

# V&V Reference Report

## L2 ASCDS Version : 10.4.2.1

Observation 17280 - L2 Version 1  
Chandra X-Ray Center

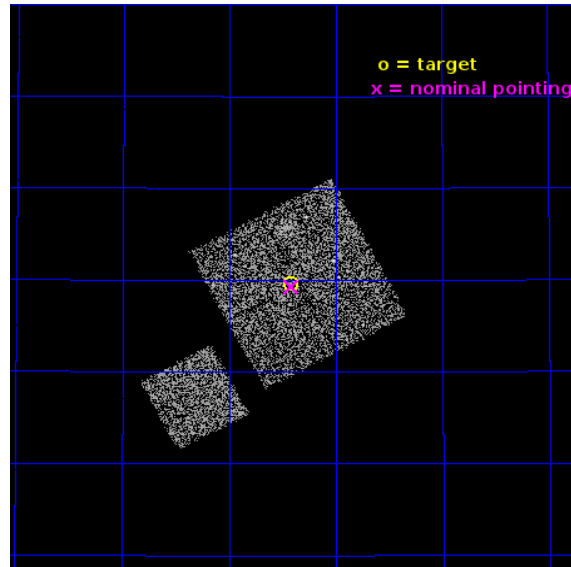
L2 Processing Date : Dec 12 2015

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# 1 Front

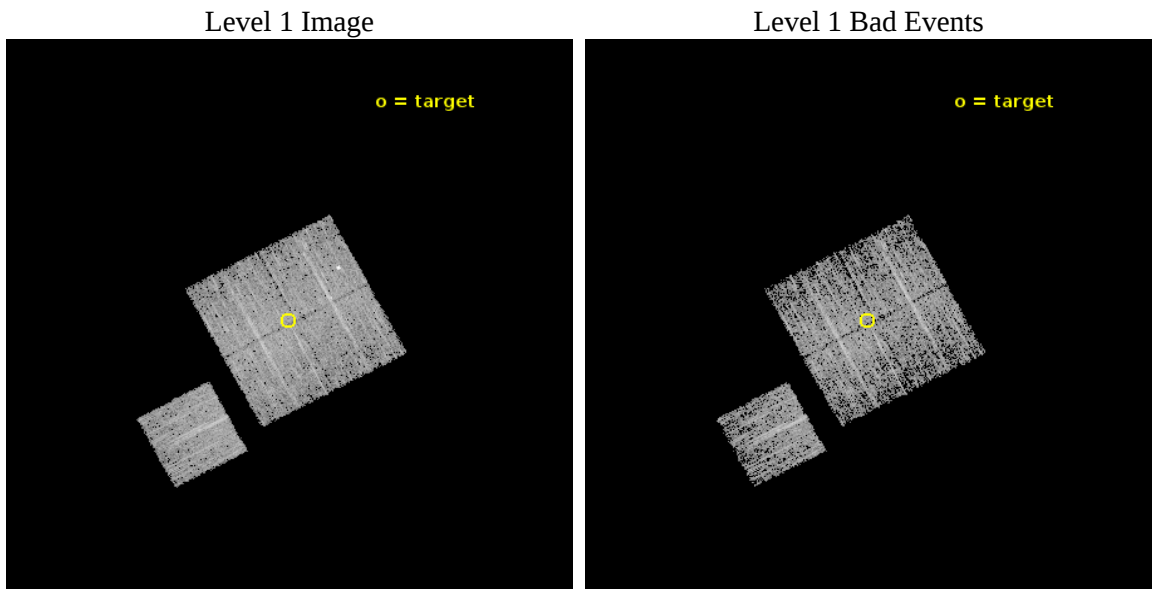
|          |                                                           |                                             |
|----------|-----------------------------------------------------------|---------------------------------------------|
| seq_num  | 801525                                                    | Sequence number                             |
| obs_id   | 17280                                                     | Observation id                              |
| title    | Perseus: A New, Low-Redshift Anchor for Cluster Cosmology | Proposal                                    |
| observer | Prof. Steven Allen                                        | Principal investigator                      |
| object   | Perseus cluster                                           | Source name                                 |
| dtcycle  | 0                                                         | &#160                                       |
| cycle    | P                                                         | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 48.85516                                                  | Observer's specified target RA [deg]        |
| dec_targ | 41.994408                                                 | Observer's specified target Dec [deg]       |
| ra_nom   | 48.854370453932                                           | Nominal RA [deg]                            |
| dec_nom  | 41.987935973596                                           | Nominal Dec [deg]                           |
| roll_nom | 241.92380539028                                           | Nominal Roll [deg]                          |
| revision | 1                                                         | Processing version of data                  |
| ontime   | 4776.5504690409                                           | Sum of GTIs [s]                             |
| livetime | 4714.1413207176                                           | Livetime [s]                                |
| ontime0  | 4776.4273593426                                           | Sum of GTIs [s]                             |
| ontime1  | 4776.4683890343                                           | Sum of GTIs [s]                             |
| ontime2  | 4776.5094393492                                           | Sum of GTIs [s]                             |
| ontime3  | 4776.5504690409                                           | Sum of GTIs [s]                             |
| ontime6  | 4776.3863192797                                           | Sum of GTIs [s]                             |
| l2events | 14233                                                     | Number of level 2 events                    |



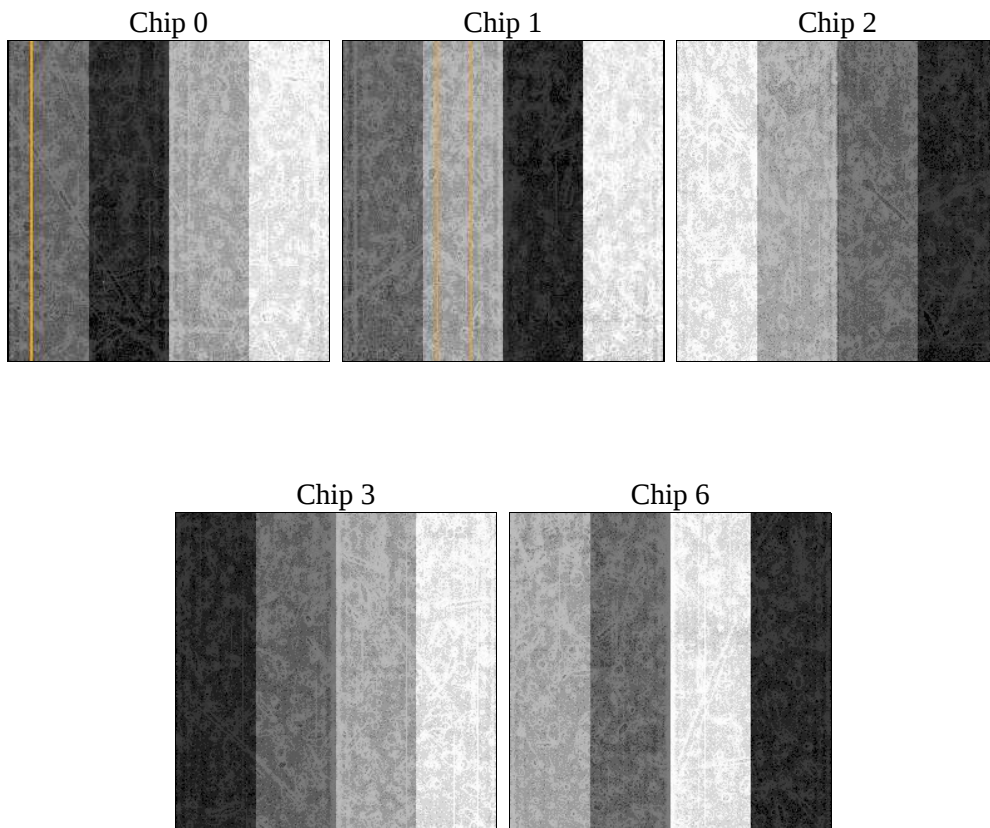
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 5000.000000     | [s] Scheduled observation exposure time |
| ascdsver | 10.4.2.1            | Processing system revision     | ontime         | 4776.5504690409 | Sum of GTIs [s]                         |
| caldsver | 4.6.10a             | &#160                          | ontime0        | 4776.4273593426 | Sum of GTIs [s]                         |
| date     | 2015-12-12T14:45:26 | Date and time of file creation | ontime1        | 4776.4683890343 | Sum of GTIs [s]                         |
| revision | 1                   | Processing version of data     | ontime2        | 4776.5094393492 | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 4776.5504690409 | Sum of GTIs [s]                         |
|          |                     |                                | ontime6        | 4776.3863192797 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 126002          | Number of level 1 events                |

