

# V&V Reference Report

## L2 ASCDS Version : 10.9.2

Observation 20413 - L2 Version 2  
Chandra X-Ray Center

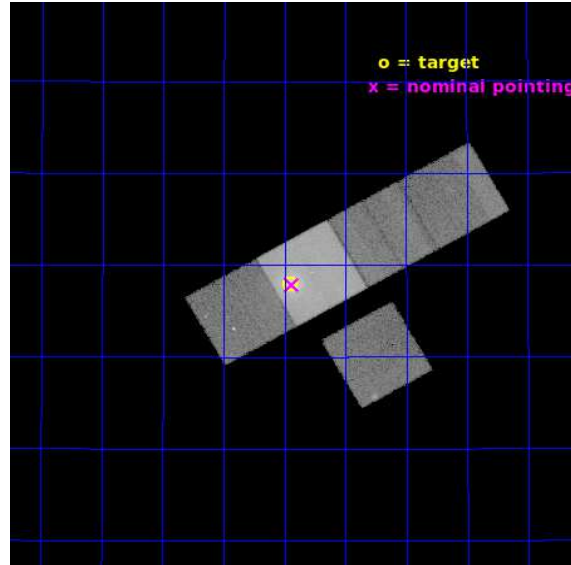
L2 Processing Date : Oct 28 2020

## Contents

|          |                               |           |
|----------|-------------------------------|-----------|
| <b>1</b> | <b>Front</b>                  | <b>2</b>  |
| <b>2</b> | <b>OBI</b>                    | <b>3</b>  |
| 2.1      | OBI . . . . .                 | 3         |
| 2.1.1    | Images . . . . .              | 3         |
| 2.1.2    | Bias . . . . .                | 3         |
| 2.1.3    | Parameters . . . . .          | 4         |
| 2.1.4    | Events . . . . .              | 4         |
| 2.2      | Compared Parameters . . . . . | 5         |
| 2.3      | Aspect . . . . .              | 6         |
| 2.4      | Star Slots . . . . .          | 9         |
| 2.4.1    | Slot 3 . . . . .              | 9         |
| 2.4.2    | Slot 4 . . . . .              | 10        |
| 2.4.3    | Slot 5 . . . . .              | 11        |
| 2.4.4    | Slot 6 . . . . .              | 12        |
| 2.4.5    | Slot 7 . . . . .              | 13        |
| 2.5      | FID Slots . . . . .           | 14        |
| 2.5.1    | Slot 0 . . . . .              | 14        |
| 2.5.2    | Slot 1 . . . . .              | 15        |
| 2.5.3    | Slot 2 . . . . .              | 16        |
| <b>A</b> | <b>Summary</b>                | <b>17</b> |
| A.1      | Status . . . . .              | 17        |
| A.2      | Comments . . . . .            | 17        |

# 1 Front

|          |                                                      |                                             |
|----------|------------------------------------------------------|---------------------------------------------|
| seq_num  | 703518                                               | Sequence number                             |
| obs_id   | 20413                                                | Observation id                              |
| title    | SEARCHING FOR THE RECOILING BLACK HOLE<br>IN BCG2261 | Proposal title                              |
| observer | Kayhan Gultekin                                      | Principal investigator                      |
| object   | SDSS J172227.18+320757.2                             | Source name                                 |
| dtcycle  | 0                                                    | &#160                                       |
| cycle    | P                                                    | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 260.613333                                           | Observer's specified target RA [deg]        |
| dec_targ | 32.132583                                            | Observer's specified target Dec [deg]       |
| ra_nom   | 260.60986807552                                      | Nominal RA [deg]                            |
| dec_nom  | 32.131248014223                                      | Nominal Dec [deg]                           |
| roll_nom | 330.34188087484                                      | Nominal Roll [deg]                          |
| revision | 2                                                    | Processing version of data                  |
| ontime   | 46096.146577716                                      | Sum of GTIs [s]                             |
| livetime | 45493.866487189                                      | Livetime [s]                                |
| ontime3  | 46096.064497709                                      | Sum of GTIs [s]                             |
| ontime6  | 46089.823557496                                      | Sum of GTIs [s]                             |
| ontime7  | 46096.146577716                                      | Sum of GTIs [s]                             |
| ontime8  | 46096.023457766                                      | Sum of GTIs [s]                             |
| ontime9  | 46092.841527224                                      | Sum of GTIs [s]                             |
| l2events | 386759                                               | Number of level 2 events                    |

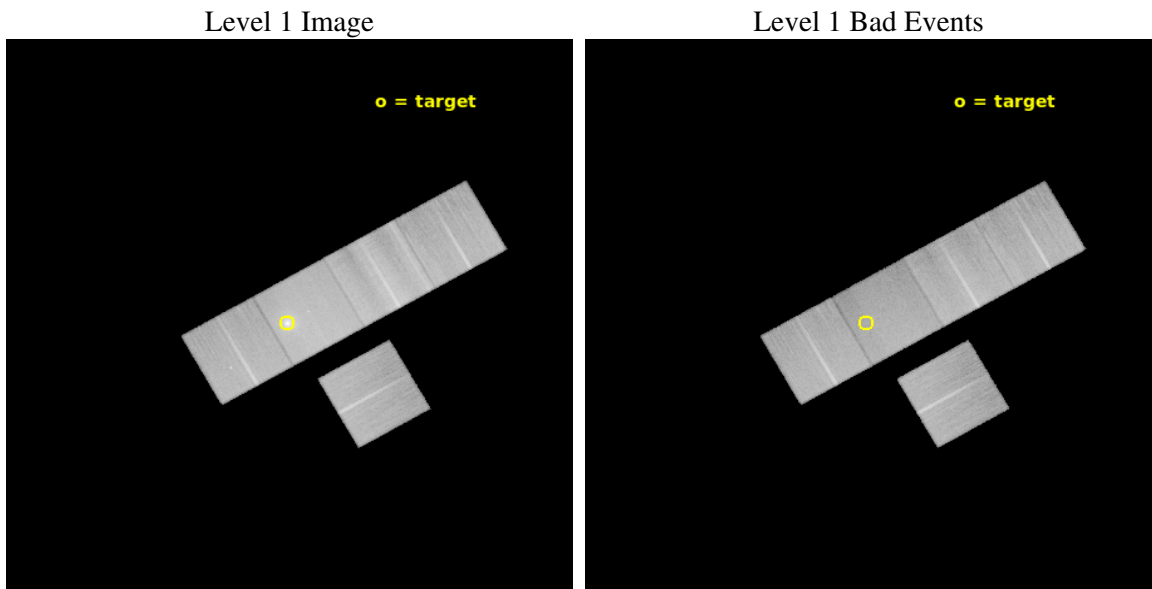




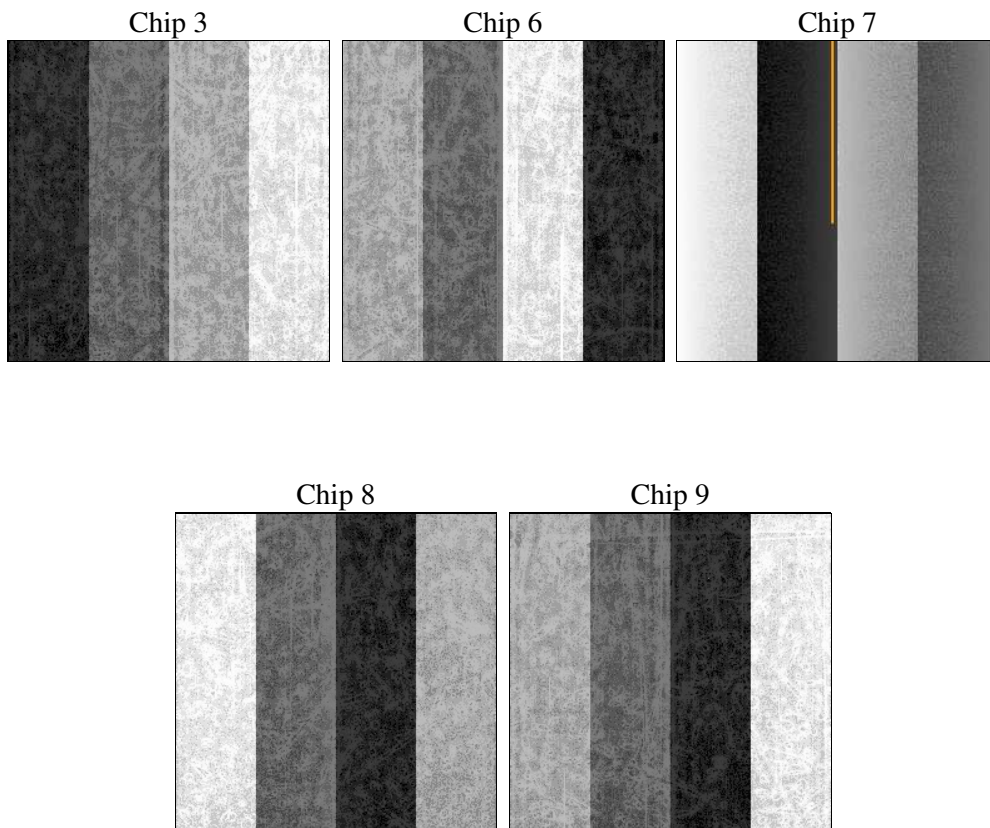
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 46000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.9.2              | Processing system revision     | ontime         | 46096.146577716 | Sum of GTIs [s]                         |
| caldsver | 4.9.3               | &#160                          | ontime3        | 46096.064497709 | Sum of GTIs [s]                         |
| date     | 2020-10-28T06:15:06 | Date and time of file creation | ontime6        | 46089.823557496 | Sum of GTIs [s]                         |
| revision | 2                   | Processing version of data     | ontime7        | 46096.146577716 | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 46096.023457766 | Sum of GTIs [s]                         |
|          |                     |                                | ontime9        | 46092.841527224 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 1989806         | Number of level 1 events                |

