

# V&V Reference Report

## L2 ASCDS Version : 10.7

Observation 21879 - L2 Version 1  
Chandra X-Ray Center

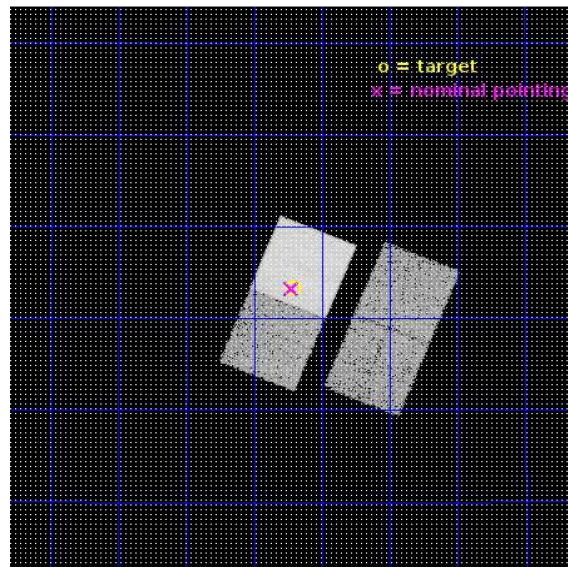
L2 Processing Date : Dec 6 2018

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# 1 Front

|          |                                                                      |                                             |
|----------|----------------------------------------------------------------------|---------------------------------------------|
| seq_num  | 703759                                                               | Sequence number                             |
| obs_id   | 21879                                                                | Observation id                              |
| title    | X-raying a rare hyperluminous ultramassive black-hole at cosmic dawn | &#160                                       |
| observer | Luca Zappacosta                                                      | Principal investigator                      |
| object   | J03064+1853                                                          | Source name                                 |
| dtcycle  | 0                                                                    | &#160                                       |
| cycle    | P                                                                    | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 46.677083                                                            | Observer's specified target RA [deg]        |
| dec_targ | 18.887722                                                            | Observer's specified target Dec [deg]       |
| ra_nom   | 46.681164901342                                                      | Nominal RA [deg]                            |
| dec_nom  | 18.887393347056                                                      | Nominal Dec [deg]                           |
| roll_nom | 292.15530071514                                                      | Nominal Roll [deg]                          |
| revision | 1                                                                    | Processing version of data                  |
| ontime   | 19067.085661173                                                      | Sum of GTIs [s]                             |
| livetime | 18817.960150025                                                      | Livetime [s]                                |
| ontime2  | 19063.821590781                                                      | Sum of GTIs [s]                             |
| ontime3  | 19066.072656035                                                      | Sum of GTIs [s]                             |
| ontime6  | 19063.903550982                                                      | Sum of GTIs [s]                             |
| ontime7  | 19067.085661173                                                      | Sum of GTIs [s]                             |
| l2events | 120778                                                               | Number of level 2 events                    |

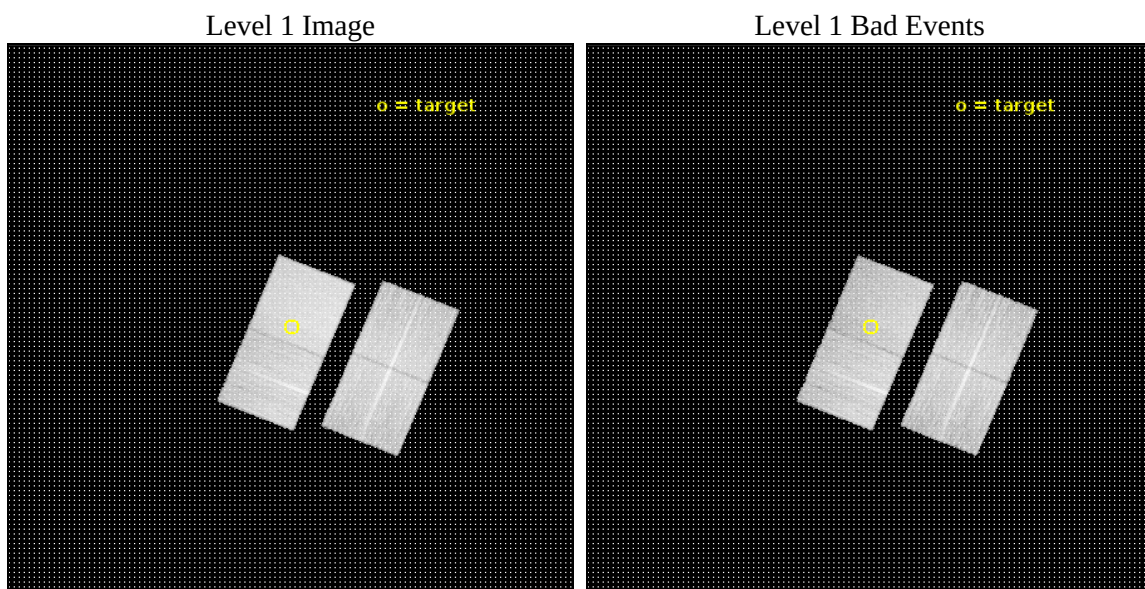




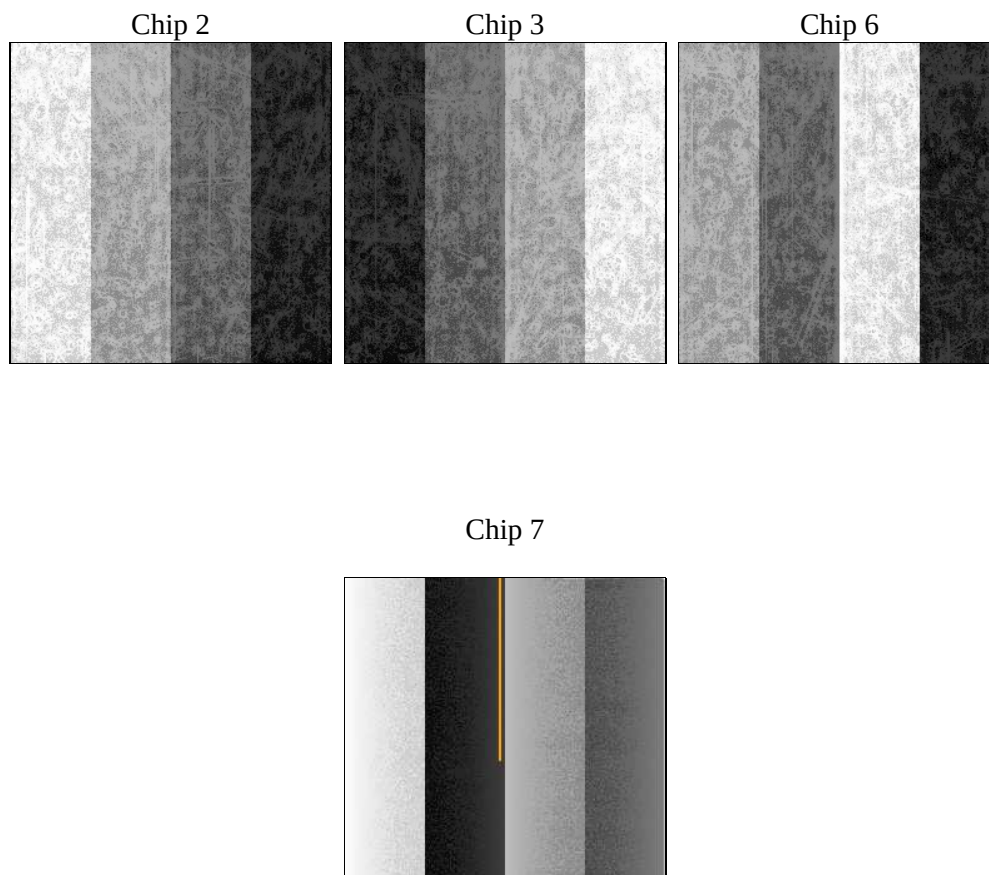
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 19000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.7                | Processing system revision     | ontime         | 19067.085661173 | Sum of GTIs [s]                         |
| caldsver | 4.8.0.1             | &#160                          | ontime2        | 19063.821590781 | Sum of GTIs [s]                         |
| date     | 2018-12-07T00:11:07 | Date and time of file creation | ontime3        | 19066.072656035 | Sum of GTIs [s]                         |
| revision | 1                   | Processing version of data     | ontime6        | 19063.903550982 | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 19067.085661173 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 619936          | Number of level 1 events                |

