

# V&V Reference Report

## L2 ASCDS Version : 10.9.1

Observation 7181 - L2 Version 5  
Chandra X-Ray Center

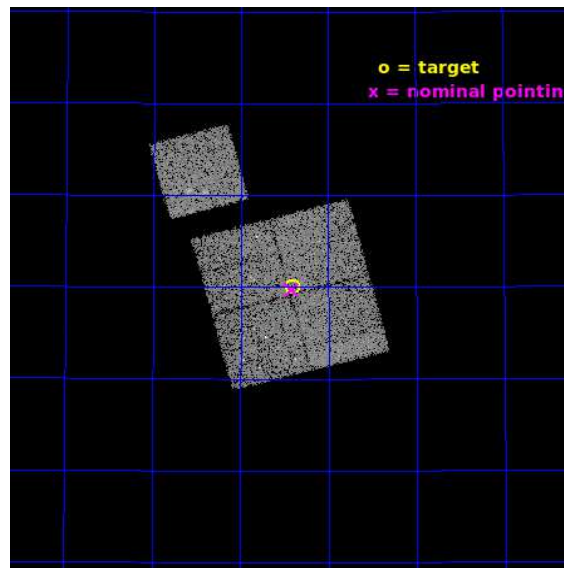
L2 Processing Date : Oct 10 2020

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# 1 Front

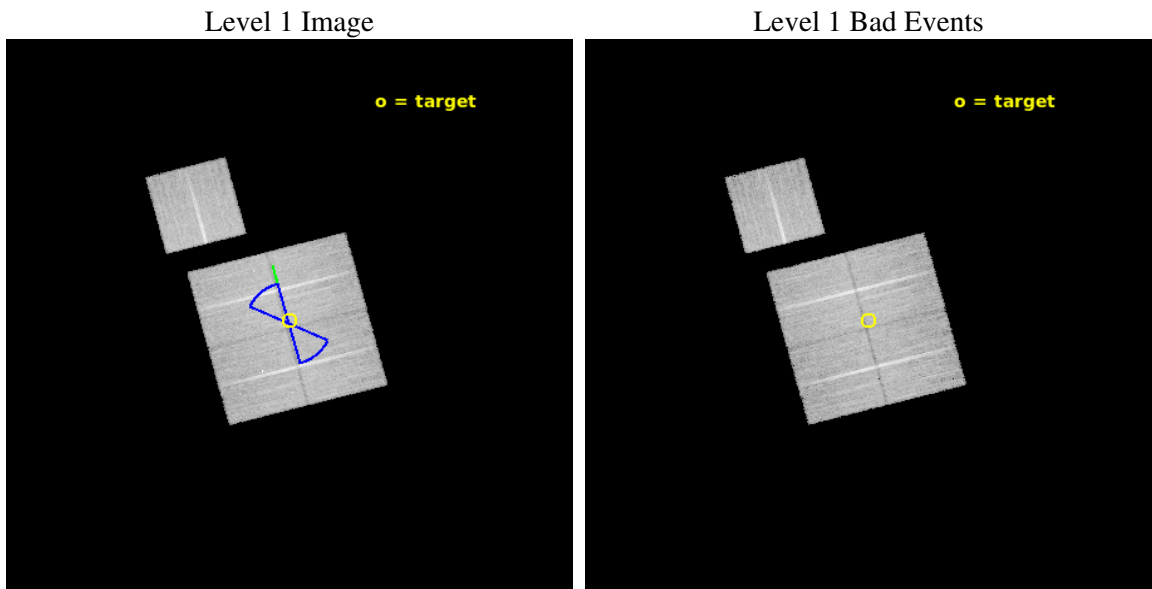
|          |  |   |
|----------|--|---|
| seq_num  | 900353   | Sequence number                             |
| obs_id   | 7181   | Observation id                              |
| title    | Deep Chandra Imaging of the Extended Groth Strip: The Co-evolution of Black Holes and Galaxies | Proposal title                              |
| observer | Prof Kirpal Nandra   | Principal investigator                      |
| object   | Extended Groth Strip (EGS)   | Source name                                 |
| dtcycle  | 0  | &#160                                       |
| cycle    | P  | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 214.102081   | Observer's specified target RA [deg]        |
| dec_targ | 52.334053  | Observer's specified target Dec [deg]       |
| ra_nom   | 214.10377117393  | Nominal RA [deg]                            |
| dec_nom  | 52.328677909191  | Nominal Dec [deg]                           |
| roll_nom | 345.20101526403  | Nominal Roll [deg]                          |
| revision | 5  | Processing version of data                  |
| ontime   | 16194.399968833  | Sum of GTIs [s]                             |
| livetime | 15982.808211096  | Livetime [s]                                |
| ontime0  | 16188.117948592  | Sum of GTIs [s]                             |
| ontime1  | 16194.399968833  | Sum of GTIs [s]                             |
| ontime2  | 16194.399968833  | Sum of GTIs [s]                             |
| ontime3  | 16194.399968833  | Sum of GTIs [s]                             |
| ontime6  | 16194.399968833  | Sum of GTIs [s]                             |
| l2events | 44391  | Number of level 2 events                    |



