

# V&V Reference Report

## L2 ASCDS Version : 10.7

Observation 21895 - L2 Version 1  
Chandra X-Ray Center

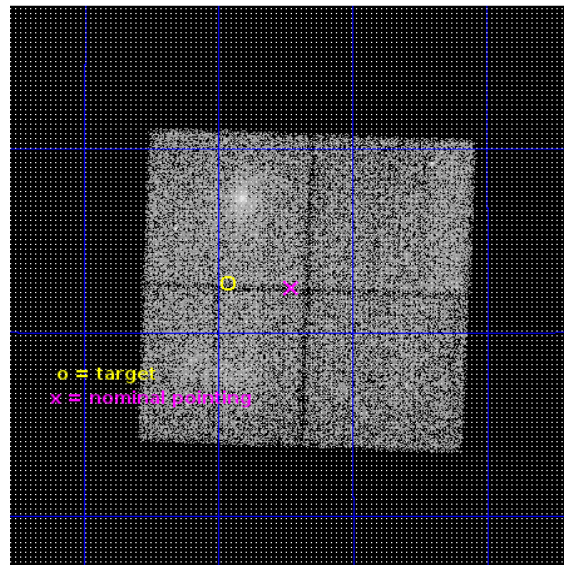
L2 Processing Date : Nov 15 2018

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# 1 Front

|          |                                                                                                    |                                             |
|----------|----------------------------------------------------------------------------------------------------|---------------------------------------------|
| seq_num  | 801818                                                                                             | Sequence number                             |
| obs_id   | 21895                                                                                              | Observation id                              |
| title    | Deep Chandra Observations of the Shock Front and Faint Filament in the Pre-Merger Cluster Abell 98 | Proposal title                              |
| observer | Scott Randall                                                                                      | Principal investigator                      |
| object   | Abell 98                                                                                           | Source name                                 |
| dtcycle  | 0                                                                                                  | &#160                                       |
| cycle    | P                                                                                                  | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 11.615833                                                                                          | Observer's specified target RA [deg]        |
| dec_targ | 20.544667                                                                                          | Observer's specified target Dec [deg]       |
| ra_nom   | 11.557136483209                                                                                    | Nominal RA [deg]                            |
| dec_nom  | 20.540720528936                                                                                    | Nominal Dec [deg]                           |
| roll_nom | 272.22928620413                                                                                    | Nominal Roll [deg]                          |
| revision | 1                                                                                                  | Processing version of data                  |
| ontime   | 28968.278137684                                                                                    | Sum of GTIs [s]                             |
| livetime | 28589.786257679                                                                                    | Livetime [s]                                |
| ontime0  | 28971.296207428                                                                                    | Sum of GTIs [s]                             |
| ontime1  | 28971.337057471                                                                                    | Sum of GTIs [s]                             |
| ontime2  | 28977.660288334                                                                                    | Sum of GTIs [s]                             |
| ontime3  | 28968.278137684                                                                                    | Sum of GTIs [s]                             |
| l2events | 87722                                                                                              | Number of level 2 events                    |

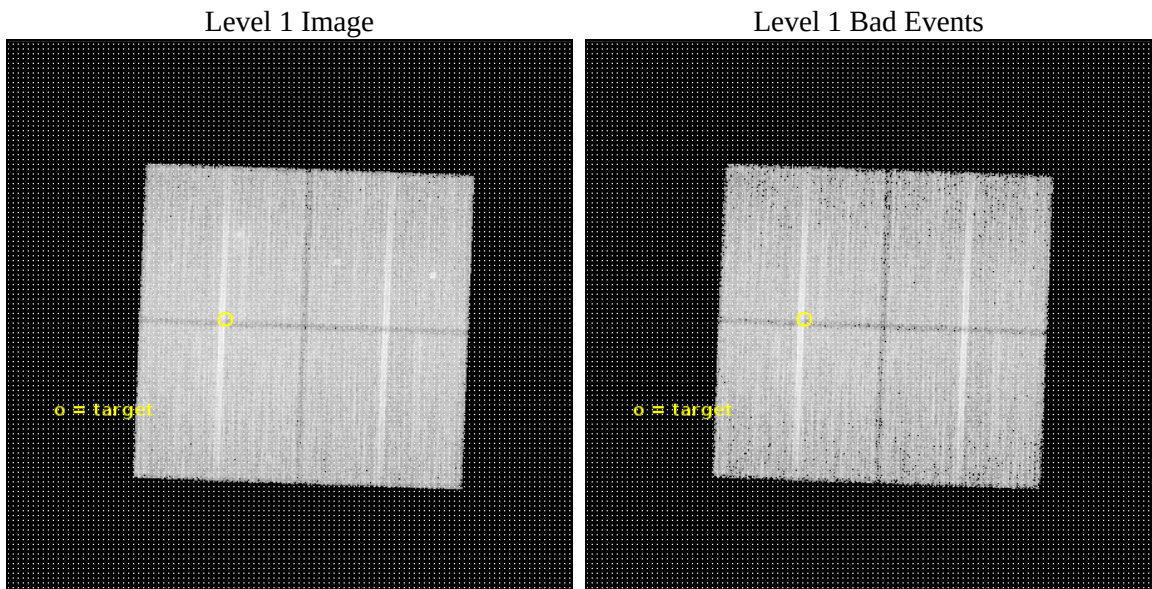




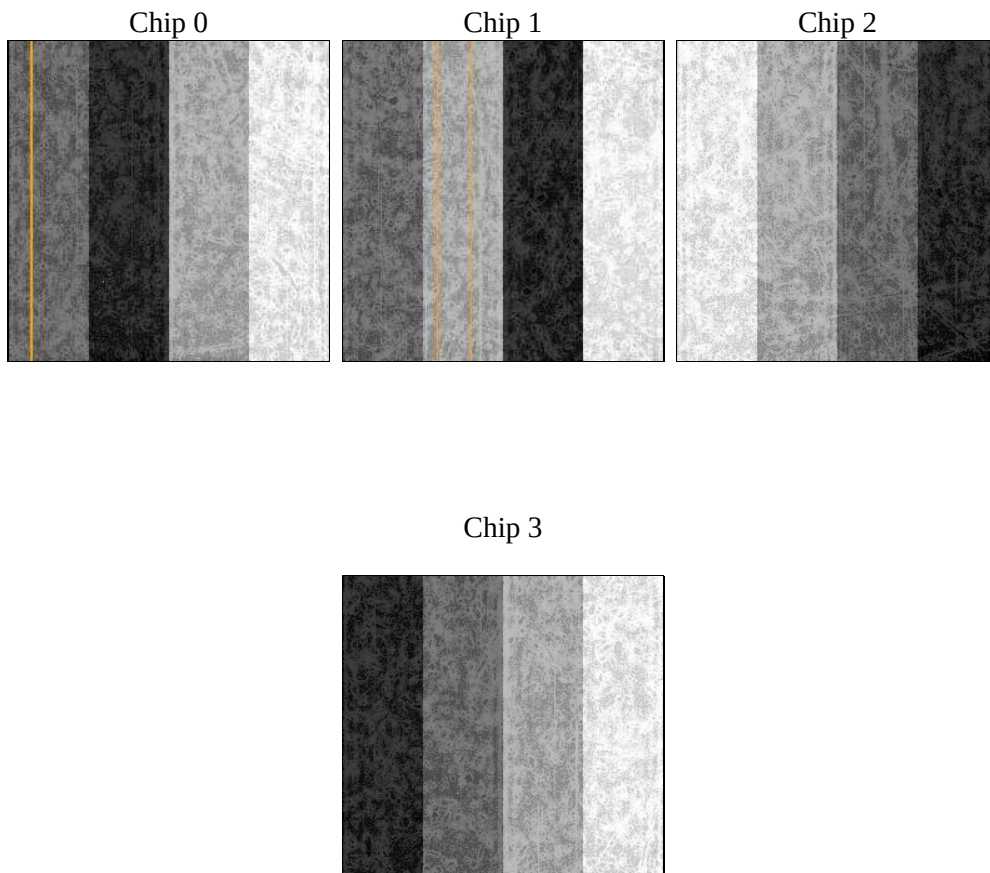
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 28900.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.7                | Processing system revision     | ontime         | 28968.278137684 | Sum of GTIs [s]                         |
| caldsver | 4.8.0.1             | &#160                          | ontime0        | 28971.296207428 | Sum of GTIs [s]                         |
| date     | 2018-11-15T16:34:38 | Date and time of file creation | ontime1        | 28971.337057471 | Sum of GTIs [s]                         |
| revision | 1                   | Processing version of data     | ontime2        | 28977.660288334 | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 28968.278137684 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 852973          | Number of level 1 events                |