### 2.1.4 Events

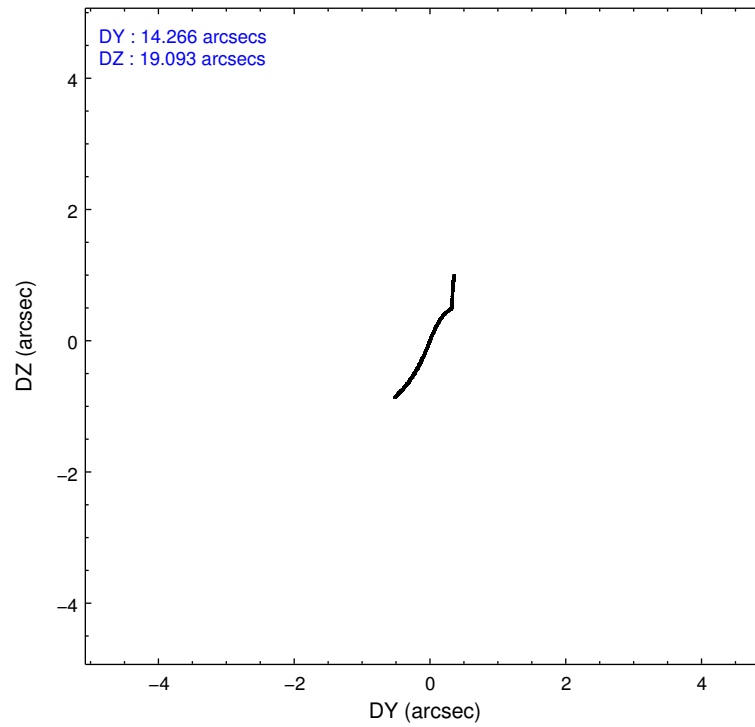
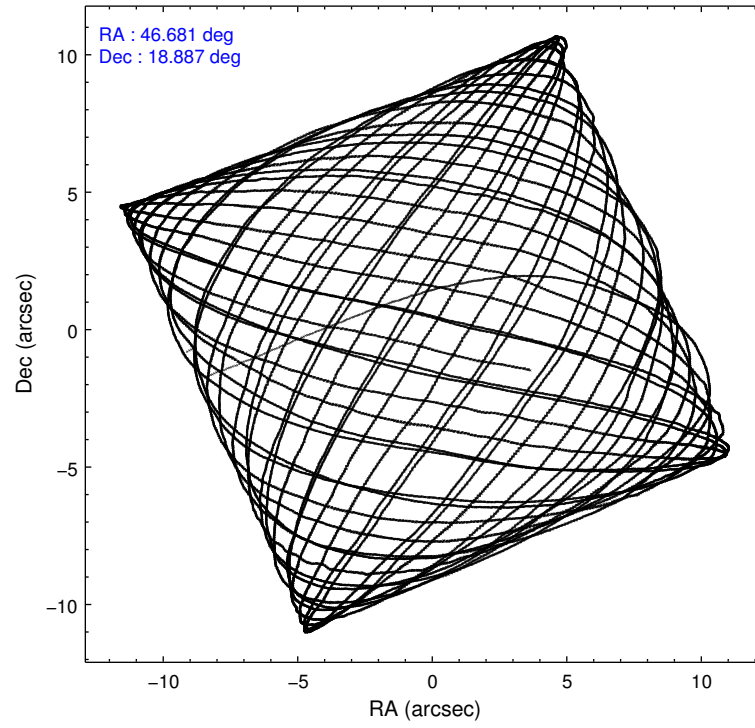
|                 | ccd 2  | ccd 3  | ccd 6  | ccd 7  |
|-----------------|--------|--------|--------|--------|
| level 1 events  | 140744 | 139253 | 152365 | 187574 |
| rejected events | 125069 | 124373 | 135686 | 105474 |
| rejected %      | 88%    | 89%    | 89%    | 56%    |

