

# V&V Reference Report

## L2 ASCDS Version : 10.9.1

Observation 4959 - L2 Version 4  
Chandra X-Ray Center

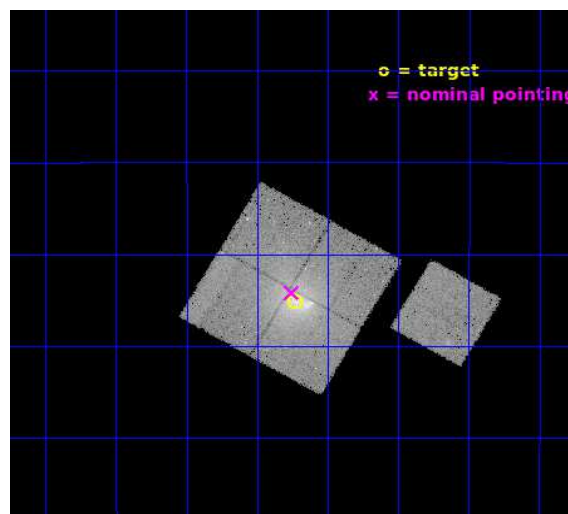
L2 Processing Date : Sep 25 2020

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# 1 Front

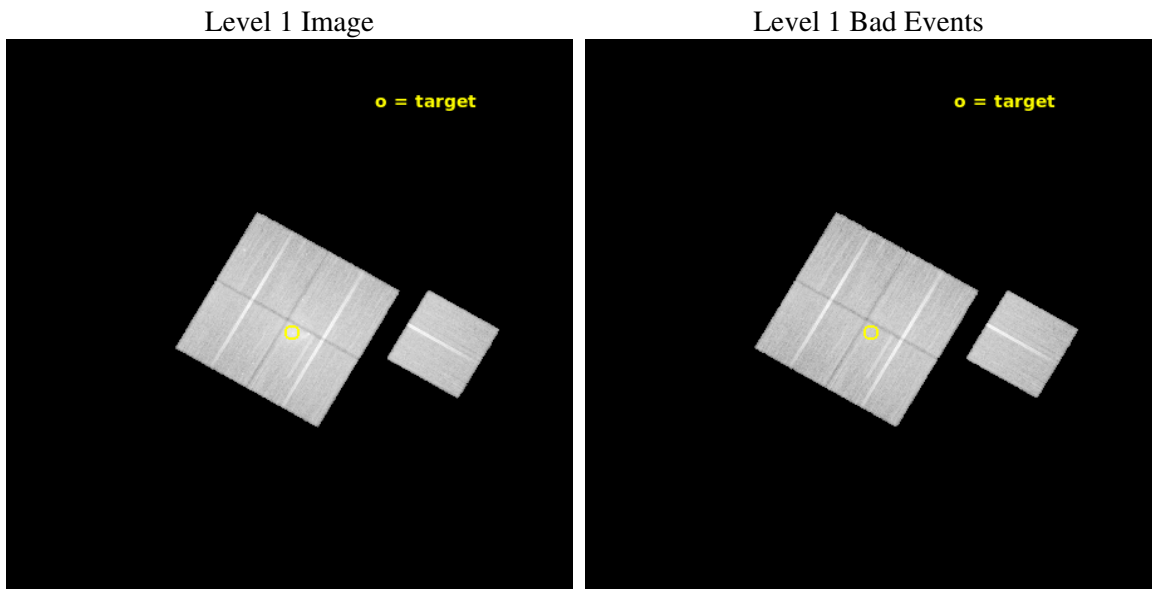
|          |  |   |
|----------|--|---|
| seq_num  | 800405   | Sequence number                             |
| obs_id   | 4959   | Observation id                              |
| title    | Chandra Observations of Galaxy Clusters with Large cD Galaxy Peculiar Velocities | Proposal title                              |
| observer | Craig Sarazin  | Principal investigator                      |
| object   | Abell 2670   | Source name                                 |
| dtcycle  | 0  | &#160                                       |
| cycle    | P  | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 358.556917   | Observer's specified target RA [deg]        |
| dec_targ | -10.418889   | Observer's specified target Dec [deg]       |
| ra_nom   | 358.56339578604  | Nominal RA [deg]                            |
| dec_nom  | -10.402976333532   | Nominal Dec [deg]                           |
| roll_nom | 120.09936107276  | Nominal Roll [deg]                          |
| revision | 4  | Processing version of data                  |
| ontime   | 40138.677101731  | Sum of GTIs [s]                             |
| livetime | 39614.235735733  | Livetime [s]                                |
| ontime0  | 40141.817972273  | Sum of GTIs [s]                             |
| ontime1  | 40138.676932335  | Sum of GTIs [s]                             |
| ontime2  | 40138.67702201   | Sum of GTIs [s]                             |
| ontime3  | 40138.677101731  | Sum of GTIs [s]                             |
| ontime6  | 40148.099922776  | Sum of GTIs [s]                             |
| l2events | 160079   | Number of level 2 events                    |



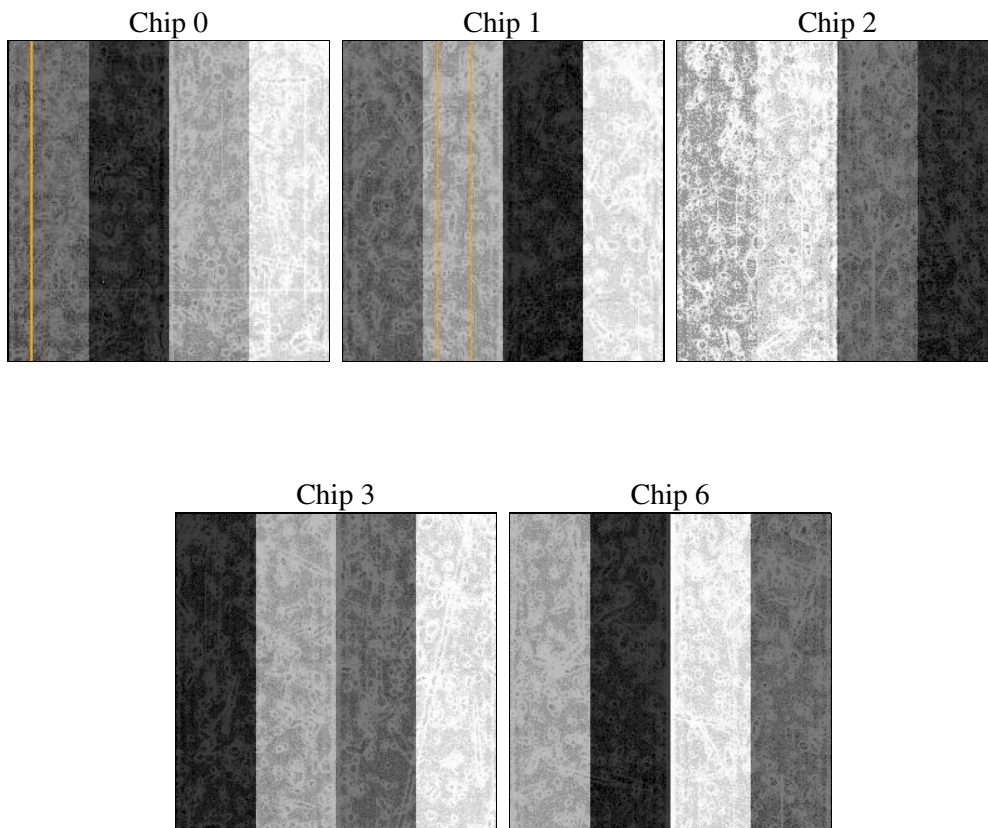
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 40030.249000    | [s] Scheduled observation exposure time |
| ascdsver | 10.9.1              | Processing system revision     | ontime         | 40138.677101731 | Sum of GTIs [s]                         |
| caldbver | 4.9.2               | &#160                          | ontime0        | 40141.817972273 | Sum of GTIs [s]                         |
| date     | 2020-09-25T19:59:22 | Date and time of file creation | ontime1        | 40138.676932335 | Sum of GTIs [s]                         |
| revision | 4                   | Processing version of data     | ontime2        | 40138.67702201  | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 40138.677101731 | Sum of GTIs [s]                         |
|          |                     |                                | ontime6        | 40148.099922776 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 1252183         | Number of level 1 events                |