### 2.1.4 Events

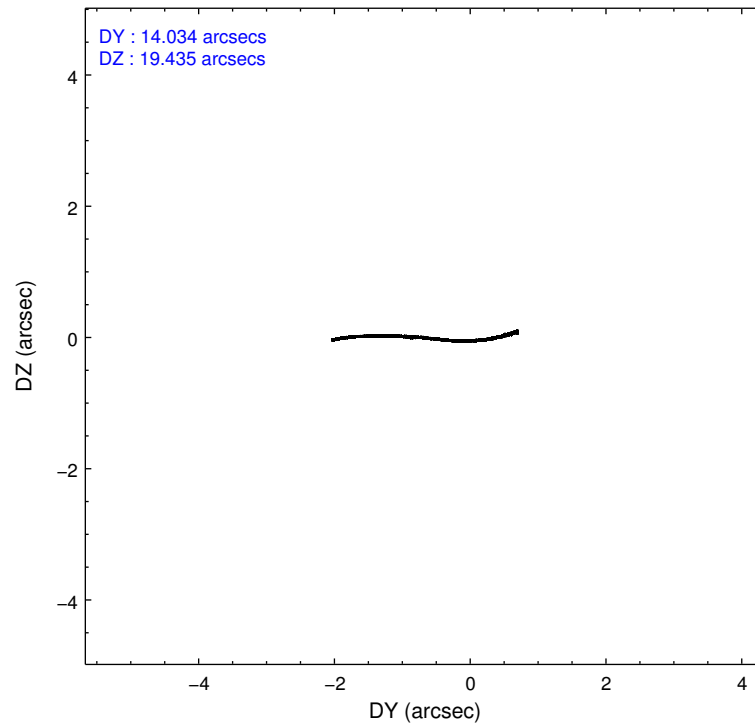
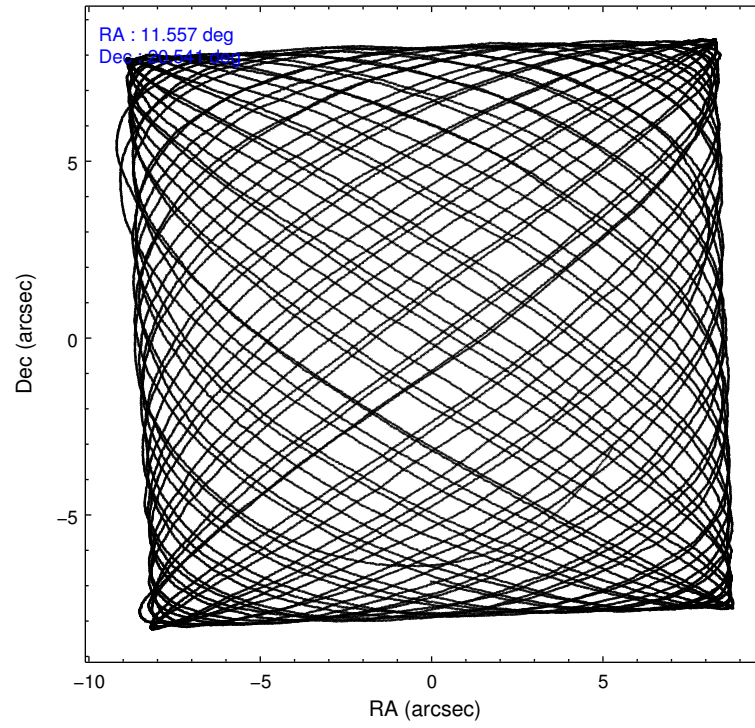
|                 | ccd 0  | ccd 1  | ccd 2  | ccd 3  |
|-----------------|--------|--------|--------|--------|
| level 1 events  | 201585 | 203567 | 228422 | 219399 |
| rejected events | 177562 | 176712 | 201879 | 192285 |
| rejected %      | 88%    | 86%    | 88%    | 87%    |