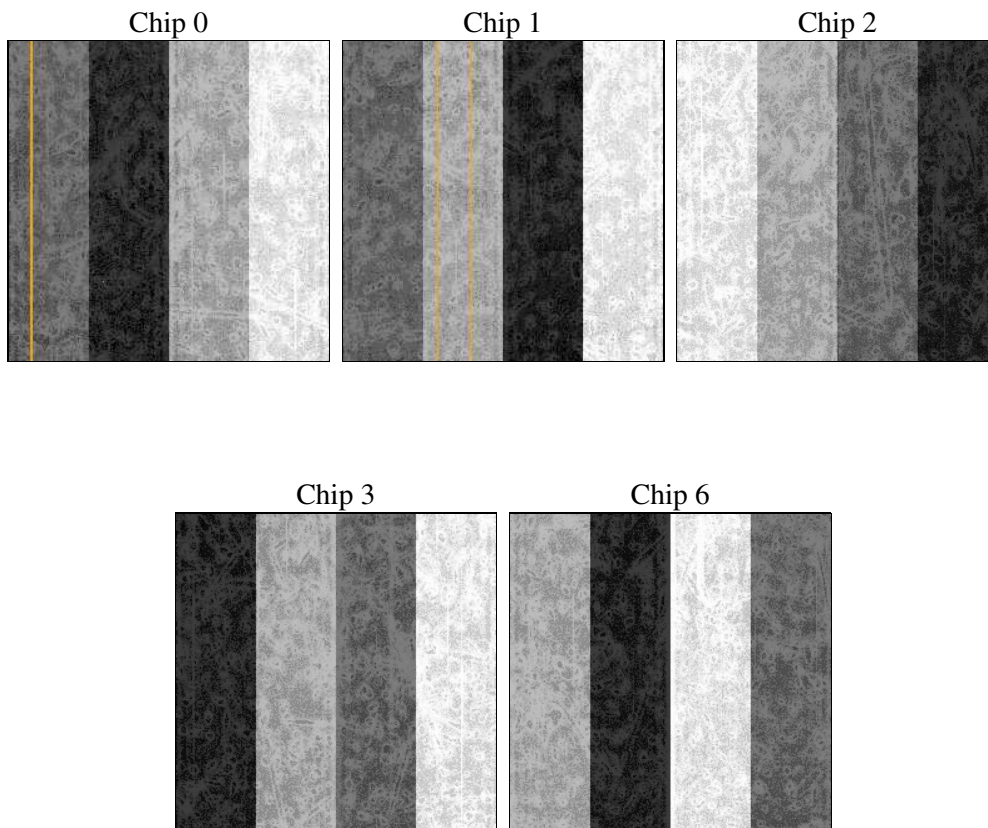
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 16035.363000    | [s] Scheduled observation exposure time |
| ascdsver | 10.9.1              | Processing system revision     | ontime         | 16194.399968833 | Sum of GTIs [s]                         |
| caldbver | 4.9.2               | &#160                          | ontime0        | 16188.117948592 | Sum of GTIs [s]                         |
| date     | 2020-10-11T02:27:50 | Date and time of file creation | ontime1        | 16194.399968833 | Sum of GTIs [s]                         |
| revision | 5                   | Processing version of data     | ontime2        | 16194.399968833 | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 16194.399968833 | Sum of GTIs [s]                         |
|          |                     |                                | ontime6        | 16194.399968833 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 526744          | Number of level 1 events                |