### 2.1.4 Events

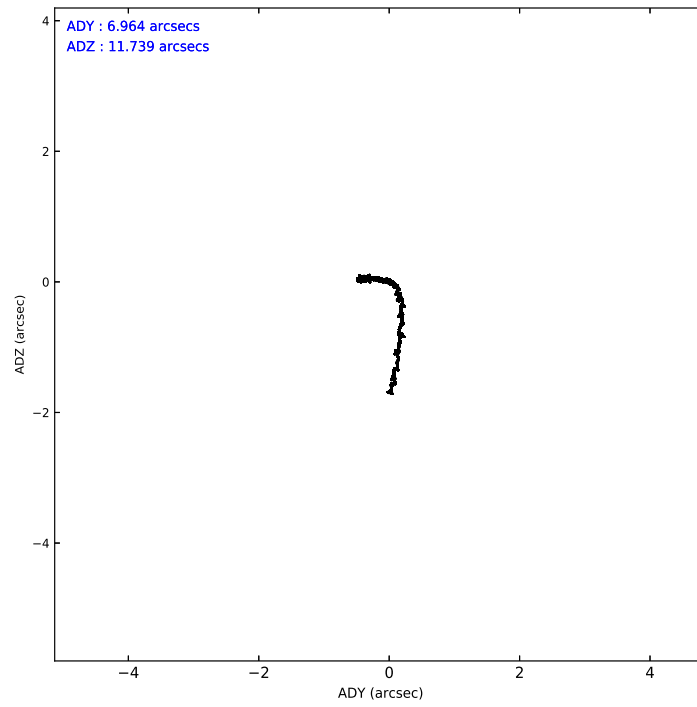
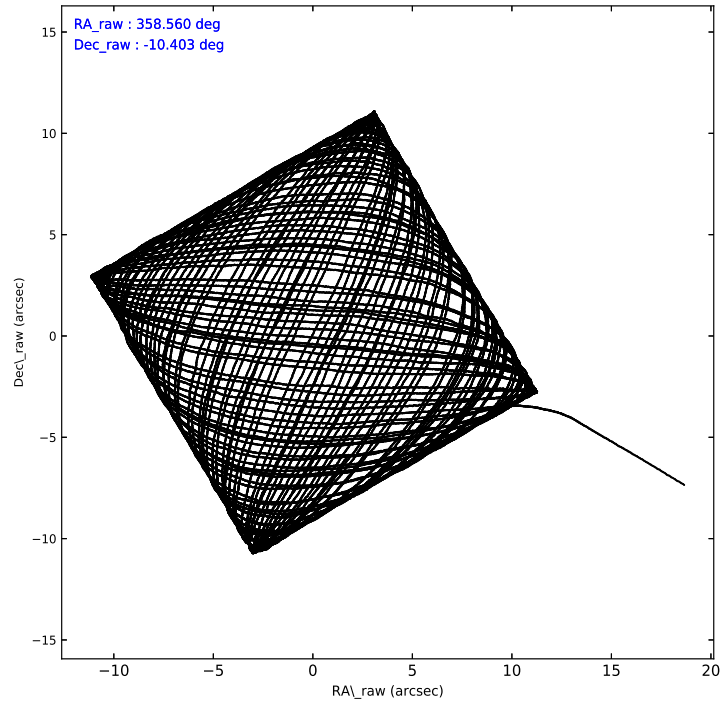
|                 | ccd 0  | ccd 1  | ccd 2  | ccd 3  | ccd 6  |
|-----------------|--------|--------|--------|--------|--------|
| level 1 events  | 228262 | 238024 | 265912 | 273575 | 246410 |
| rejected events | 197017 | 201429 | 230946 | 219648 | 219398 |
| rejected %      | 86%    | 84%    | 86%    | 80%    | 89%    |

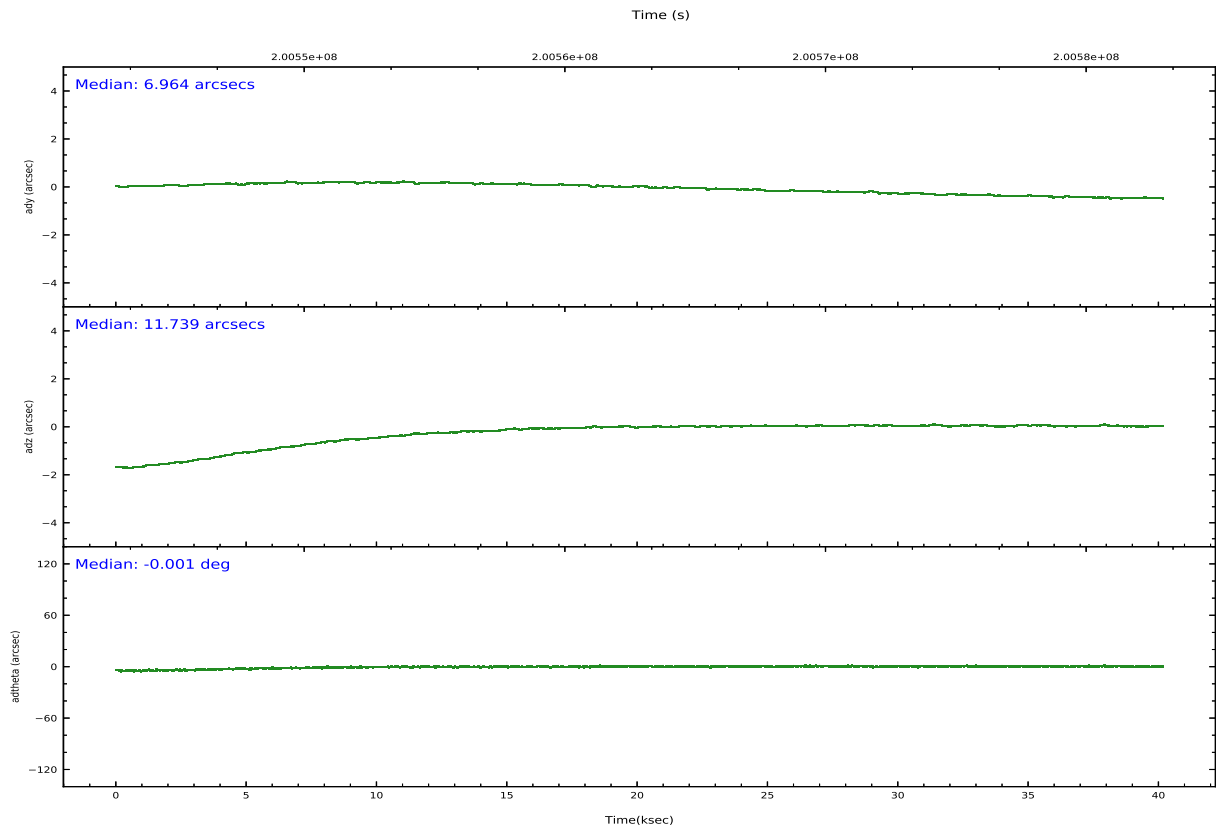
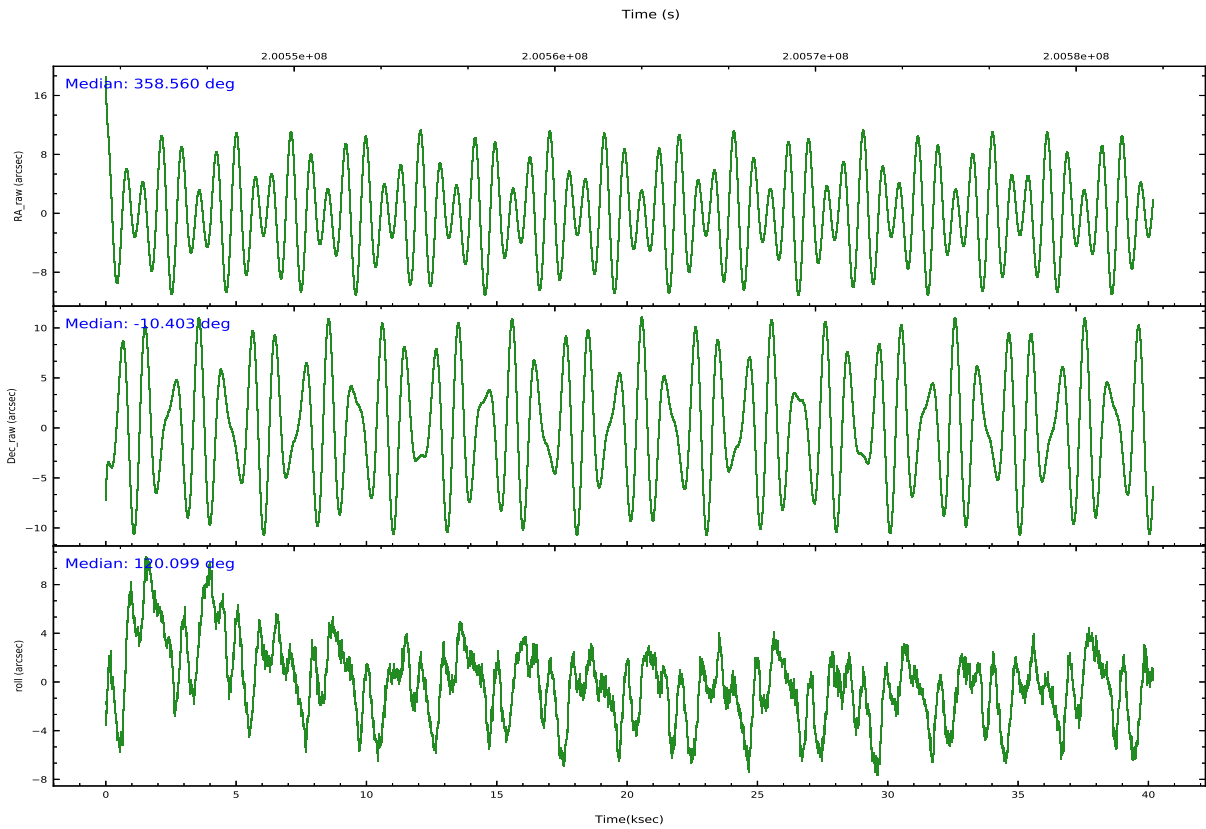
|                | ccd 0  | ccd 1  | ccd 2  | ccd 3  | ccd 6  |
|----------------|--------|--------|--------|--------|--------|
| grade 0 events | 14310  | 17941  | 18061  | 33864  | 10480  |
|                | 6%     | 7%     | 6%     | 12%    | 4%     |
| grade 1 events | 135    | 141    | 177    | 276    | 115    |
|                | 0%     | 0%     | 0%     | 0%     | 0%     |
| grade 2 events | 6271   | 6565   | 6403   | 7774   | 5423   |
|                | 2%     | 2%     | 2%     | 2%     | 2%     |
| grade 3 events | 3037   | 3210   | 2912   | 3553   | 2908   |
|                | 1%     | 1%     | 1%     | 1%     | 1%     |
| grade 4 events | 2836   | 3167   | 3012   | 3459   | 2820   |
|                | 1%     | 1%     | 1%     | 1%     | 1%     |
| grade 5 events | 8244   | 9042   | 8079   | 9425   | 9179   |
|                | 3%     | 3%     | 3%     | 3%     | 3%     |
| grade 6 events | 4803   | 5720   | 4589   | 5283   | 5393   |
|                | 2%     | 2%     | 1%     | 1%     | 2%     |
| grade 7 events | 188626 | 192238 | 222679 | 209941 | 210092 |
|                | 82%    | 80%    | 83%    | 76%    | 85%    |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual                | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|-----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                  | Obspar version number                 | 8         | 8       |
| Detector                          | ACIS-01236          | ACIS-01236            | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                           | NONE                | NONE                  | Obspar update status                  | NONE      | UPDATED |
| Data mode                         | VFAINT              | VFAINT                | Number of optional ACIS chips dropped | 0         | 0       |
| Observation mode                  | POINTING            | POINTING              | On-chip summing requested             | N         | N       |
| [deg] Pointing RA                 | 358.583641          | 358.56339578604       | Subarray requested                    | NONE      | NONE    |
| [deg] Pointing Dec                | -10.416463          | -10.402976333532      | Alternating exposures requested       | N         | N       |
| [deg] Pointing Roll               | 119.899532          | 120.09936107276       | [s] Primary exposure time             | 0.000000  | 3.1     |
| [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)  | 200542924.184000    | 200541956.69062       |                                       |           |         |
| Observation start date            | 2004-05-10T02:21:00 | 2004-05-10T02:05:56   |                                       |           |         |
| [s] Observation end time (MET)    | 200582954.184000    | 200583268.80495       |                                       |           |         |
| Observation end date              | 2004-05-10T13:28:10 | 2004-05-10T13:34:28   |                                       |           |         |
| Read mode                         | TIMED               | TIMED                 |                                       |           |         |