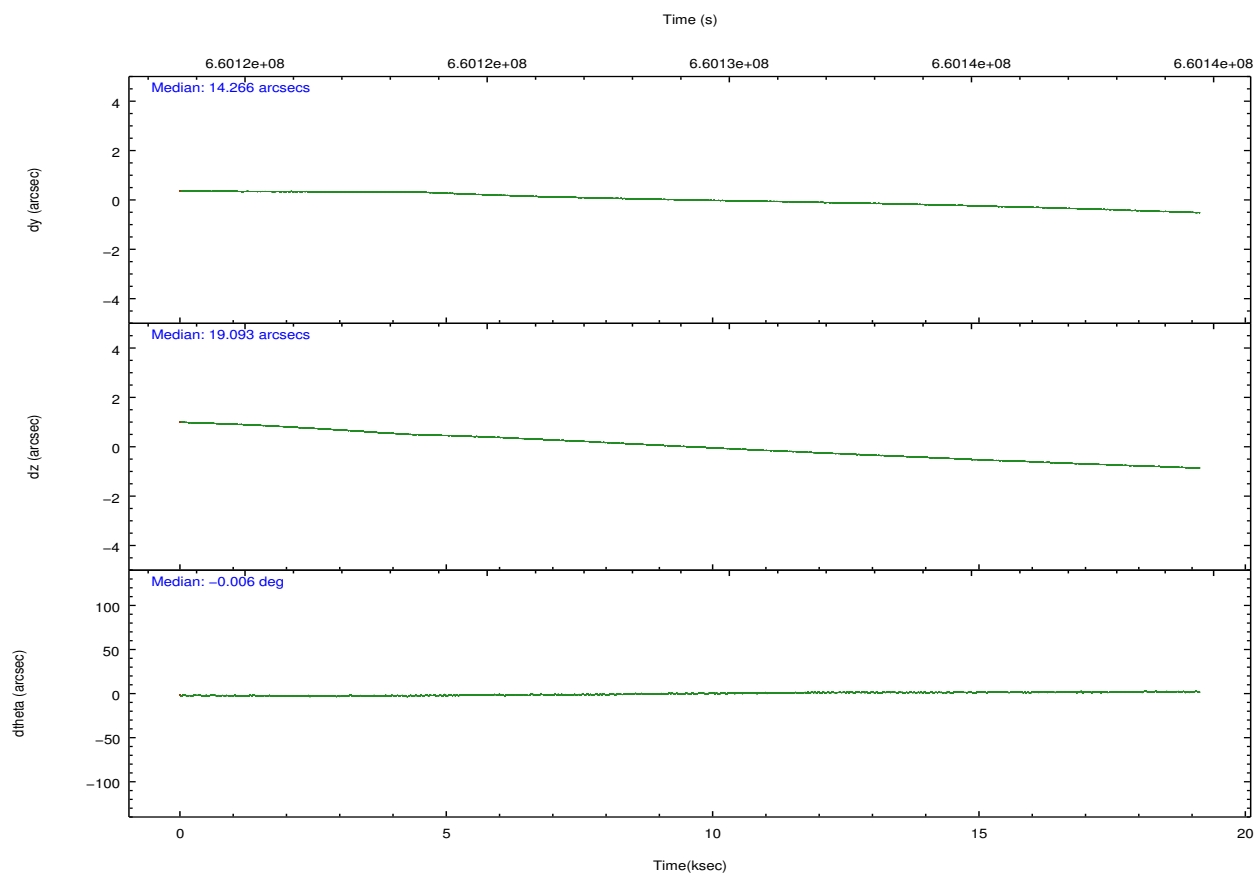
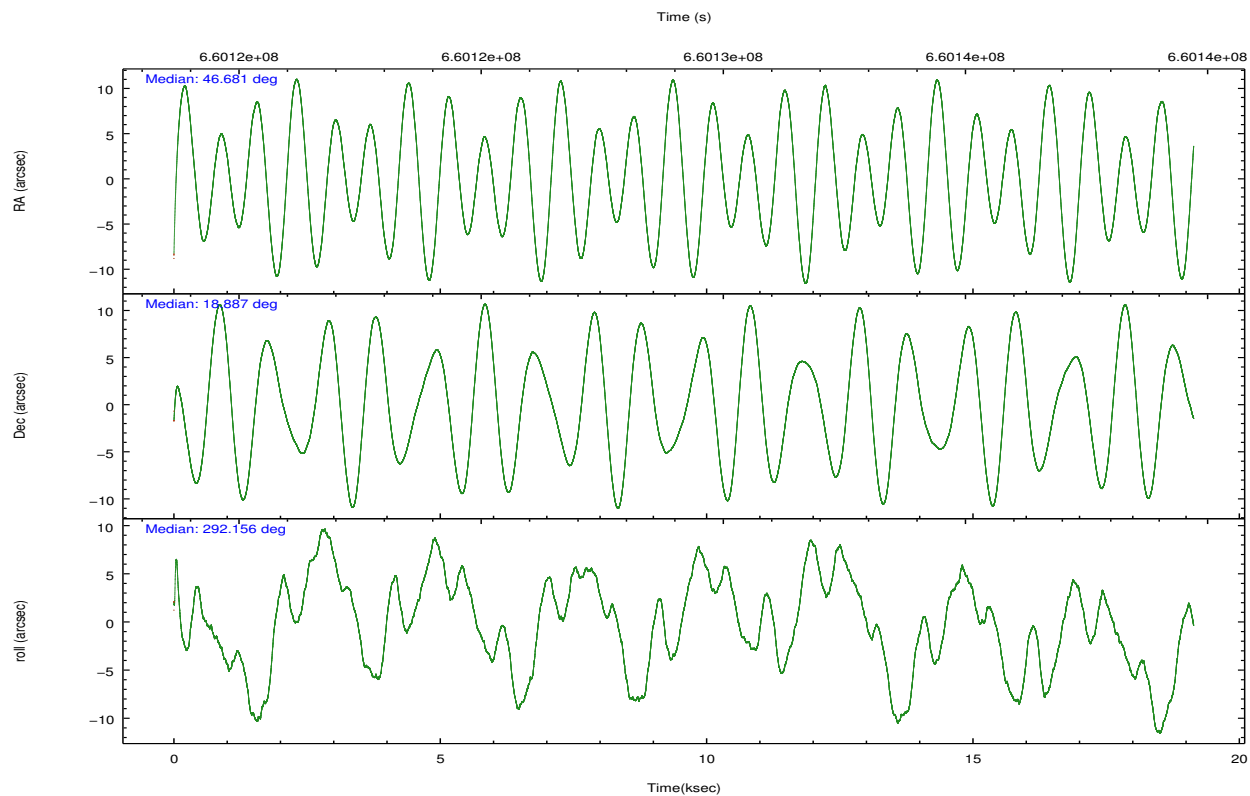
|                | ccd 2  | ccd 3  | ccd 6  | ccd 7 |
|----------------|--------|--------|--------|-------|
| grade 0 events | 5575   | 5275   | 5458   | 6915  |
|                | 3%     | 3%     | 3%     | 3%    |
| grade 1 events | 79     | 93     | 75     | 269   |
|                | 0%     | 0%     | 0%     | 0%    |
| grade 2 events | 3911   | 3337   | 3979   | 17625 |
|                | 2%     | 2%     | 2%     | 9%    |
| grade 3 events | 1588   | 1603   | 1668   | 6530  |
|                | 1%     | 1%     | 1%     | 3%    |
| grade 4 events | 1596   | 1548   | 1581   | 6561  |
|                | 1%     | 1%     | 1%     | 3%    |
| grade 5 events | 5619   | 6870   | 6958   | 18519 |
|                | 3%     | 4%     | 4%     | 9%    |
| grade 6 events | 3011   | 3119   | 3994   | 44493 |
|                | 2%     | 2%     | 2%     | 23%   |
| grade 7 events | 119365 | 117408 | 128652 | 86662 |
|                | 84%    | 84%    | 84%    | 46%   |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar format version number          | 7         | 7       |
| Detector                          | ACIS-2367           | ACIS-2367            | 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                 | 46.658022           | 46.6811649013415     | CCD I2 on                             | O1        | Y       |
| [deg] Pointing Dec                | 18.903944           | 18.88739334705565    | CCD I3 on                             | Y         | Y       |
| [deg] Pointing Roll               | 292.006175          | 292.1553007151392    | CCD S0 on                             | N         | N       |
| [mm] SIM focus pos                | -0.684267           | -0.6828225247311905  | CCD S1 on                             | N         | N       |
| [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                             | N         | N       |
| [s] Observation start time (MET)  | 660119773.184000    | 660118471.89643      | CCD S5 on                             | N         | N       |
| Observation start date            | 2018-12-02T06:35:04 | 2018-12-02T06:14:31  | Number of optional ACIS chips dropped | 0         | 0       |
| [s] Observation end time (MET)    | 660138773.184000    | 660138907.32266      | On-chip summing requested             | N         | N       |
| Observation end date              | 2018-12-02T11:51:44 | 2018-12-02T11:55:07  | Subarray requested                    | NONE      | NONE    |
| Read mode                         | TIMED               | TIMED                | Alternating exposures requested       | N         | N       |
|                                   |                     |                      | [s] Primary exposure time             | 0.000000  | 3.1     |