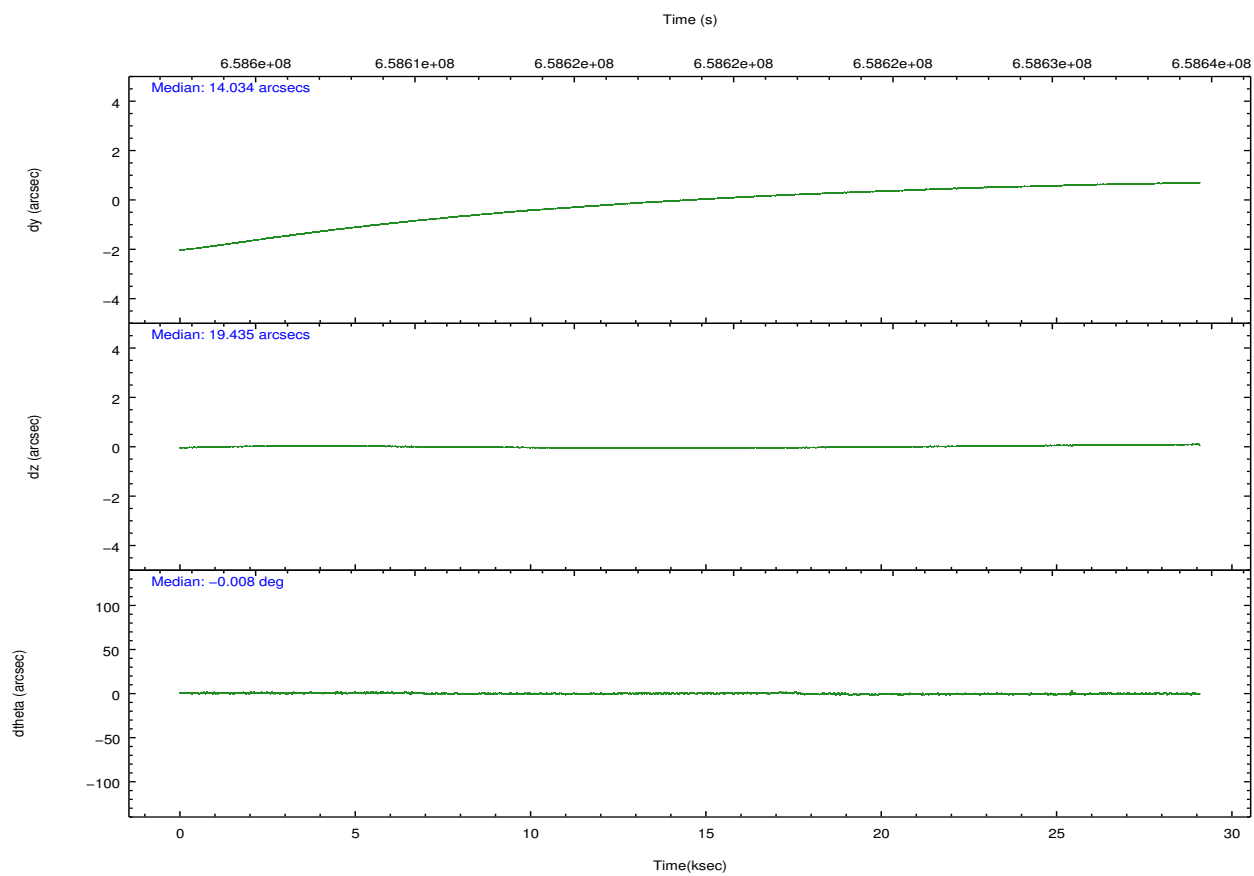
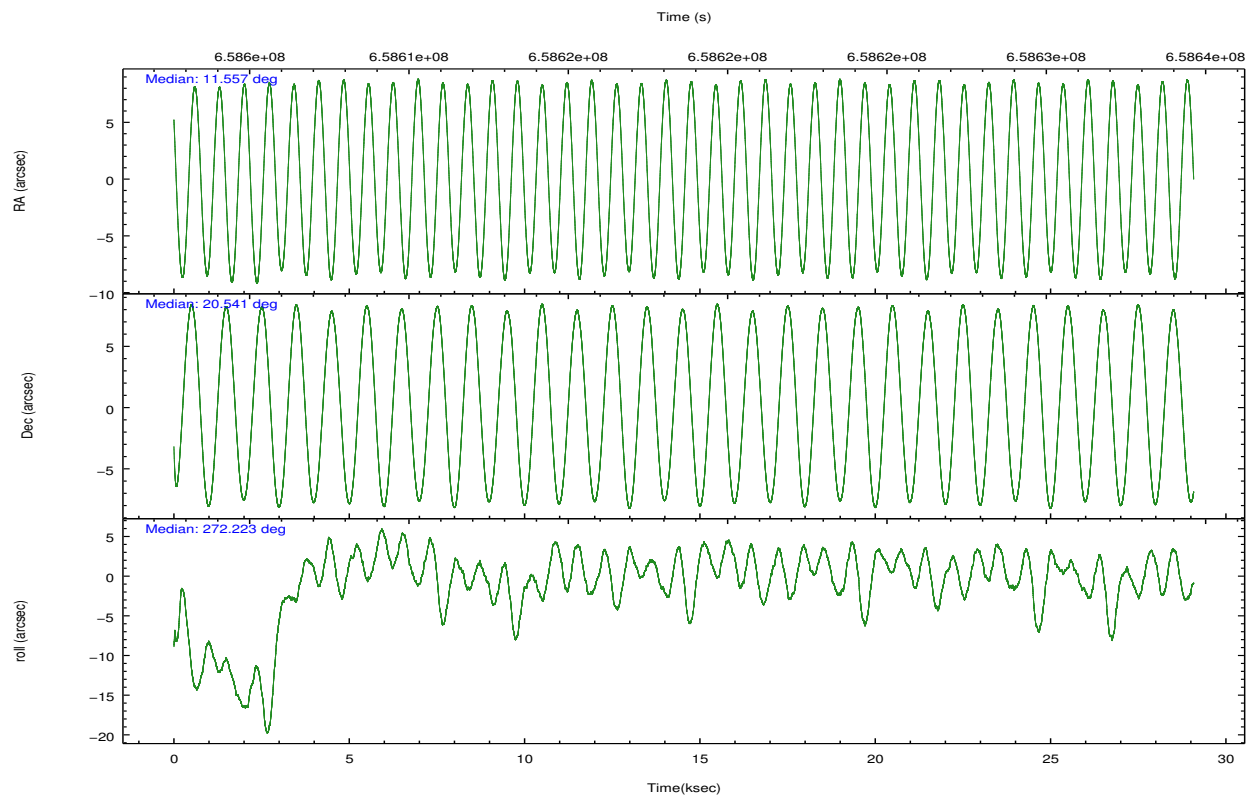
|                | ccd 0  | ccd 1  | ccd 2  | ccd 3  |
|----------------|--------|--------|--------|--------|
| grade 0 events | 8284   | 9304   | 11237  | 11452  |
|                | 4%     | 4%     | 4%     | 5%     |
| grade 1 events | 118    | 141    | 134    | 146    |
|                | 0%     | 0%     | 0%     | 0%     |
| grade 2 events | 5938   | 6695   | 5870   | 5407   |
|                | 2%     | 3%     | 2%     | 2%     |
| grade 3 events | 2507   | 2345   | 2454   | 2627   |
|                | 1%     | 1%     | 1%     | 1%     |
| grade 4 events | 2264   | 2386   | 2408   | 2522   |
|                | 1%     | 1%     | 1%     | 1%     |
| grade 5 events | 8775   | 9036   | 8391   | 9962   |
|                | 4%     | 4%     | 3%     | 4%     |
| grade 6 events | 5034   | 6132   | 4581   | 5111   |
|                | 2%     | 3%     | 2%     | 2%     |
| grade 7 events | 168665 | 167528 | 193347 | 182172 |
|                | 83%    | 82%    | 84%    | 83%    |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual                | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|-----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                  | Obspar format version number          | 7         | 7       |
| Detector                          | ACIS-0123           | ACIS-0123             | 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                 | 11.541322           | 11.55713648320898     | CCD I2 on                             | Y         | Y       |
| [deg] Pointing Dec                | 20.564018           | 20.54072052893562     | CCD I3 on                             | Y         | Y       |
| [deg] Pointing Roll               | 272.026148          | 272.2292862041269     | 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        | N       |
| [mm] SIM translation stage pos    | -233.592463         | -233.5874344608287    | CCD S3 on                             | N         | N       |
| [mm] SIM translation stage offset | 0                   | -0.005018542100998502 | CCD S4 on                             | N         | N       |
| [s] Observation start time (MET)  | 658604270.184000    | 658603108.21868       | CCD S5 on                             | N         | N       |
| Observation start date            | 2018-11-14T17:36:41 | 2018-11-14T17:18:28   | Number of optional ACIS chips dropped | 1         | 1       |
| [s] Observation end time (MET)    | 658633170.184000    | 658634184.17053       | On-chip summing requested             | N         | N       |
| Observation end date              | 2018-11-15T01:38:21 | 2018-11-15T01:56:24   | Subarray requested                    | NONE      | NONE    |
| Read mode                         | TIMED               | TIMED                 | Alternating exposures requested       | N         | N       |
|                                   |                     |                       | [s] Primary exposure time             | 0.000000  | 3.1     |

## 2.3 Aspect



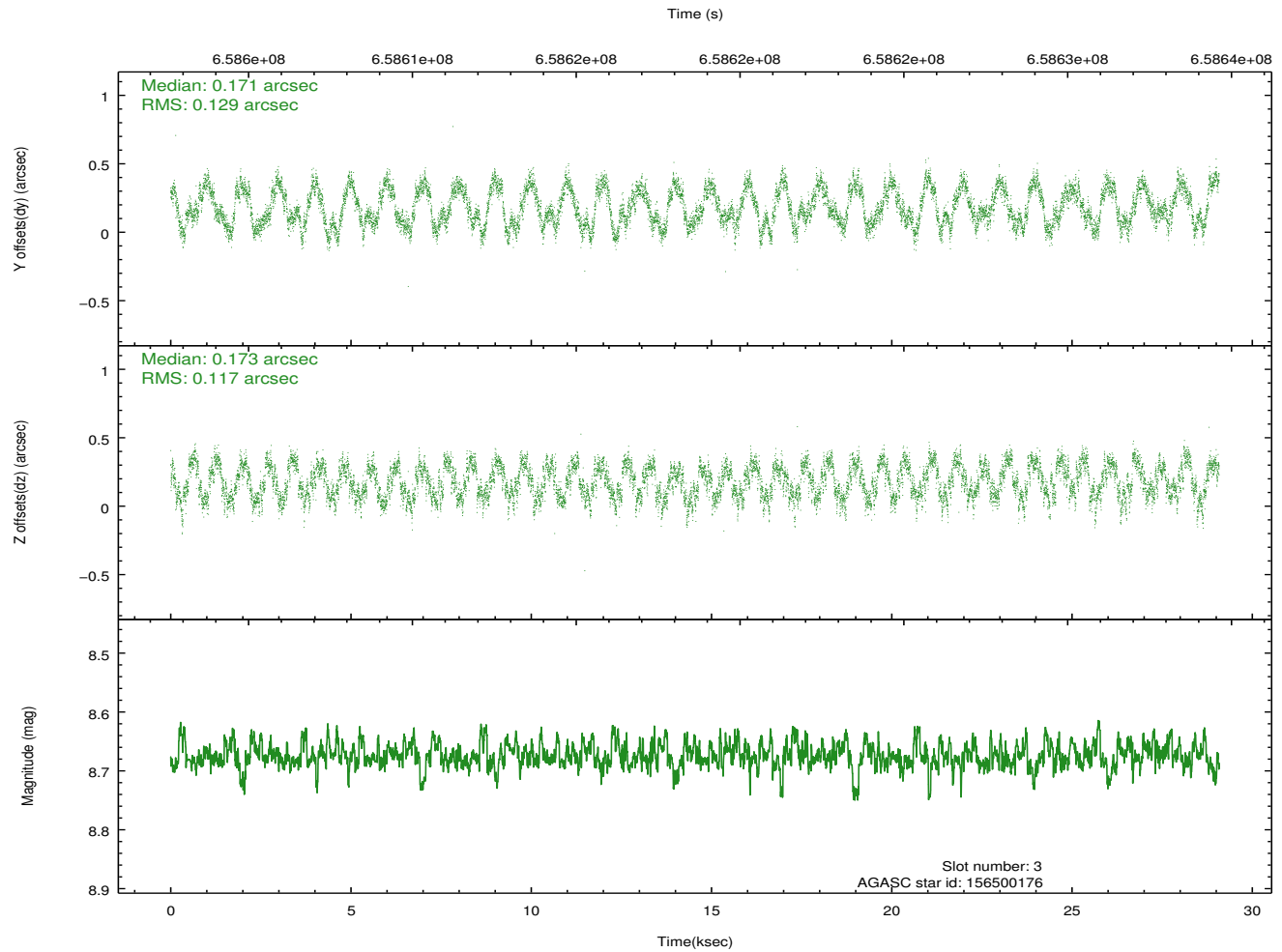
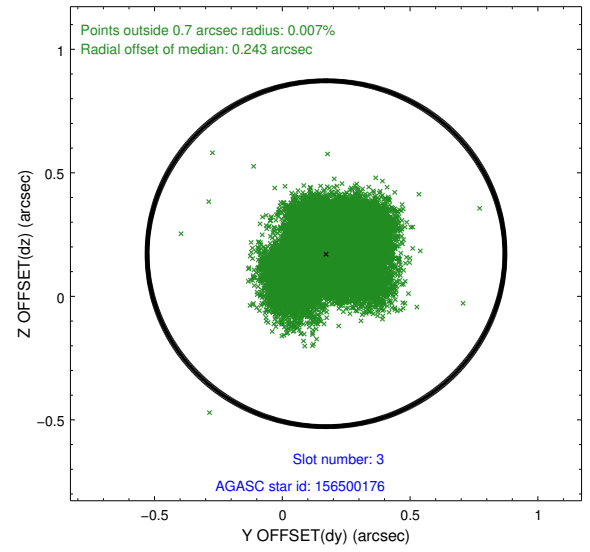
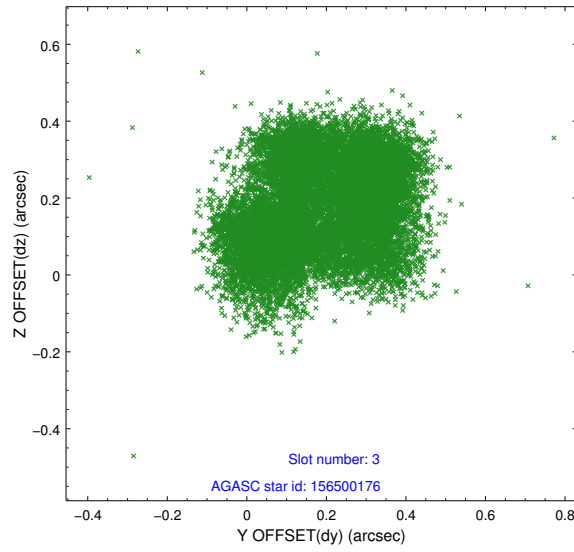