### 2.1.4 Events

|                 | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 |
|-----------------|-------|-------|-------|-------|-------|
| level 1 events  | 23404 | 26095 | 25708 | 24813 | 25982 |
| rejected events | 20320 | 21478 | 22656 | 21736 | 22389 |
| rejected %      | 86%   | 82%   | 88%   | 87%   | 86%   |

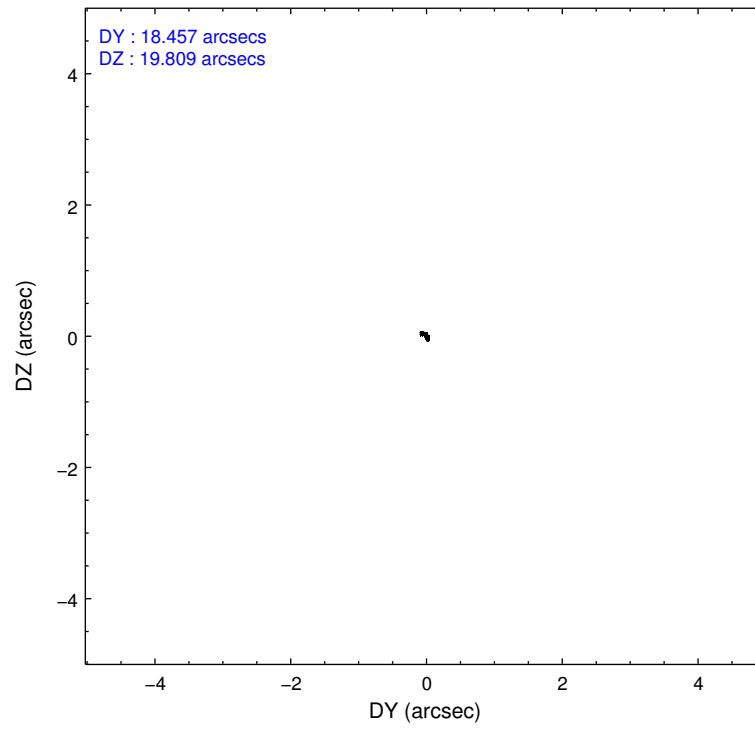
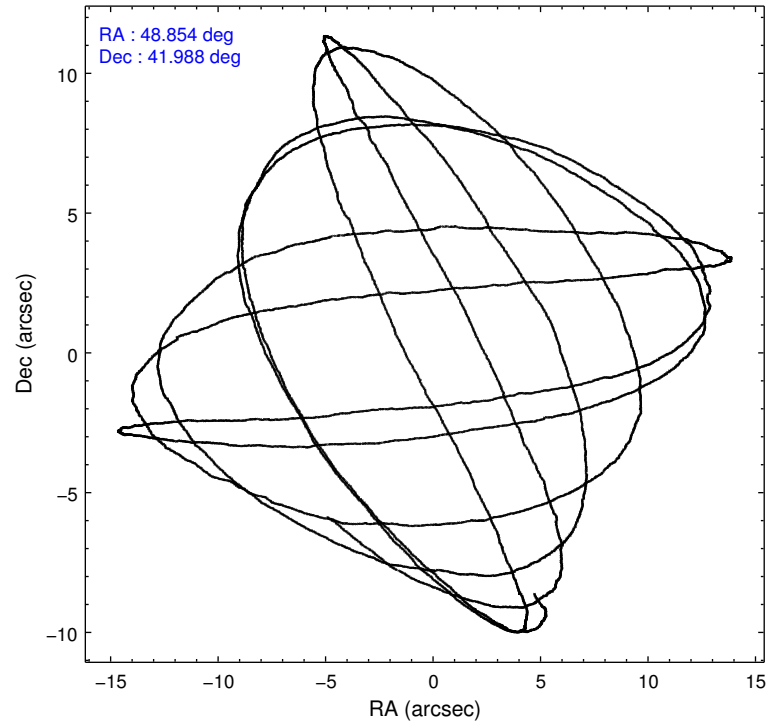
|                | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 |
|----------------|-------|-------|-------|-------|-------|
| grade 0 events | 1164  | 2368  | 1193  | 1207  | 1436  |
|                | 4%    | 9%    | 4%    | 4%    | 5%    |
| grade 1 events | 16    | 28    | 18    | 18    | 16    |
|                | 0%    | 0%    | 0%    | 0%    | 0%    |
| grade 2 events | 715   | 847   | 716   | 640   | 774   |
|                | 3%    | 3%    | 2%    | 2%    | 2%    |
| grade 3 events | 290   | 335   | 275   | 297   | 330   |
|                | 1%    | 1%    | 1%    | 1%    | 1%    |
| grade 4 events | 294   | 288   | 298   | 295   | 298   |
|                | 1%    | 1%    | 1%    | 1%    | 1%    |
| grade 5 events | 1171  | 1181  | 1098  | 1302  | 1224  |
|                | 5%    | 4%    | 4%    | 5%    | 4%    |
| grade 6 events | 626   | 783   | 570   | 638   | 755   |
|                | 2%    | 3%    | 2%    | 2%    | 2%    |
| grade 7 events | 19128 | 20265 | 21540 | 20416 | 21149 |
|                | 81%   | 77%   | 83%   | 82%   | 81%   |