## 2.3 Aspect



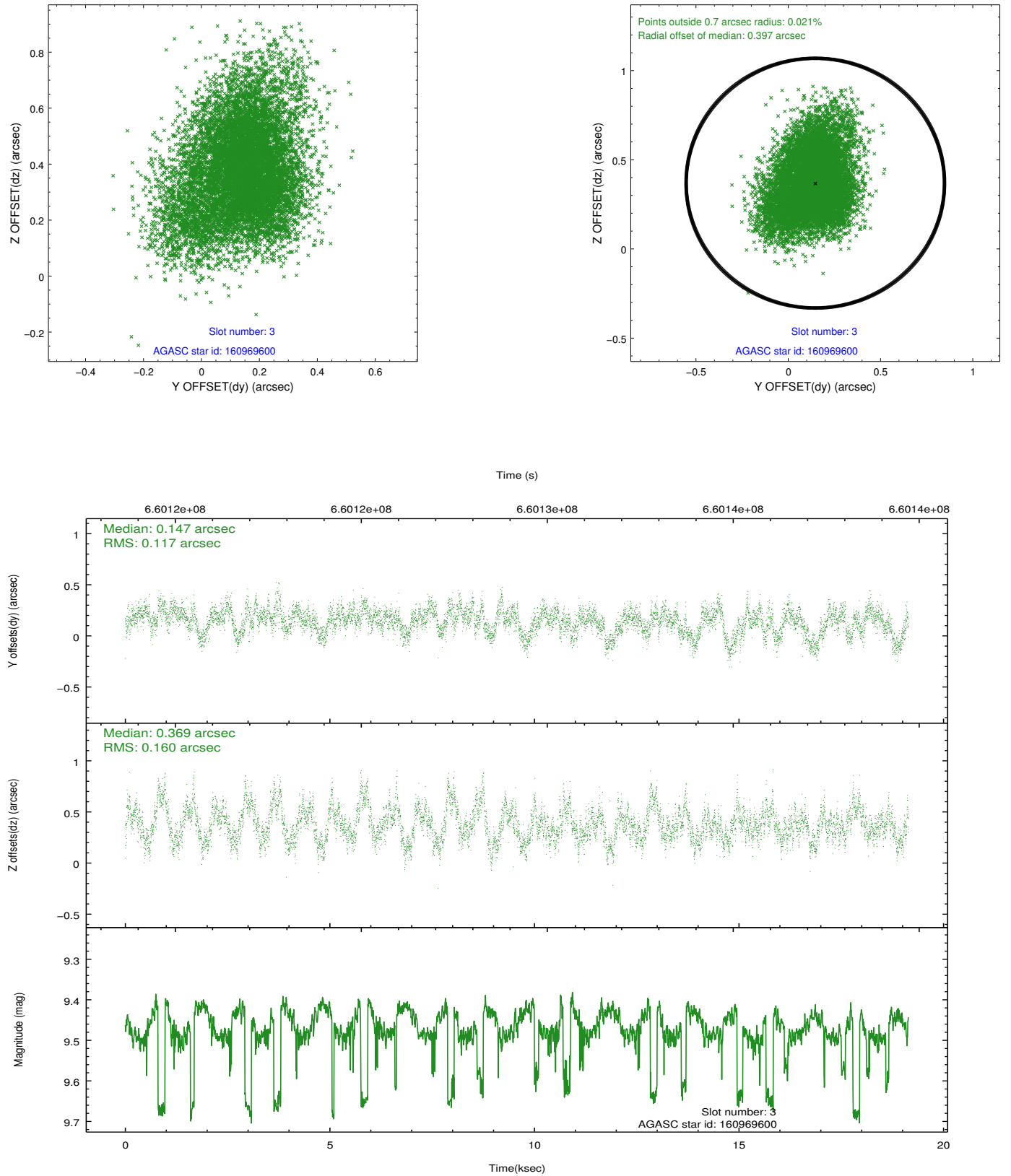


# Slot Statistics

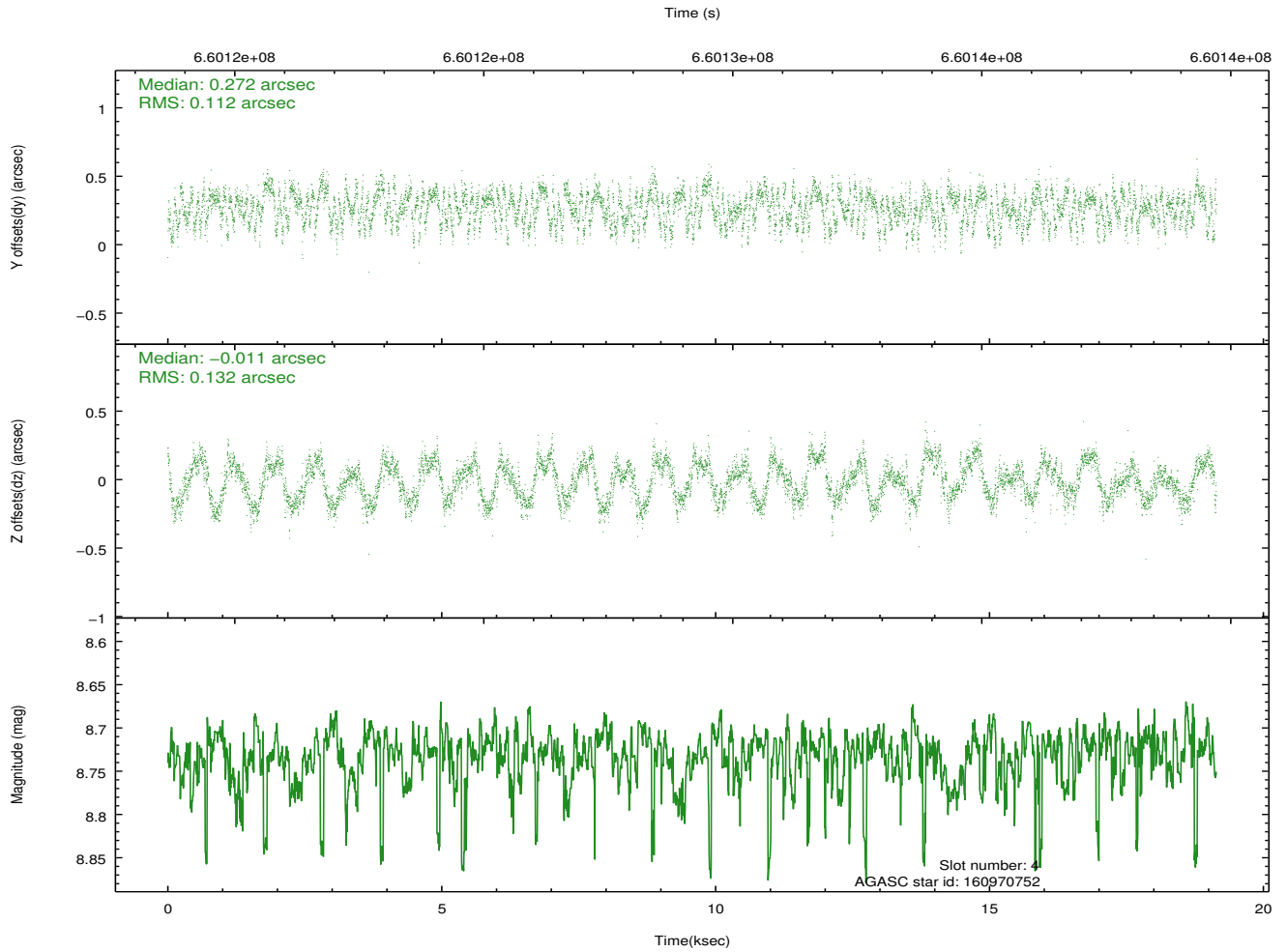
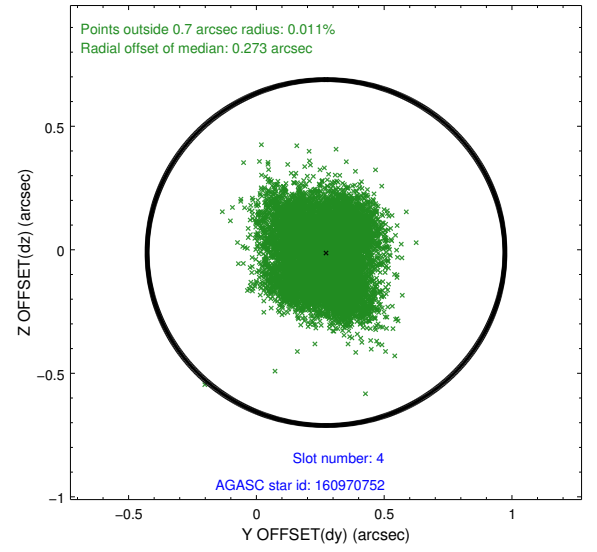
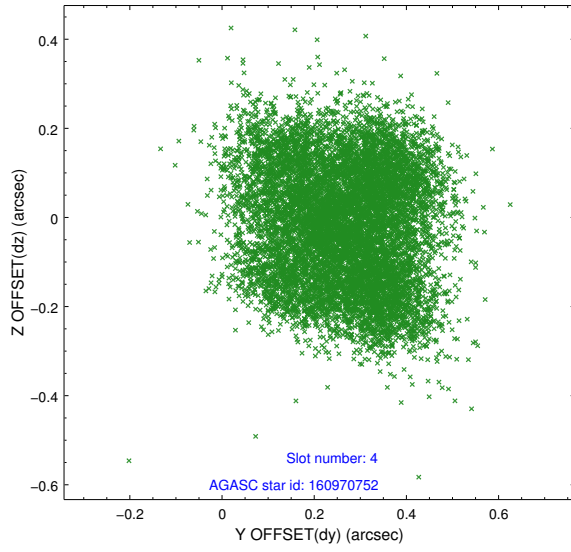
| pt | status  | used | id        | mag  | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec       | mean_y   | mea   |
|----|---------|------|-----------|------|-------|----------|--------|--------|-------|-------|-----------|-----------|----------|-------|
| 0  | FID     |      | ACIS-S-2  | 6.97 | 4670  | 1.000    | -0.310 | -0.195 | 0.041 | 0.057 | 0.000000  | 0.000000  | -767.46  | -1740 |
| 1  | FID     |      | ACIS-S-4  | 7.09 | 4670  | 1.000    | 0.783  | 0.202  | 0.018 | 0.033 | 0.000000  | 0.000000  | 2146.74  | 167   |
| 2  | FID     |      | ACIS-S-5  | 7.06 | 4669  | 1.000    | -0.500 | 0.002  | 0.037 | 0.056 | 0.000000  | 0.000000  | -1820.30 | 161   |
| 3  | GUIDE   | used | 160969600 | 9.47 | 9321  | 1.000    | 0.147  | 0.369  | 0.209 | 0.353 | 46.119625 | 19.240769 | -1812.61 | -1240 |
| 4  | GUIDE   | used | 160970752 | 8.73 | 9329  | 1.000    | 0.272  | -0.011 | 0.192 | 0.278 | 46.447391 | 18.179789 | 2146.58  | -1644 |
| 5  | GUIDE   | used | 160971216 | 9.04 | 9260  | 1.000    | 0.036  | -0.037 | 0.165 | 0.300 | 46.546179 | 18.182525 | 2264.56  | -1327 |
| 6  | OMITTED |      |           | 0.00 | 0     | 0.000    | 0.000  | 0.000  | 0.000 | 0.000 | 0.000000  | 0.000000  | 0.00     | 0     |
| 7  | GUIDE   | used | 160960896 | 9.30 | 9314  | 1.000    | -0.441 | -0.330 | 0.139 | 0.230 | 47.061243 | 18.753698 | 1014.85  | 1072  |