# Slot Statistics

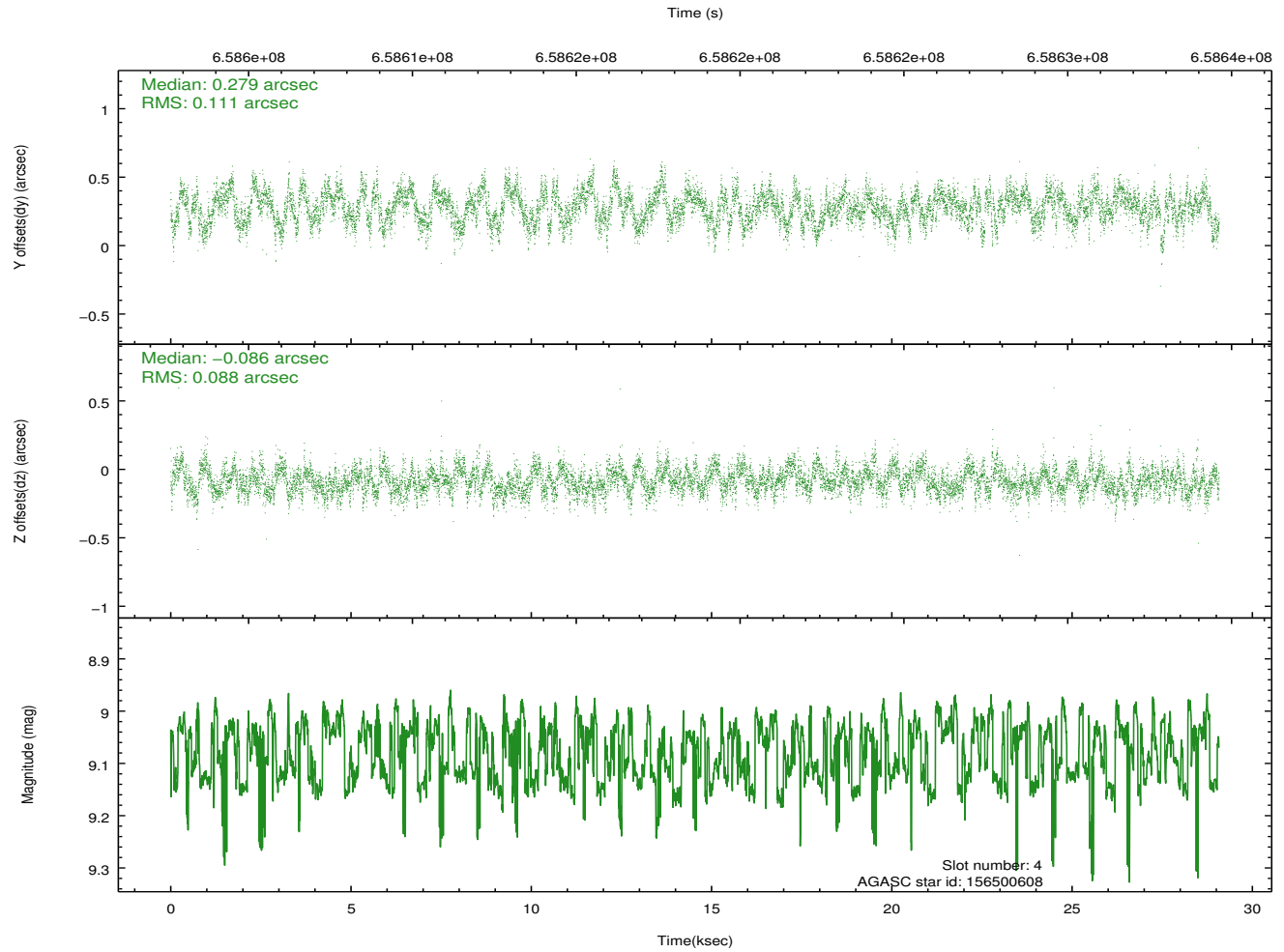
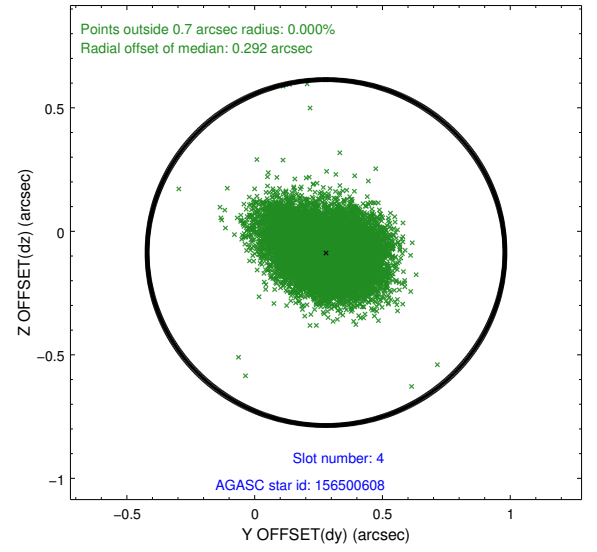
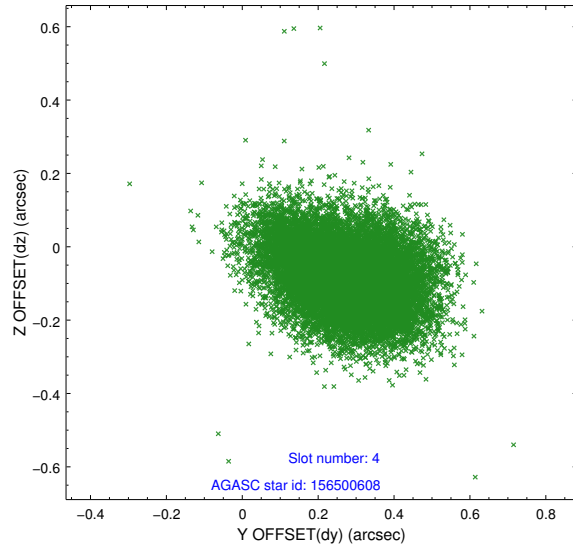
| pt | status | used | id        | mag  | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec       | mean_y   | mea   |
|----|--------|------|-----------|------|-------|----------|--------|--------|-------|-------|-----------|-----------|----------|-------|
| 0  | FID    |      | ACIS-I-1  | 7.25 | 7093  | 1.000    | 0.079  | -0.070 | 0.010 | 0.017 | 0.000000  | 0.000000  | 925.85   | -843  |
| 1  | FID    |      | ACIS-I-5  | 7.25 | 7093  | 1.000    | -0.496 | -0.010 | 0.024 | 0.031 | 0.000000  | 0.000000  | -1822.99 | 1054  |
| 2  | FID    |      | ACIS-I-6  | 7.26 | 7093  | 1.000    | 0.326  | 0.149  | 0.025 | 0.037 | 0.000000  | 0.000000  | 391.28   | 1699  |
| 3  | GUIDE  | used | 156500176 | 8.68 | 14168 | 1.000    | 0.171  | 0.173  | 0.192 | 0.269 | 11.171670 | 20.448926 | 371.50   | -1258 |
| 4  | GUIDE  | used | 156500608 | 9.08 | 14148 | 1.000    | 0.279  | -0.086 | 0.150 | 0.245 | 11.245383 | 20.021682 | 1916.02  | -1069 |
| 5  | GUIDE  | used | 156501376 | 6.69 | 14183 | 1.000    | -0.091 | 0.154  | 0.110 | 0.180 | 11.978451 | 20.925347 | -1250.14 | 1517  |
| 6  | GUIDE  | used | 156502176 | 8.01 | 14183 | 1.000    | -0.031 | 0.280  | 0.097 | 0.164 | 11.982190 | 21.024044 | -1604.59 | 1539  |
| 7  | GUIDE  | used | 156509336 | 7.46 | 14180 | 1.000    | -0.343 | -0.529 | 0.105 | 0.162 | 12.201488 | 20.214746 | 1330.68  | 2184  |