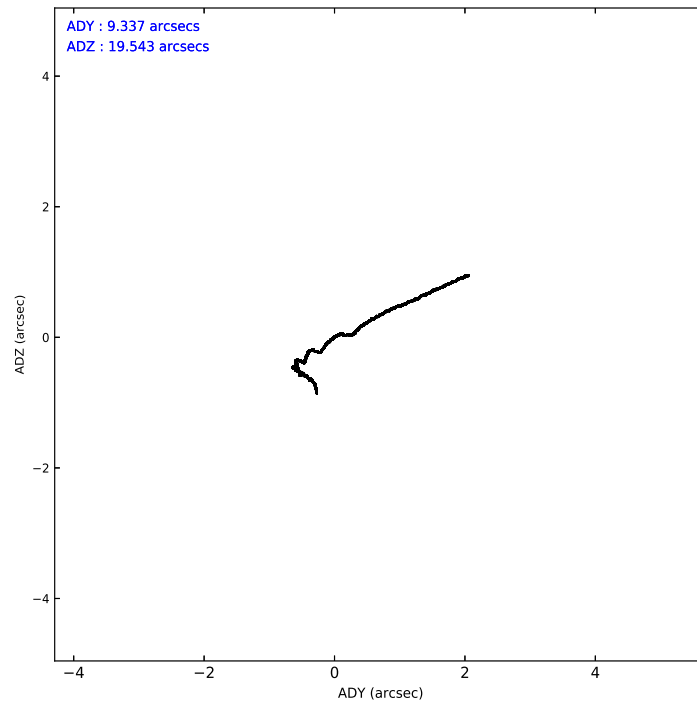
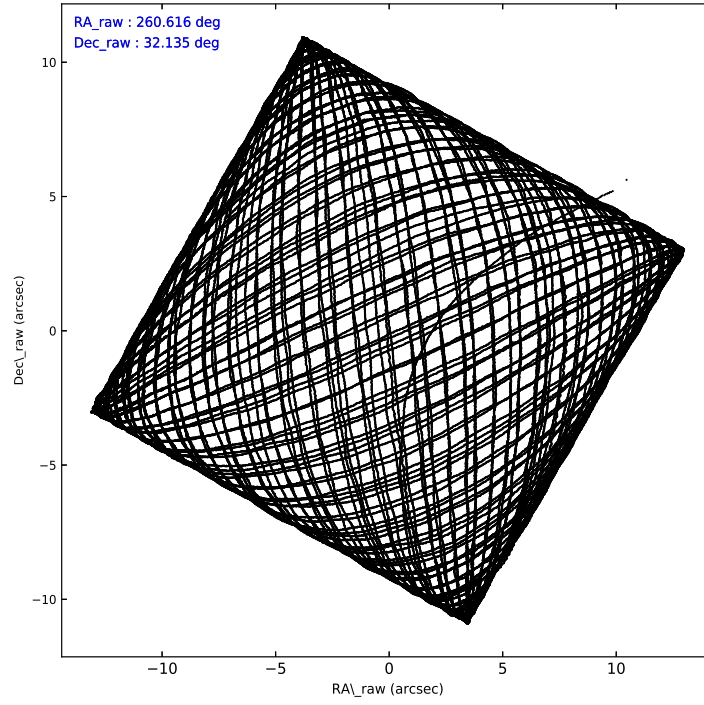
### 2.1.4 Events

