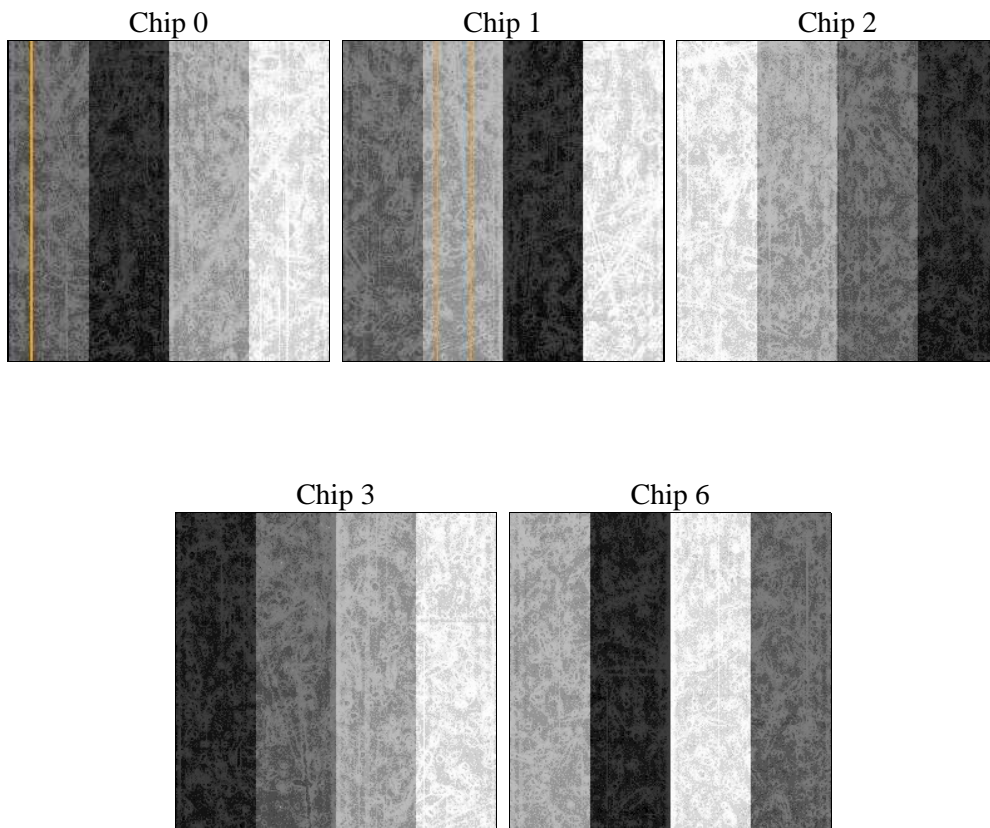
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 16500.000000    | [s] Scheduled observation exposure time |
| ascdsver | 8.4.5               | Processing system revision     | ontime         | 16555.950728238 | Sum of GTIs [s]                         |
| caldbver | 4.5.0               | &#160                          | ontime0        | 16552.686597884 | Sum of GTIs [s]                         |
| date     | 2012-07-05T22:15:03 | Date and time of file creation | ontime1        | 16555.868648231 | Sum of GTIs [s]                         |
| revision | 3                   | Processing version of data     | ontime2        | 16552.76867795  | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 16555.950728238 | Sum of GTIs [s]                         |
|          |                     |                                | ontime6        | 16555.786568224 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 579439          | Number of level 1 events                |

### 2.1.4 Events

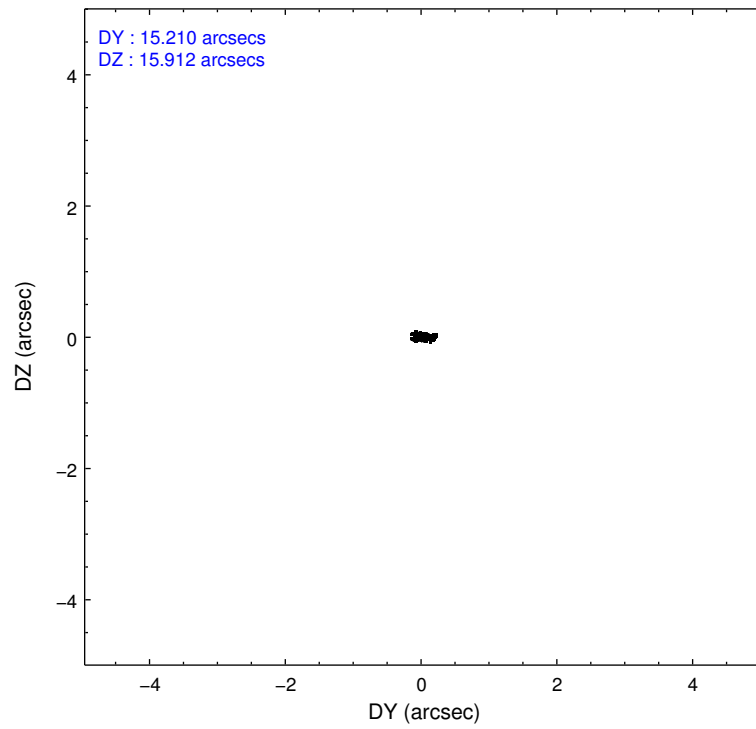
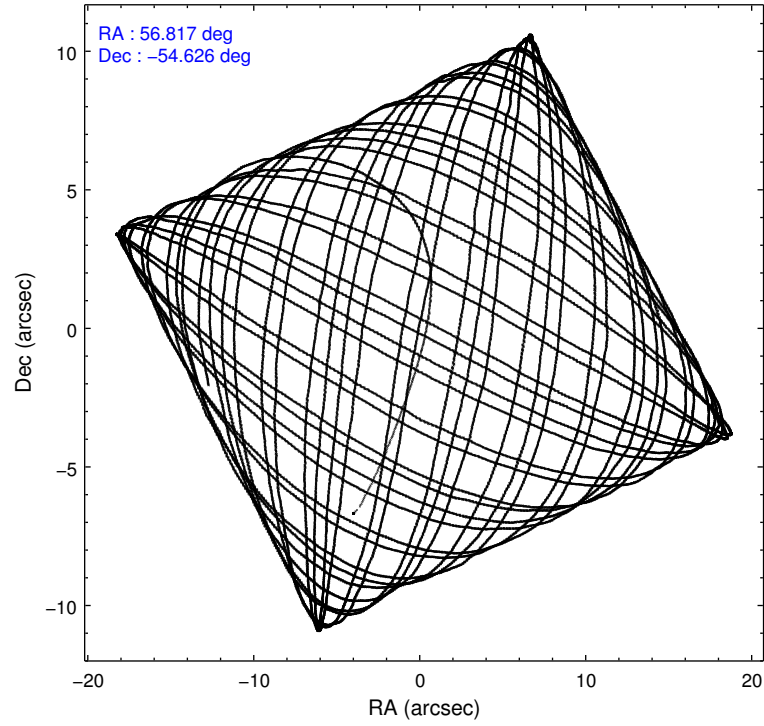
|                 | ccd 0  | ccd 1  | ccd 2  | ccd 3  | ccd 6  |
|-----------------|--------|--------|--------|--------|--------|
| level 1 events  | 111882 | 112525 | 119999 | 118856 | 116177 |
| rejected events | 93749  | 97842  | 107042 | 104588 | 102802 |
| rejected %      | 83%    | 86%    | 89%    | 87%    | 88%    |