## 2.4 Star Slots

### 2.4.1 Slot 3

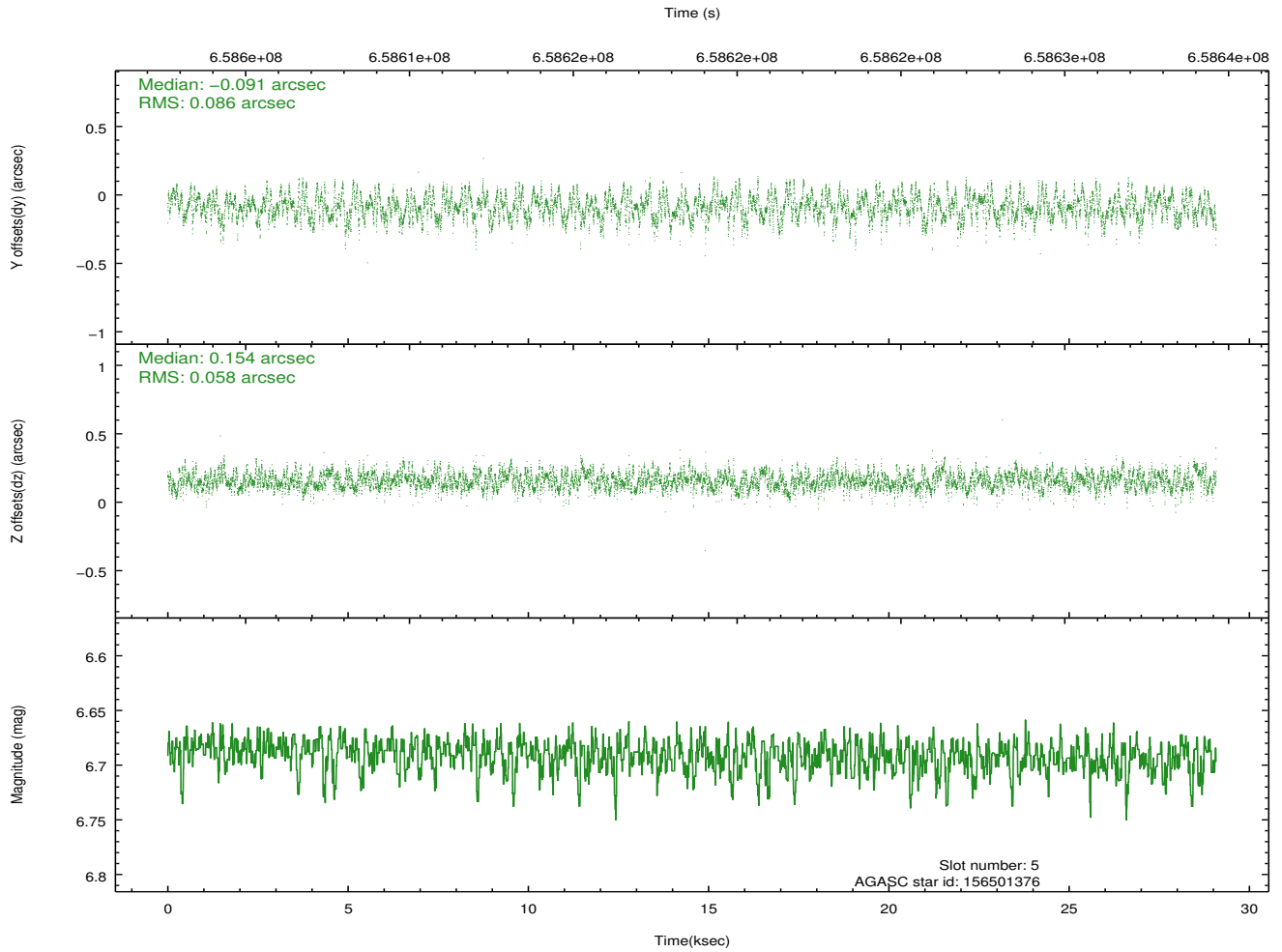
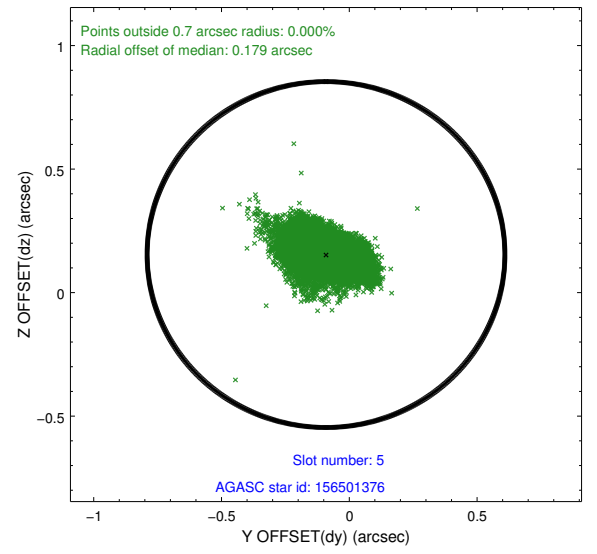
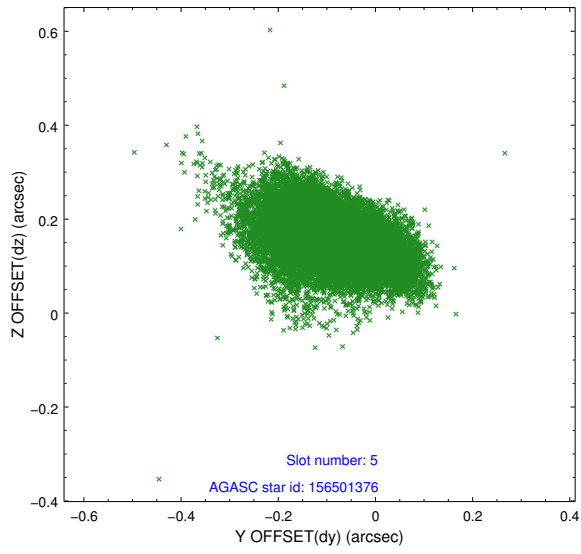