## 2.4 Star Slots

### 2.4.1 Slot 3

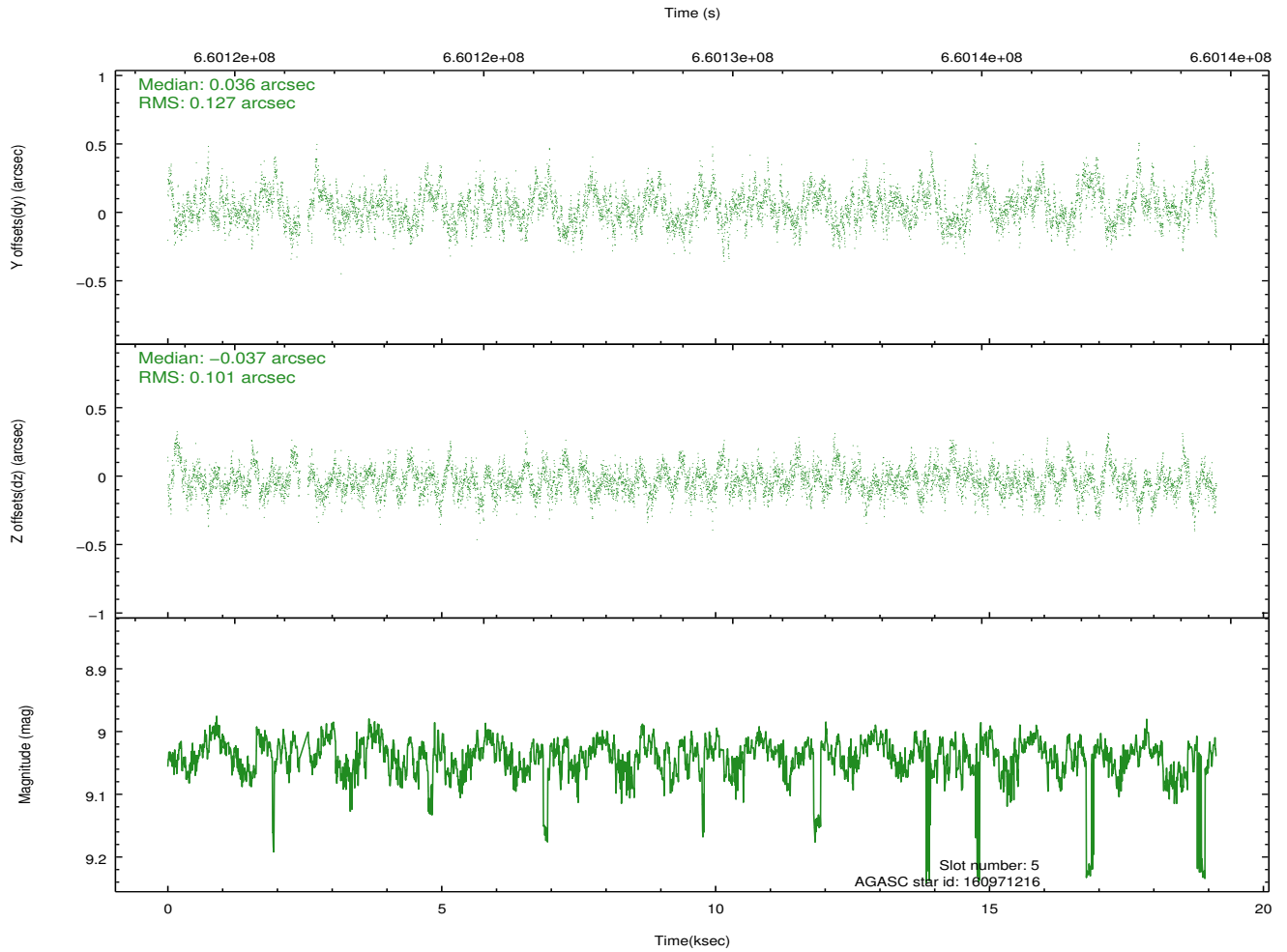
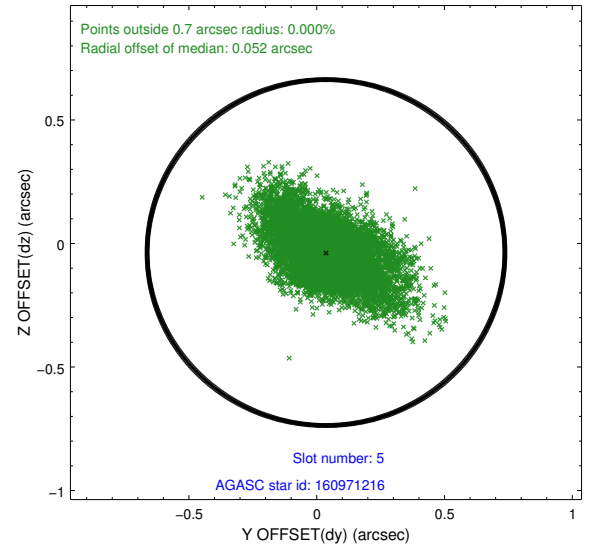
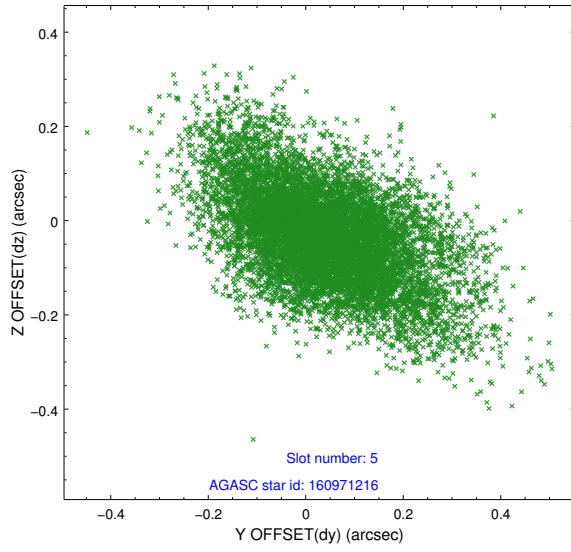