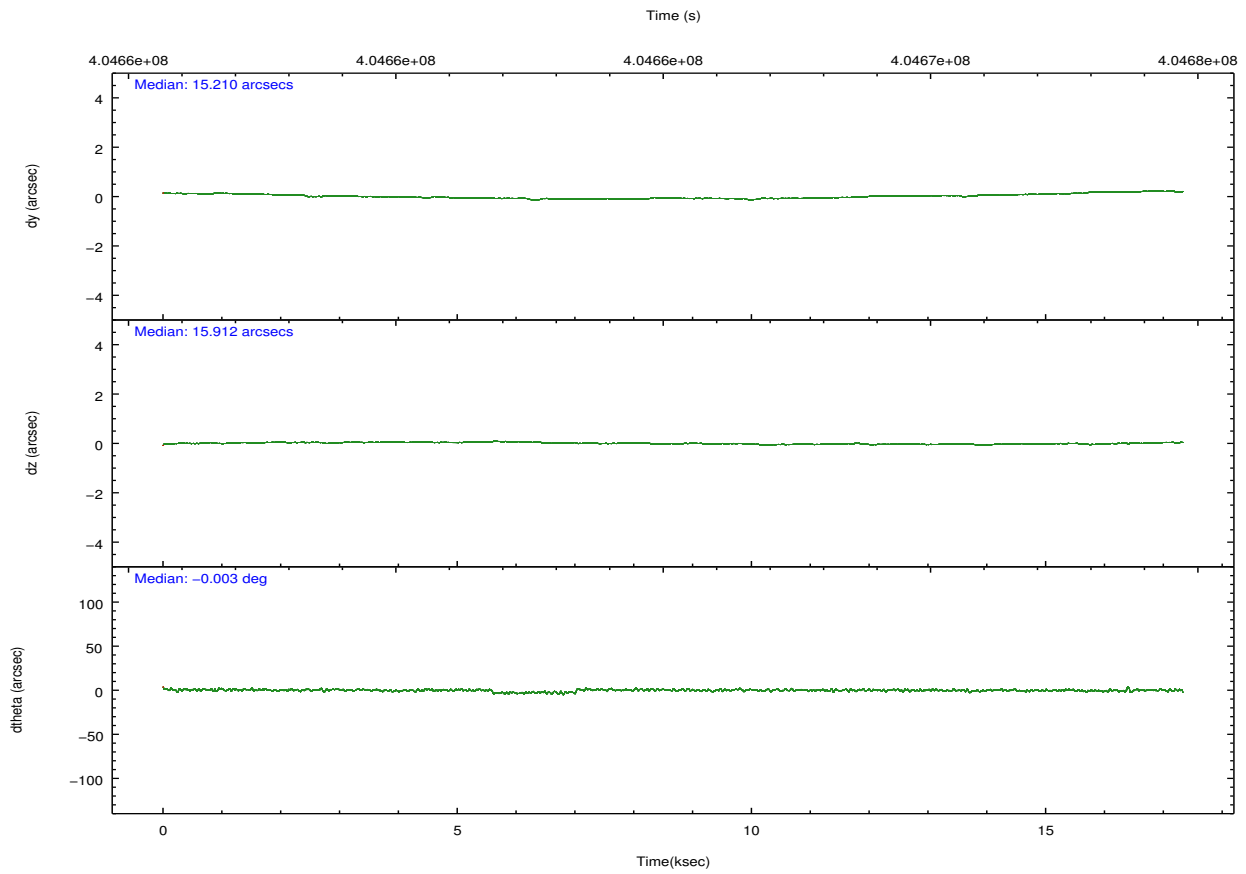
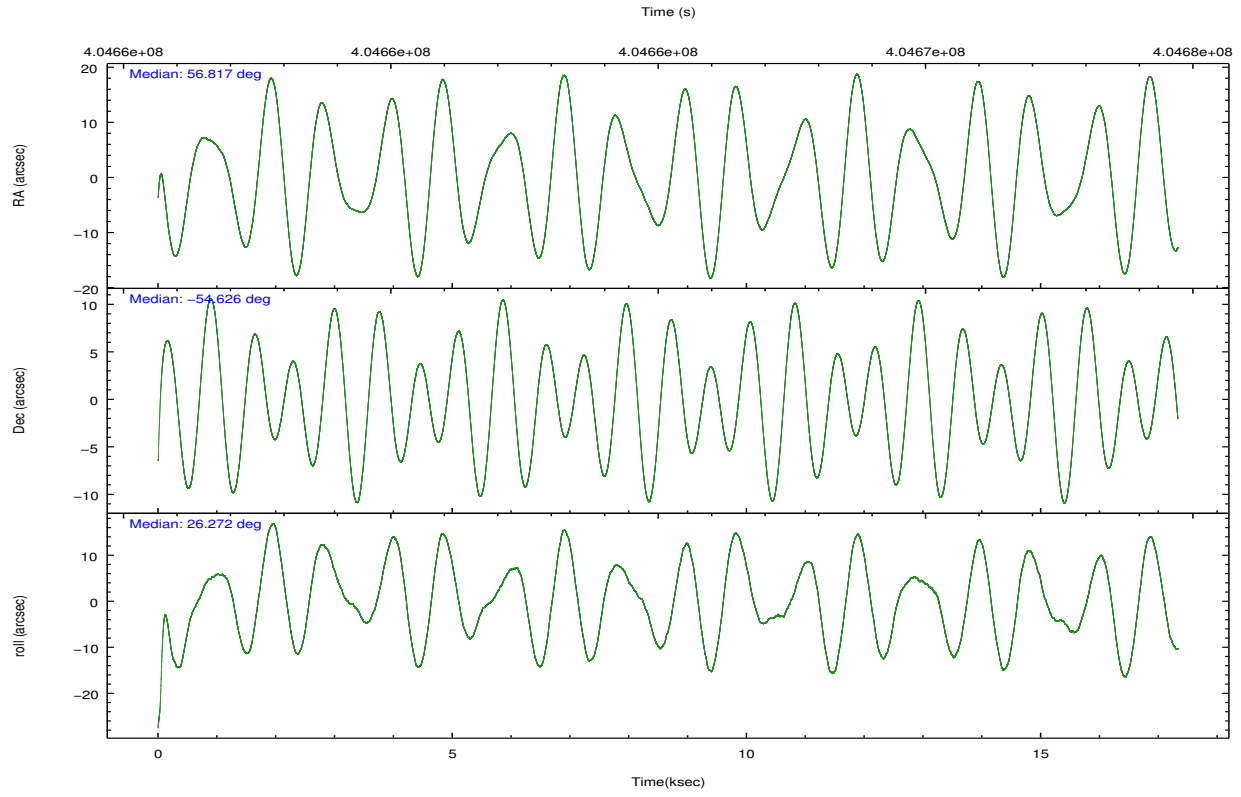
|                | ccd 0 | ccd 1 | ccd 2  | ccd 3 | ccd 6 |
|----------------|-------|-------|--------|-------|-------|
| grade 0 events | 9442  | 5228  | 4670   | 5755  | 4543  |
|                | 8%    | 4%    | 3%     | 4%    | 3%    |
| grade 1 events | 88    | 67    | 82     | 91    | 71    |
|                | 0%    | 0%    | 0%     | 0%    | 0%    |
| grade 2 events | 3369  | 3486  | 3142   | 2991  | 2956  |
|                | 3%    | 3%    | 2%     | 2%    | 2%    |
| grade 3 events | 1445  | 1549  | 1326   | 1438  | 1450  |
|                | 1%    | 1%    | 1%     | 1%    | 1%    |
| grade 4 events | 1299  | 1455  | 1339   | 1466  | 1432  |
|                | 1%    | 1%    | 1%     | 1%    | 1%    |
| grade 5 events | 5096  | 5228  | 4851   | 5601  | 5260  |
|                | 4%    | 4%    | 4%     | 4%    | 4%    |
| grade 6 events | 2581  | 2969  | 2483   | 2620  | 2997  |
|                | 2%    | 2%    | 2%     | 2%    | 2%    |
| grade 7 events | 88562 | 92543 | 102106 | 98894 | 97468 |
|                | 79%   | 82%   | 85%    | 83%   | 83%   |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar format version number          | 7         | 7       |
| Detector                          | ACIS-01236          | ACIS-01236           | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                           | NONE                | NONE                 | Obspar update status                  | NONE      | UPDATED |
| Data mode                         | VFAINT              | VFAINT               | CCD I0 on                             | Y         | Y       |
| Observation mode                  | POINTING            | POINTING             | CCD I1 on                             | Y         | Y       |
| [deg] Pointing RA                 | 56.790766           | 56.81694299865741    | CCD I2 on                             | Y         | Y       |
| [deg] Pointing Dec                | -54.649188          | -54.6262289886011    | CCD I3 on                             | Y         | Y       |
| [deg] Pointing Roll               | 26.048533           | 26.27854931510663    | CCD S0 on                             | N         | N       |
| [mm] SIM focus pos                | -0.782348           | -0.7809083437167272  | CCD S1 on                             | N         | N       |
| [mm] SIM defocus                  | 0                   | 0.001439871863259334 | CCD S2 on                             | O1        | Y       |
| [mm] SIM translation stage pos    | -225.792463         | -225.7829997647864   | CCD S3 on                             | N         | N       |
| [mm] SIM translation stage offset | -7.8                | -7.809453238143249   | CCD S4 on                             | N         | N       |
| [s] Observation start time (MET)  | 404657345.184000    | 404655805.57285      | CCD S5 on                             | N         | N       |
| Observation start date            | 2010-10-28T12:47:59 | 2010-10-28T12:23:25  | Number of optional ACIS chips dropped | 0         | 0       |
| [s] Observation end time (MET)    | 404673845.184000    | 404674800.87383      | On-chip summing requested             | N         | N       |
| Observation end date              | 2010-10-28T17:22:59 | 2010-10-28T17:40:00  | Subarray requested                    | NONE      | NONE    |
| Read mode                         | TIMED               | TIMED                | Alternating exposures requested       | N         | N       |
|                                   |                     |                      | [s] Primary exposure time             | 0.000000  | 3.1     |