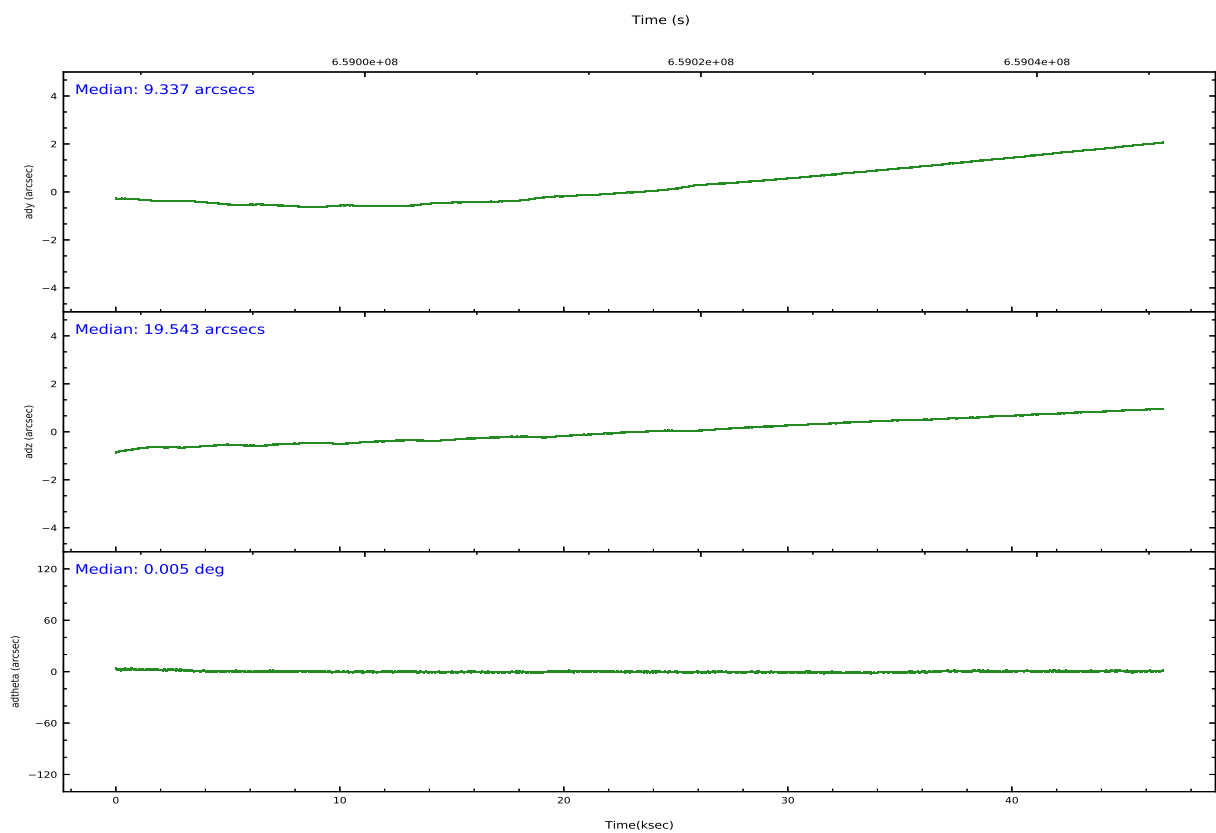
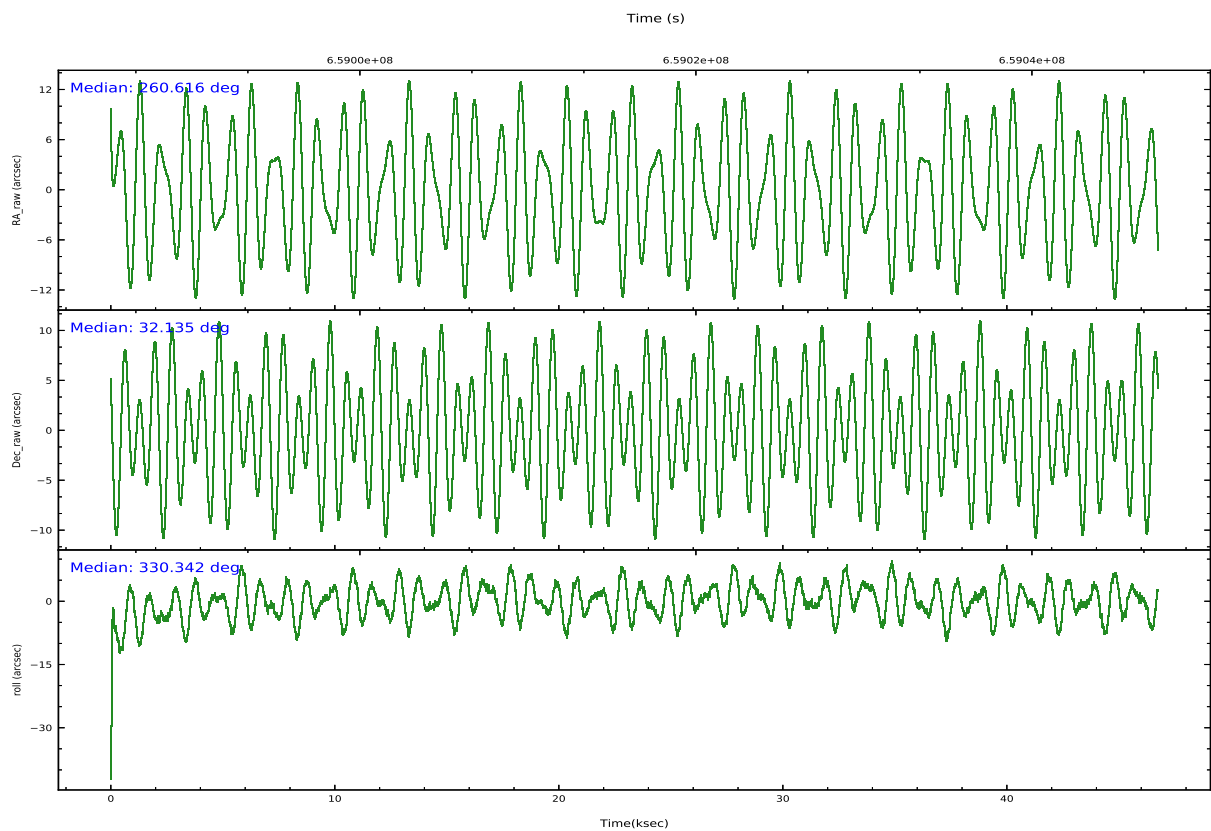
|                 | ccd 3  | ccd 6  | ccd 7  | ccd 8  | ccd 9  |                | ccd 3  | ccd 6  | ccd 7  | ccd 8  | ccd 9  |
|-----------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|
| level 1 events  | 326475 | 356484 | 491022 | 467531 | 348294 | grade 0 events | 14249  | 15745  | 27654  | 38456  | 15105  |
| rejected events | 289194 | 313574 | 250331 | 334959 | 305769 |                | 4%     | 4%     | 5%     | 8%     | 4%     |
| rejected %      | 88%    | 87%    | 50%    | 71%    | 87%    | grade 1 events | 201    | 178    | 726    | 341    | 221    |
|                 |        |        |        |        |        |                | 0%     | 0%     | 0%     | 0%     | 0%     |
|                 |        |        |        |        |        | grade 2 events | 7900   | 9779   | 54296  | 31864  | 9821   |
|                 |        |        |        |        |        |                | 2%     | 2%     | 11%    | 6%     | 2%     |
|                 |        |        |        |        |        | grade 3 events | 3737   | 4049   | 20836  | 13833  | 4277   |
|                 |        |        |        |        |        |                | 1%     | 1%     | 4%     | 2%     | 1%     |
|                 |        |        |        |        |        | grade 4 events | 3809   | 3885   | 20278  | 13229  | 4066   |
|                 |        |        |        |        |        |                | 1%     | 1%     | 4%     | 2%     | 1%     |
|                 |        |        |        |        |        | grade 5 events | 16156  | 16557  | 44366  | 25100  | 18244  |
|                 |        |        |        |        |        |                | 4%     | 4%     | 9%     | 5%     | 5%     |
|                 |        |        |        |        |        | grade 6 events | 7589   | 9457   | 117640 | 35194  | 9262   |
|                 |        |        |        |        |        |                | 2%     | 2%     | 23%    | 7%     | 2%     |
|                 |        |        |        |        |        | grade 7 events | 272834 | 296834 | 205226 | 309514 | 287298 |
|                 |        |        |        |        |        |                | 83%    | 83%    | 41%    | 66%    | 82%    |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar version number                 | 8         | 8       |
| Detector                          | ACIS-36789          | ACIS-36789           | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                           | NONE                | NONE                 | Obspar update status                  | NONE      | UPDATED |
| Data mode                         | FAINT               | FAINT                | CCD I0 on                             | N         | N       |
| Observation mode                  | POINTING            | POINTING             | CCD I1 on                             | N         | N       |
| [deg] Pointing RA                 | 260.583644          | 260.60986807552      | CCD I2 on                             | O1        | N       |
| [deg] Pointing Dec                | 32.134218           | 32.131248014223      | CCD I3 on                             | Y         | Y       |
| [deg] Pointing Roll               | 330.212815          | 330.34188087484      | 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                             | O3        | Y       |
| [s] Observation start time (MET)  | 658994634.184000    | 658993239.12941      | CCD S5 on                             | O2        | Y       |
| Observation start date            | 2018-11-19T06:02:45 | 2018-11-19T05:40:39  | Number of optional ACIS chips dropped | 1         | 1       |
| [s] Observation end time (MET)    | 659040634.184000    | 659041646.80729      | On-chip summing requested             | N         | N       |
| Observation end date              | 2018-11-19T18:49:25 | 2018-11-19T19:07:26  | Subarray requested                    | NONE      | NONE    |
| Read mode                         | TIMED               | TIMED                | Alternating exposures requested       | N         | N       |
|                                   |                     |                      | [s] Primary exposure time             | 0.000000  | 3.1     |

## 2.3 Aspect



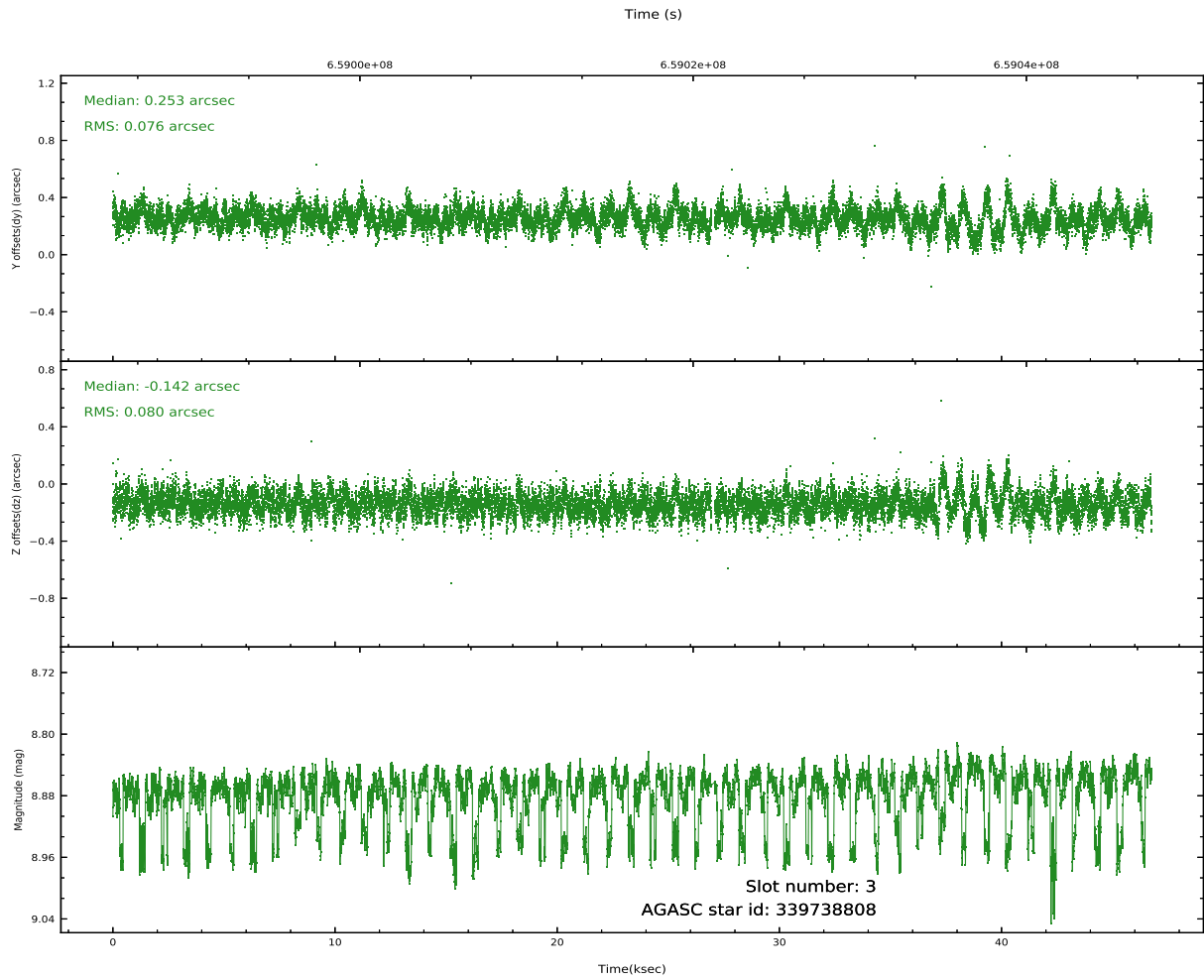
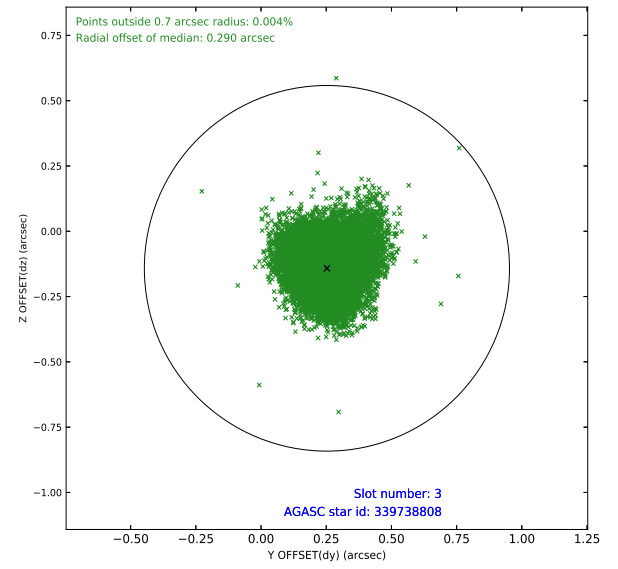
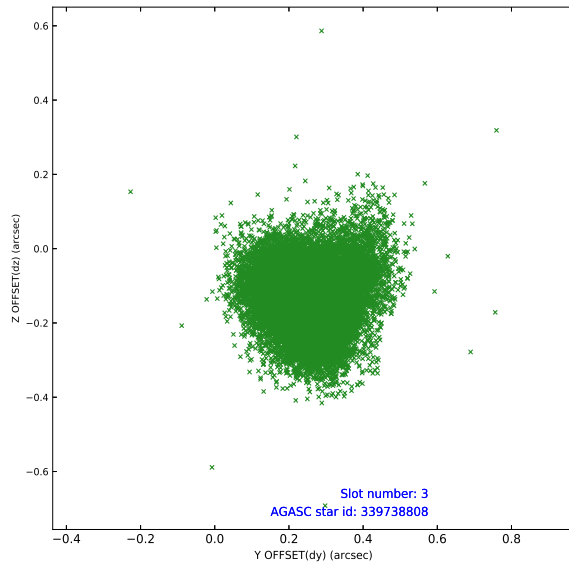