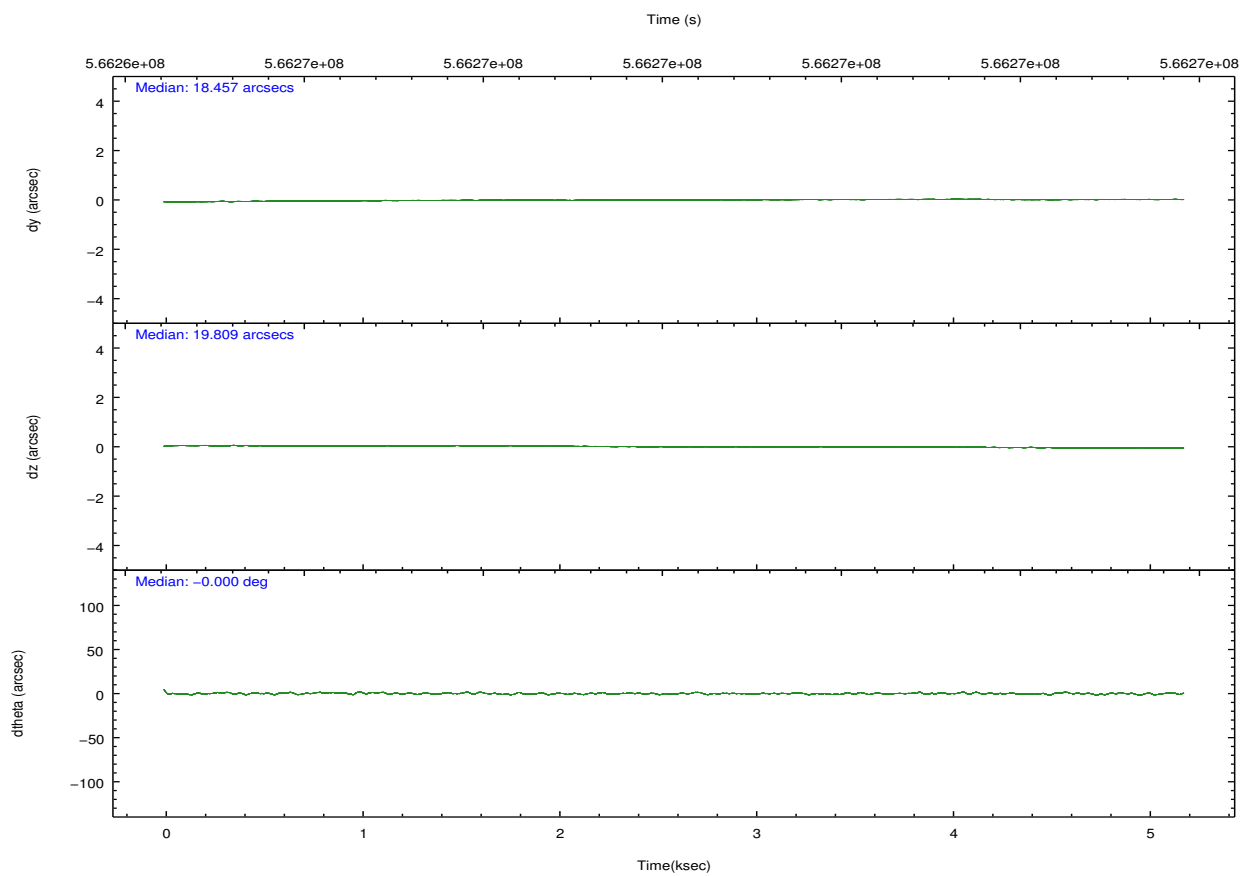
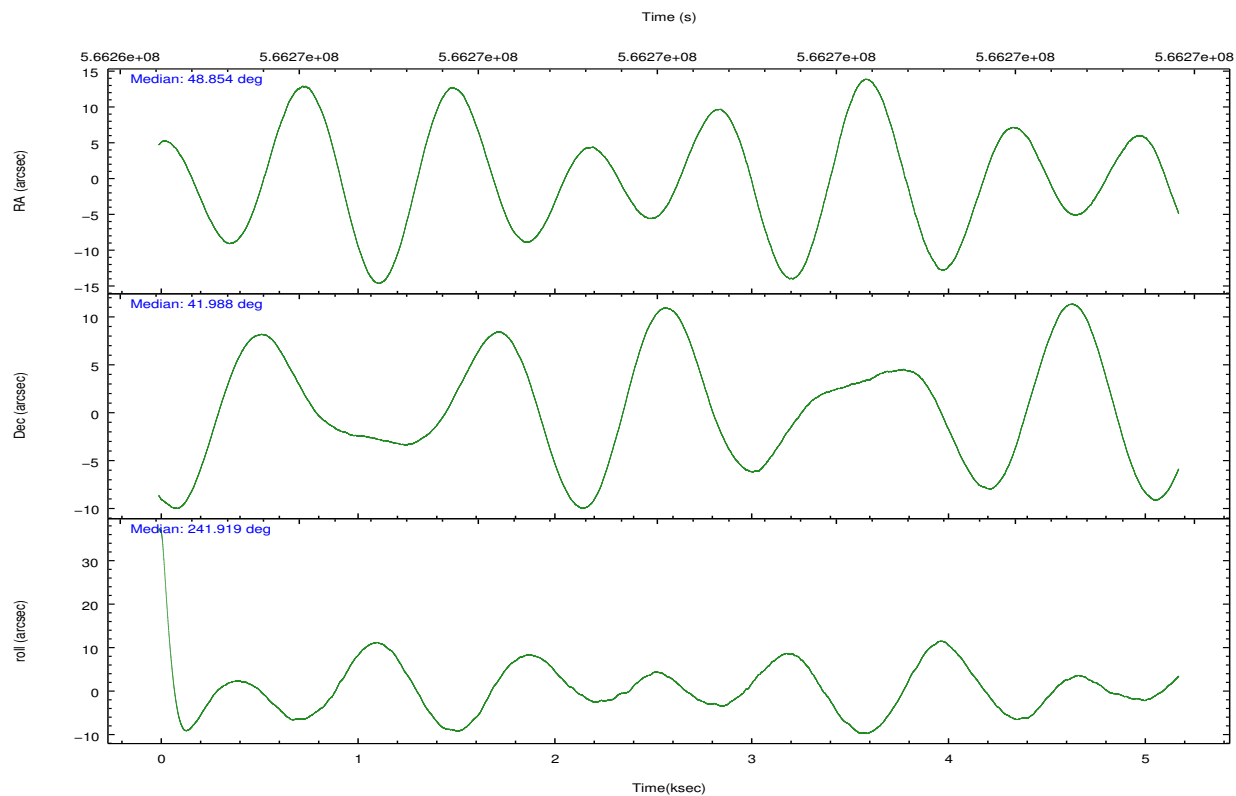
## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual                |
|-----------------------------------|---------------------|-----------------------|
| Instrument                        | ACIS                | ACIS                  |
| Detector                          | ACIS-01236          | ACIS-01236            |
| Grating                           | NONE                | NONE                  |
| Data mode                         | VFAINT              | VFAINT                |
| Observation mode                  | POINTING            | POINTING              |
| [deg] Pointing RA                 | 48.852926           | 48.85437045393164     |
| [deg] Pointing Dec                | 42.015636           | 41.9879359735957      |
| [deg] Pointing Roll               | 241.716080          | 241.9238053902793     |
| [mm] SIM focus pos                | -0.782348           | -0.7809083437167272   |
| [mm] SIM defocus                  | 0                   | 0.001439871863259334  |
| [mm] SIM translation stage pos    | -233.592463         | -233.5874344608287    |
| [mm] SIM translation stage offset | 0                   | -0.005018542100998502 |
| [s] Observation start time (MET)  | 566265642.184000    | 566265250.0793101     |
| Observation start date            | 2015-12-11T23:59:34 | 2015-12-11T23:54:10   |
| [s] Observation end time (MET)    | 566270642.184000    | 566270797.89212       |
| Observation end date              | 2015-12-12T01:22:54 | 2015-12-12T01:26:37   |
| Read mode                         | TIMED               | TIMED                 |

| Parameter                             | Planned   | Actual  |
|---------------------------------------|-----------|---------|
| Obspar format version number          | 7         | 7       |
| Obspar file type                      | PREDICTED | ACTUAL  |
| Obspar update status                  | NONE      | UPDATED |
| CCD I0 on                             | Y         | Y       |
| CCD I1 on                             | Y         | Y       |
| CCD I2 on                             | Y         | Y       |
| CCD I3 on                             | Y         | Y       |
| CCD S0 on                             | N         | N       |
| CCD S1 on                             | N         | N       |
| CCD S2 on                             | O1        | Y       |
| CCD S3 on                             | N         | N       |
| CCD S4 on                             | N         | N       |
| CCD S5 on                             | N         | N       |
| Number of optional ACIS chips dropped | 0         | 0       |
| On-chip summing requested             | N         | N       |
| Subarray requested                    | NONE      | NONE    |
| Alternating exposures requested       | N         | N       |
| [s] Primary exposure time             | 0.000000  | 3.1     |