## 2.3 Aspect



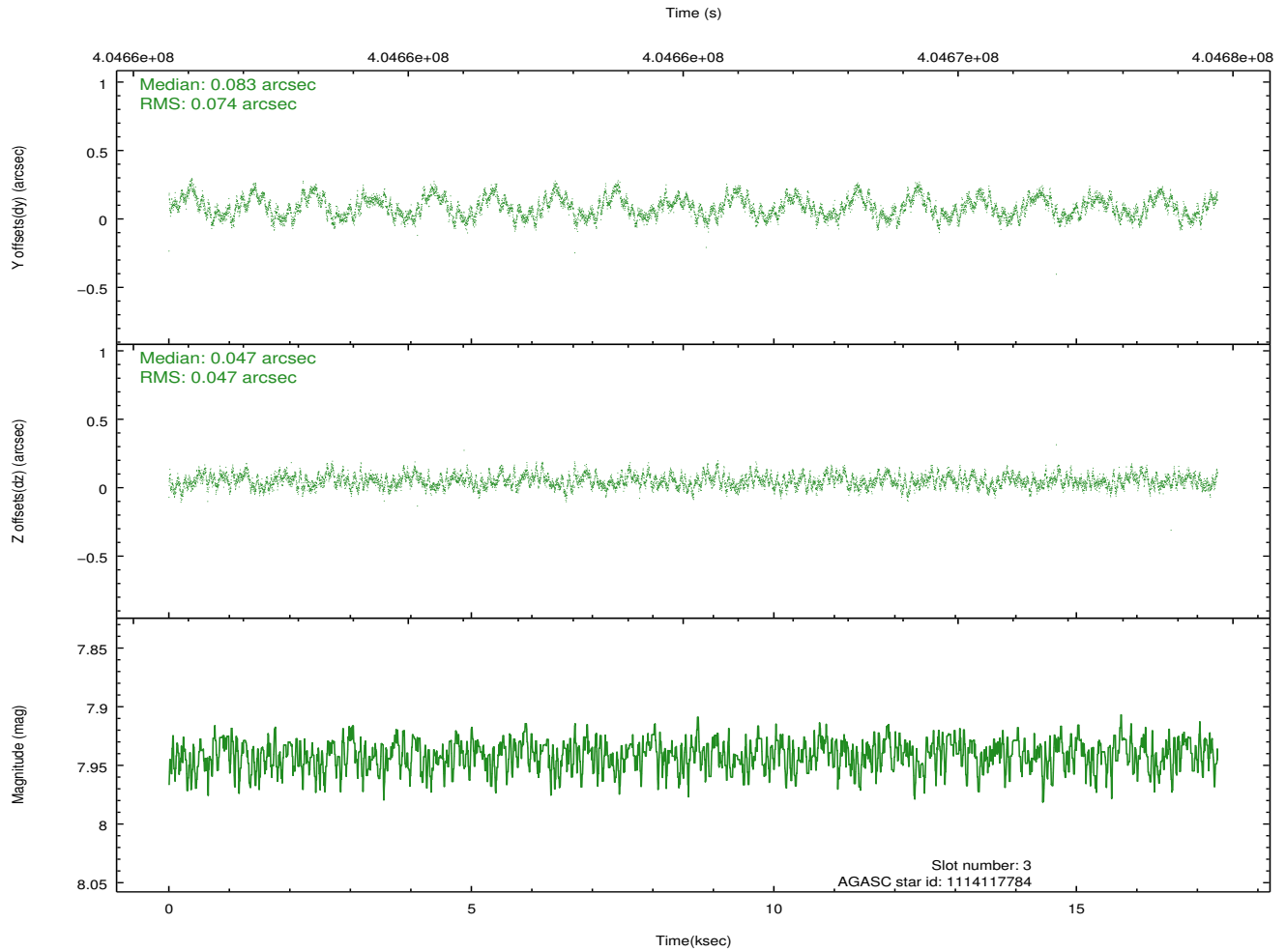
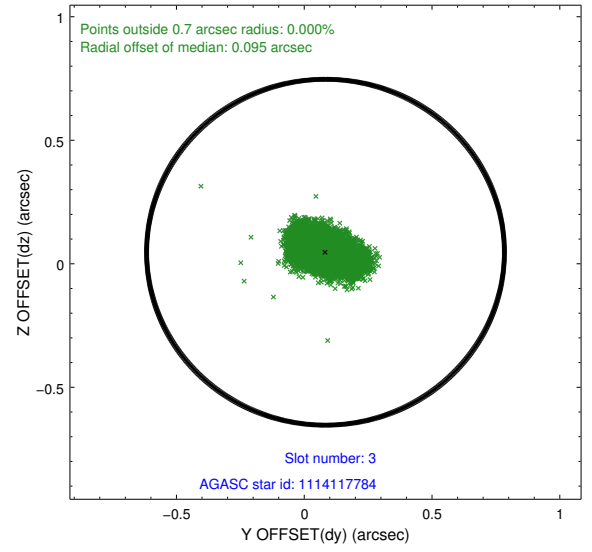
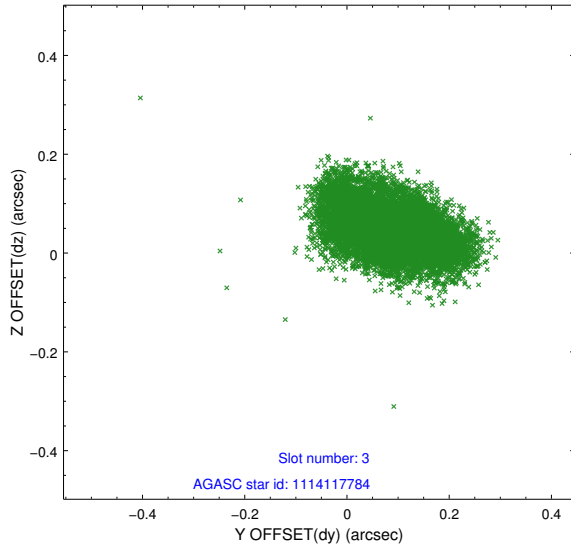