Slot Statistics

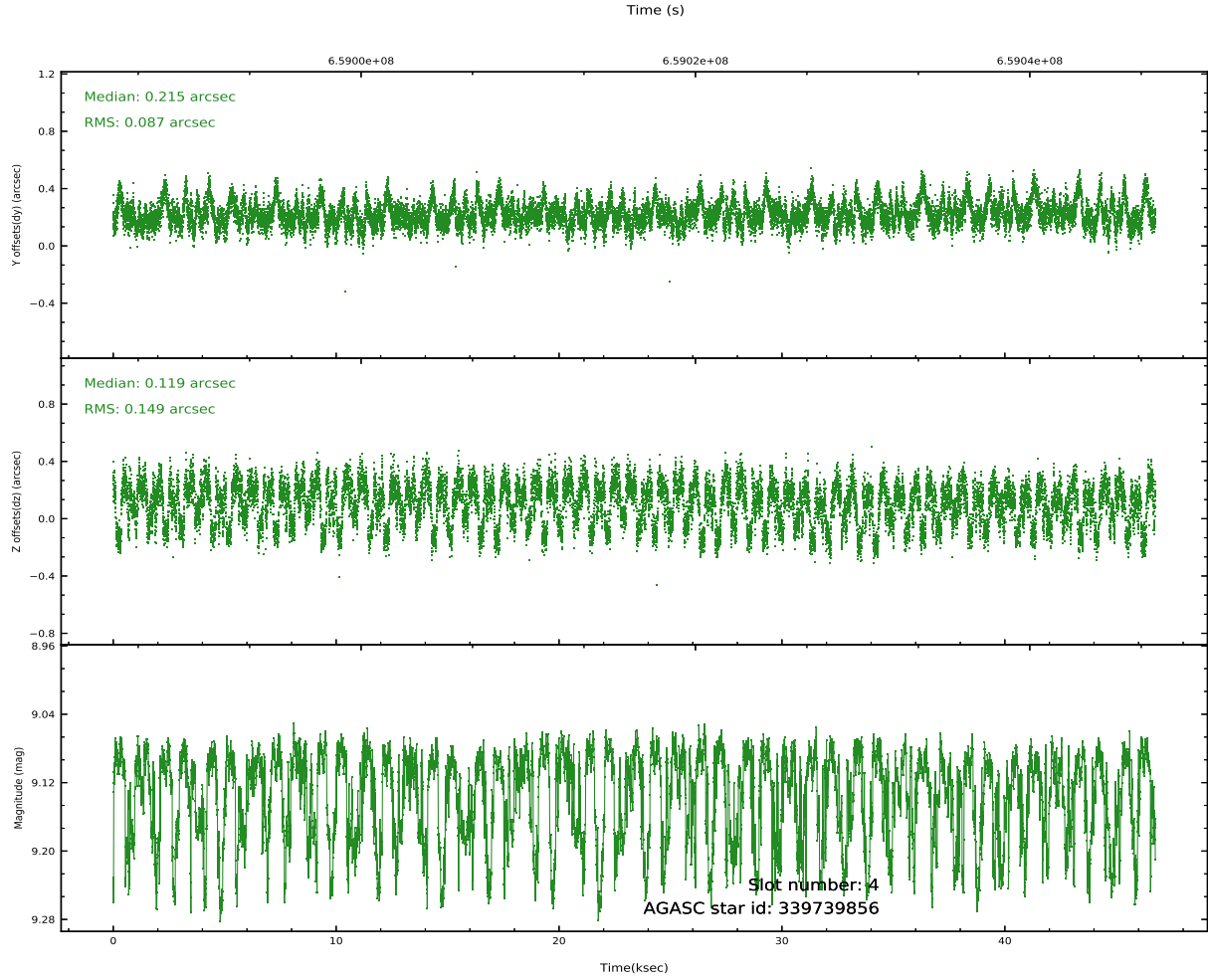
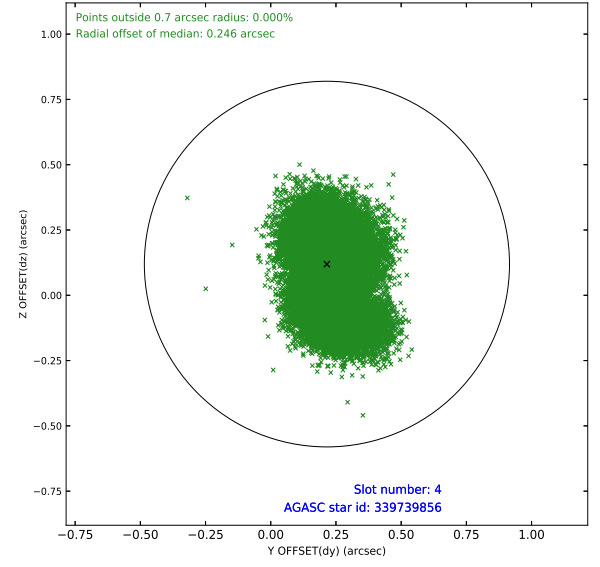
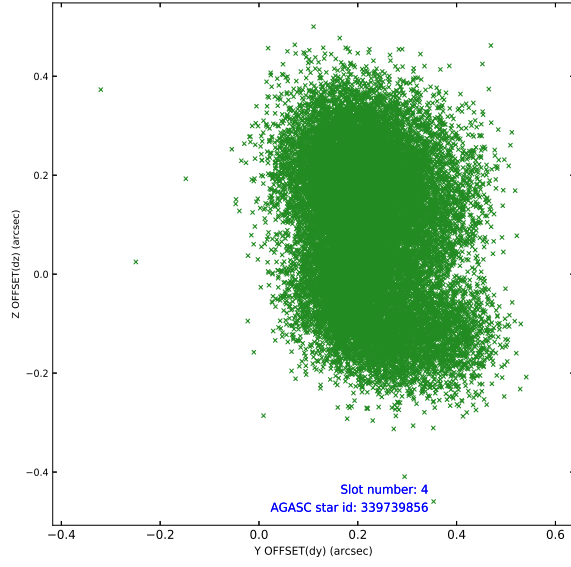
| pt | status | used | id        | mag  | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec       | mean_y   | mea   |
|----|--------|------|-----------|------|-------|----------|--------|--------|-------|-------|------------|-----------|----------|-------|
| 0  | FID    |      | ACIS-S-4  | 7.08 | 11404 | 1.000    | 0.218  | 0.018  | 0.011 | 0.017 | 0.000000   | 0.000000  | 2151.12  | 167   |
| 1  | FID    |      | ACIS-S-5  | 7.08 | 11404 | 1.000    | -0.221 | 0.020  | 0.014 | 0.029 | 0.000000   | 0.000000  | -1815.51 | 161   |
| 2  | FID    |      | ACIS-S-6  | 7.22 | 11404 | 1.000    | -0.025 | -0.023 | 0.016 | 0.036 | 0.000000   | 0.000000  | 399.26   | 804   |
| 3  | GUIDE  | used | 339738808 | 8.87 | 22722 | 1.000    | 0.253  | -0.142 | 0.114 | 0.195 | 260.388344 | 31.860977 | -28.78   | -1150 |
| 4  | GUIDE  | used | 339739856 | 9.12 | 22772 | 1.000    | 0.215  | 0.119  | 0.185 | 0.303 | 260.043055 | 31.783835 | -810.52  | -1912 |
| 5  | GUIDE  | used | 339744832 | 8.70 | 22782 | 1.000    | -0.046 | 0.034  | 0.098 | 0.160 | 260.010938 | 31.654375 | -667.01  | -2366 |
| 6  | GUIDE  | used | 340269152 | 7.46 | 22804 | 1.000    | -0.223 | 0.331  | 0.129 | 0.212 | 260.189436 | 32.674396 | -2004.07 | 1096  |
| 7  | GUIDE  | used | 341973056 | 7.61 | 22794 | 1.000    | -0.202 | -0.318 | 0.098 | 0.142 | 261.162193 | 32.290362 | 1246.13  | 1367  |