### 2.1.4 Events

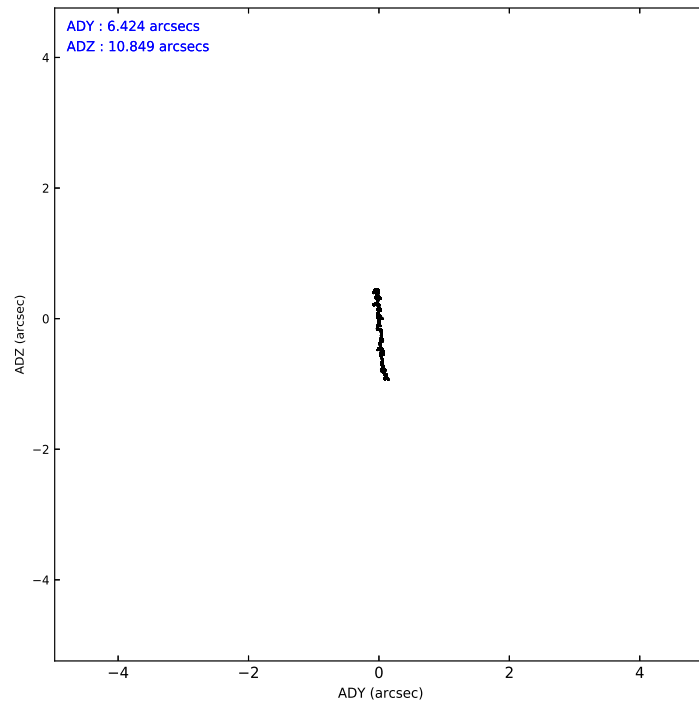
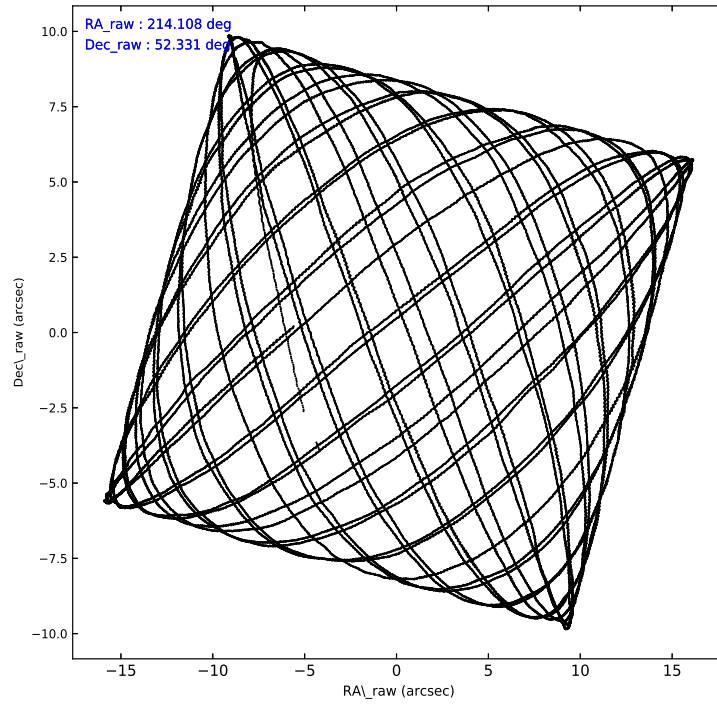
|                 | ccd 0 | ccd 1  | ccd 2  | ccd 3  | ccd 6  |
|-----------------|-------|--------|--------|--------|--------|
| level 1 events  | 99364 | 101406 | 114192 | 106308 | 105474 |
| rejected events | 88534 | 89792  | 103732 | 96647  | 94413  |
| rejected %      | 89%   | 88%    | 90%    | 90%    | 89%    |