### Slot Statistics

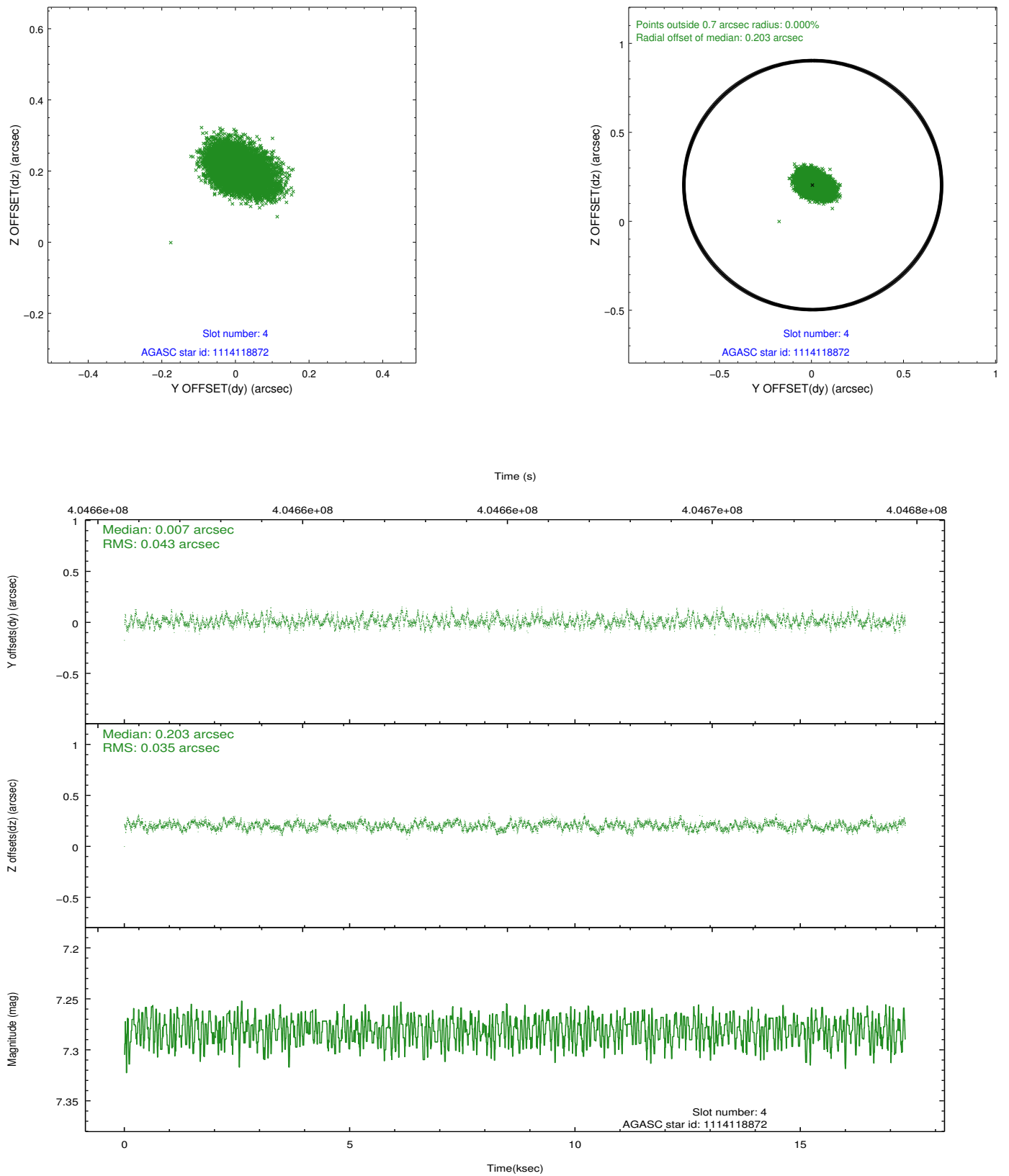
| slot | status | id         | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec        | mean_y   | mean_z   |
|------|--------|------------|------|-------|--------|--------|-------|-------|-----------|------------|----------|----------|
| 0    | FID    | ACIS-I-1   | 7.06 | 4228  | 0.115  | -0.088 | 0.009 | 0.021 | 0.000000  | 0.000000   | 924.21   | -999.93  |
| 1    | FID    | ACIS-I-2   | 7.01 | 4227  | -0.230 | 0.032  | 0.007 | 0.015 | 0.000000  | 0.000000   | -770.50  | -1005.39 |
| 2    | FID    | ACIS-I-4   | 6.97 | 4228  | 0.018  | 0.123  | 0.006 | 0.013 | 0.000000  | 0.000000   | 2143.42  | 900.92   |
| 3    | GUIDE  | 1114117784 | 7.94 | 8455  | 0.083  | 0.047  | 0.094 | 0.147 | 56.191874 | -54.166281 | -373.07  | 2111.24  |
| 4    | GUIDE  | 1114118872 | 7.28 | 8453  | 0.007  | 0.203  | 0.059 | 0.097 | 56.068532 | -54.477824 | -1088.96 | 1211.68  |
| 5    | GUIDE  | 1114122600 | 6.98 | 8455  | 0.076  | -0.041 | 0.075 | 0.110 | 57.103378 | -54.293770 | 1151.31  | 859.88   |
| 6    | GUIDE  | 1114124344 | 9.51 | 8422  | 0.158  | 0.667  | 0.132 | 0.216 | 56.031987 | -54.902586 | -1814.48 | -137.10  |
| 7    | GUIDE  | 1114124776 | 9.50 | 8448  | -0.318 | -0.874 | 0.105 | 0.170 | 55.841690 | -54.293270 | -1235.66 | 2013.48  |