## 2.4 Star Slots

### 2.4.1 Slot 3

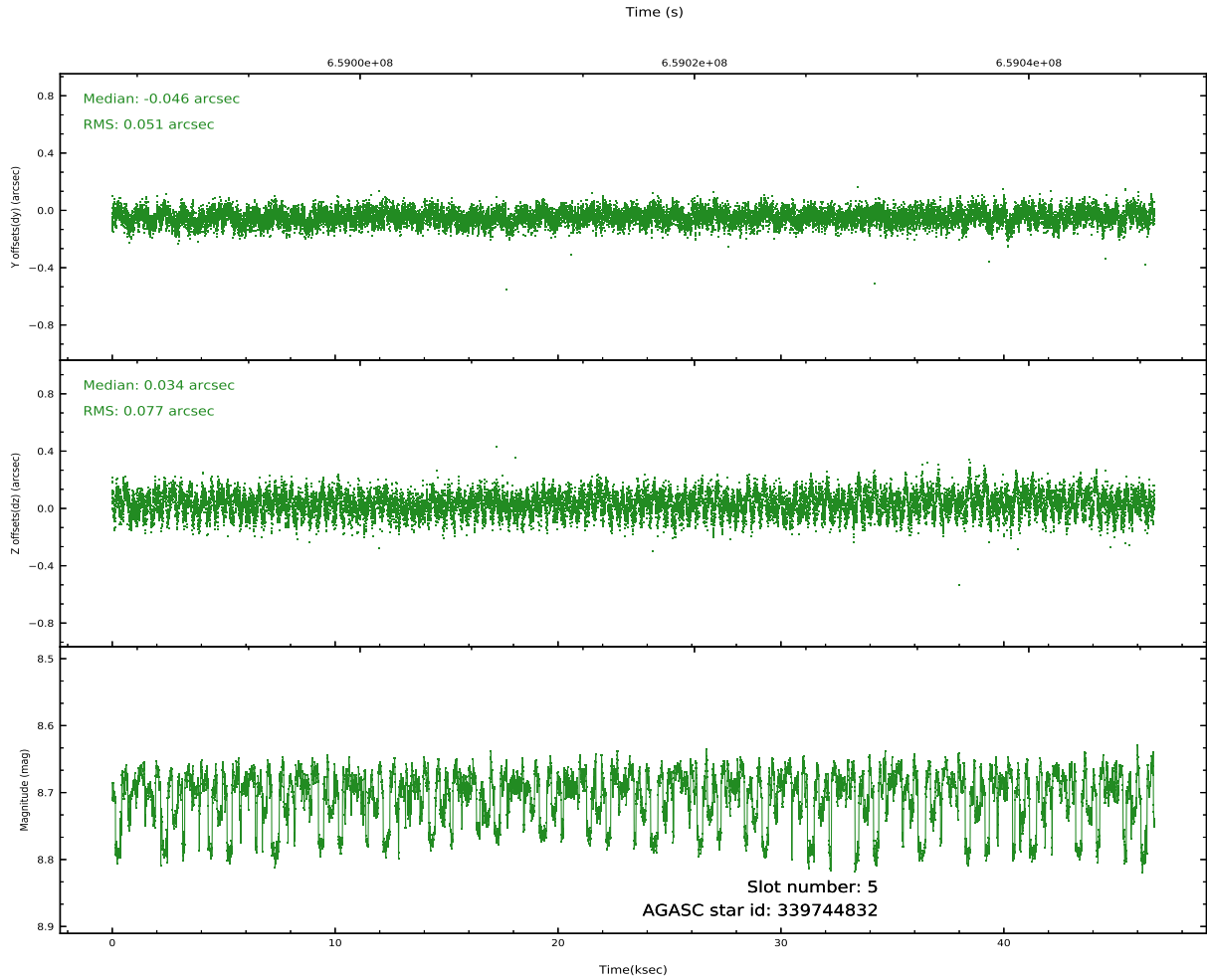
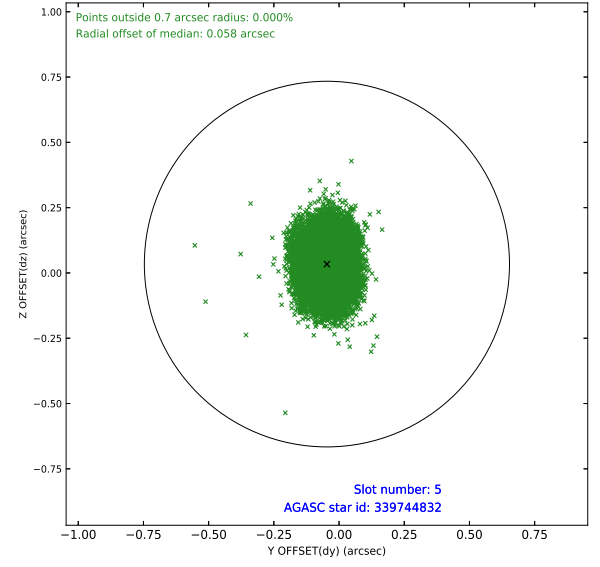
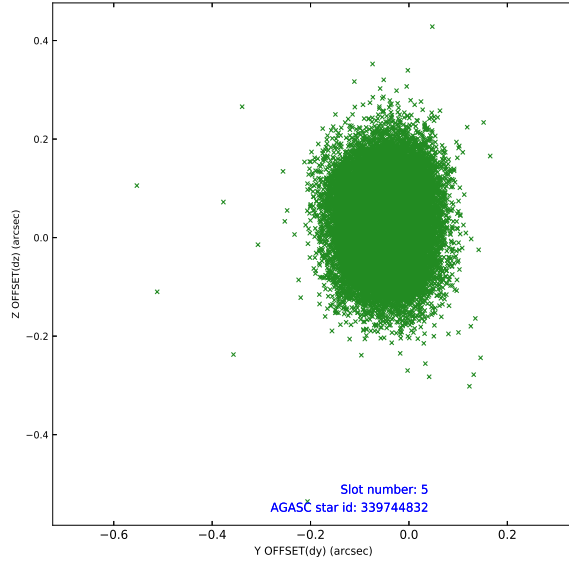