## 2.3 Aspect



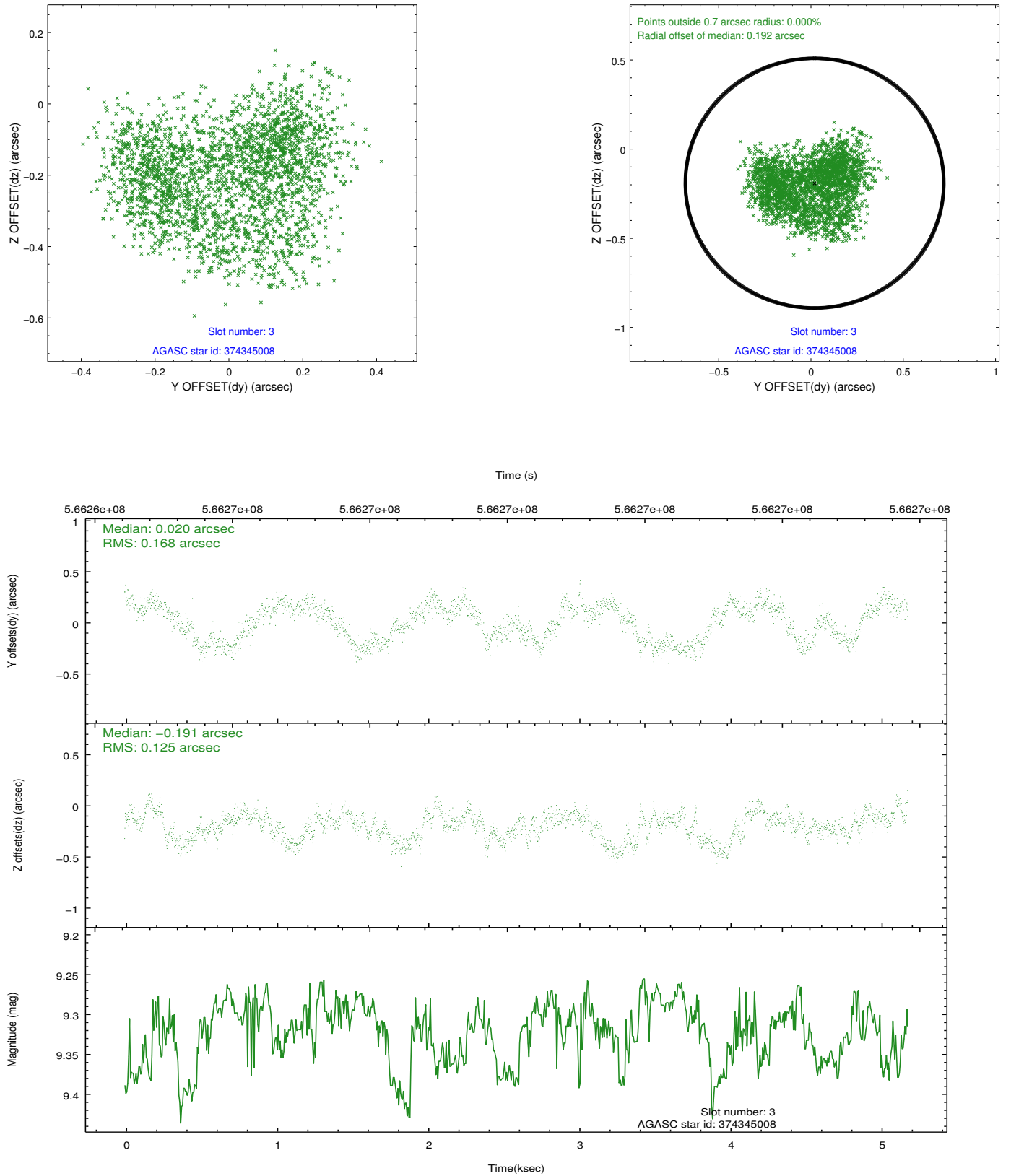


# Slot Statistics

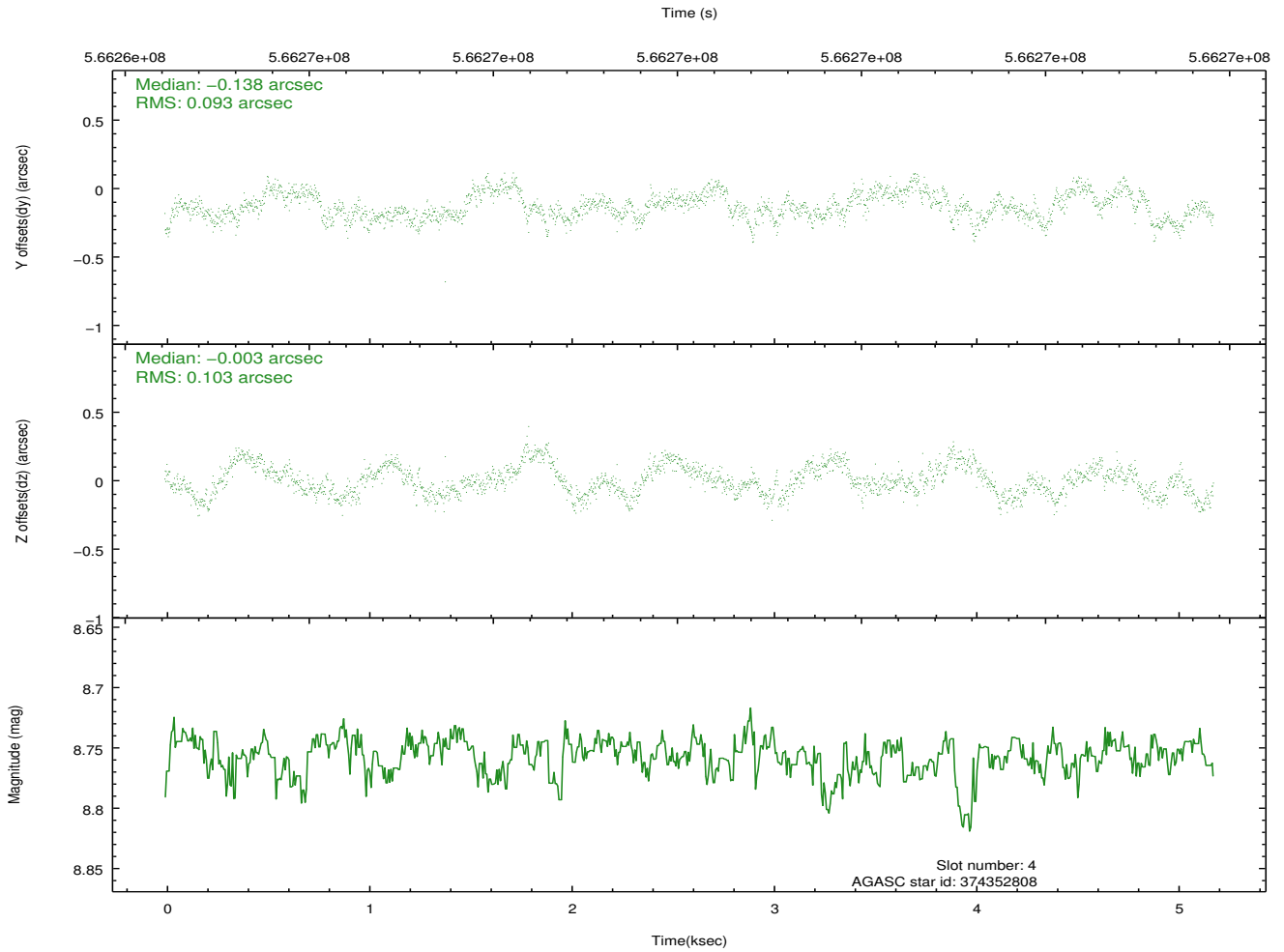
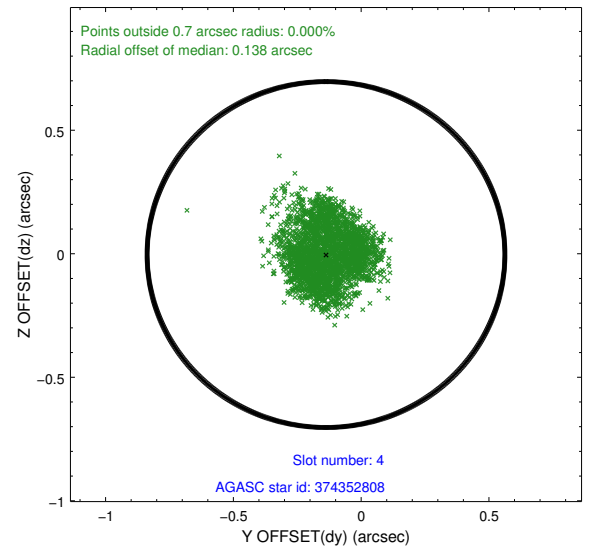
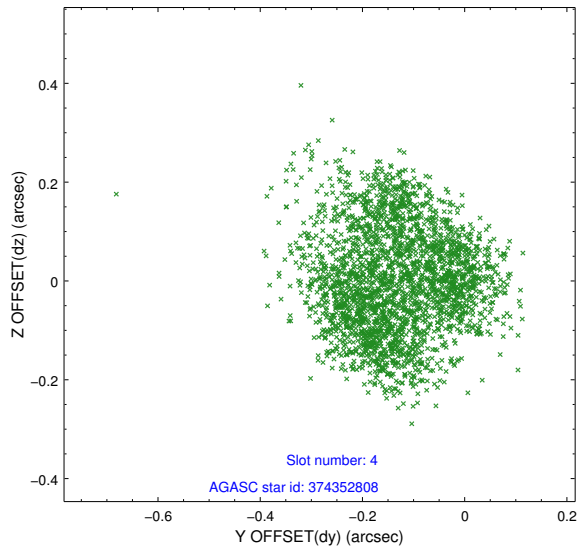
| slot | status | used | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec       | mean_y   | mean_z   |
|------|--------|------|-----------|------|-------|--------|--------|-------|-------|-----------|-----------|----------|----------|
| 0    | FID    |      | ACIS-I-1  | 7.25 | 1263  | 0.053  | 0.050  | 0.008 | 0.013 | 0.000000  | 0.000000  | 920.94   | -843.52  |
| 1    | FID    |      | ACIS-I-2  | 7.14 | 1264  | -0.170 | -0.091 | 0.008 | 0.014 | 0.000000  | 0.000000  | -772.73  | -850.63  |
| 2    | FID    |      | ACIS-I-6  | 7.26 | 1264  | 0.026  | 0.108  | 0.008 | 0.013 | 0.000000  | 0.000000  | 386.09   | 1697.78  |
| 3    | GUIDE  | used | 374345008 | 9.32 | 2525  | 0.020  | -0.191 | 0.236 | 0.330 | 48.768668 | 41.619367 | 1363.93  | 476.93   |
| 4    | GUIDE  | used | 374352808 | 8.76 | 2528  | -0.138 | -0.003 | 0.152 | 0.218 | 49.969955 | 42.208621 | -2040.10 | 2284.63  |
| 5    | GUIDE  | used | 374355168 | 8.56 | 2528  | 0.071  | -0.176 | 0.098 | 0.156 | 48.517523 | 41.466988 | 2165.83  | 139.92   |
| 6    | GUIDE  | used | 374357808 | 8.67 | 2529  | -0.049 | 0.078  | 0.085 | 0.142 | 49.921429 | 42.176083 | -1874.58 | 2228.33  |
| 7    | GUIDE  | used | 374359480 | 8.74 | 2527  | 0.115  | 0.305  | 0.111 | 0.171 | 48.054064 | 42.164482 | 529.05   | -2134.43 |