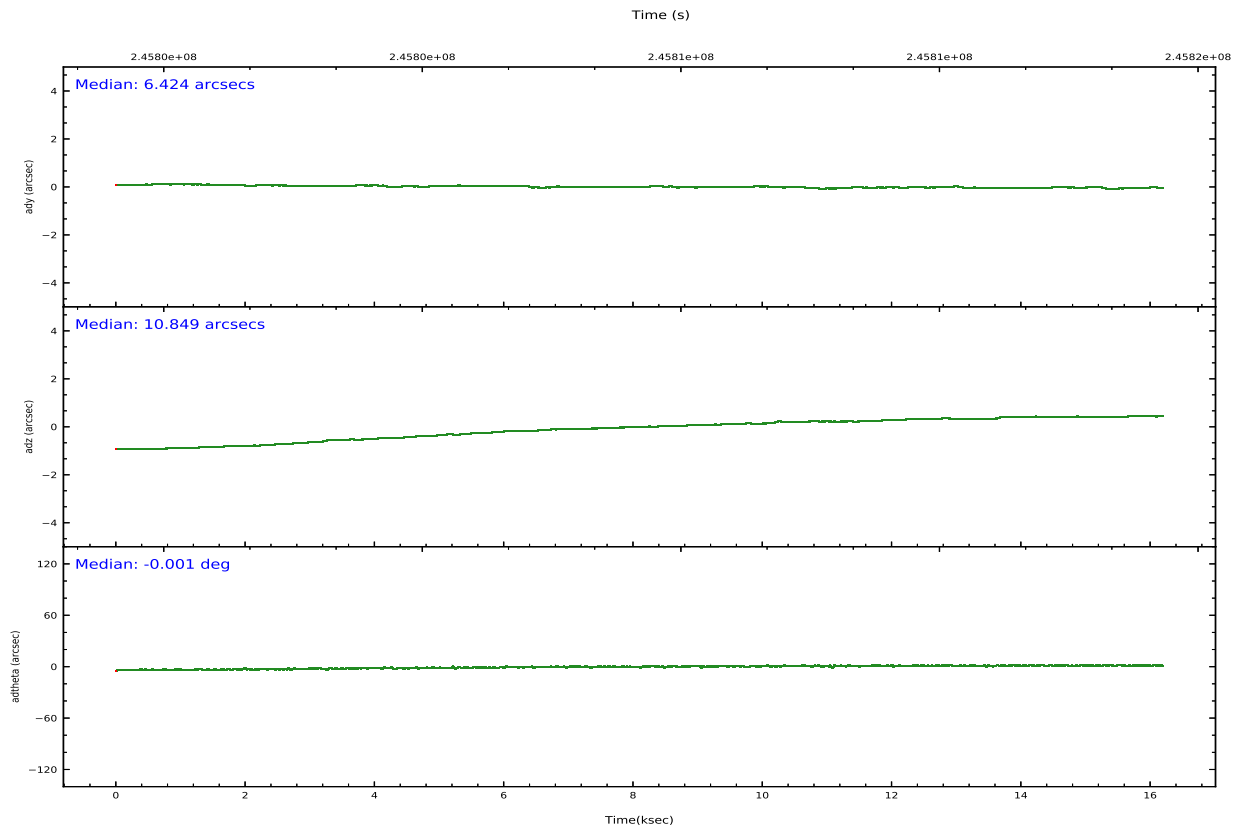
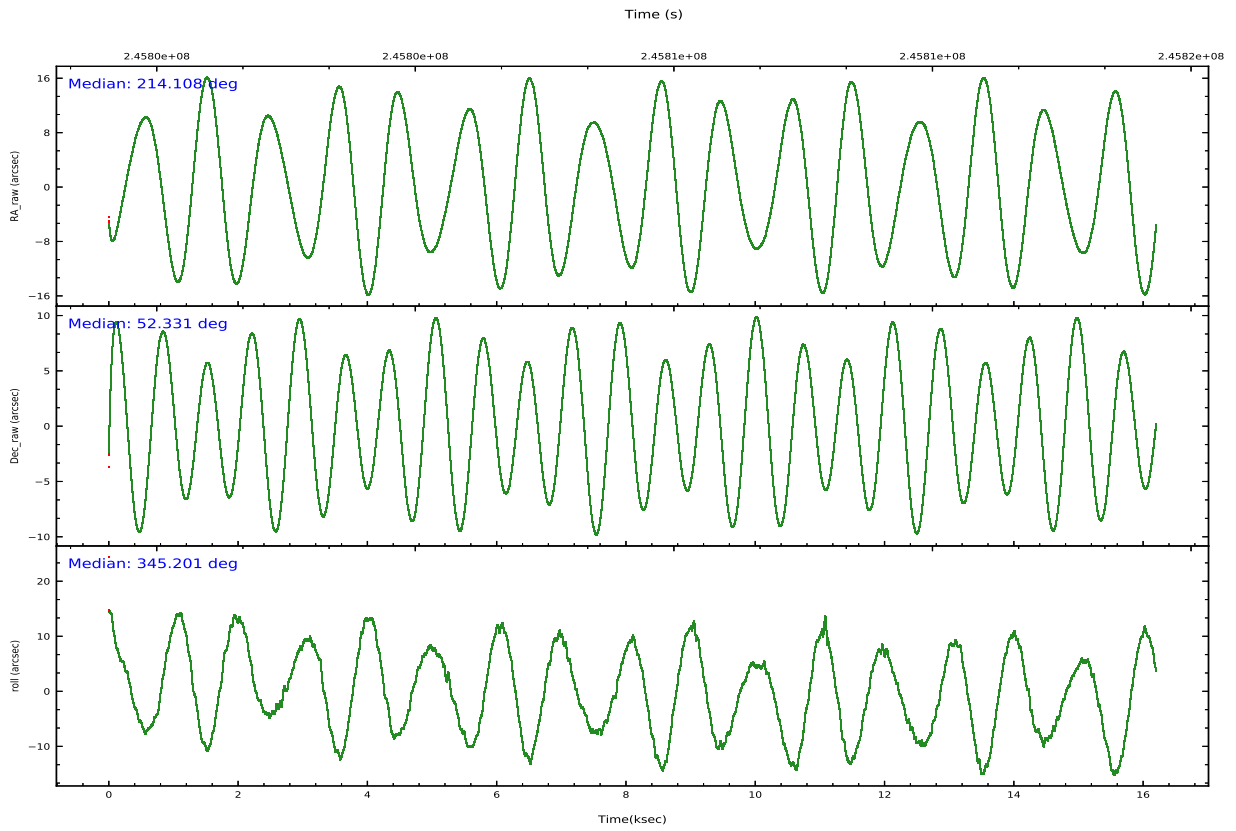
|                | ccd 0 | ccd 1 | ccd 2  | ccd 3 | ccd 6 |
|----------------|-------|-------|--------|-------|-------|
| grade 0 events | 4232  | 4299  | 4048   | 3493  | 3980  |
|                | 4%    | 4%    | 3%     | 3%    | 3%    |
| grade 1 events | 59    | 57    | 62     | 49    | 47    |
|                | 0%    | 0%    | 0%     | 0%    | 0%    |
| grade 2 events | 2450  | 2584  | 2434   | 2154  | 2429  |
|                | 2%    | 2%    | 2%     | 2%    | 2%    |
| grade 3 events | 1249  | 1361  | 1176   | 1140  | 1214  |
|                | 1%    | 1%    | 1%     | 1%    | 1%    |
| grade 4 events | 1103  | 1322  | 1154   | 1117  | 1226  |
|                | 1%    | 1%    | 1%     | 1%    | 1%    |
| grade 5 events | 3599  | 4072  | 3431   | 4354  | 4310  |
|                | 3%    | 4%    | 3%     | 4%    | 4%    |
| grade 6 events | 2068  | 2319  | 1882   | 2012  | 2482  |
|                | 2%    | 2%    | 1%     | 1%    | 2%    |
| grade 7 events | 84604 | 85392 | 100005 | 91989 | 89786 |
|                | 85%   | 84%   | 87%    | 86%   | 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                    | 214.064887          | 214.10377117393       | Subarray requested                    | NONE      | NONE    |
| [deg] Pointing Dec                   | 52.323922           | 52.328677909191       | Alternating exposures requested       | N         | N       |
| [deg] Pointing Roll                  | 345.029437          | 345.20101526403       | [s] Primary exposure time             | 0.000000  | 3.1     |
| [deg] Roll angle                     | 50.756000           | 50.756000             |                                       |           |         |
| [deg] Roll tolerance                 | 25.000000           | 25.000000             |                                       |           |         |
| Roll constraint allows 180D rotation | Y                   | Y                     |                                       |           |         |
| [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)     | 245799425.184000    | 245798241.5082        |                                       |           |         |
| Observation start date               | 2005-10-15T21:36:01 | 2005-10-15T21:17:21   |                                       |           |         |
| [s] Observation end time (MET)       | 245815461.184000    | 245815699.309         |                                       |           |         |
| Observation end date                 | 2005-10-16T02:03:17 | 2005-10-16T02:08:19   |                                       |           |         |
| Read mode                            | TIMED               | TIMED                 |                                       |           |         |