## 2.4 Star Slots

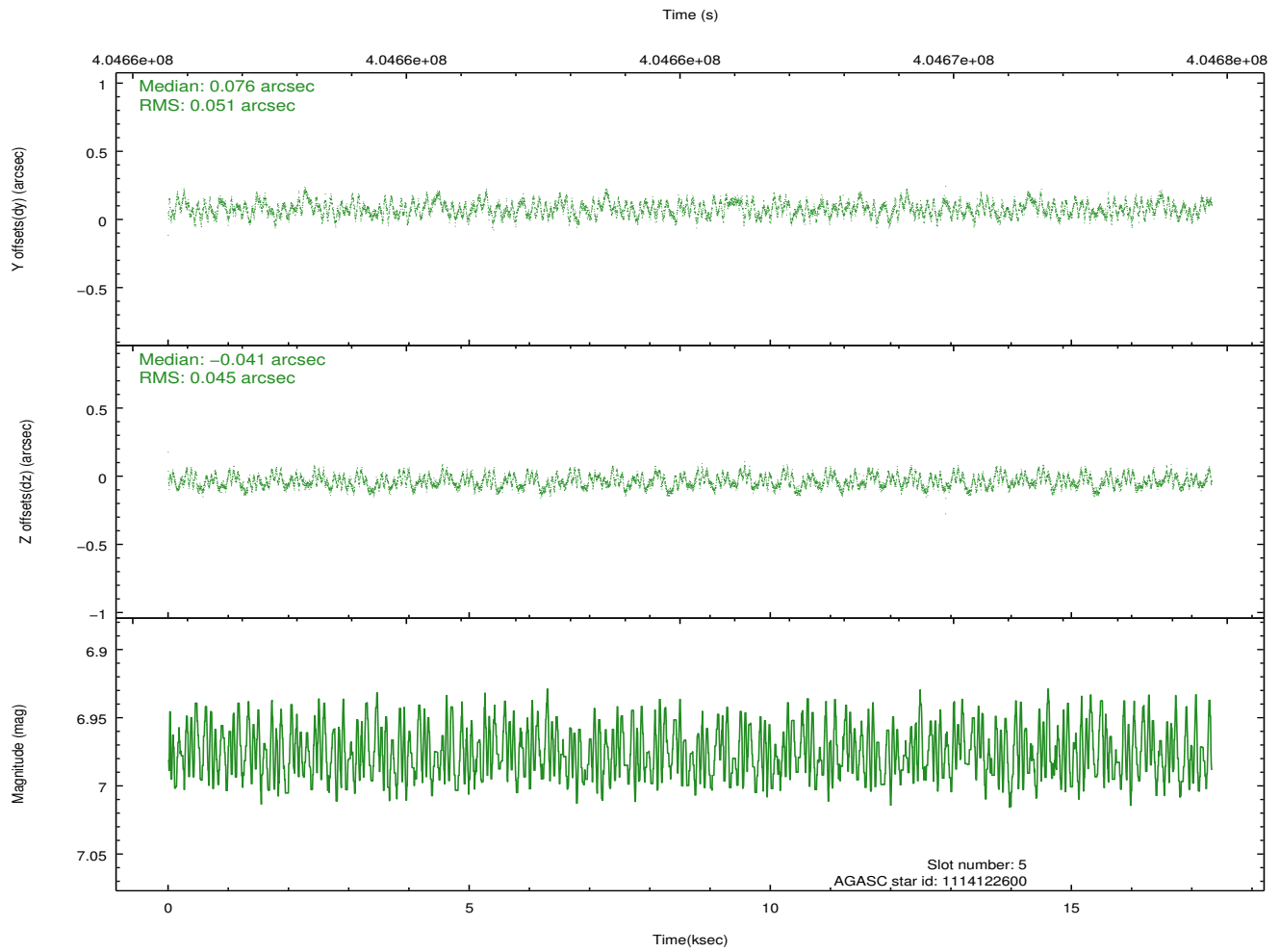
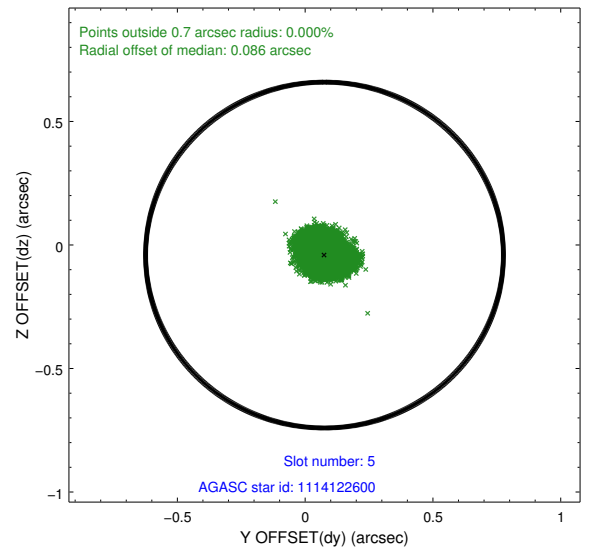
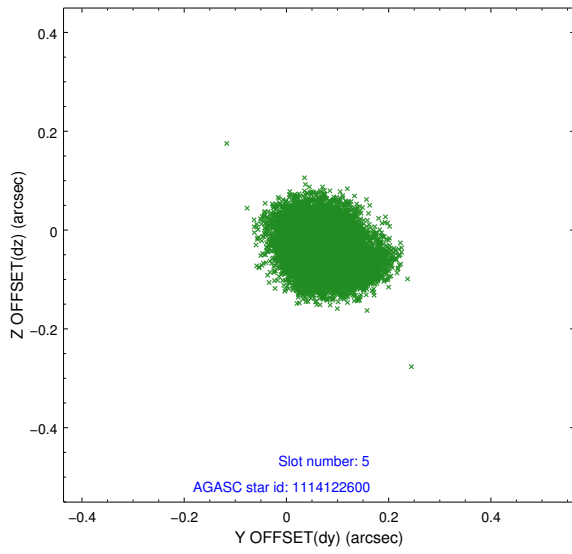
### 2.4.1 Slot 3



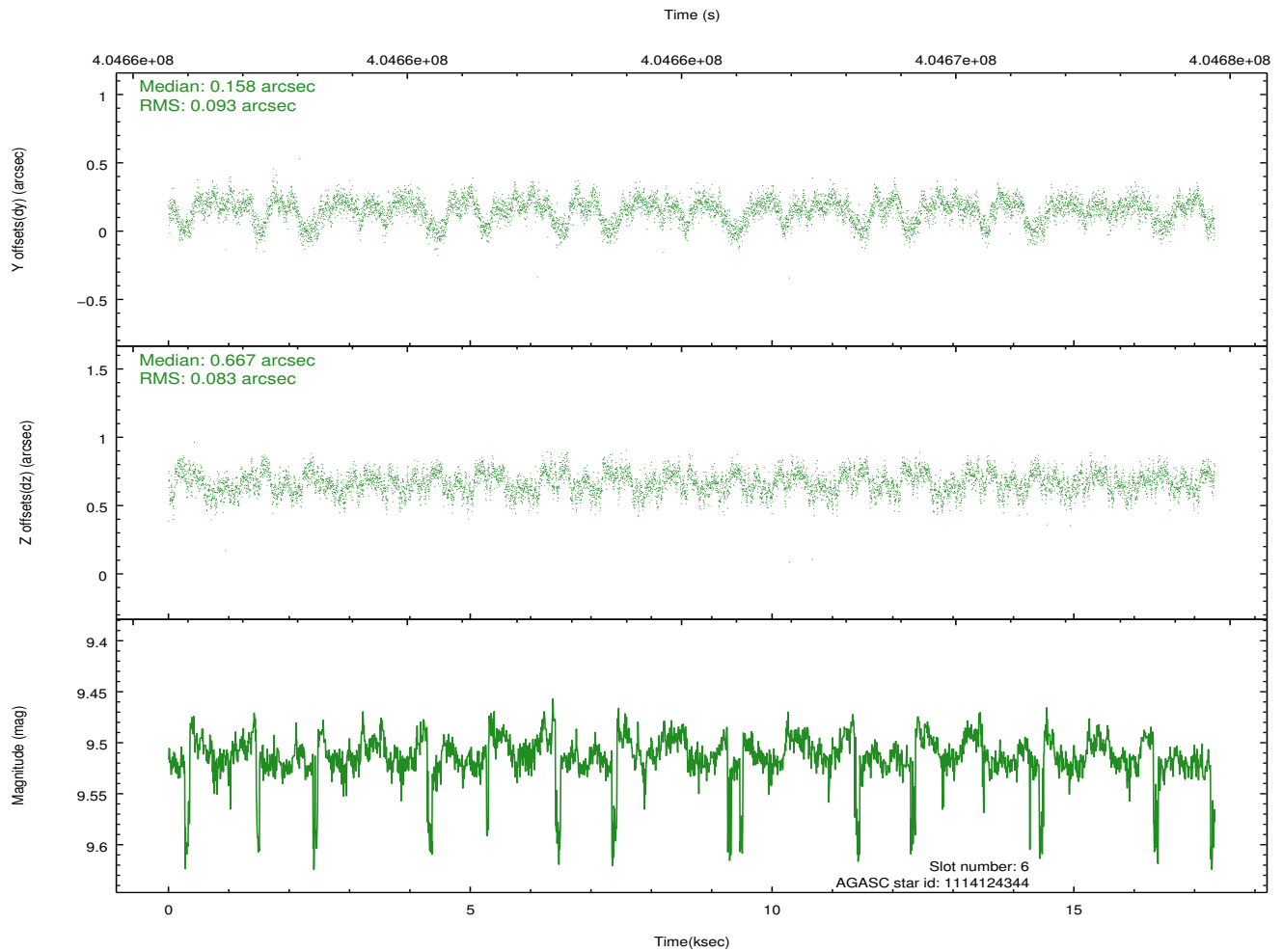
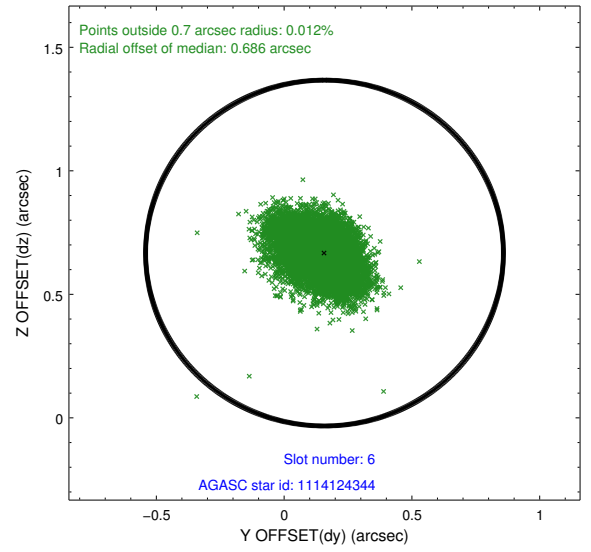
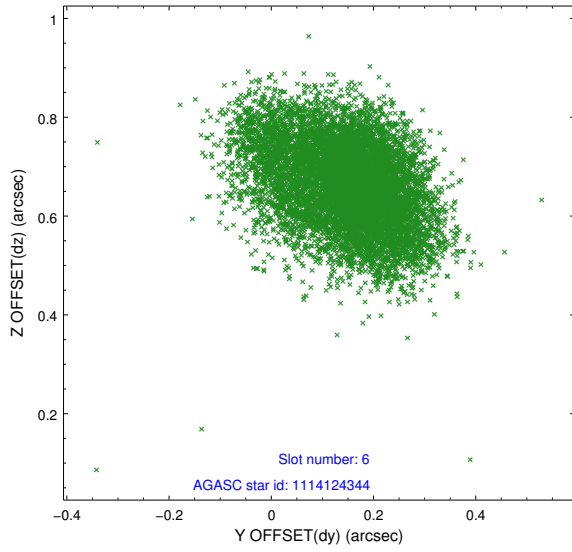
## 2.4.2 Slot 4