## 2.4.2 Slot 4

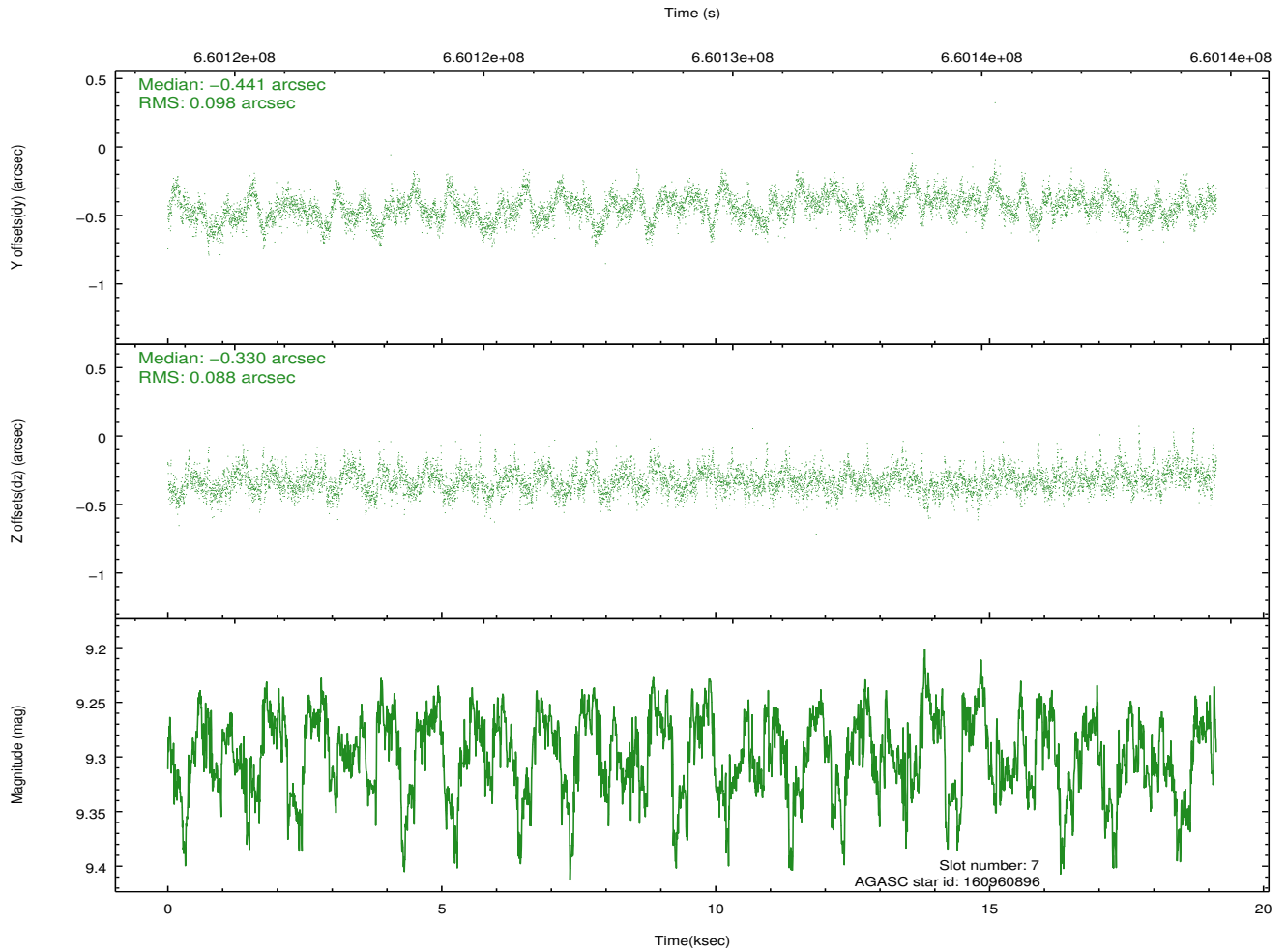
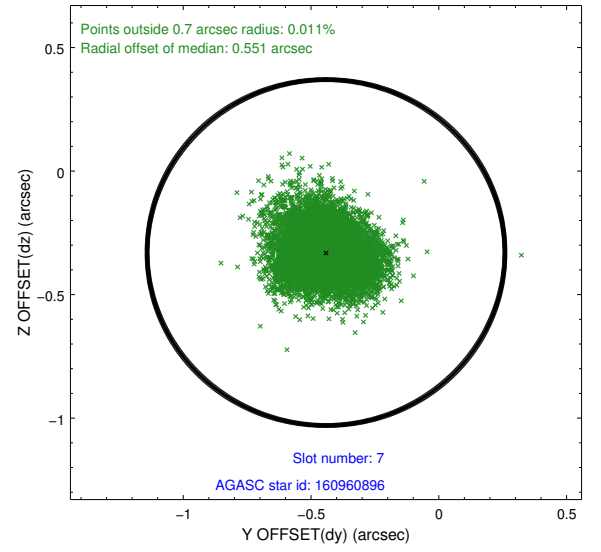
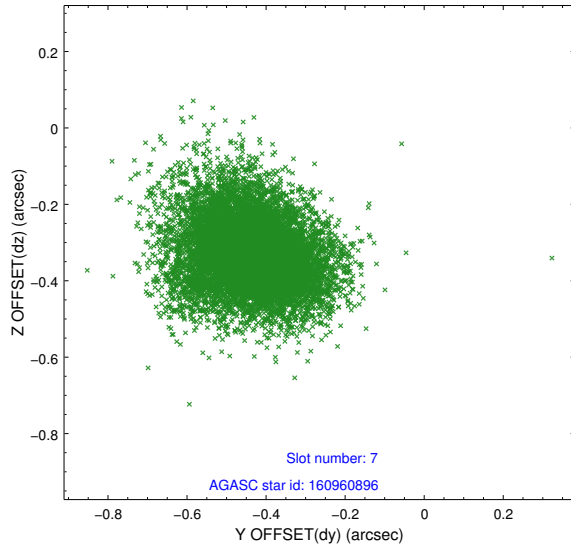