## 2.3 Aspect





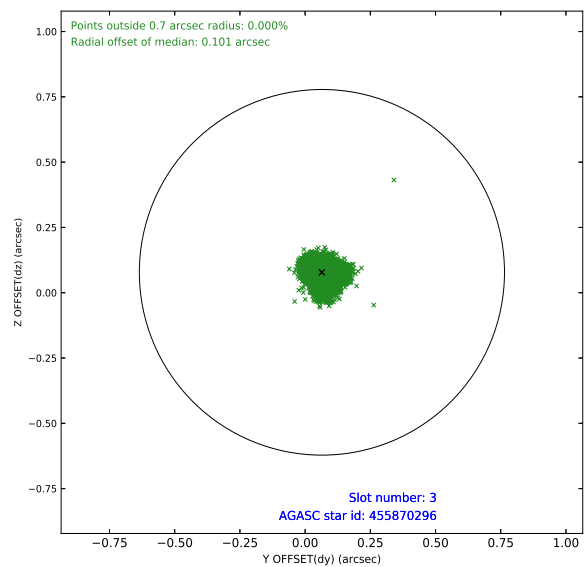
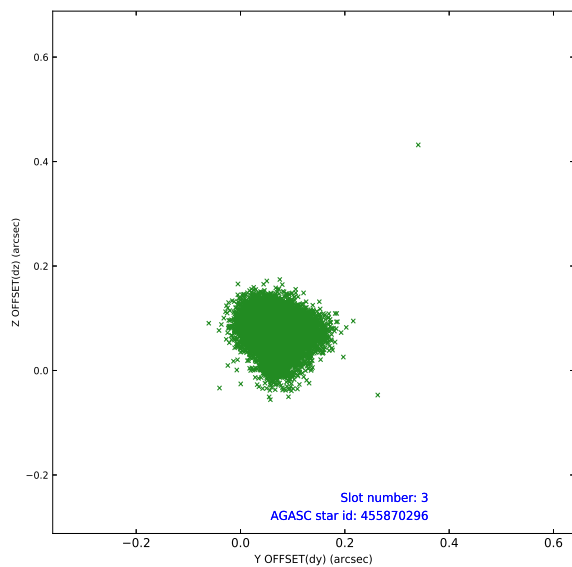
### Slot Statistics

| slot | status | used | id        | mag  | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec       | mean_y   | mean_x |
|------|--------|------|-----------|------|-------|----------|--------|--------|-------|-------|------------|-----------|----------|--------|
| 0    | FID    |      | ACIS-I-1  | 7.24 | 3952  | 1.000    | 0.046  | -0.049 | 0.023 | 0.051 | 0.000000   | 0.000000  | 933.30   | -834   |
| 1    | FID    |      | ACIS-I-5  | 7.23 | 3952  | 1.000    | -0.202 | 0.044  | 0.016 | 0.026 | 0.000000   | 0.000000  | -1814.89 | 1063   |
| 2    | FID    |      | ACIS-I-6  | 7.26 | 3952  | 1.000    | 0.066  | 0.072  | 0.013 | 0.025 | 0.000000   | 0.000000  | 398.59   | 1708   |
| 3    | GUIDE  | used | 455870296 | 7.33 | 7903  | 1.000    | 0.064  | 0.078  | 0.051 | 0.085 | 214.629779 | 52.033323 | 1477.92  | -682   |
| 4    | GUIDE  | used | 504894728 | 8.81 | 7835  | 1.000    | 0.042  | 0.090  | 0.056 | 0.094 | 213.220892 | 52.722550 | -2150.85 | 921    |
| 5    | GUIDE  | used | 505806936 | 7.01 | 7903  | 1.000    | 0.001  | -0.011 | 0.072 | 0.112 | 213.820815 | 52.535927 | -713.84  | 600    |
| 6    | GUIDE  | used | 505812376 | 7.66 | 7904  | 1.000    | -0.074 | -0.093 | 0.045 | 0.073 | 214.039537 | 52.937930 | -624.43  | 2121   |
| 7    | GUIDE  | used | 455871352 | 8.13 | 7902  | 1.000    | -0.040 | -0.062 | 0.055 | 0.092 | 215.099961 | 52.172669 | 2344.23  | 80     |