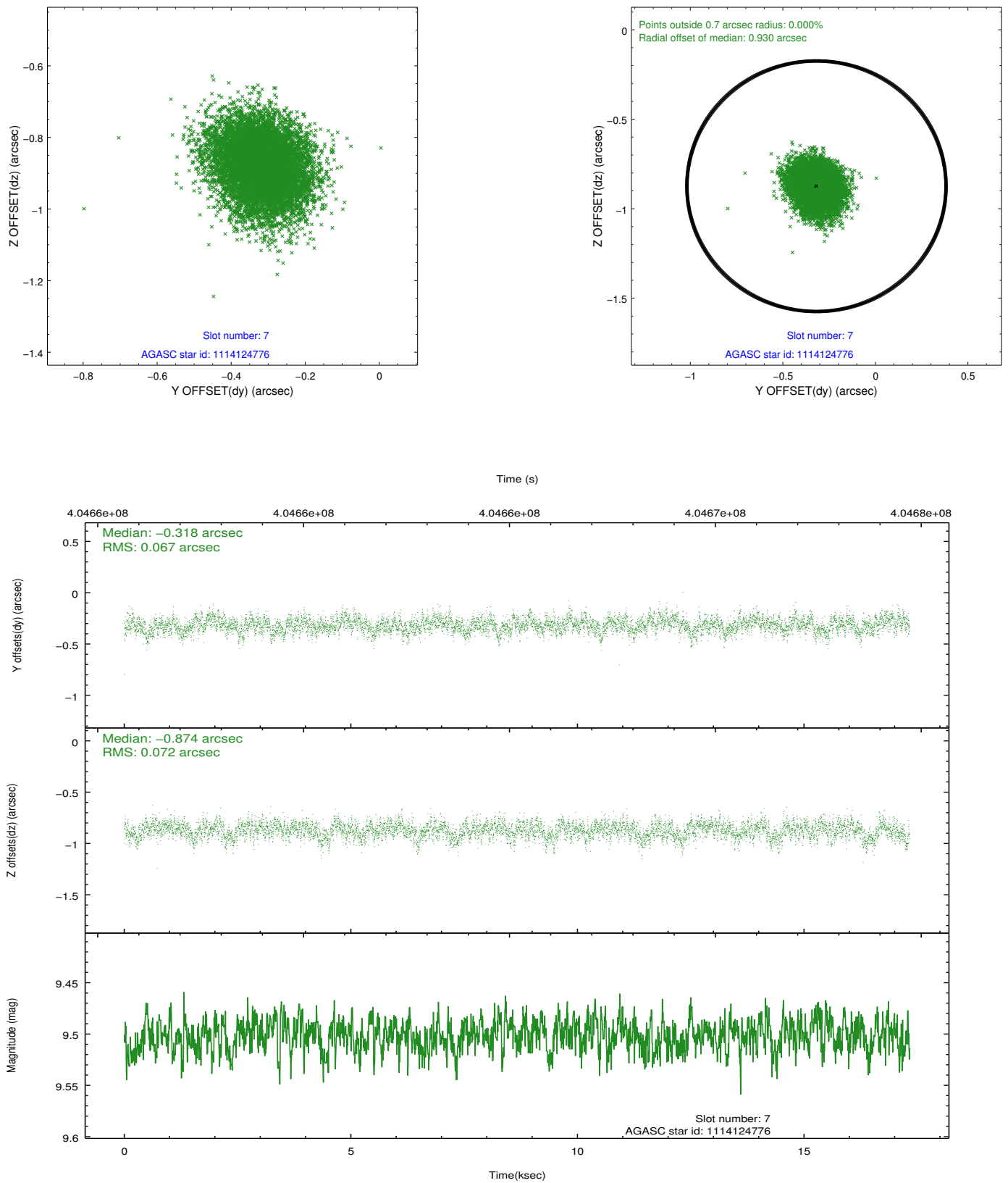
### 2.4.3 Slot 5



### 2.4.4 Slot 6

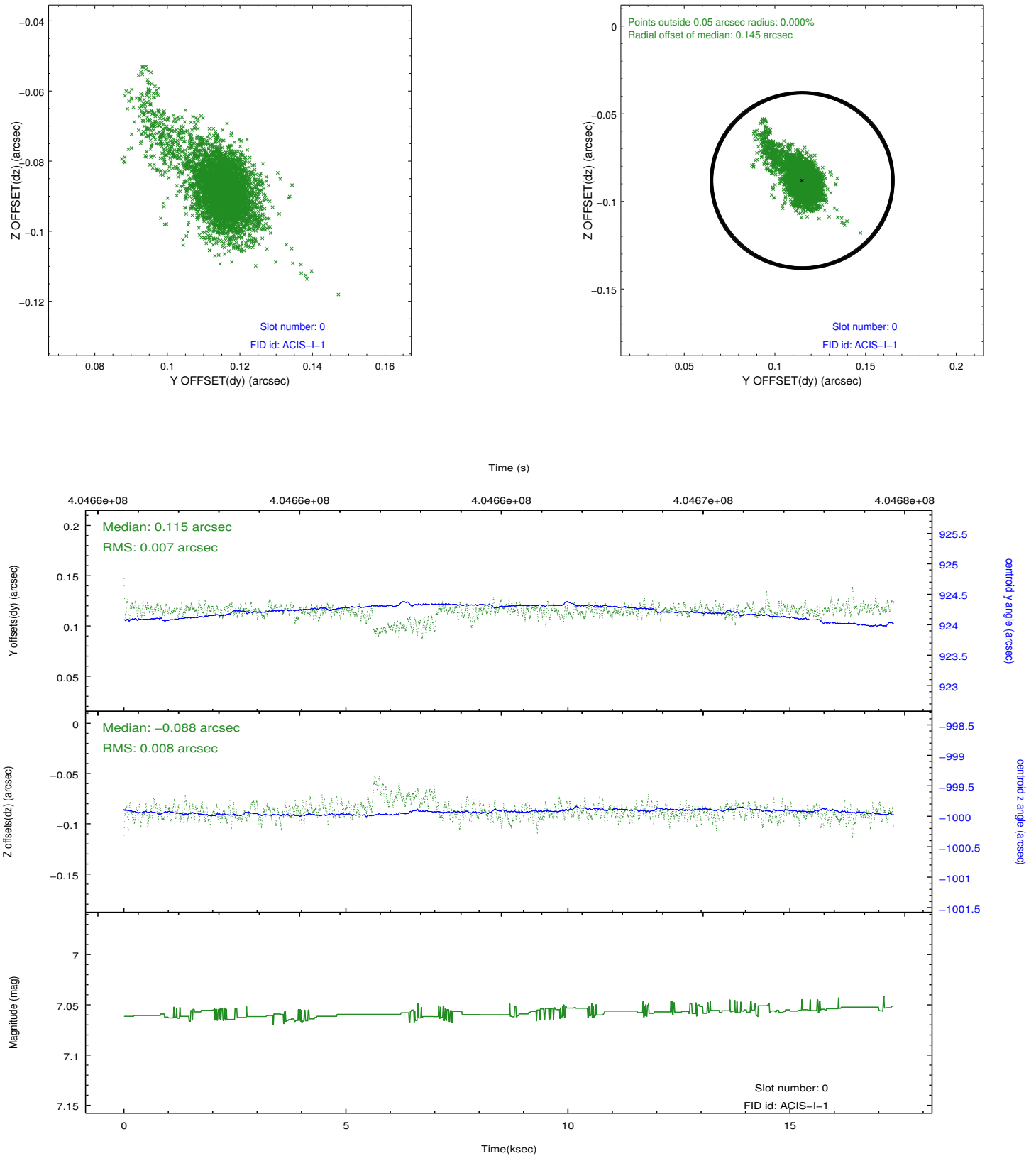