## 2.4 Star Slots

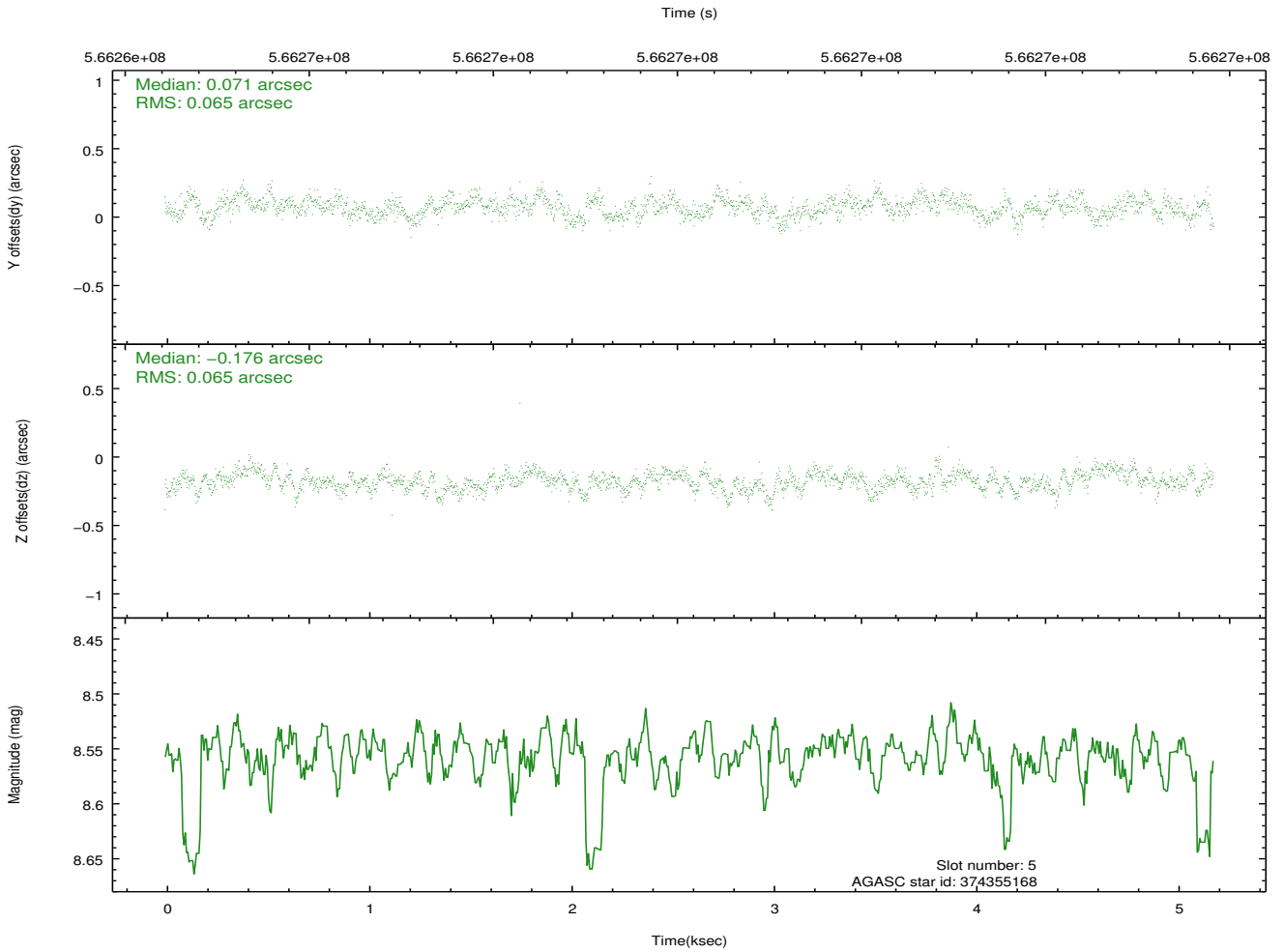
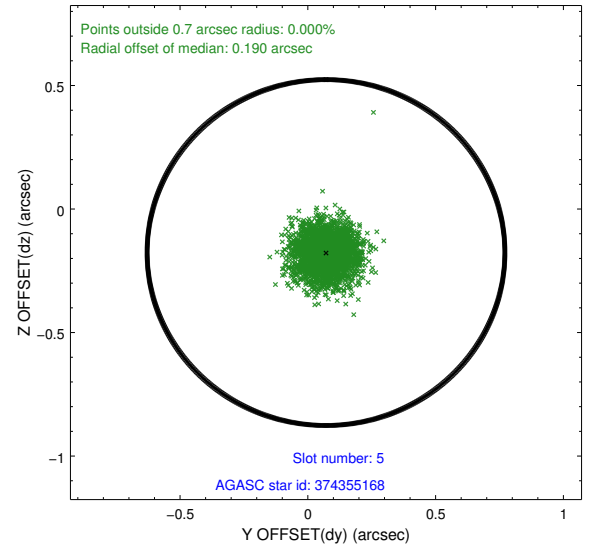
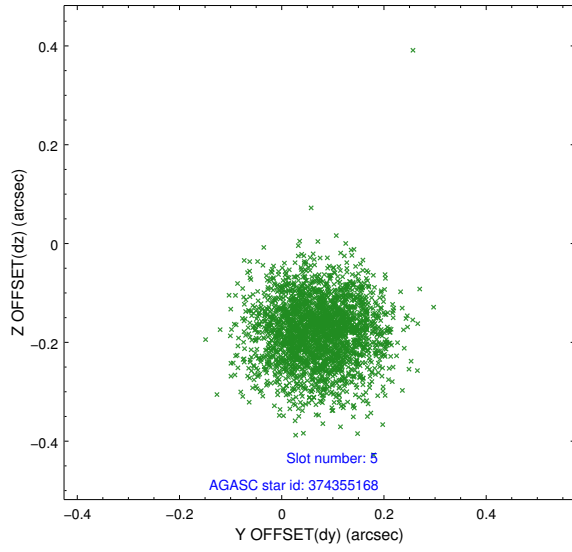
### 2.4.1 Slot 3