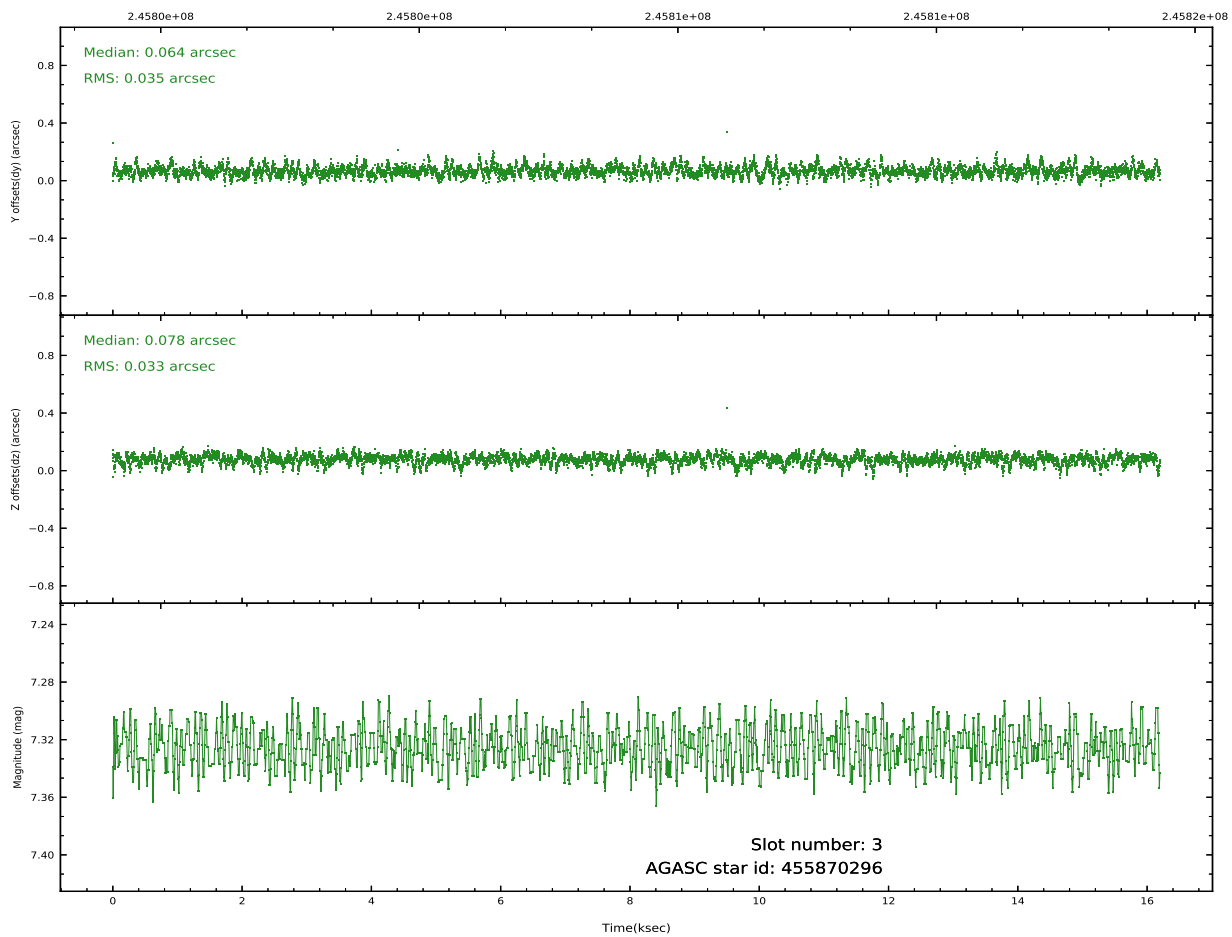
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## 2.4 Star Slots

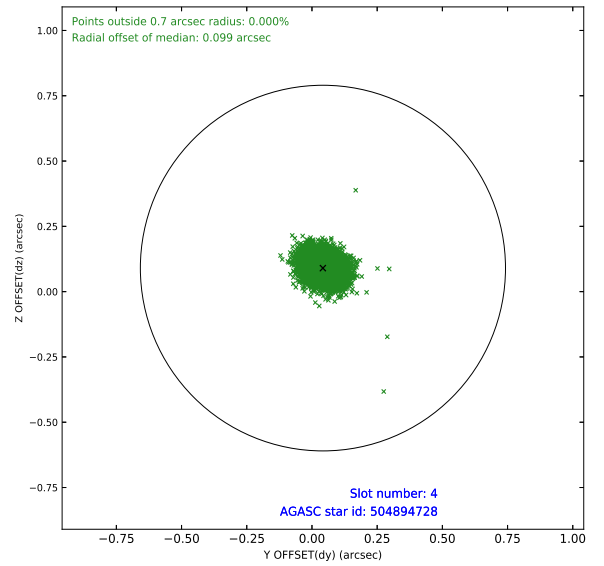
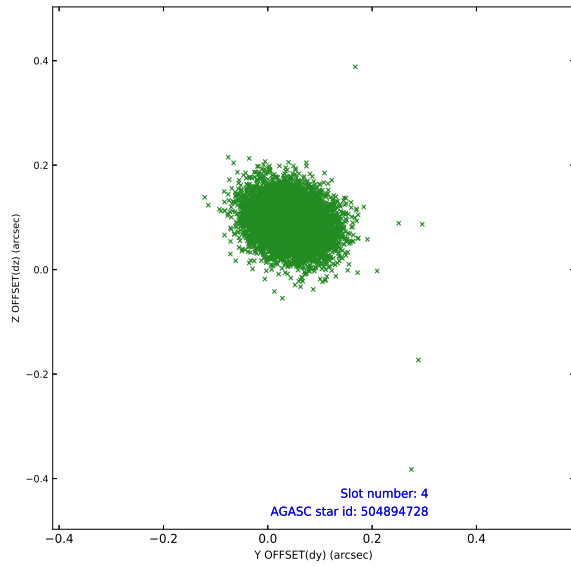
### 2.4.1 Slot 3