## 2.3 Aspect





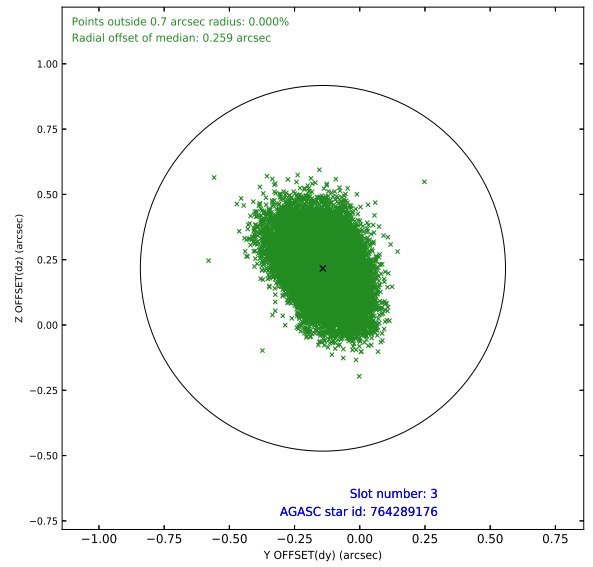
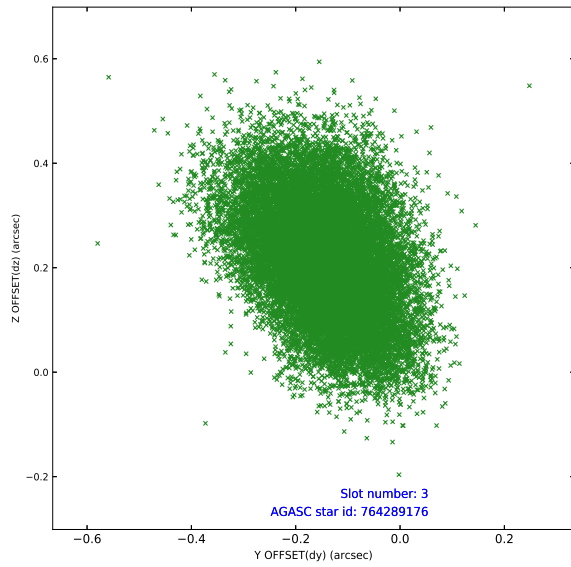
### Slot Statistics

|  | status | used | id        | mag   | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec        | mean_y   | m   |
|--|--------|------|-----------|-------|-------|----------|--------|--------|-------|-------|------------|------------|----------|-----|
|  | FID    |      | ACIS-I-1  | 7.24  | 9801  | 1.000    | 0.047  | -0.030 | 0.011 | 0.035 | 0.000000   | 0.000000   | 932.82   | -8  |
|  | FID    |      | ACIS-I-5  | 7.23  | 9799  | 1.000    | -0.193 | 0.054  | 0.011 | 0.029 | 0.000000   | 0.000000   | -1815.49 | 10  |
|  | FID    |      | ACIS-I-6  | 7.25  | 9801  | 1.000    | 0.054  | 0.048  | 0.014 | 0.031 | 0.000000   | 0.000000   | 398.40   | 17  |
|  | GUIDE  | used | 764289176 | 9.74  | 19583 | 1.000    | -0.141 | 0.217  | 0.145 | 0.239 | 358.916243 | -9.780607  | 1395.88  | -21 |
|  | GUIDE  | used | 764674064 | 7.84  | 19599 | 1.000    | -0.233 | 0.150  | 0.061 | 0.099 | 358.377713 | -10.005844 | 1645.22  | -1  |
|  | GUIDE  | used | 764676096 | 10.28 | 19559 | 1.000    | 0.016  | -0.314 | 0.141 | 0.231 | 358.114809 | -10.840116 | -497.06  | 21  |
|  | GUIDE  | used | 764681792 | 8.36  | 19597 | 1.000    | 0.114  | 0.033  | 0.072 | 0.115 | 358.985420 | -10.865799 | -2110.98 | -4  |
|  | BAD    | used | 764677232 | 10.23 | 18829 | 1.000    | 0.258  | -0.092 | 0.188 | 0.333 | 358.400281 | -11.249271 | -2276.69 | 20  |