## 2.4.2 Slot 4

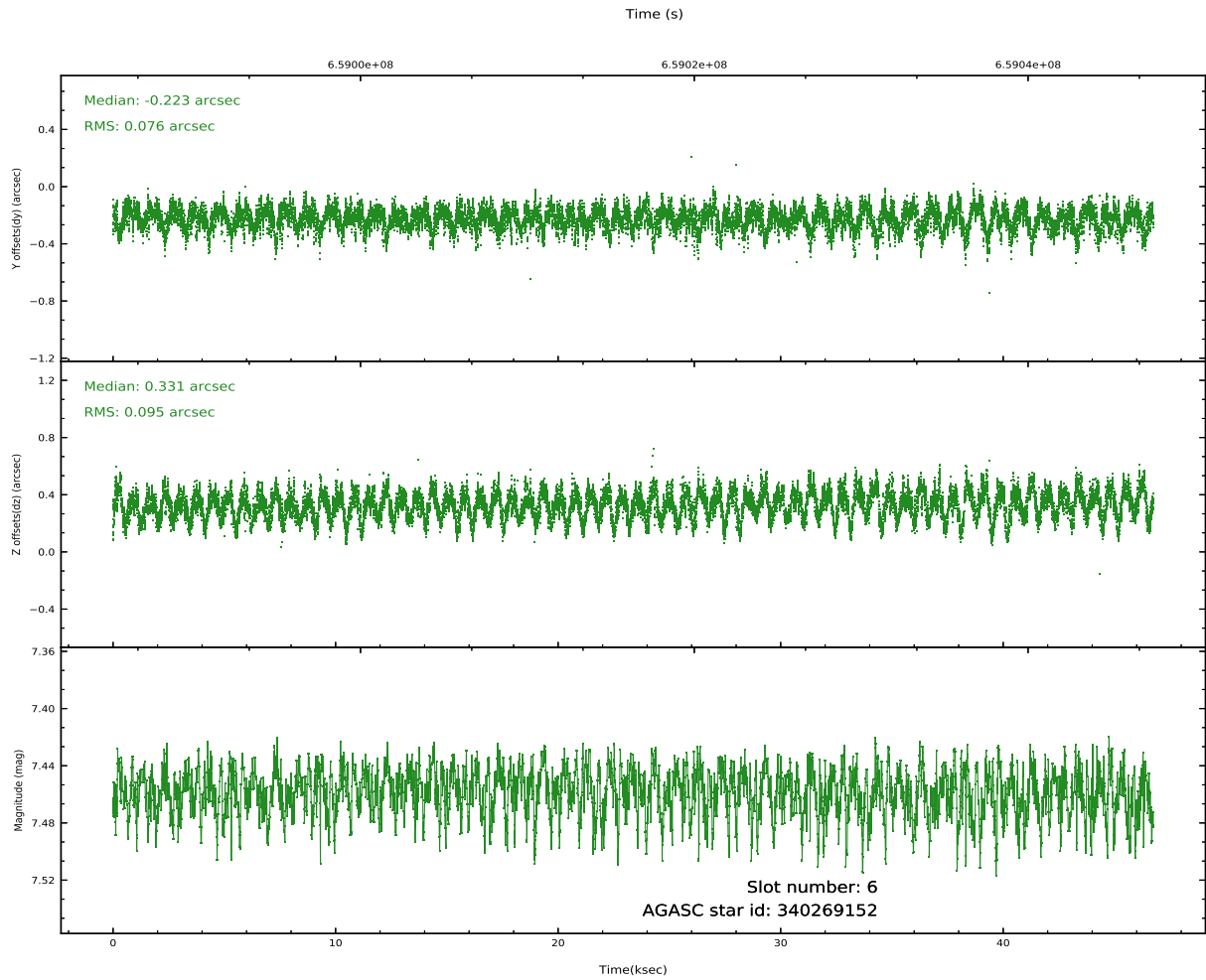
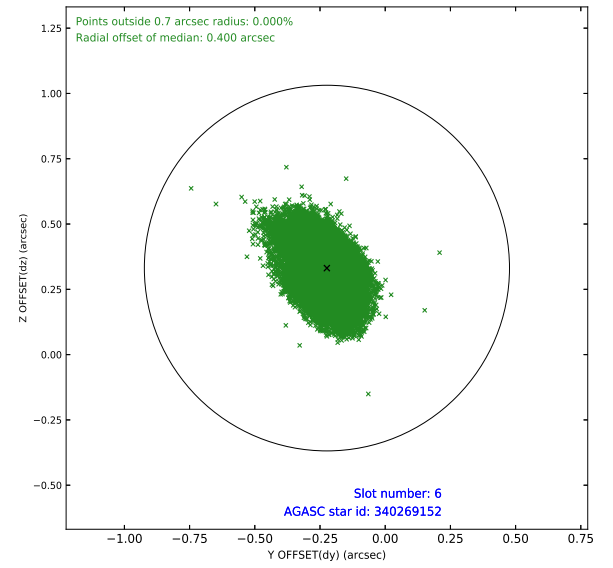
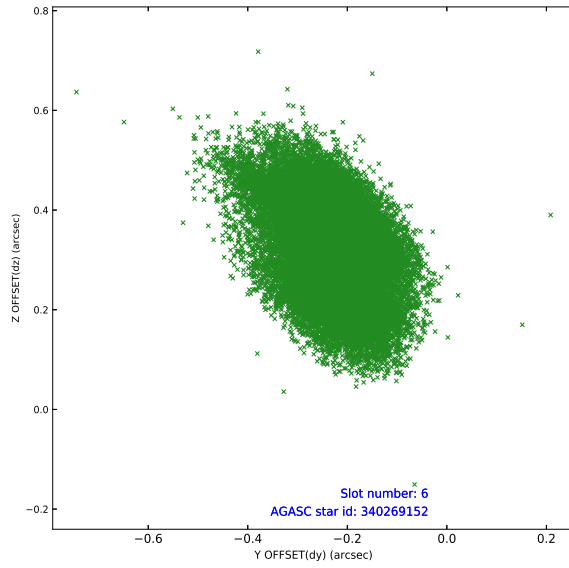




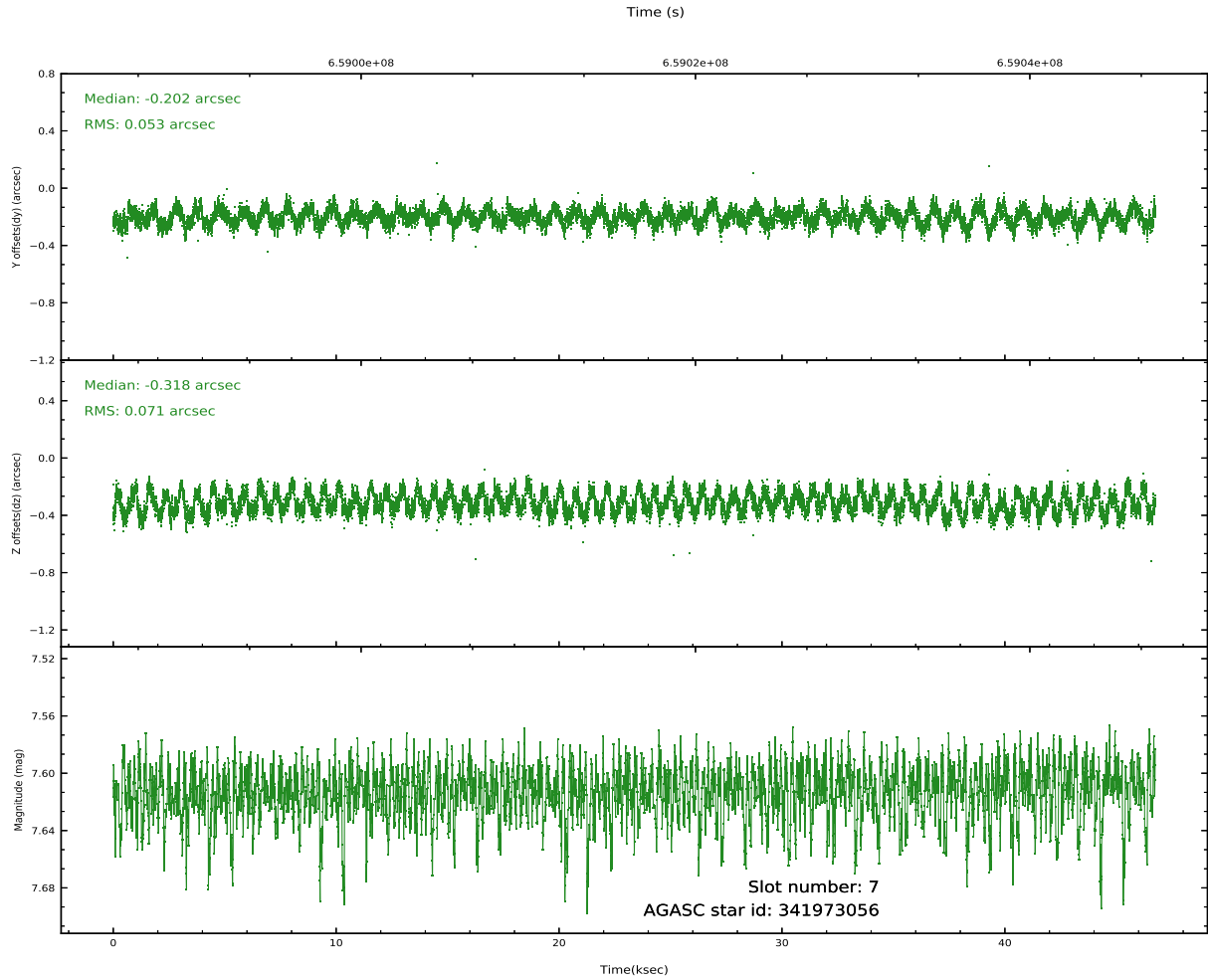
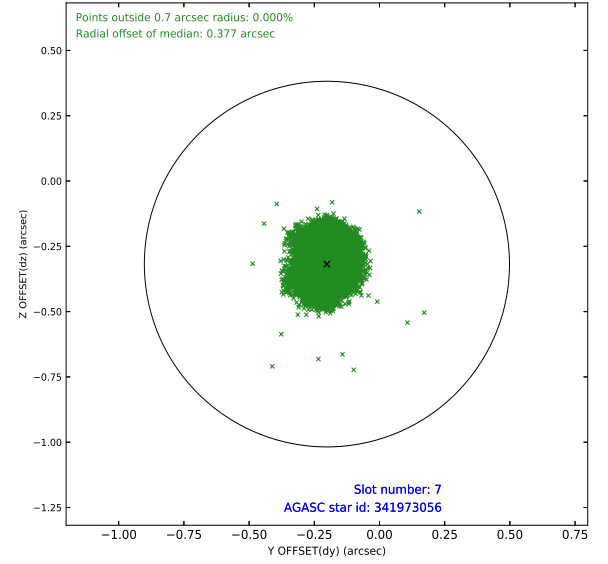
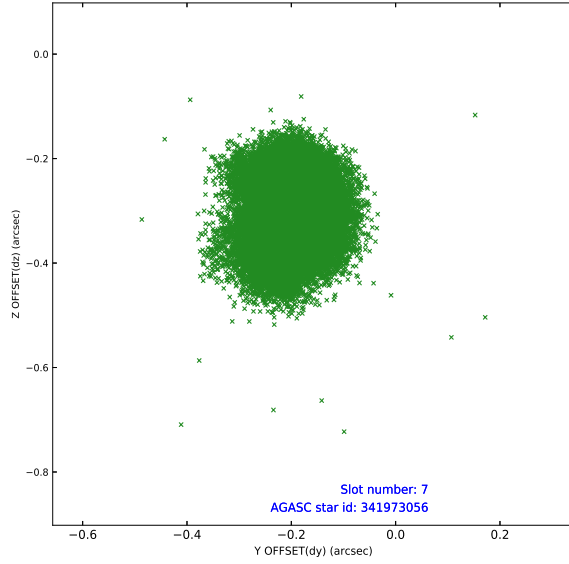
### 2.4.3 Slot 5