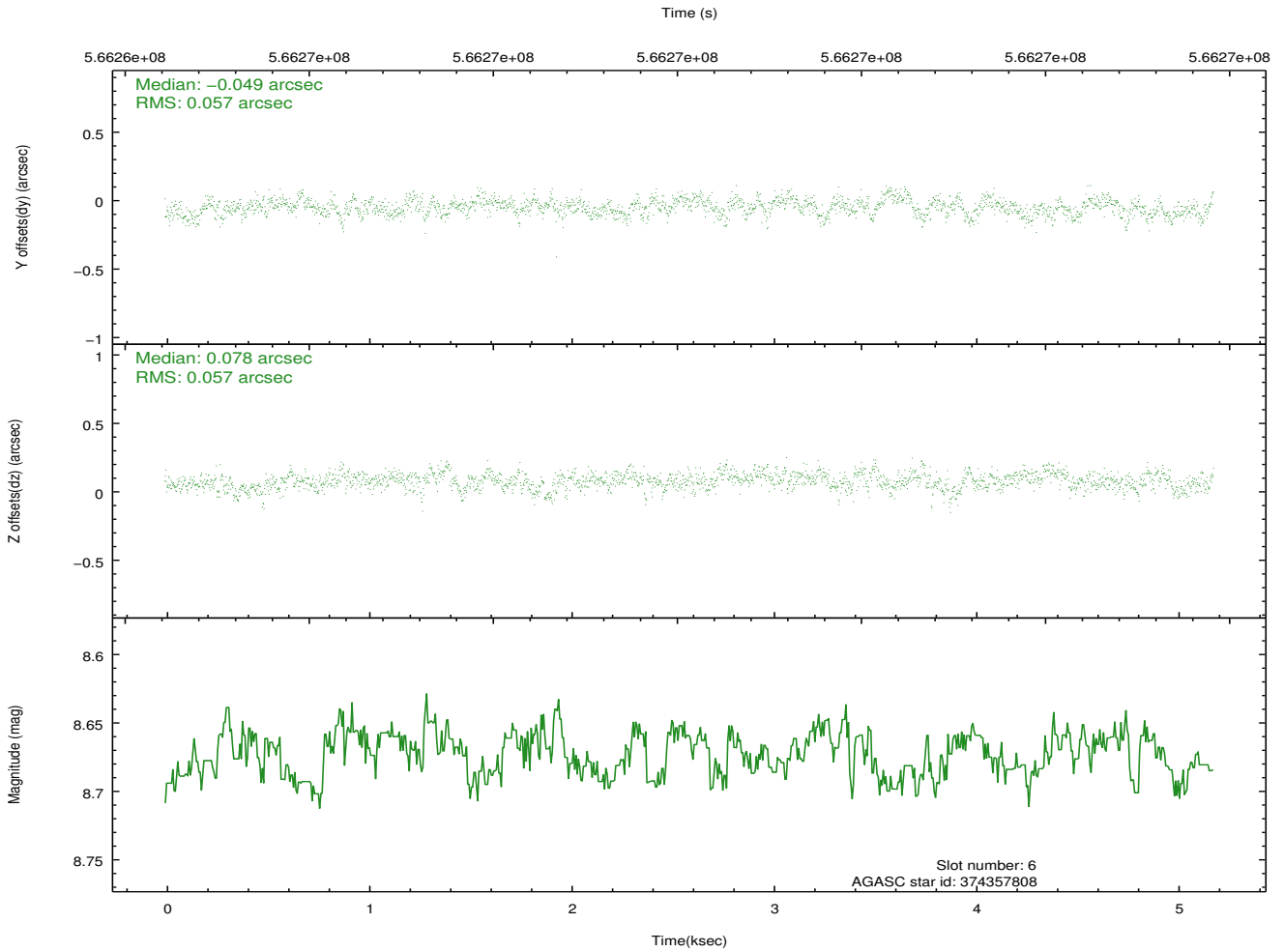
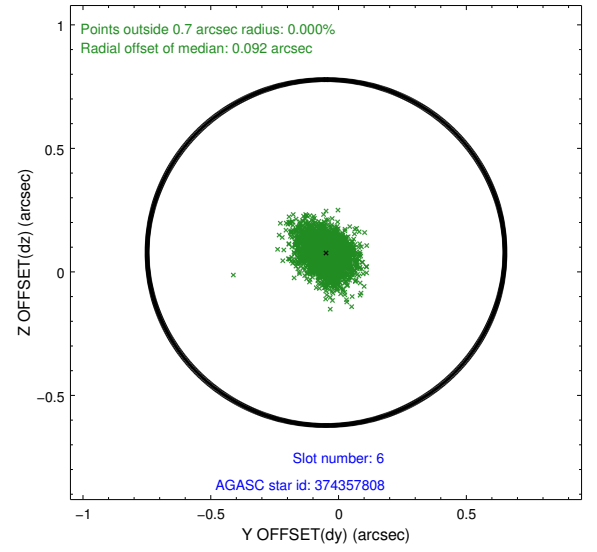
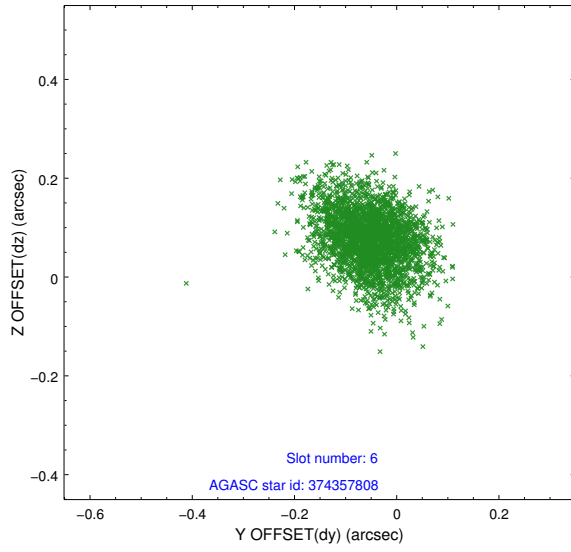
## 2.4.2 Slot 4



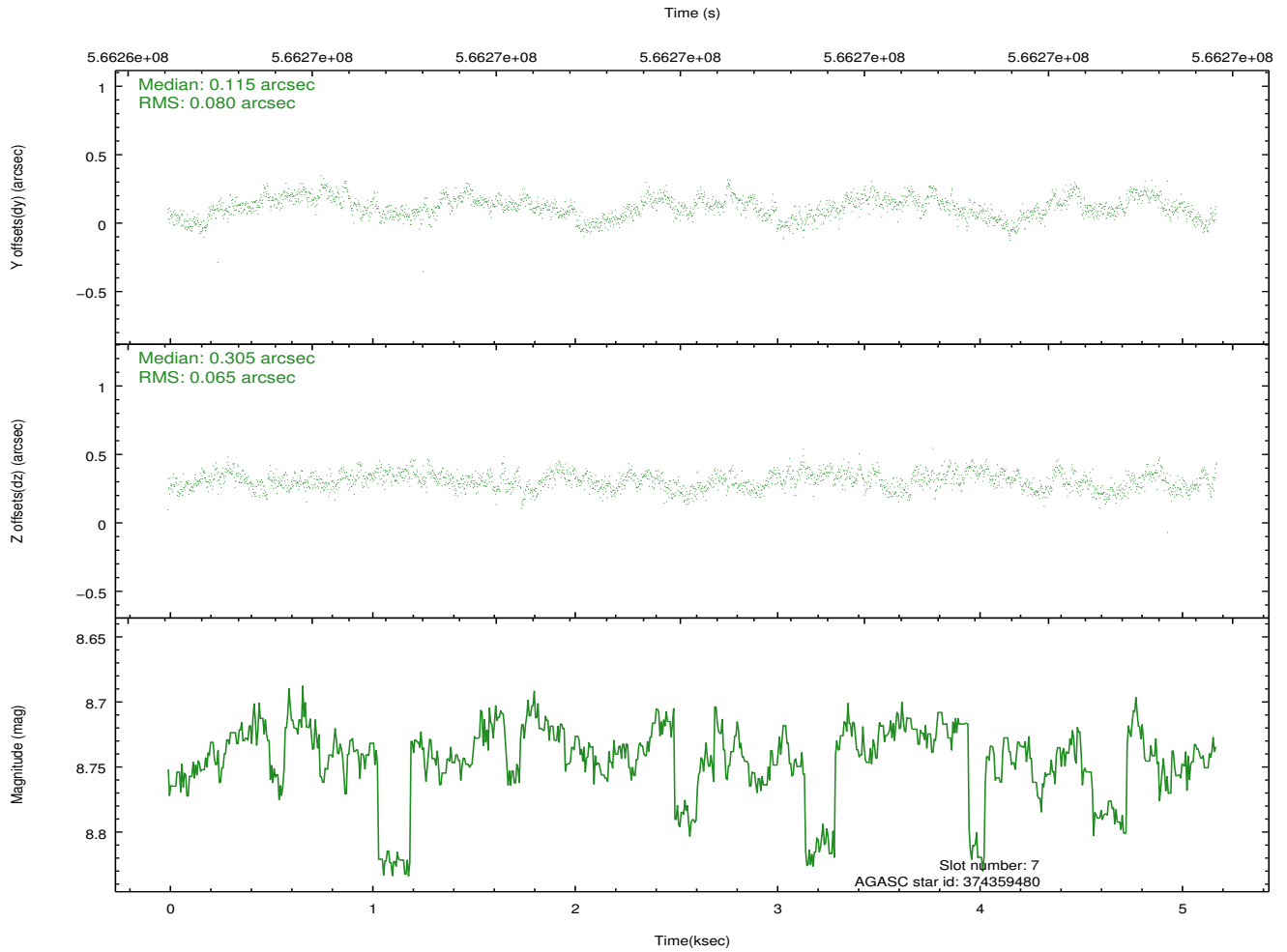
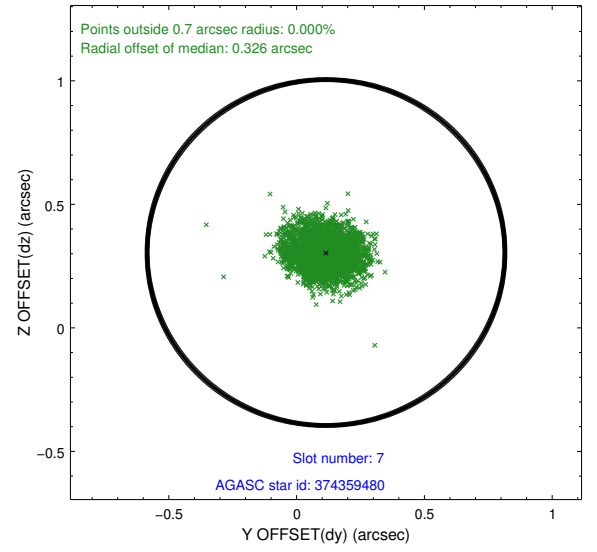
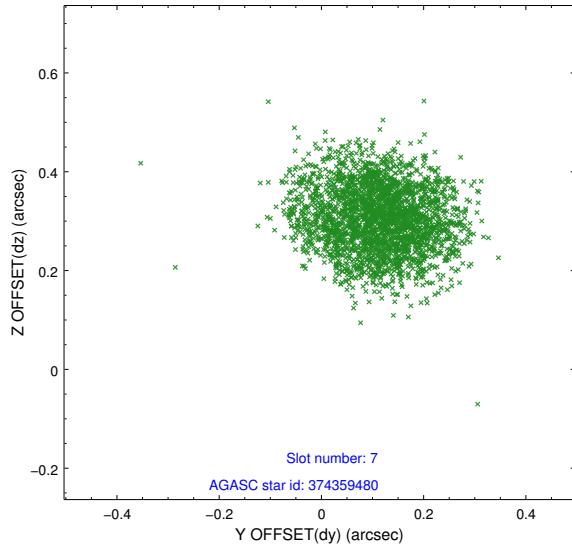
### 2.4.3 Slot 5