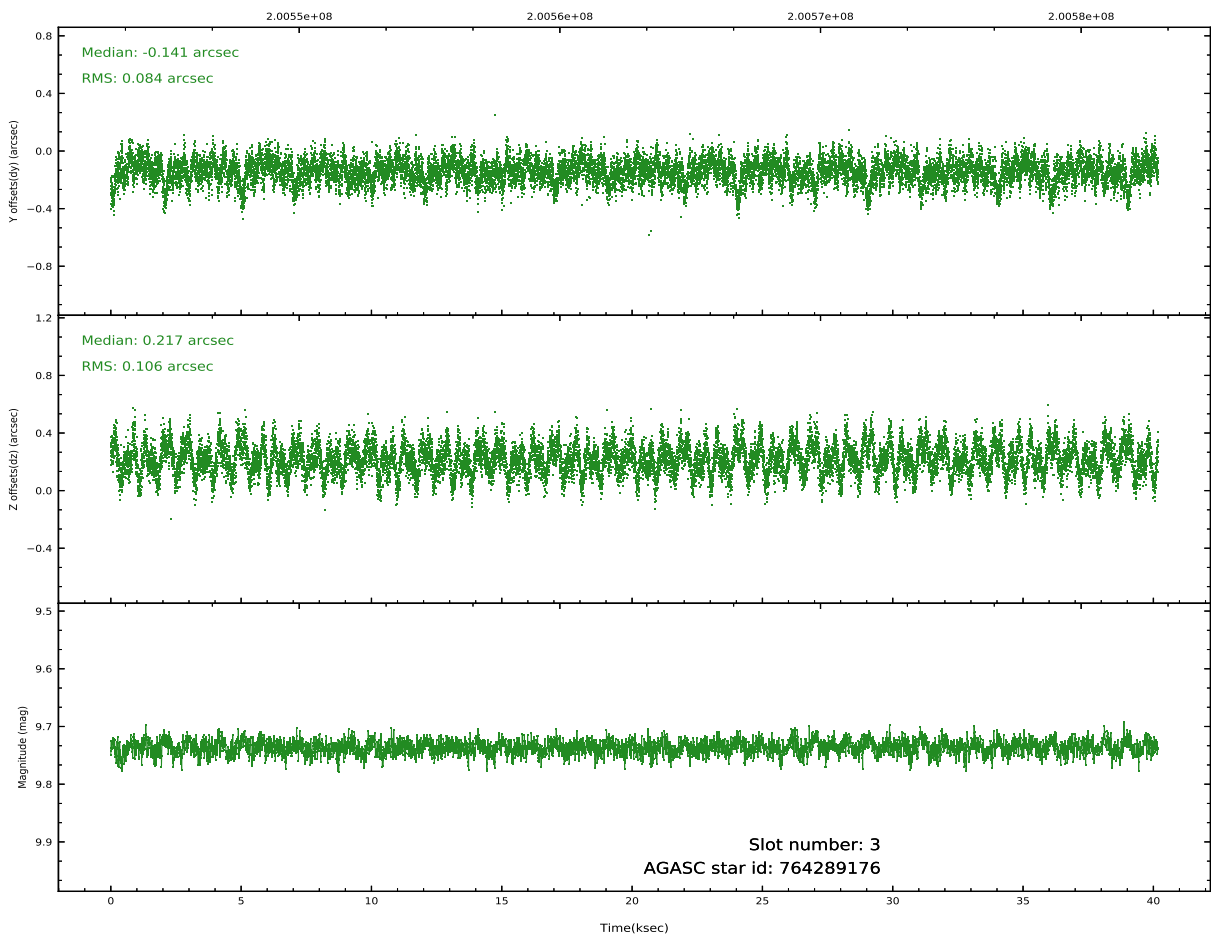
∞

## 2.4 Star Slots

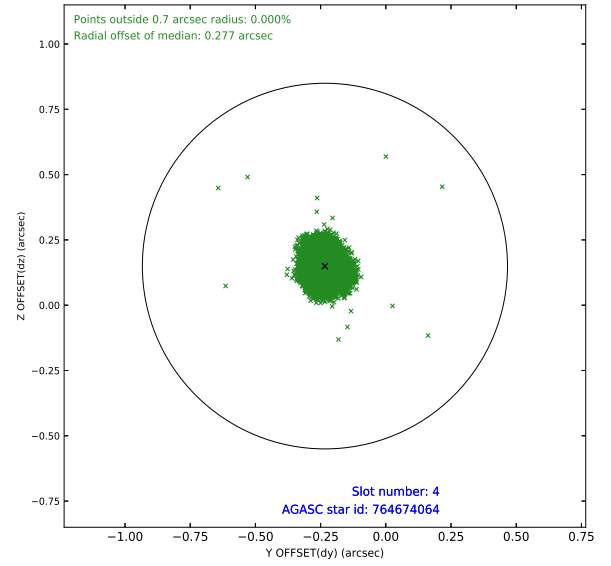
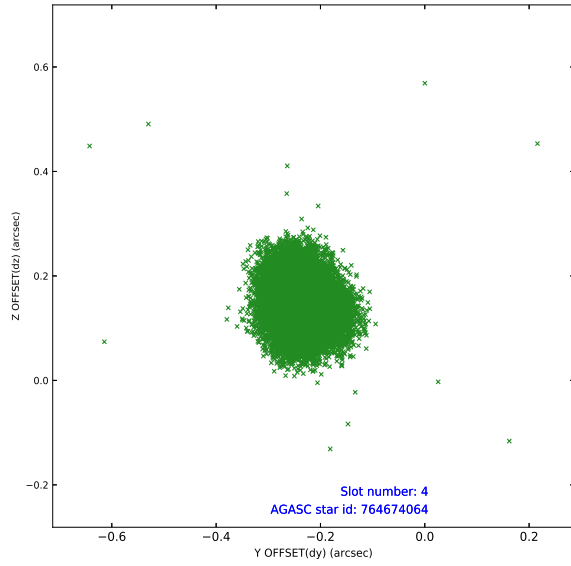
### 2.4.1 Slot 3



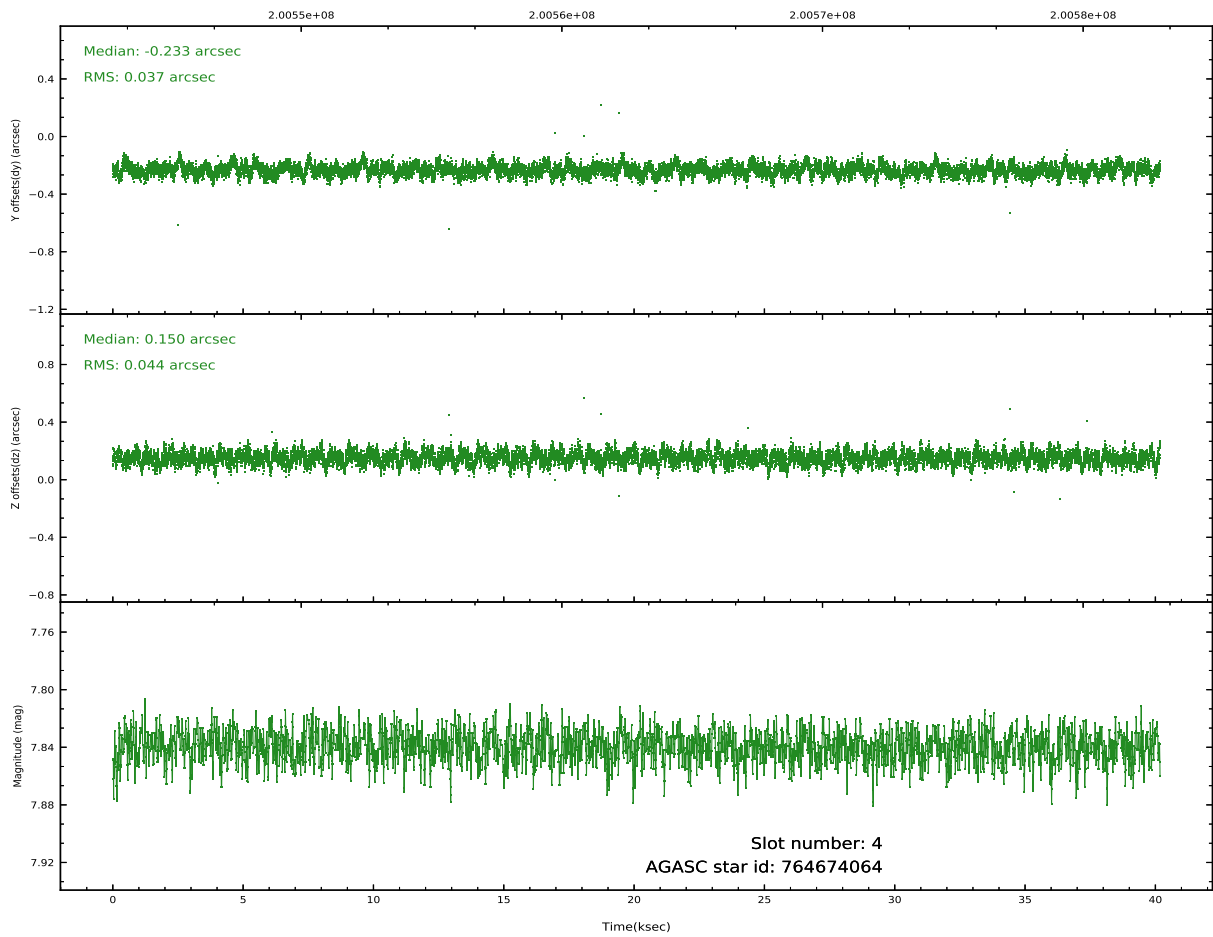
Time (s)