## 2.4.4 Slot 6

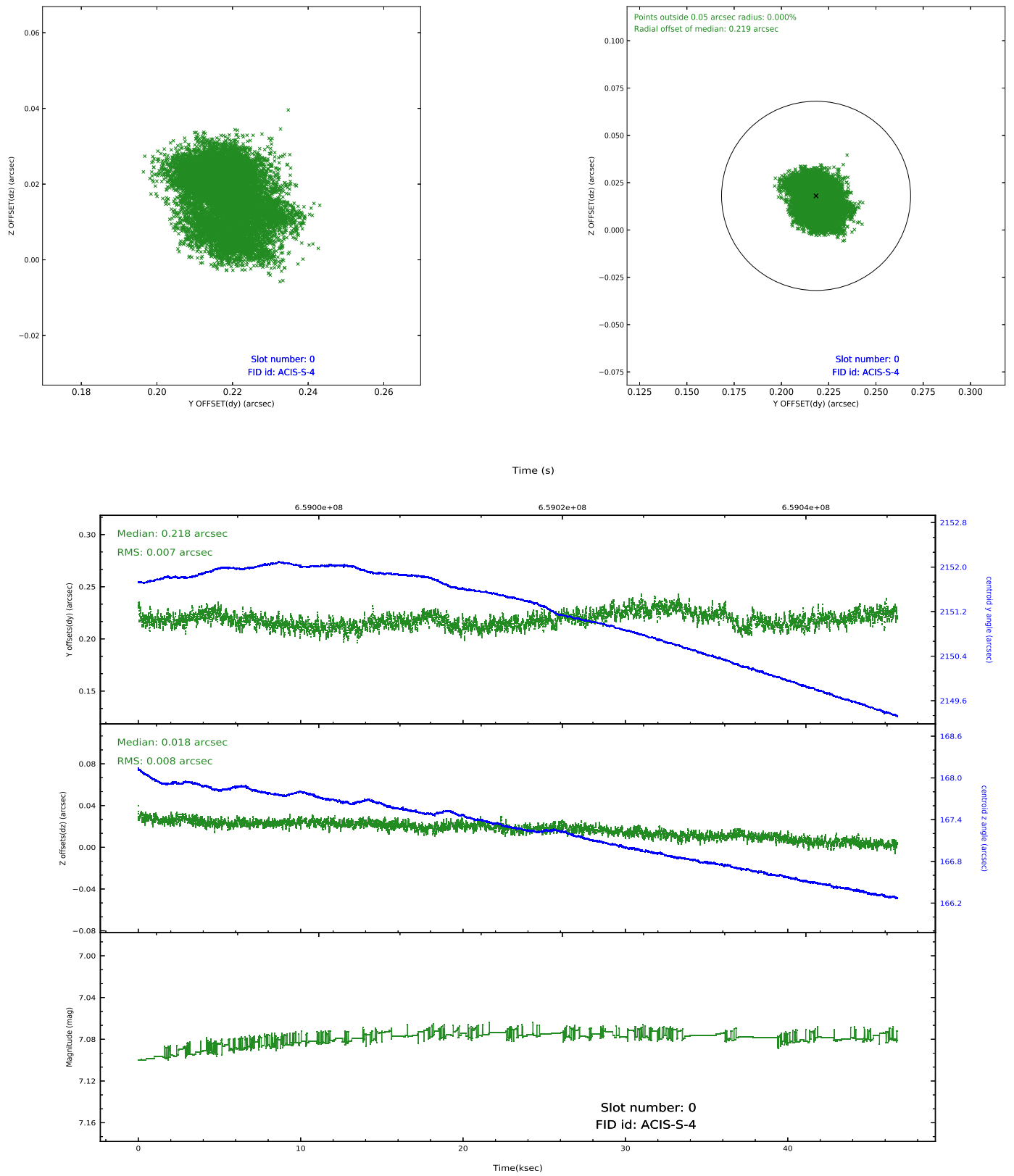


## 2.4.5 Slot 7

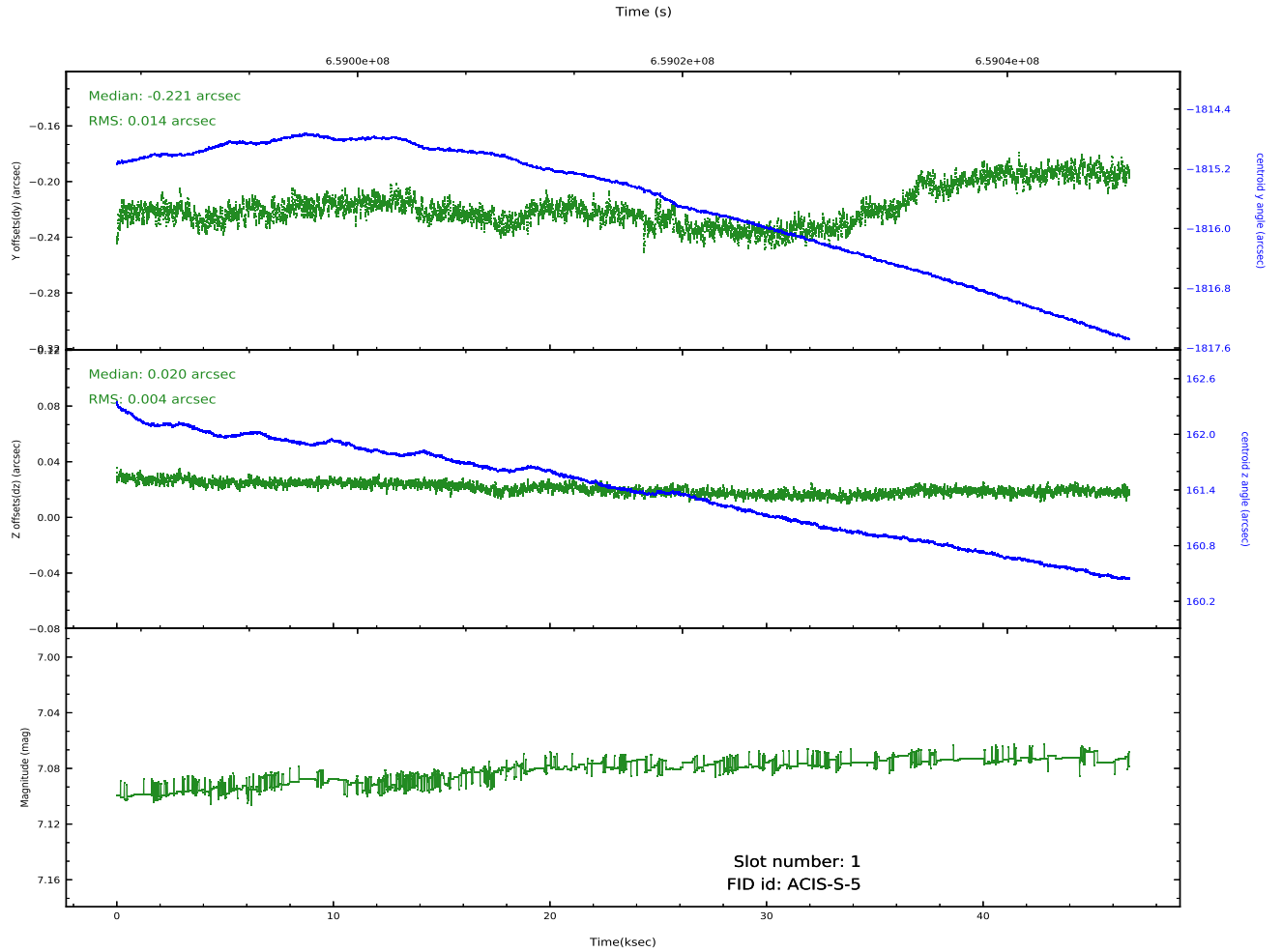
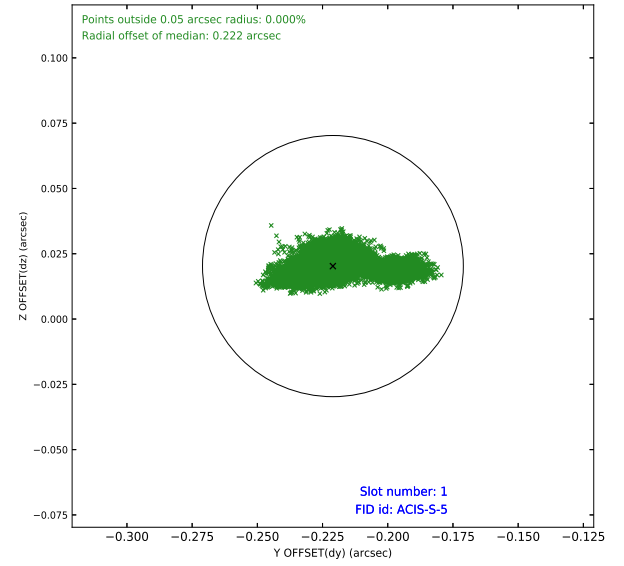
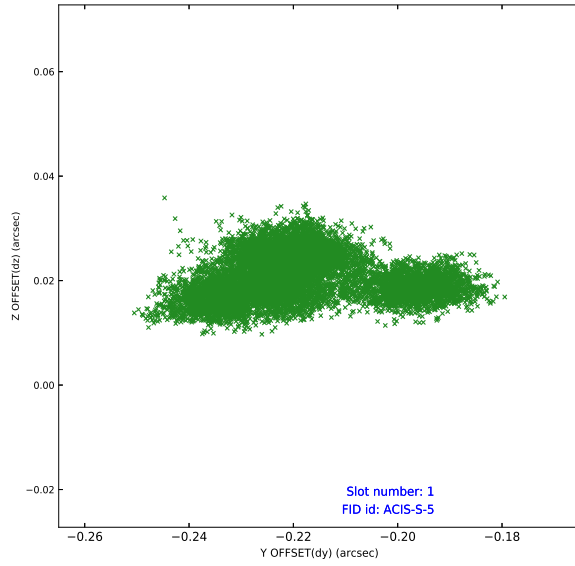