## 2.4.5 Slot 7

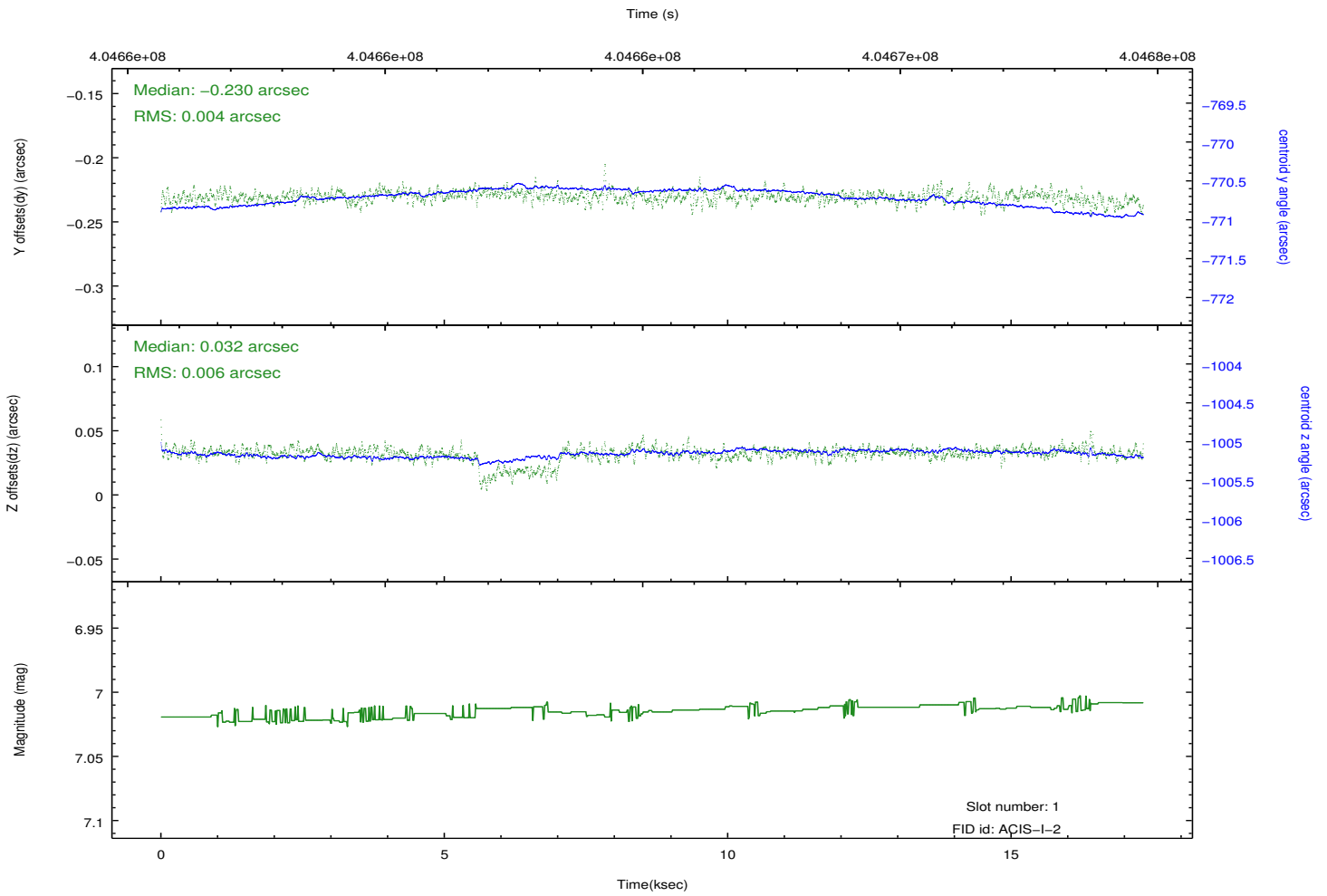
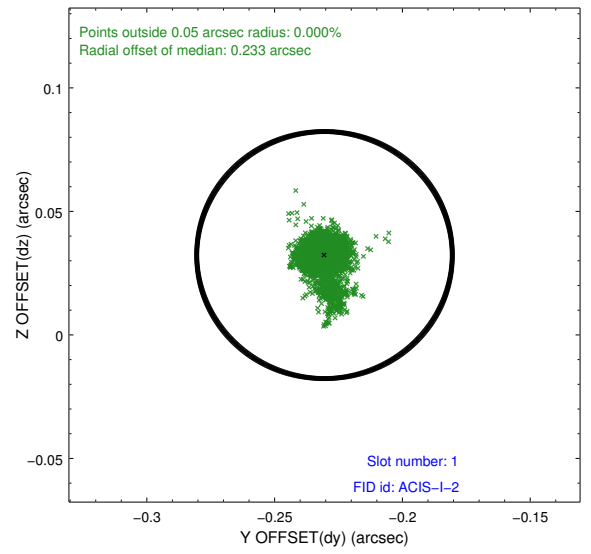
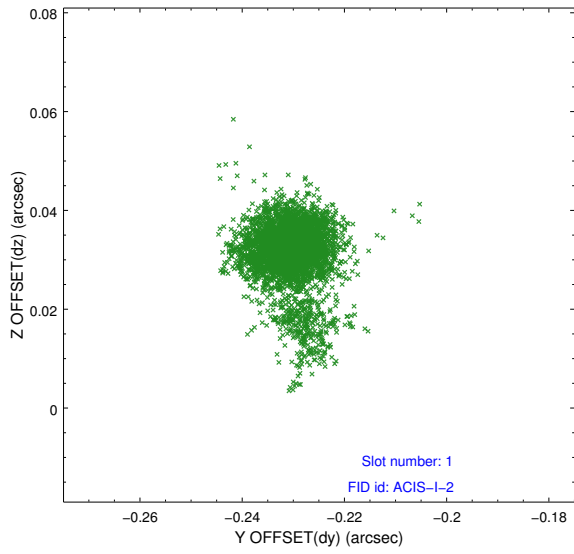