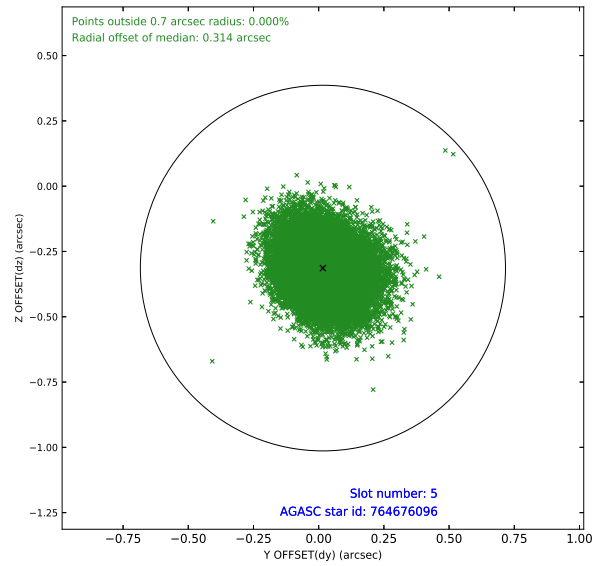
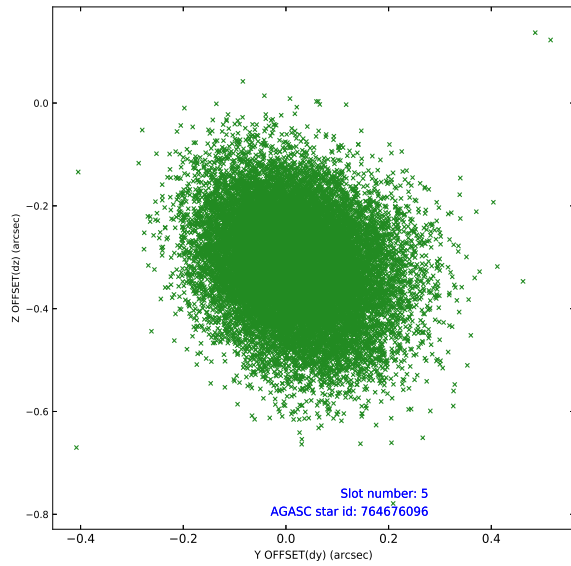
## 2.4.2 Slot 4



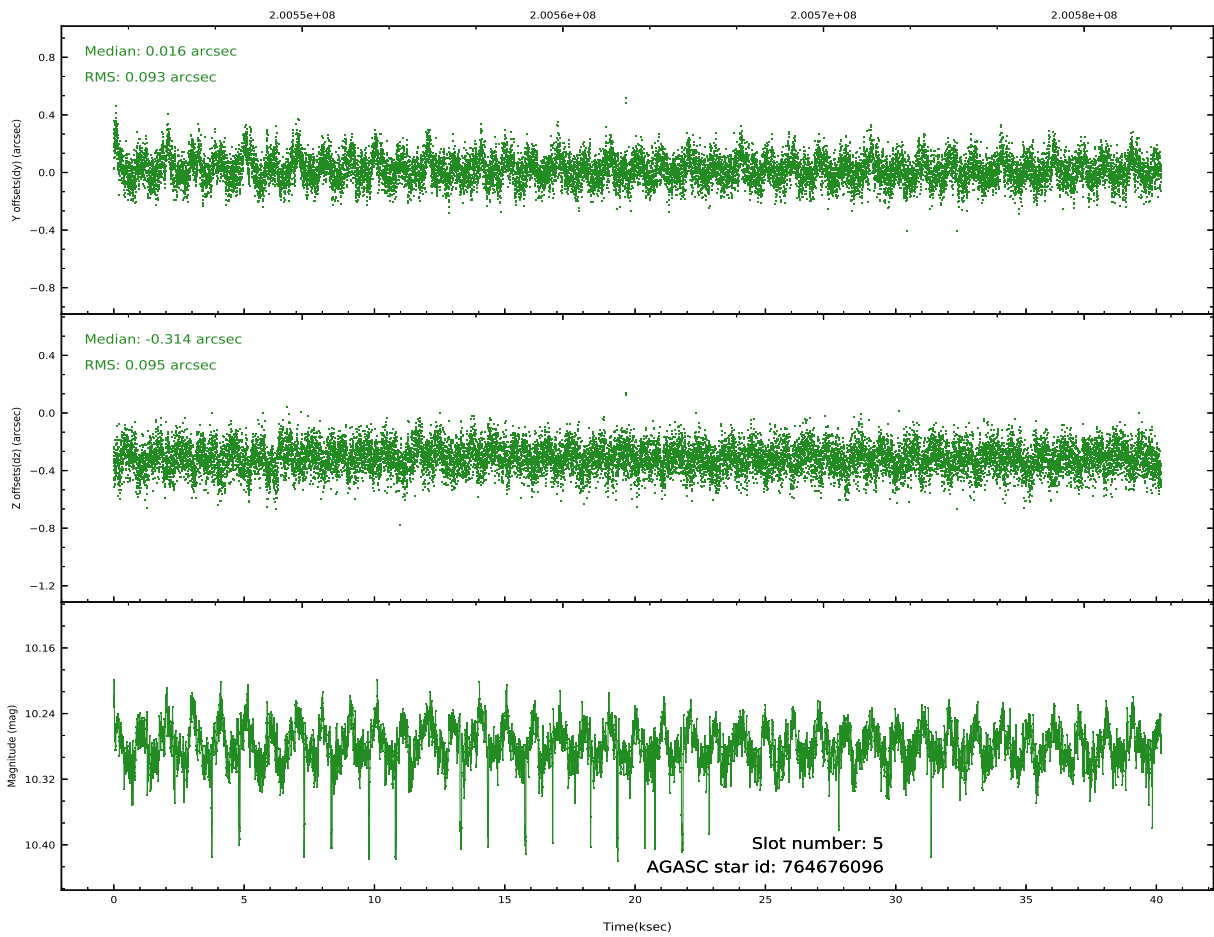
Time (s)



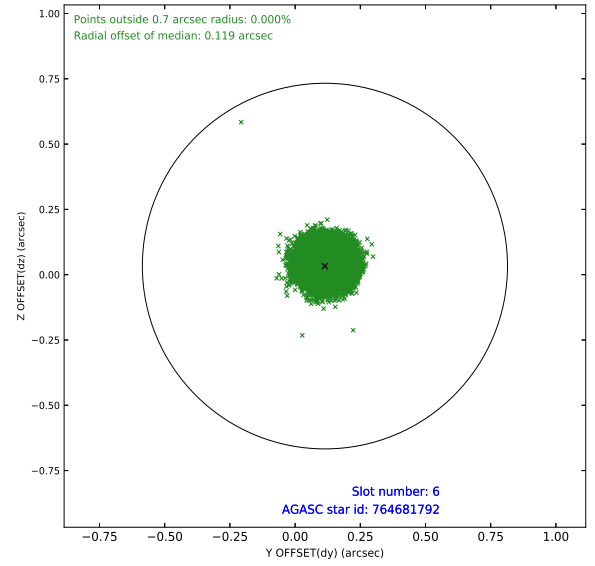
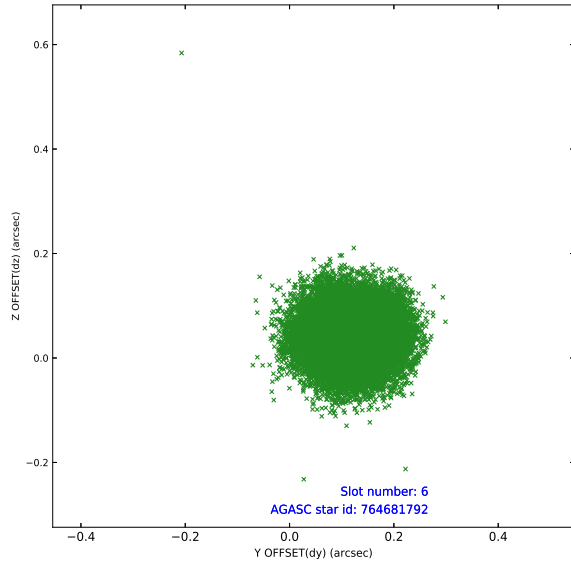
### 2.4.3 Slot 5