### 2.4.3 Slot 5

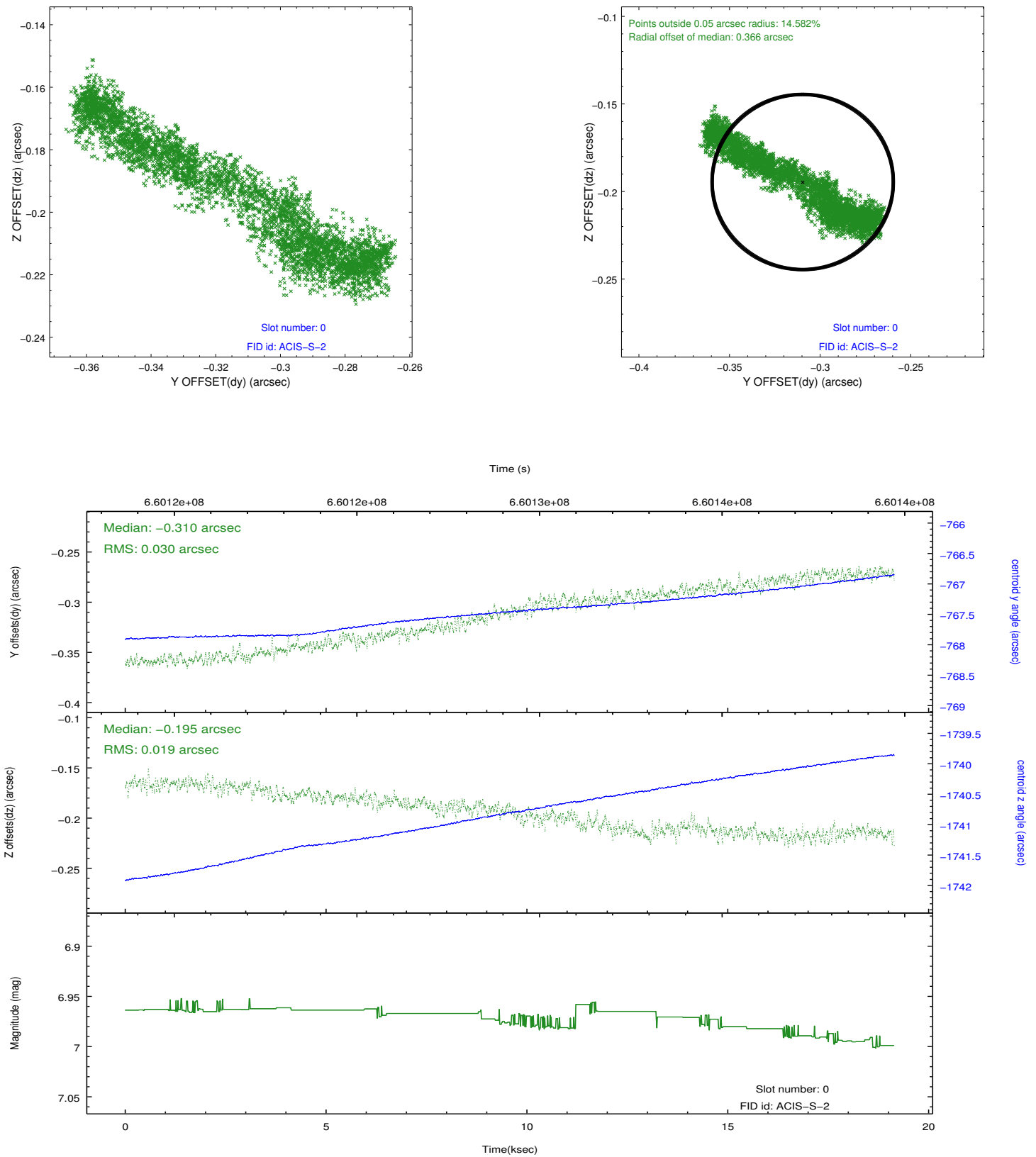


## 2.4.4 Slot 7

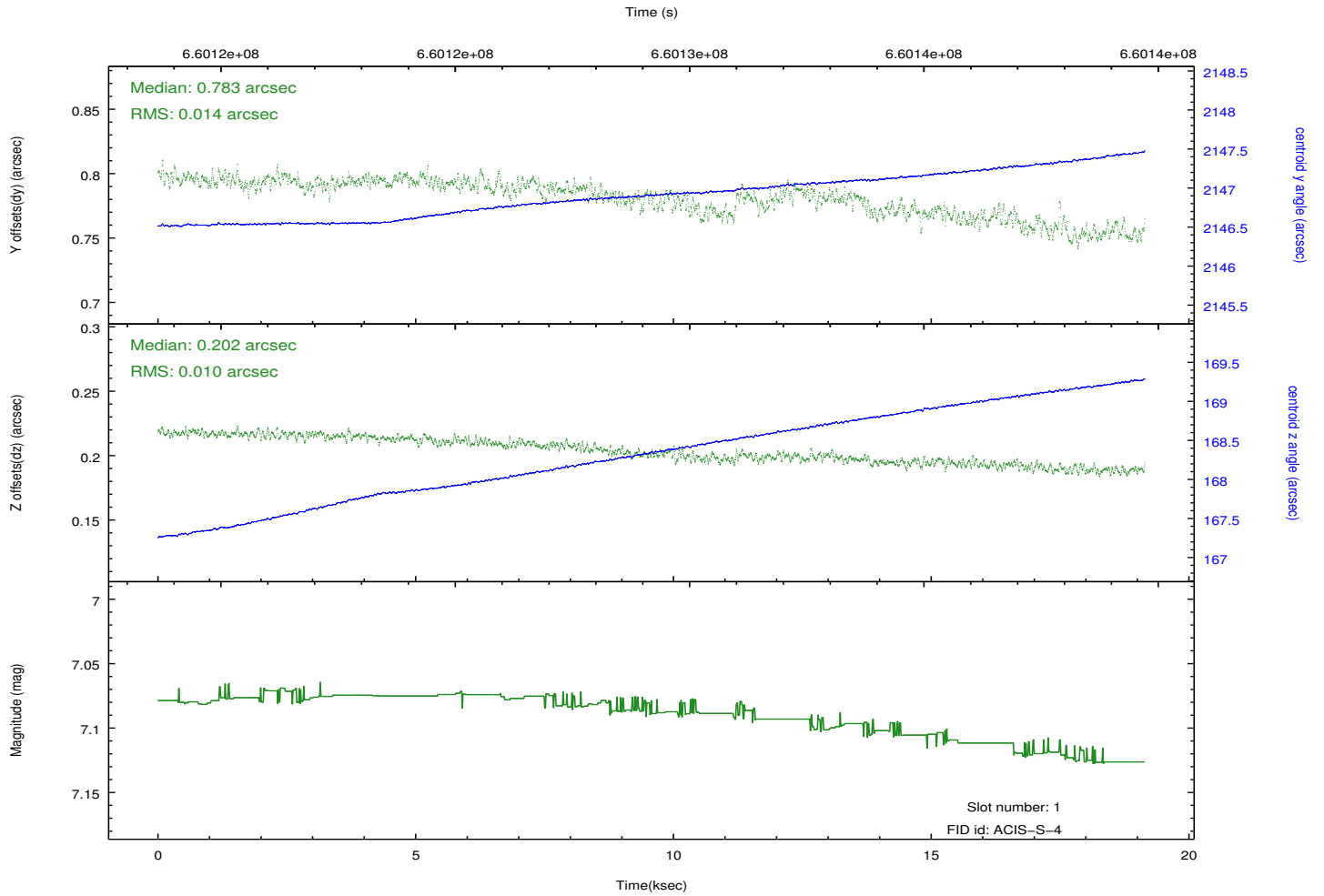
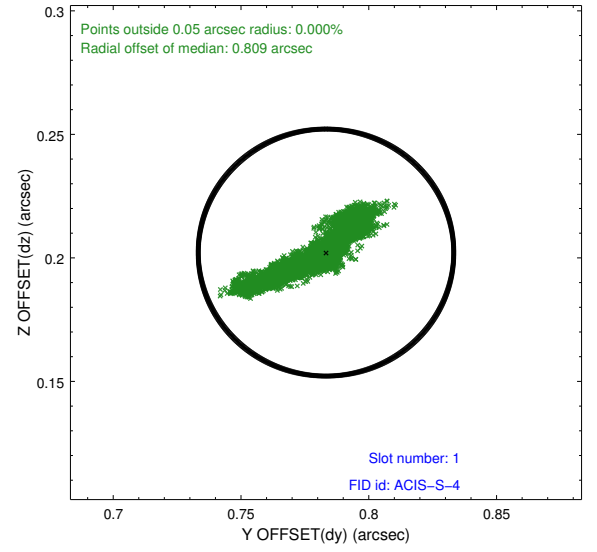
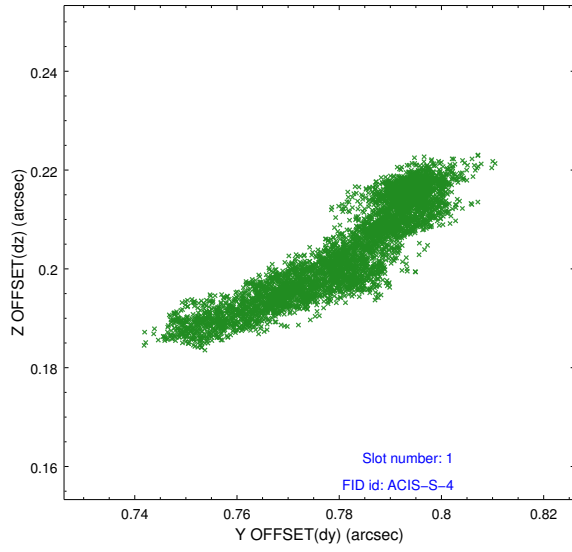