## 2.4.2 Slot 4

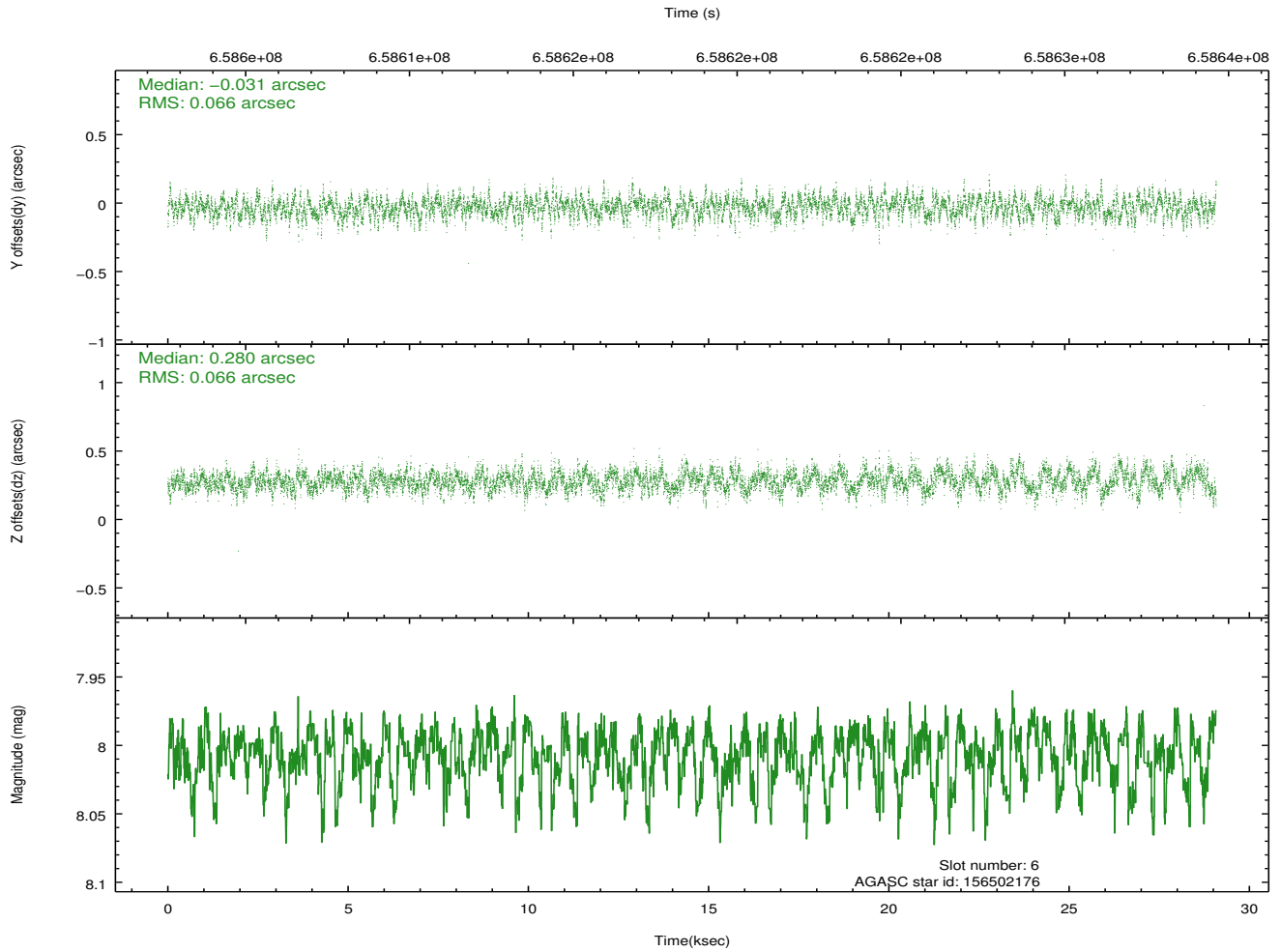
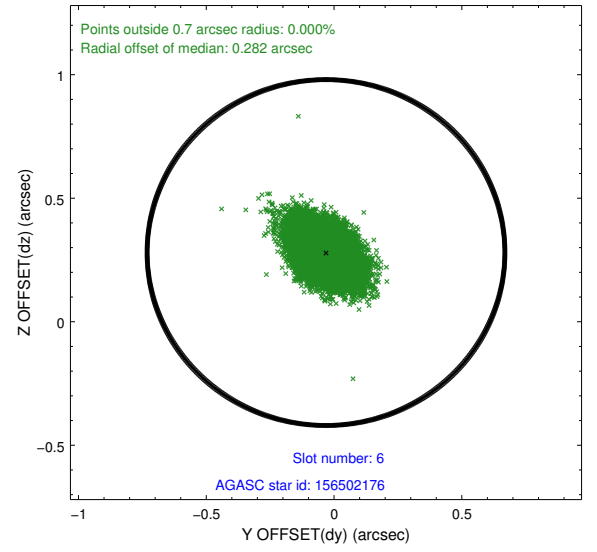
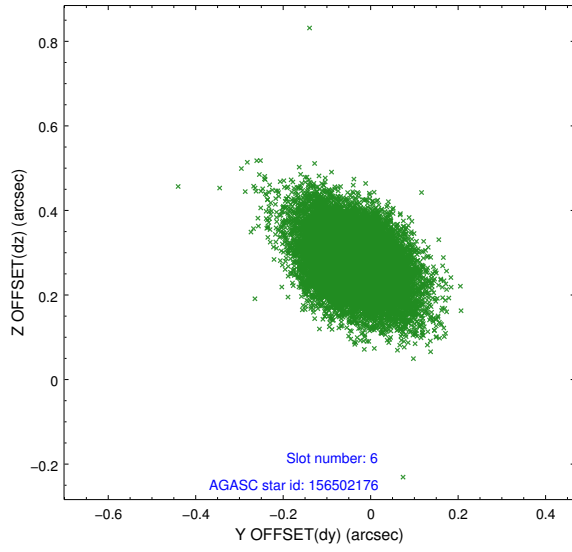