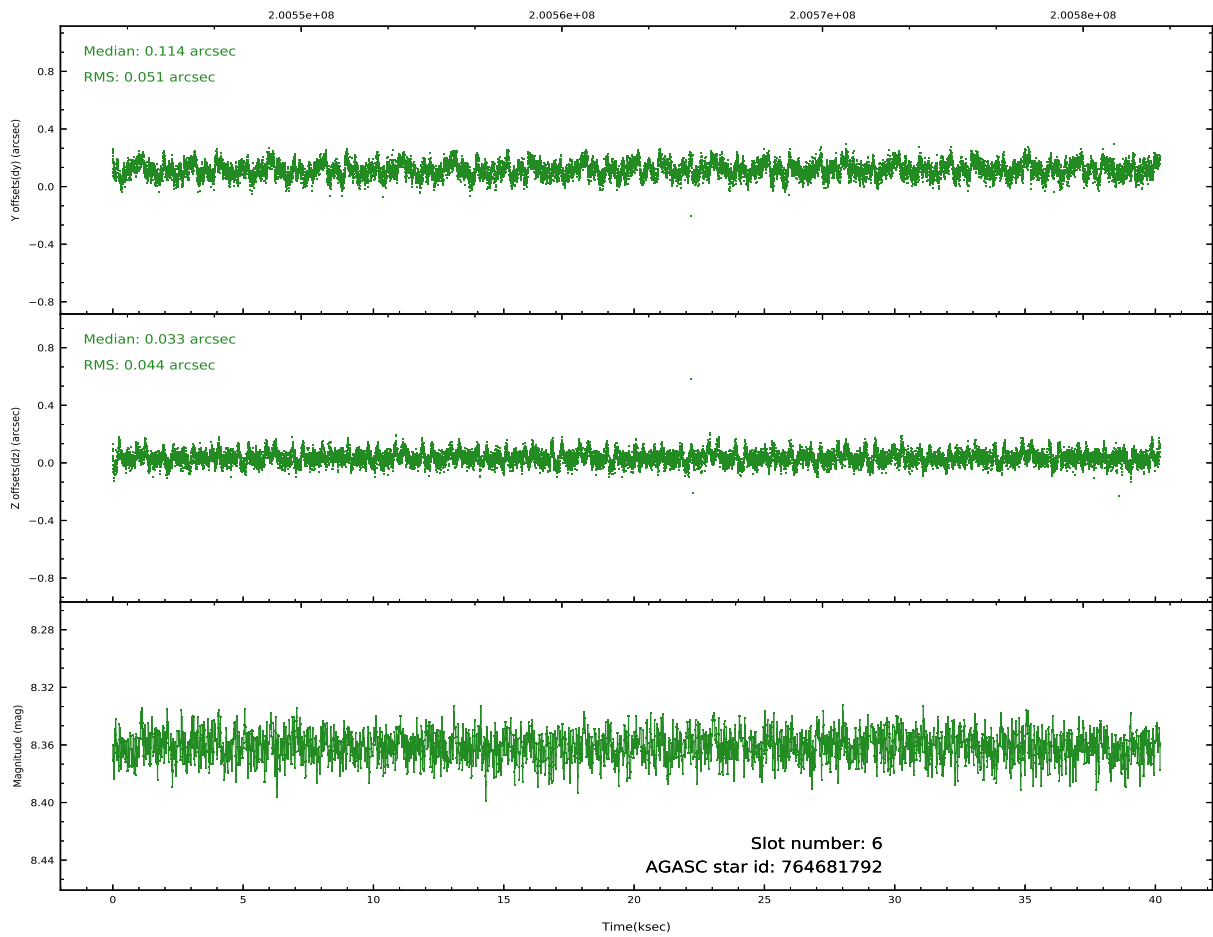
Time (s)



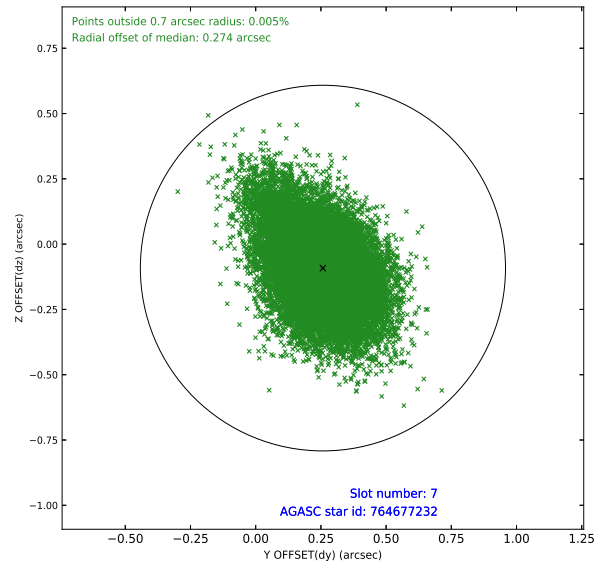
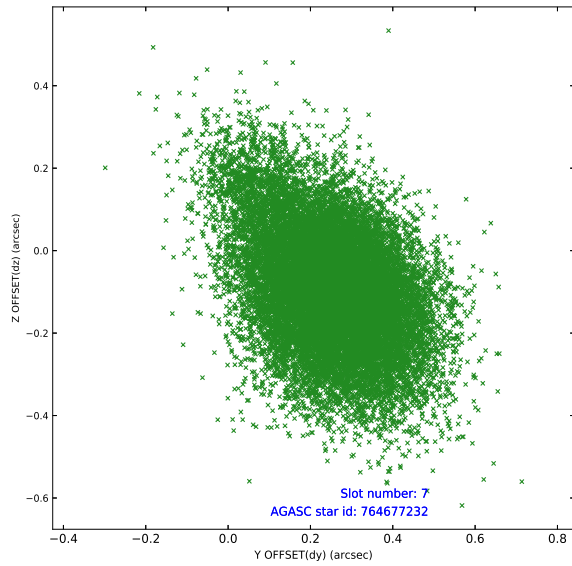
## 2.4.4 Slot 6



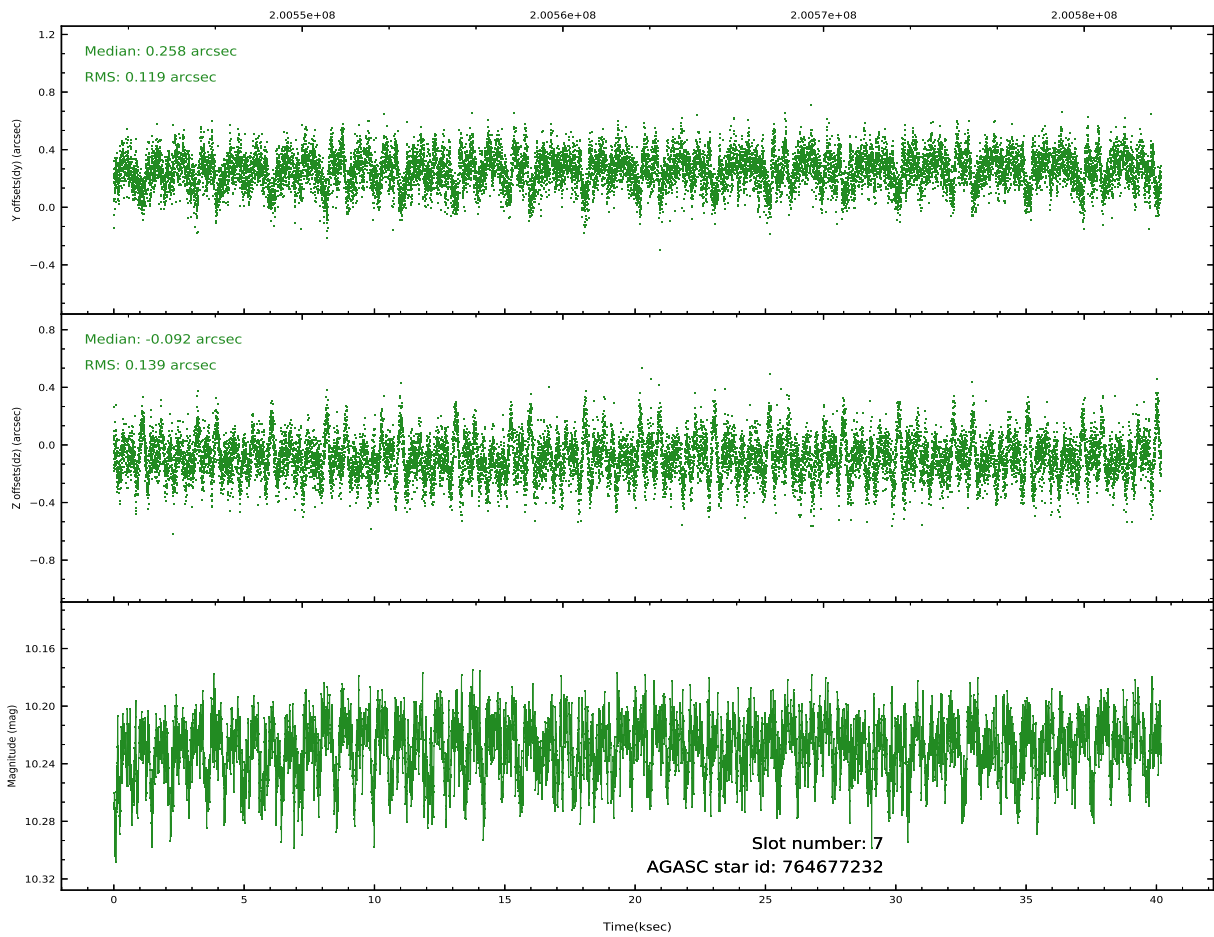
Time (s)