## 2.5 FID Slots

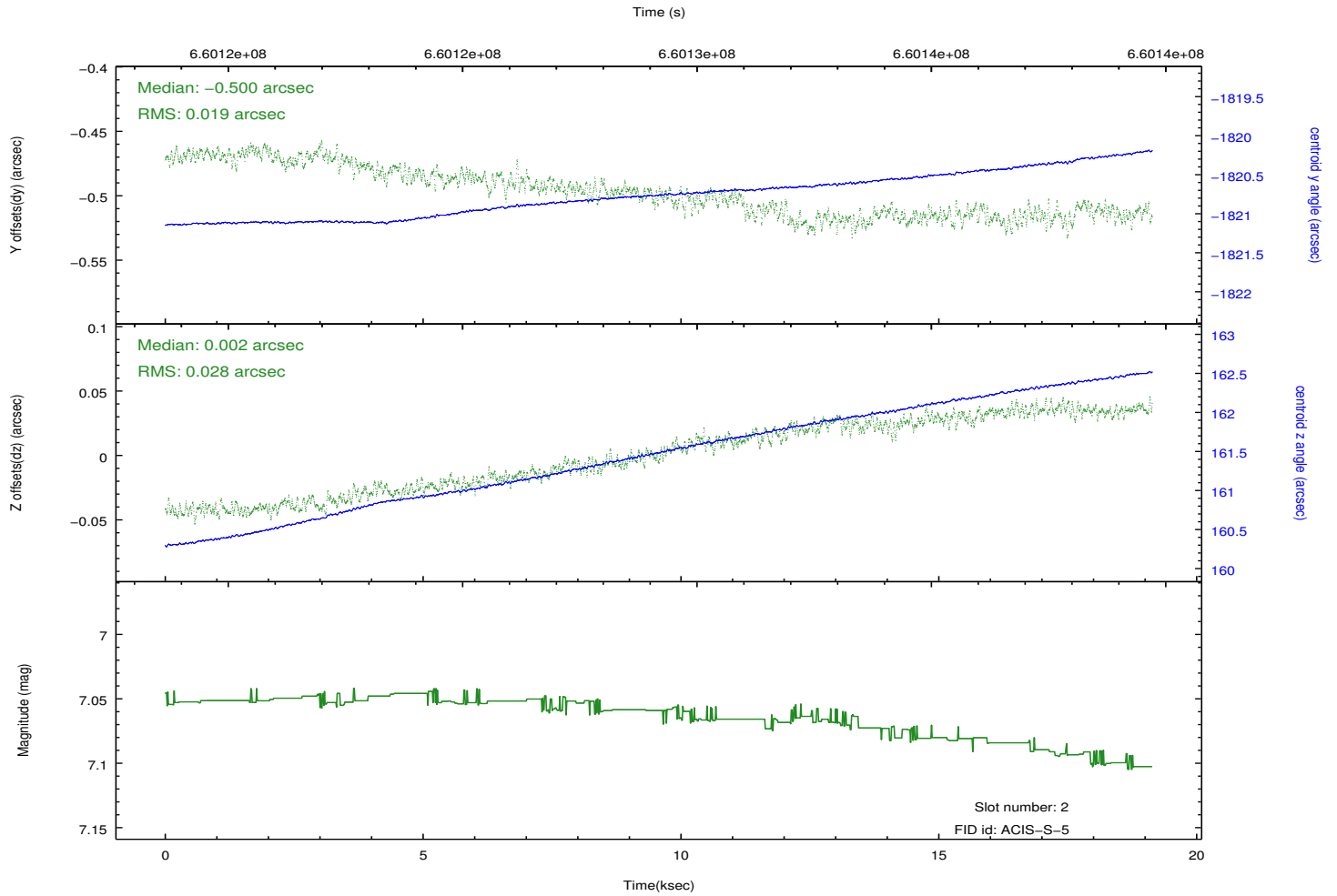
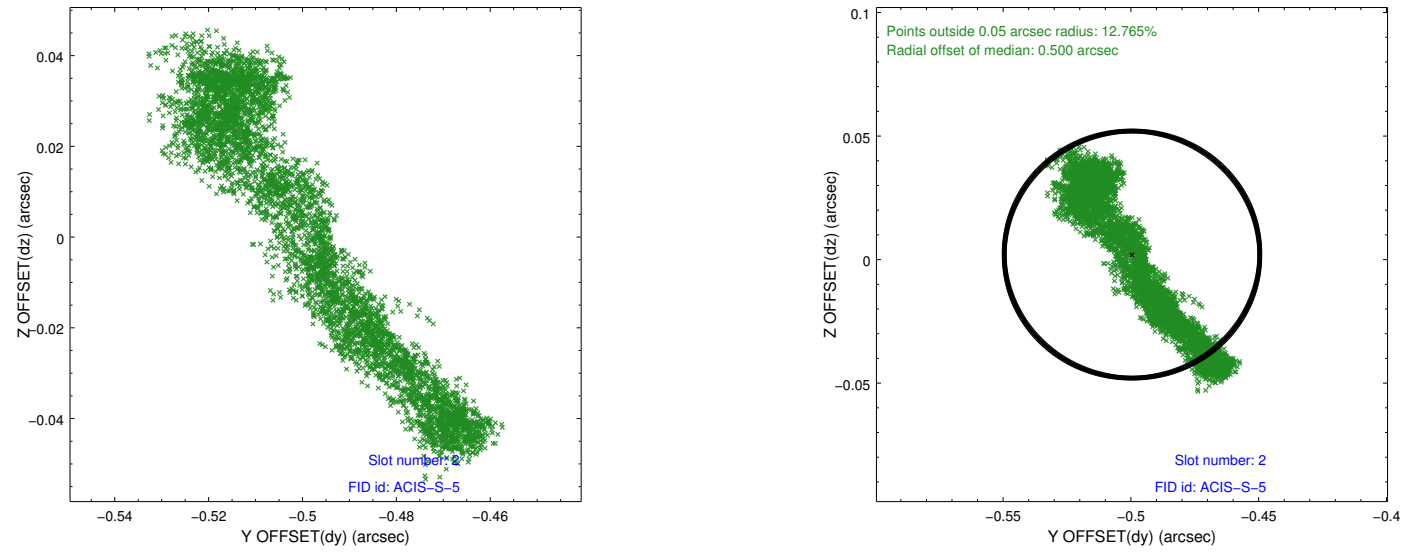
### 2.5.1 Slot 0



## 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)      | 2018.12.07      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 19.067085661173 |

### A.2 Comments

The guide star in slot 6 was removed from the aspect solution due to poor data quality. The aspect solution is improved by the removal of this slot from the solution.