## 2.5 FID Slots

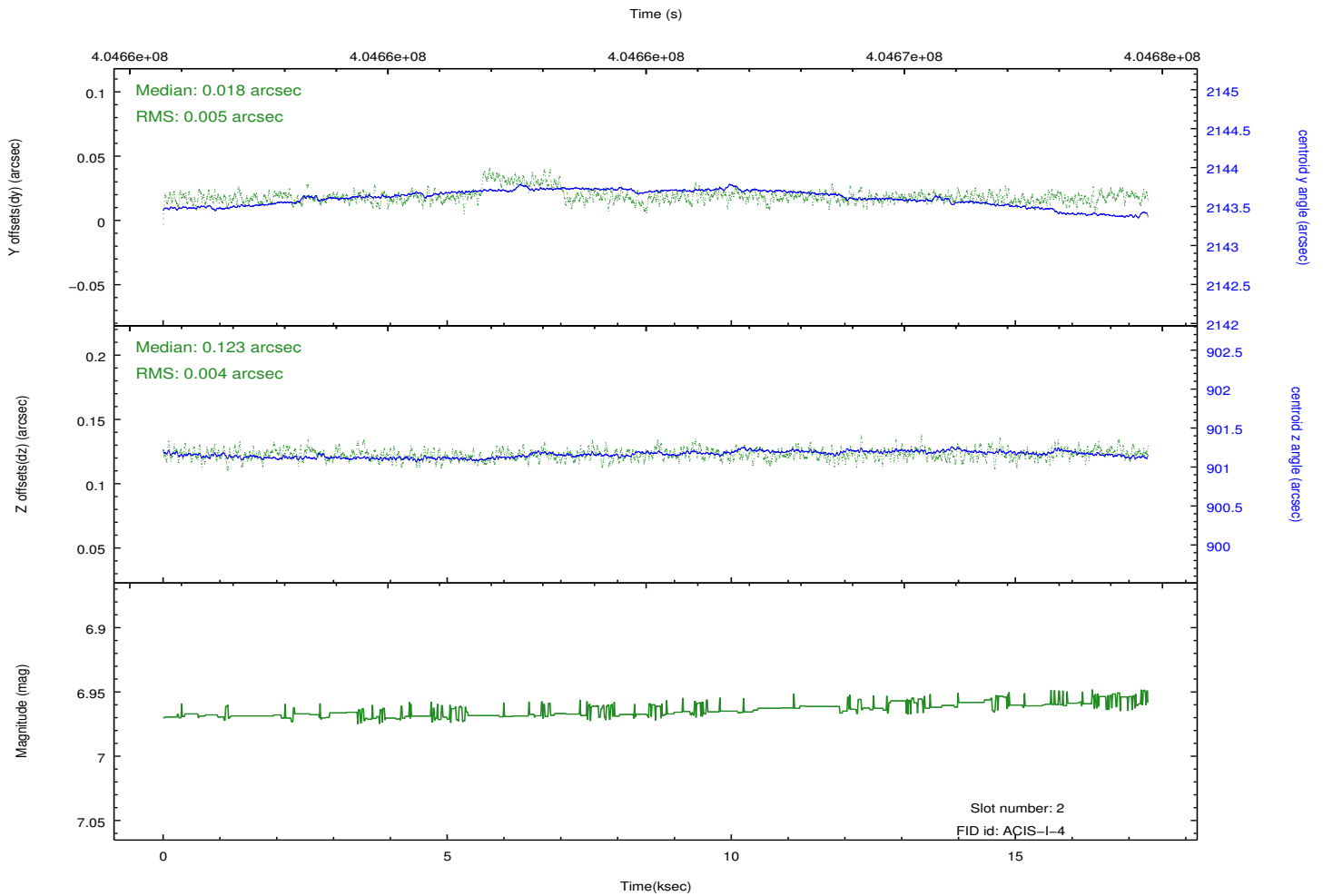
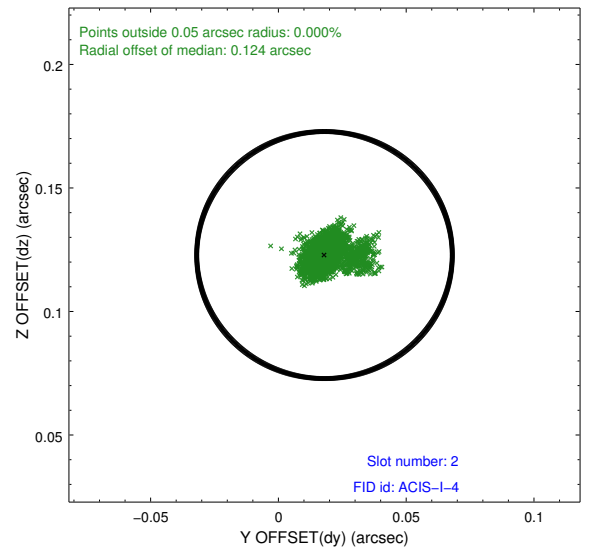
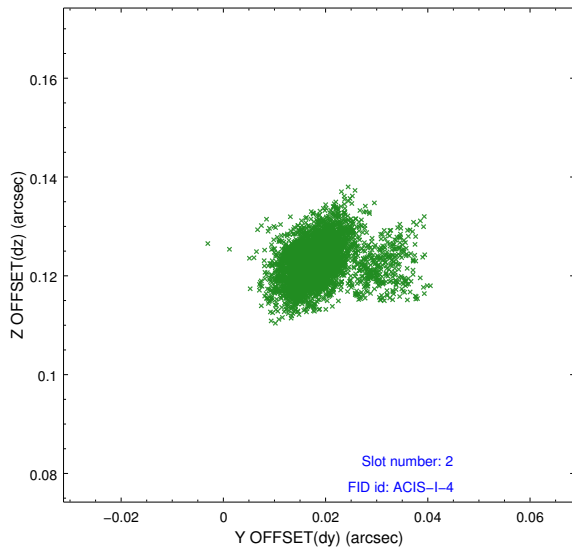
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# A Summary

## A.1 Status

|                            |               |
|----------------------------|---------------|
| V&V Scientist              | Jen Lauer     |
| V&V Date (YYYY-MM-DD)      | 2012.07.16    |
| V&V Edition                | 1             |
| V&V Disposition and Status | OK            |
| V&V Charge Time            | 16.5559507339 |

## A.2 Comments

A spatial region of the original bias map for CCD = 3 suffered from anomalously high data values. Pixels in the event data that were bias-corrected by one of the original affected bias pixels may have an apparent energy shift. While the change in energy is expected to be small ( $\sim 20$  eV), it depends on many parameters that have not yet been fully explored for this bias anomaly. The bias map for CCD = 3 has been reconstructed for this processing to remove this anomaly using scaled data from a comparable bias map from another observation. The pixels affected by the anomaly are bounded by sky coords:  
(56.59838, -54.68566), (56.59962, -54.68713), (56.72785, -54.65071), (56.72428, -54.64990)