## 2.4.5 Slot 7

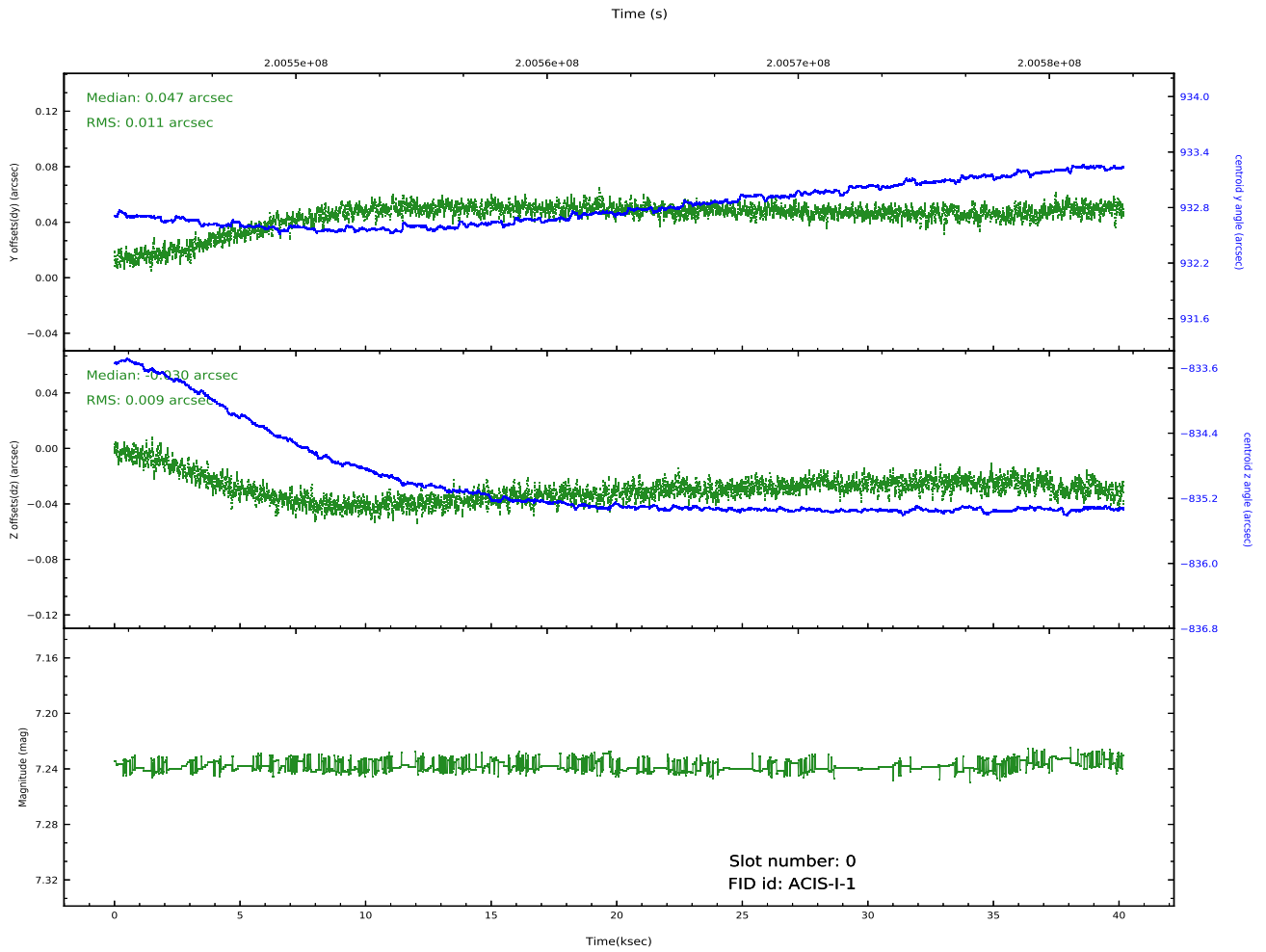
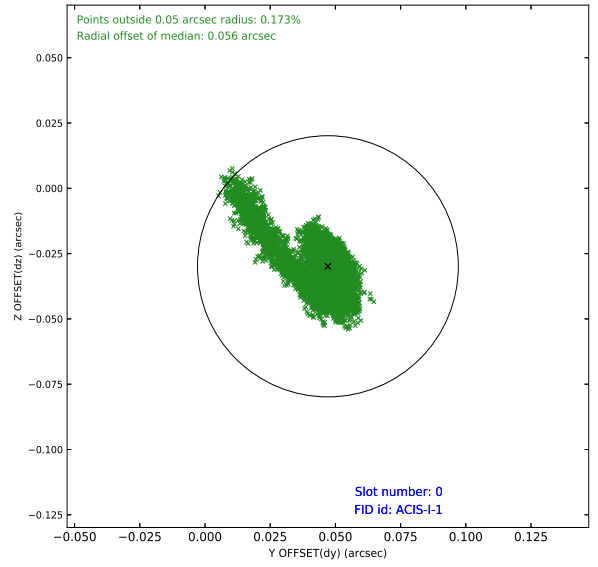
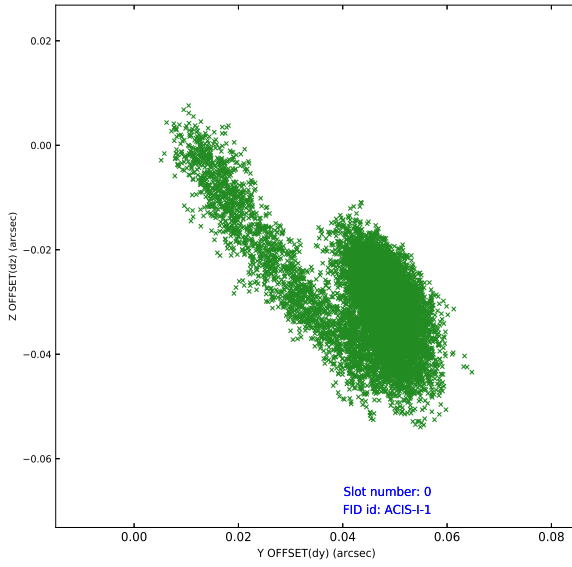


Time (s)

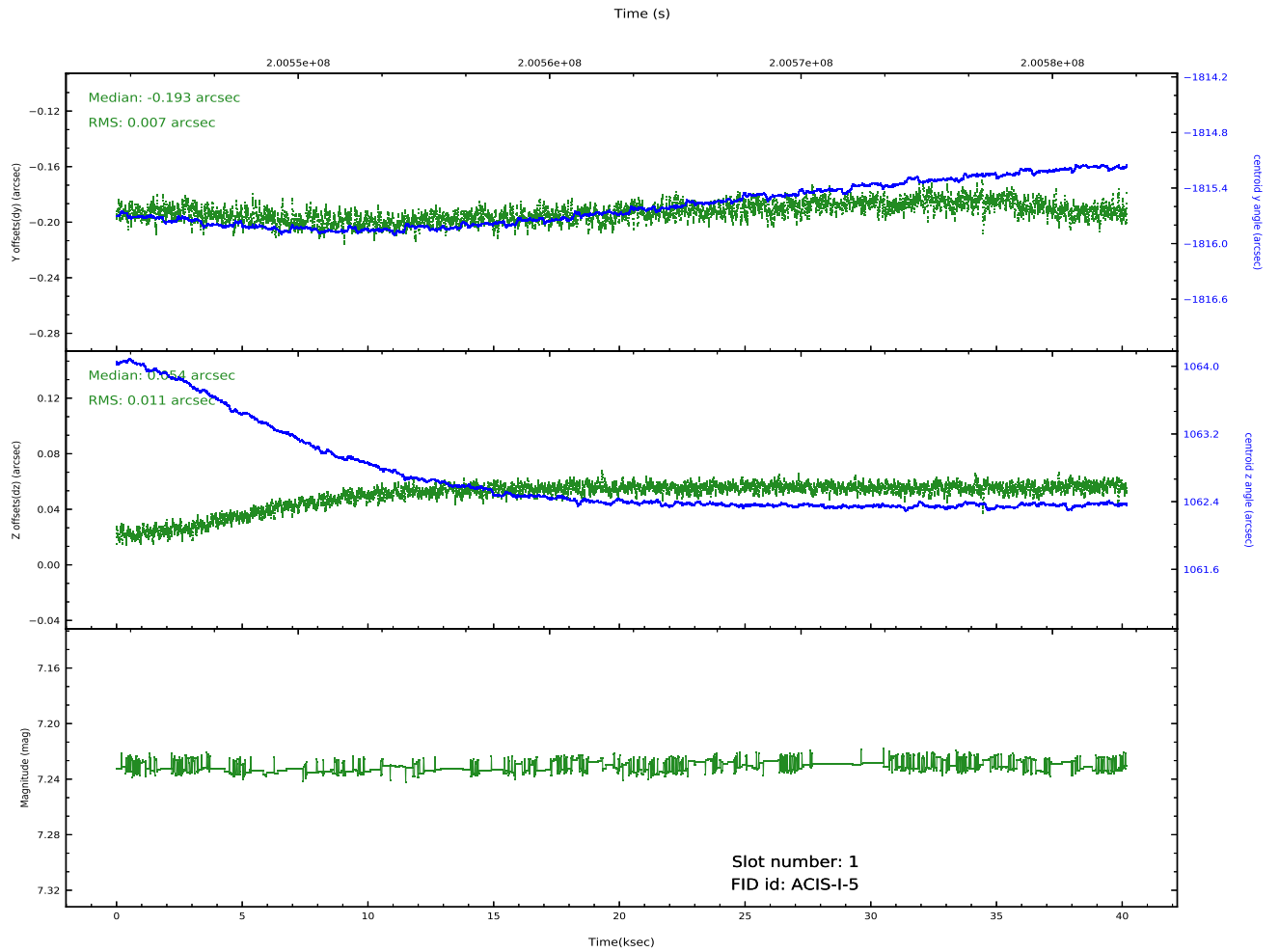
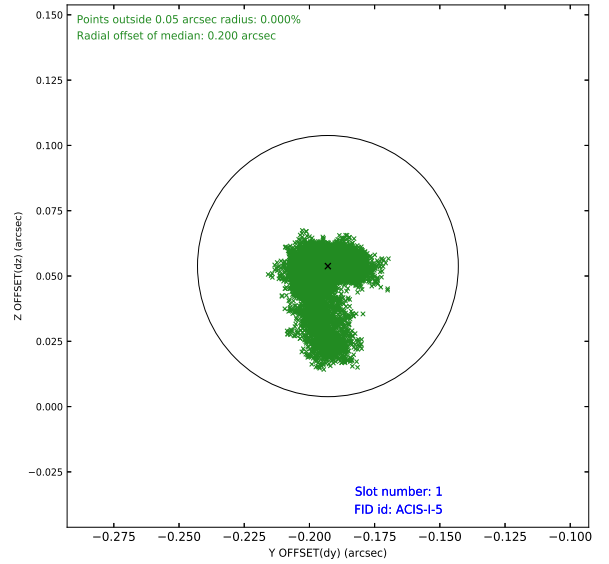
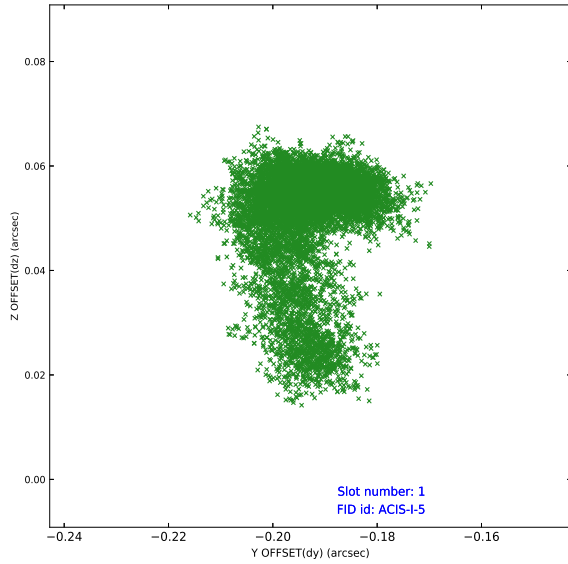