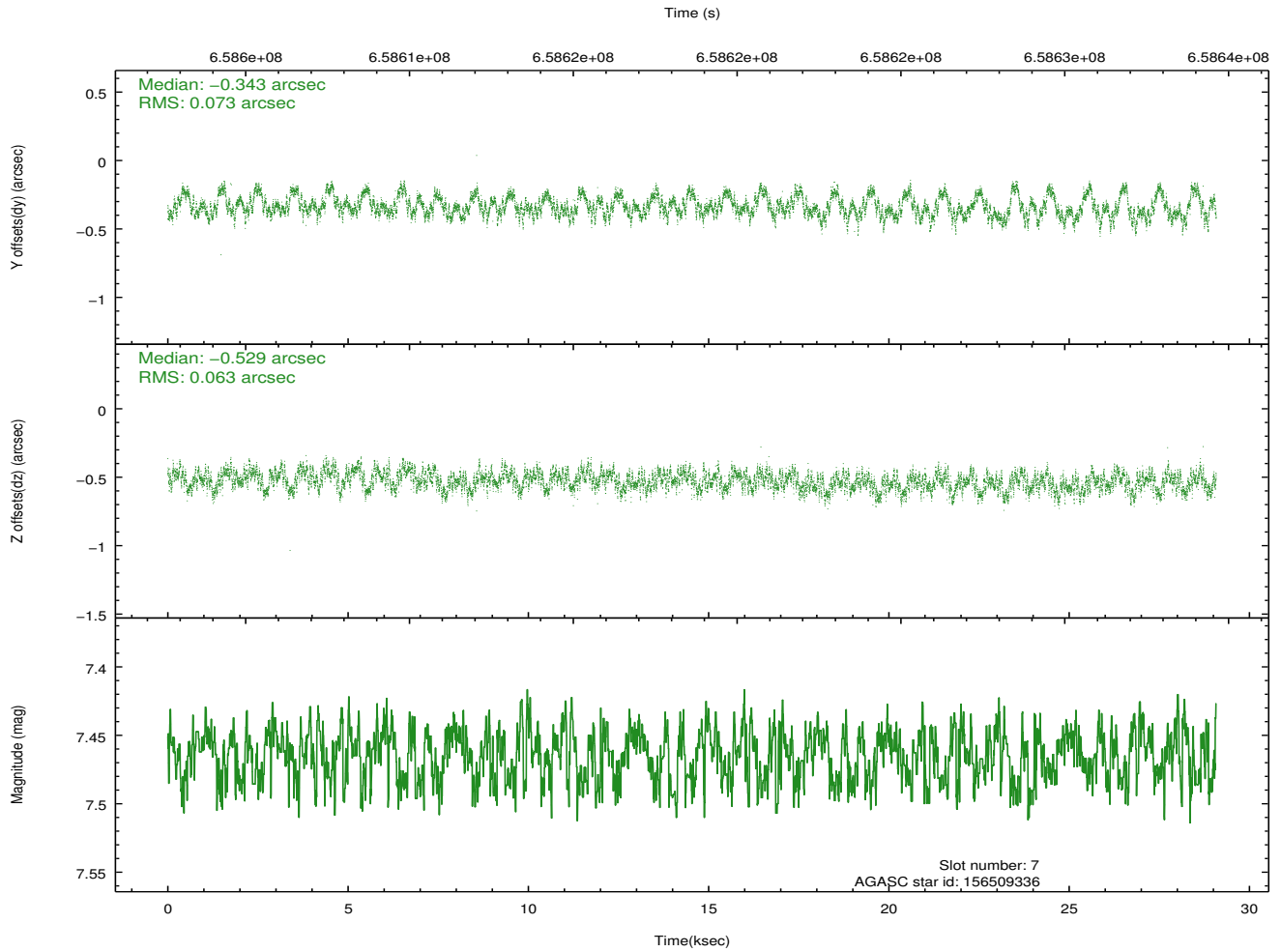
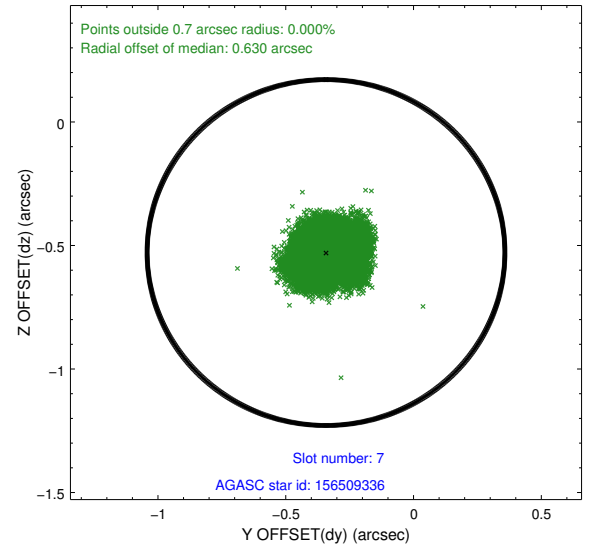
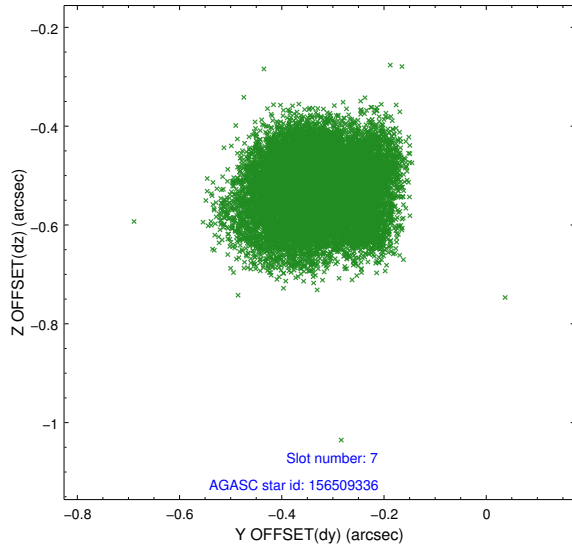
### 2.4.3 Slot 5