## 2.4.4 Slot 6

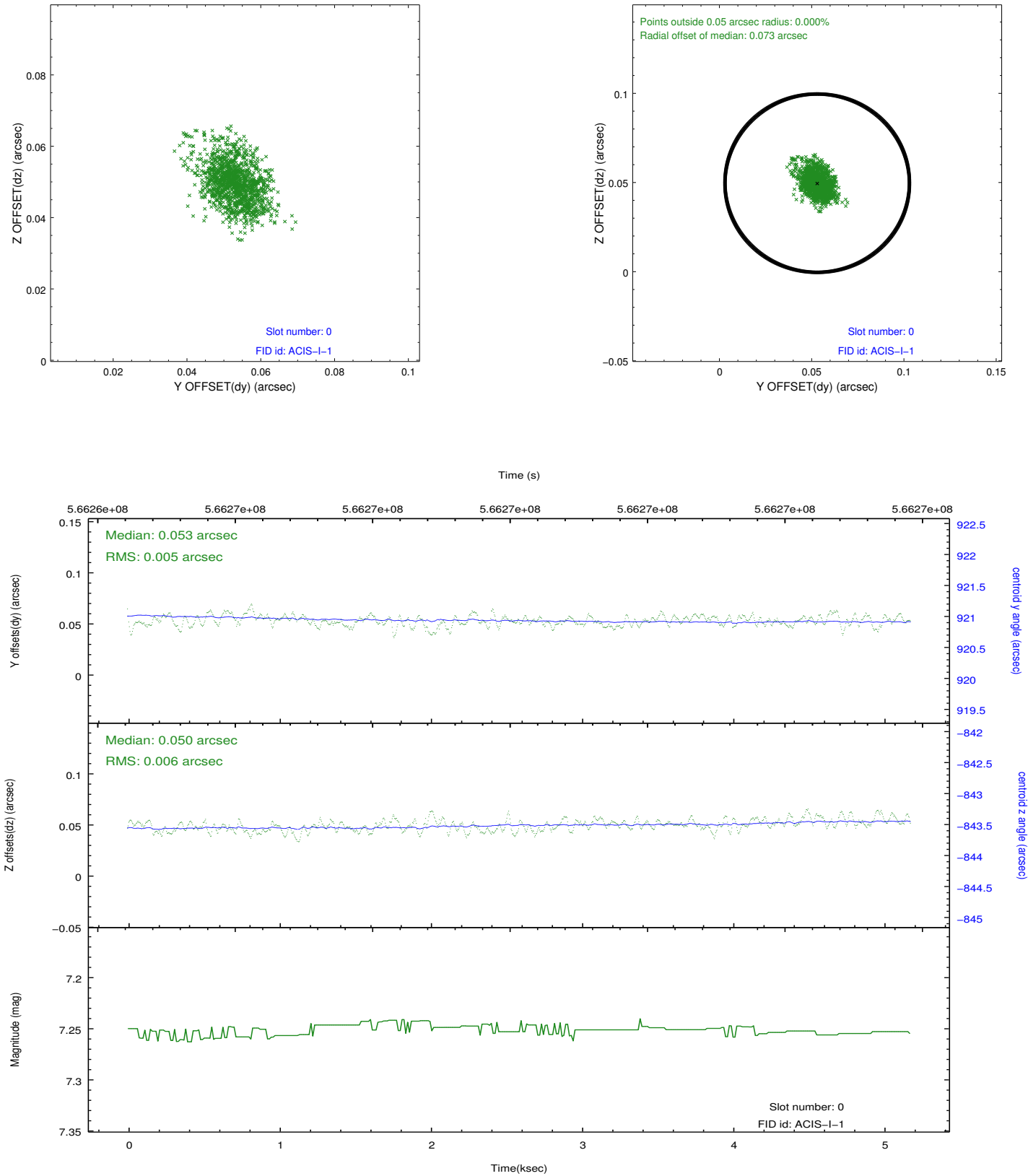


## 2.4.5 Slot 7

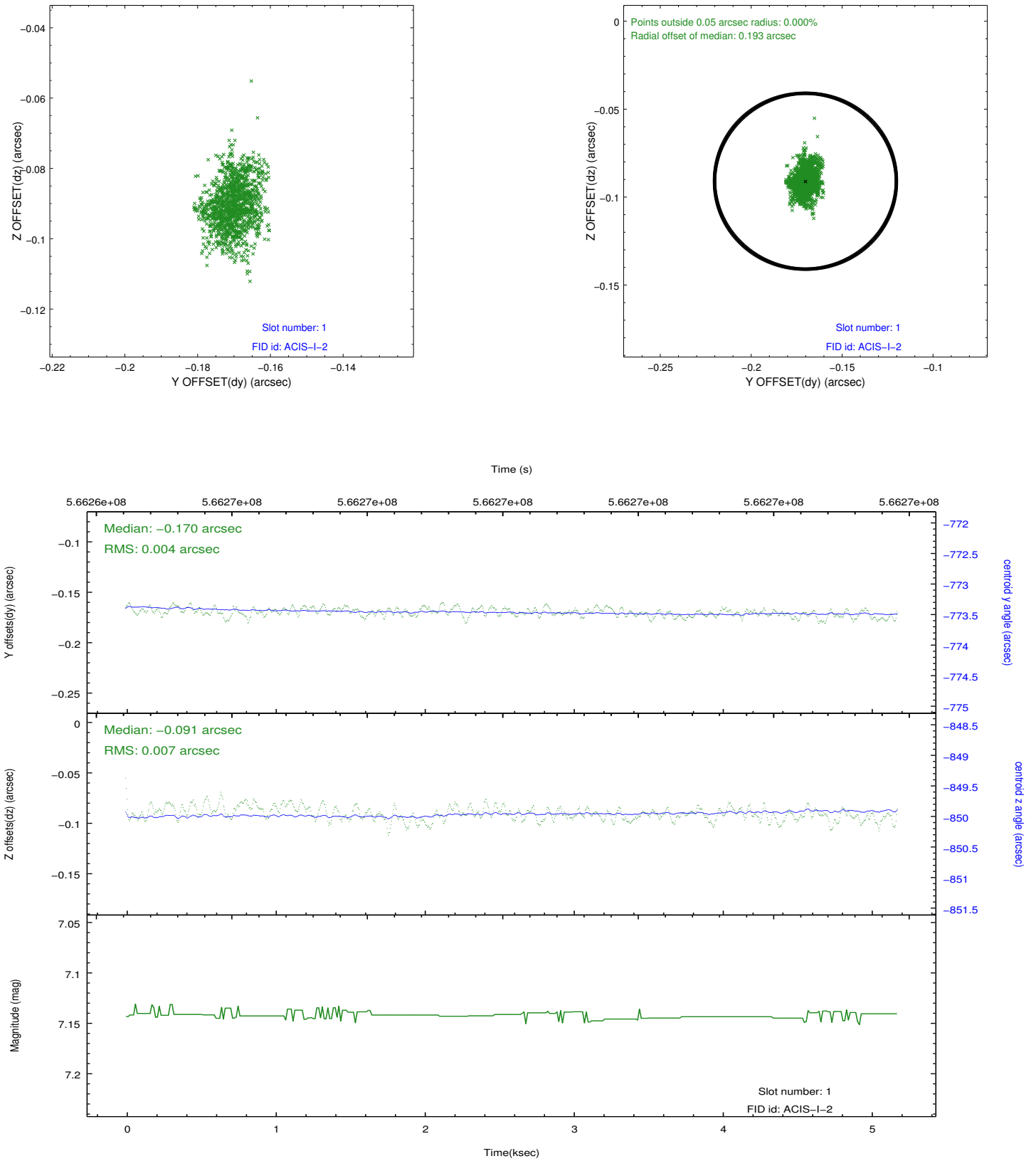


## 2.5 FID Slots

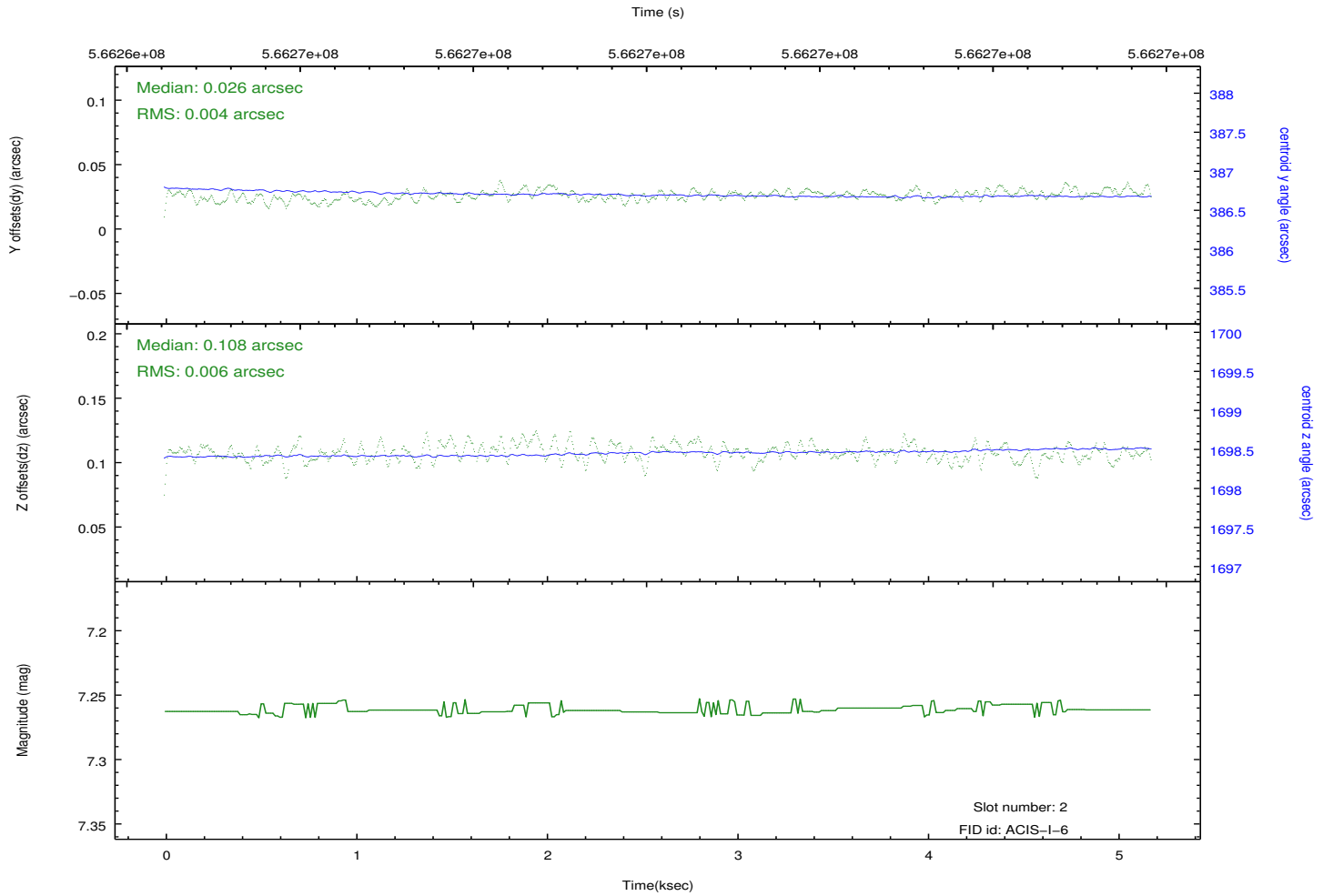
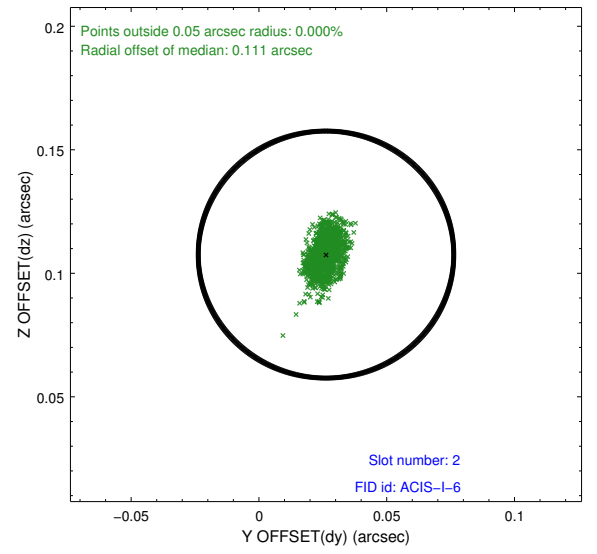
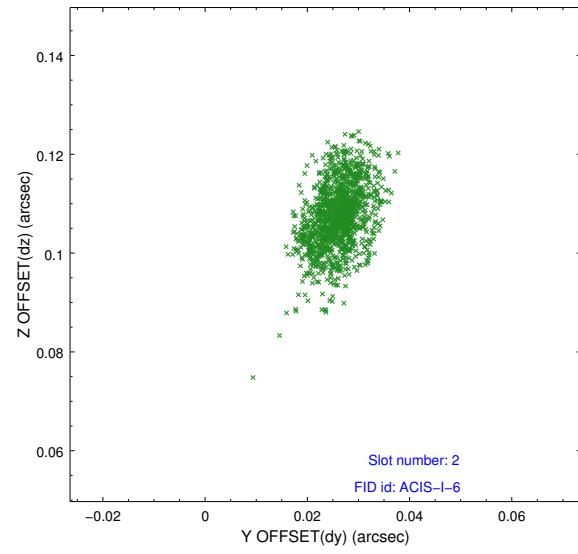
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



## A Summary

### A.1 Status

|                            |                 |
|----------------------------|-----------------|
| V&V Scientist              | Beth Sundheim   |
| V&V Date (YYYY-MM-DD)      | 2015.12.12      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 4.7765504690409 |

### A.2 Comments