## 2.5 FID Slots

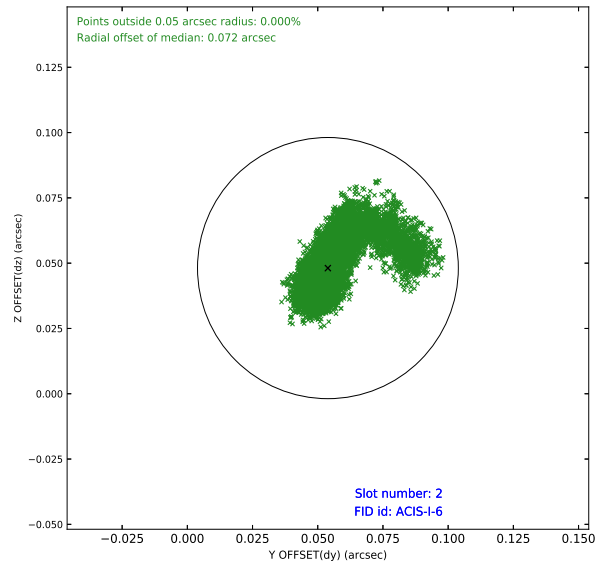
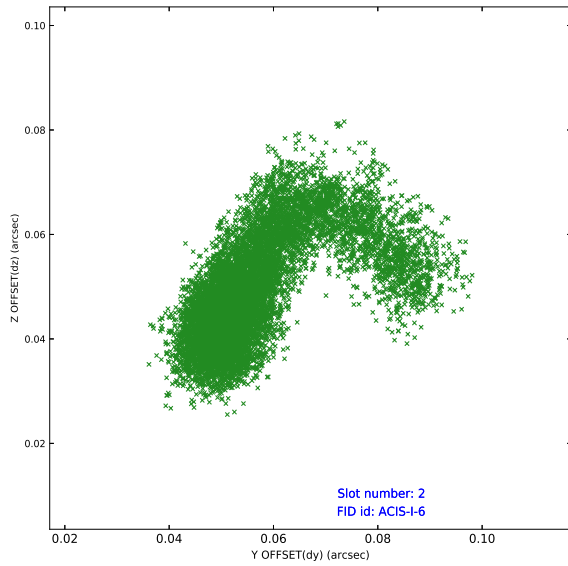
### 2.5.1 Slot 0



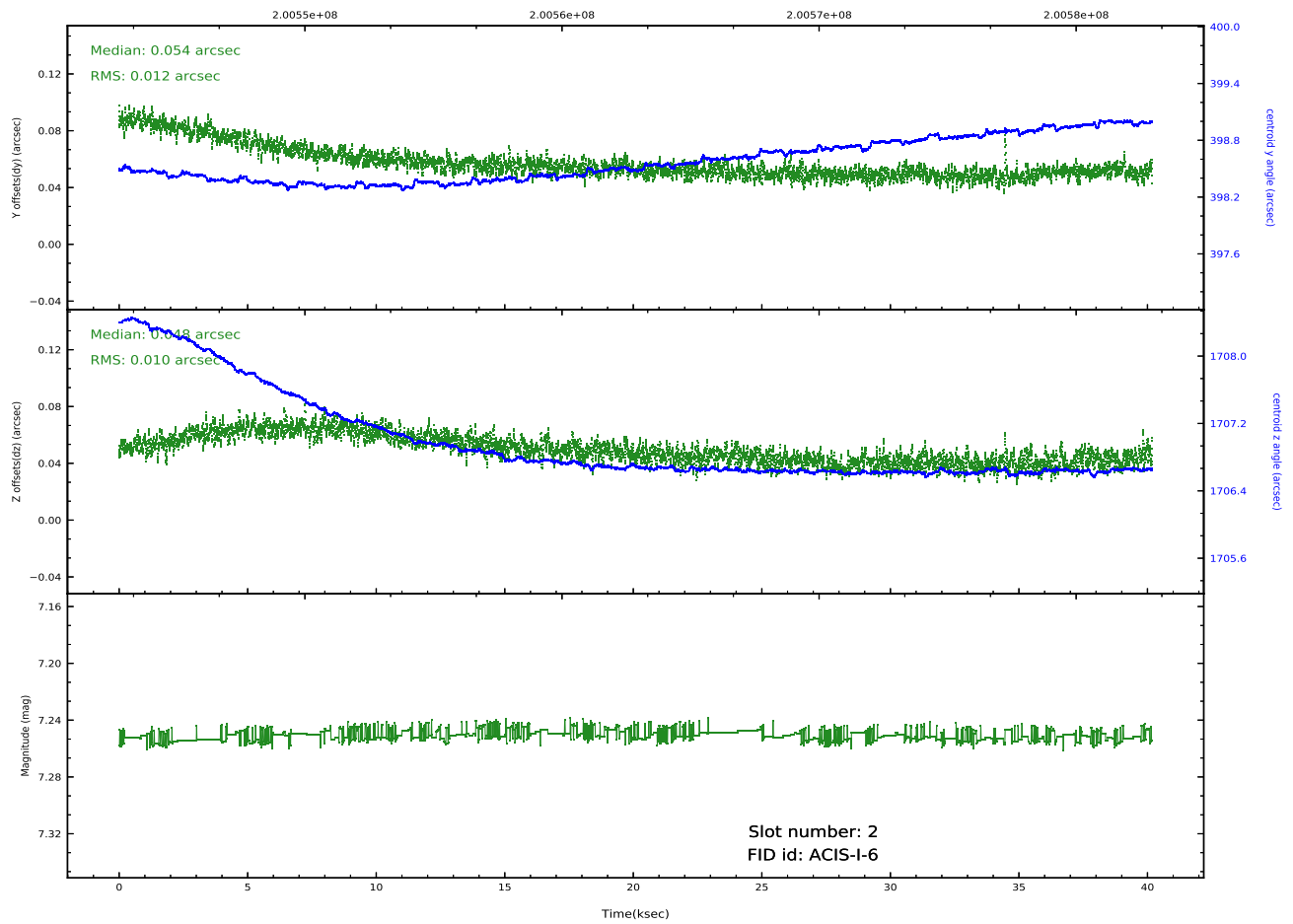
## 2.5.2 Slot 1



### 2.5.3 Slot 2



Time (s)



# A Summary

## A.1 Status

|                            |               |
|----------------------------|---------------|
| V&V Scientist              | Beth Sundheim |
| V&V Date (YYYY-MM-DD)      | 2020.09.25    |
| V&V Edition                | 1             |
| V&V Disposition and Status | OK            |
| V&V Charge Time            | 40.141        |

## A.2 Comments