## 2.4.4 Slot 6

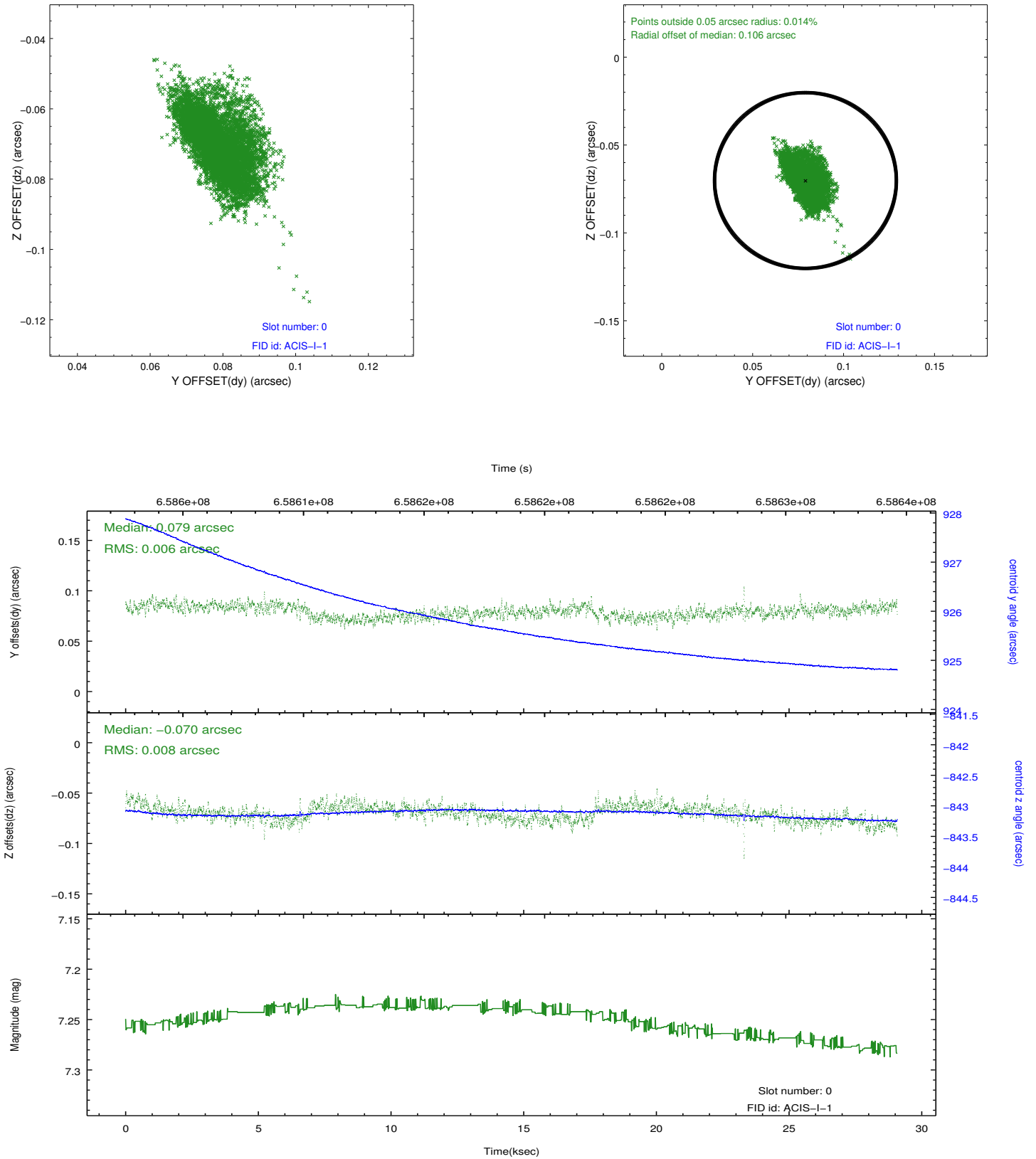


## 2.4.5 Slot 7

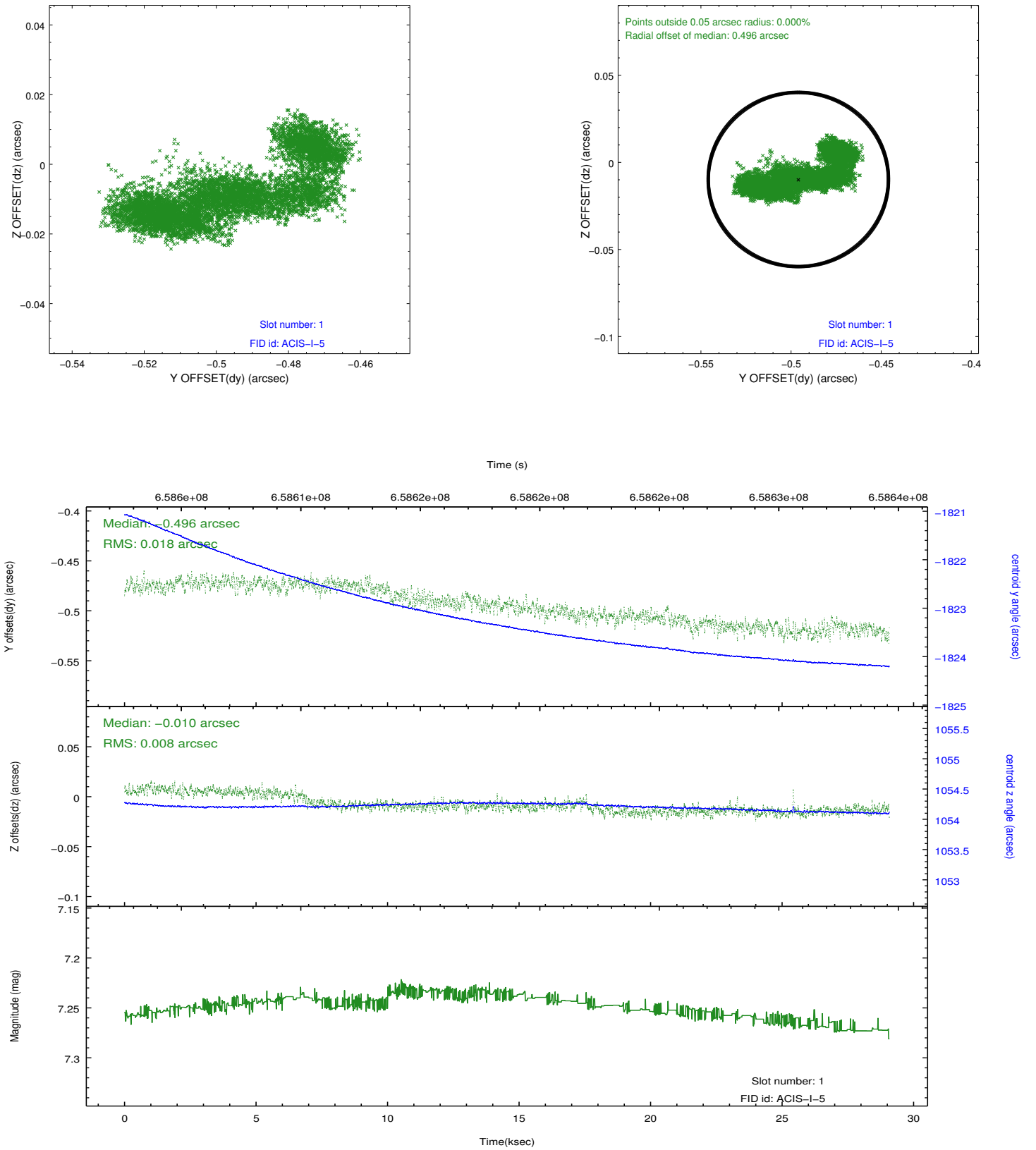


## 2.5 FID Slots

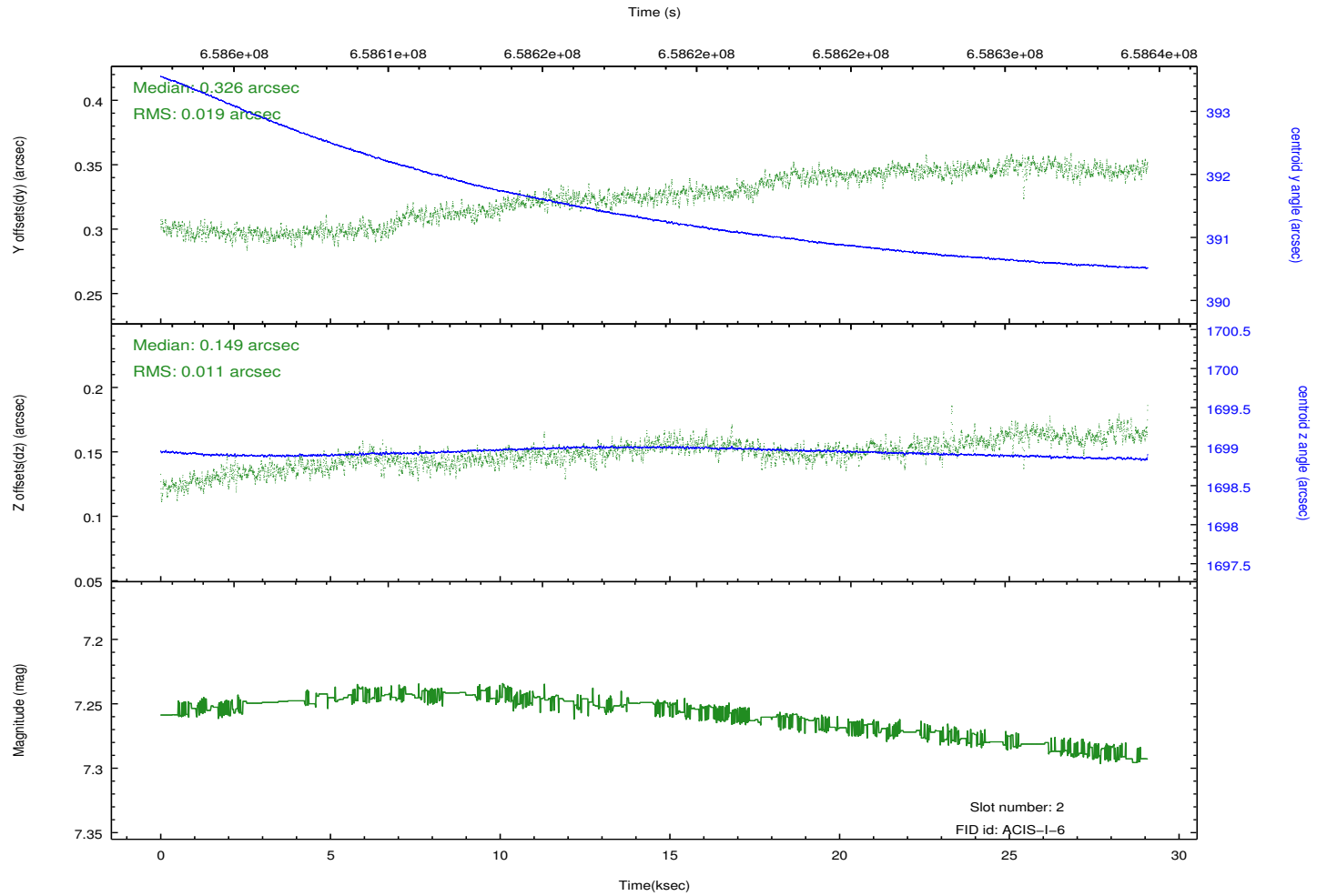
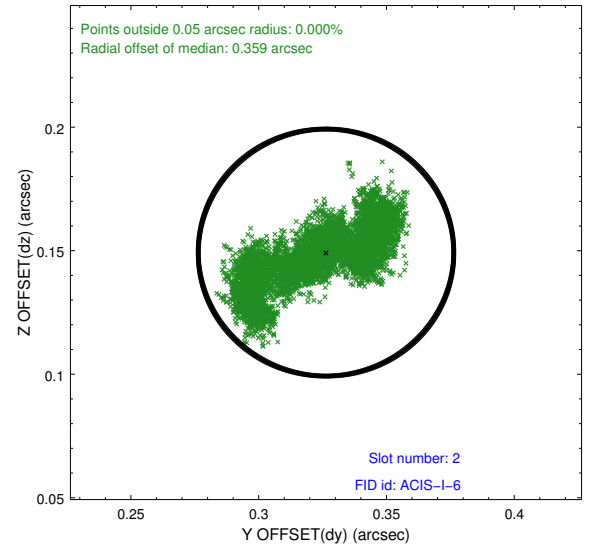
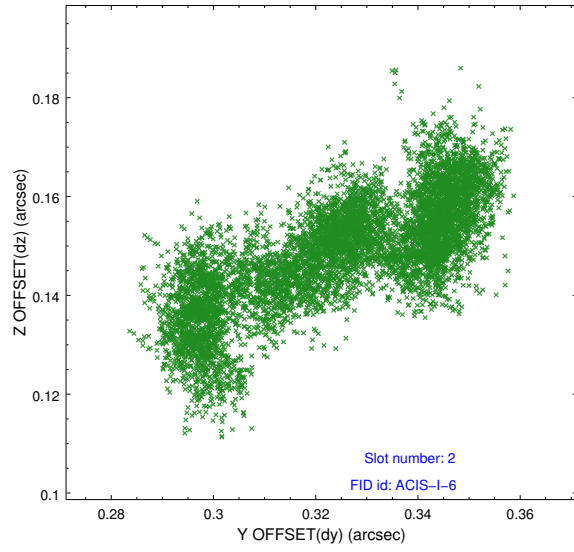
### 2.5.1 Slot 0



## 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)      | 2018.11.15      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 28.968278137684 |

### A.2 Comments

One optional chip was dropped.