## 2.5 FID Slots

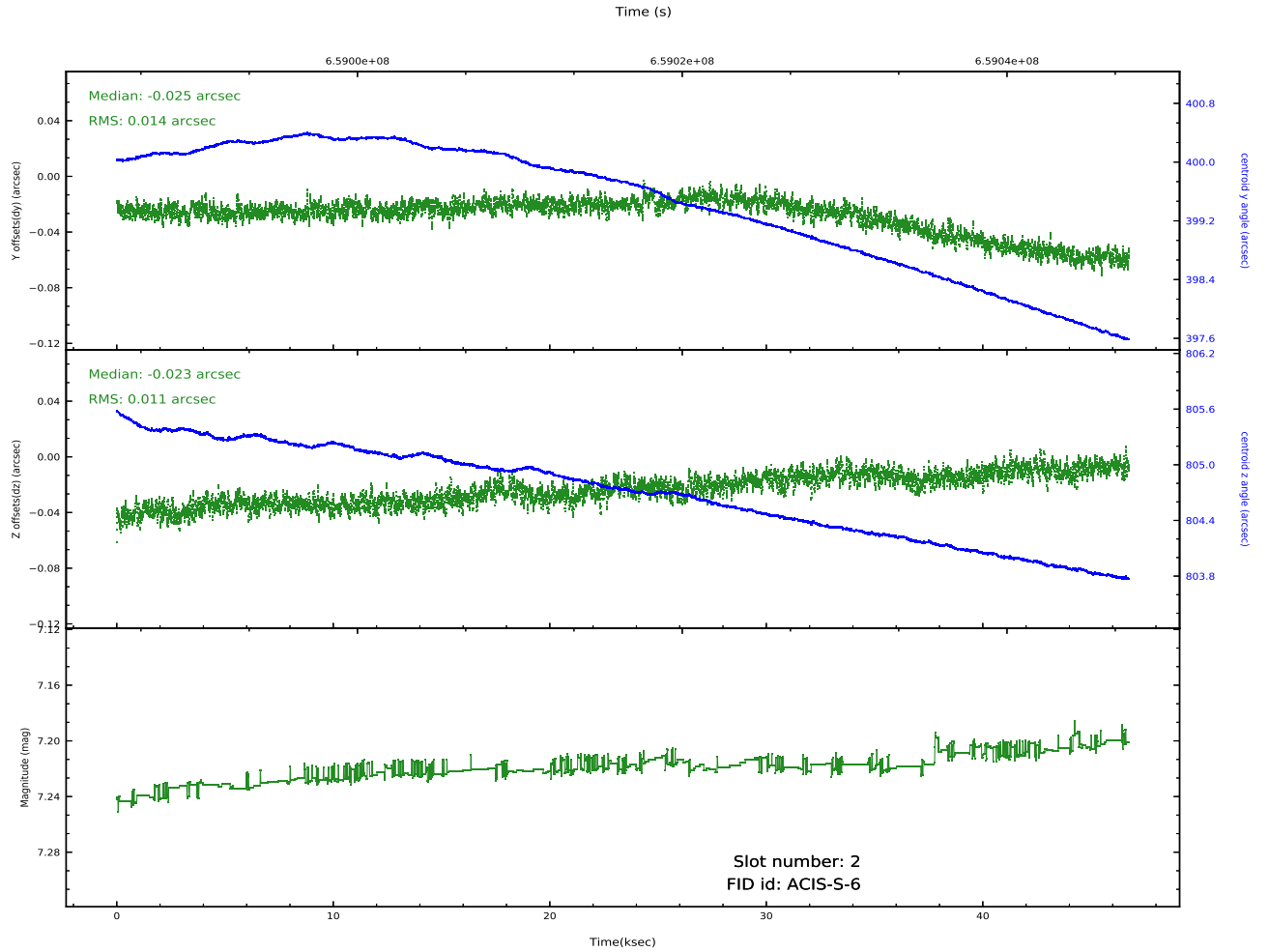
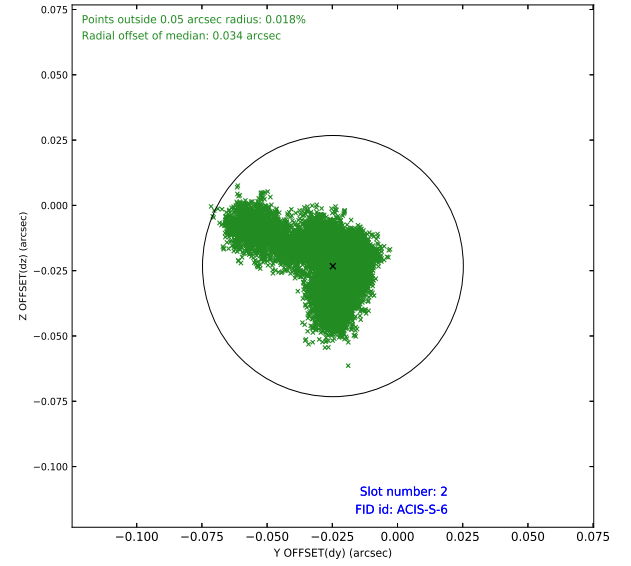
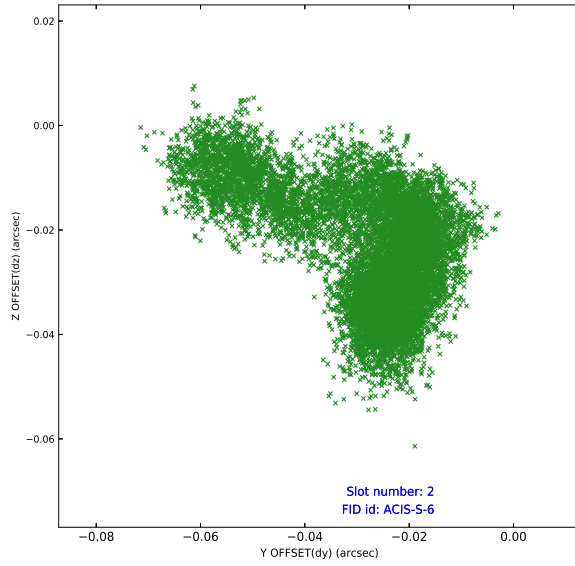
### 2.5.1 Slot 0



## 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)      | 2020.10.29      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 46.096146574497 |

### A.2 Comments

Optional chip I2 not included.