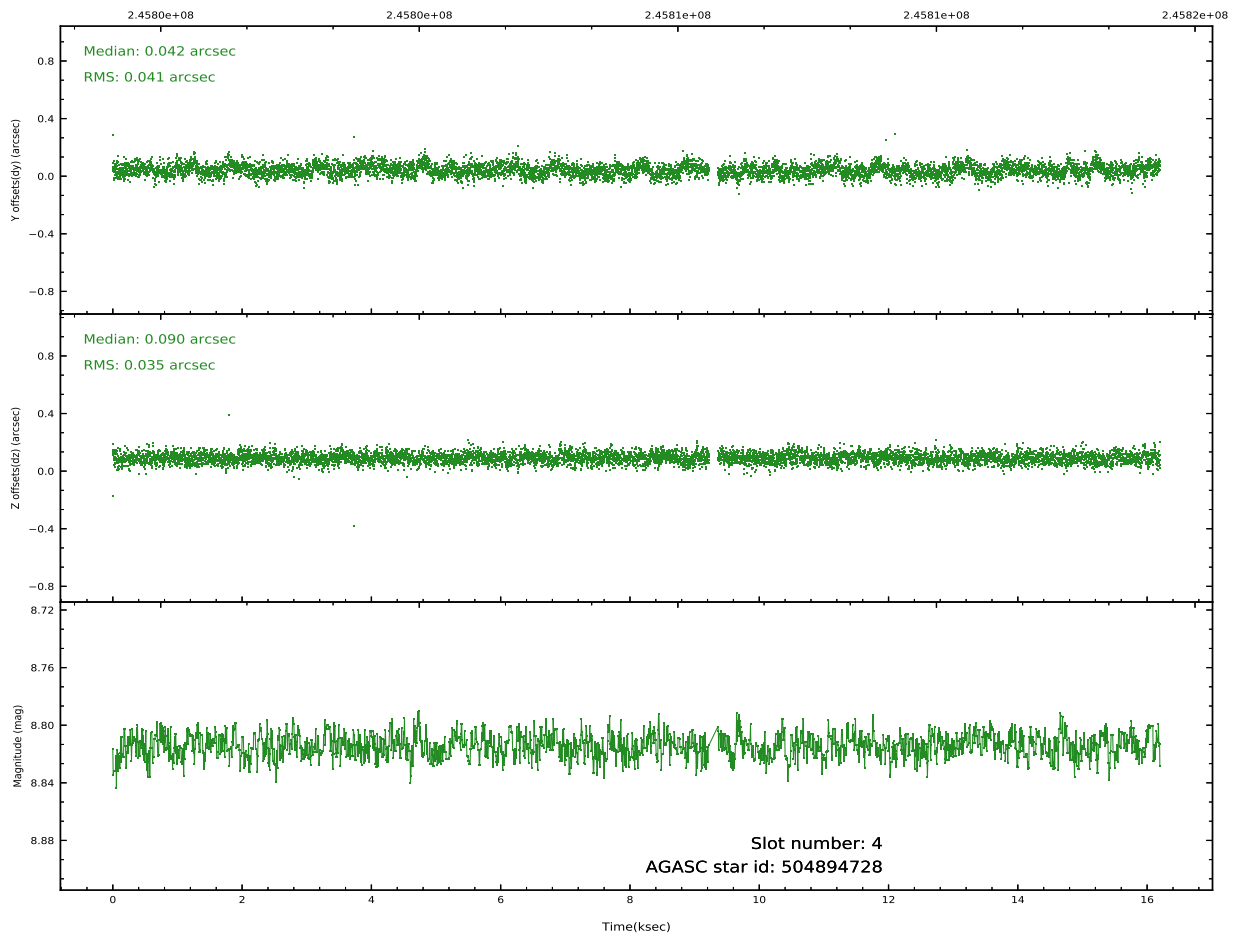
Time (s)



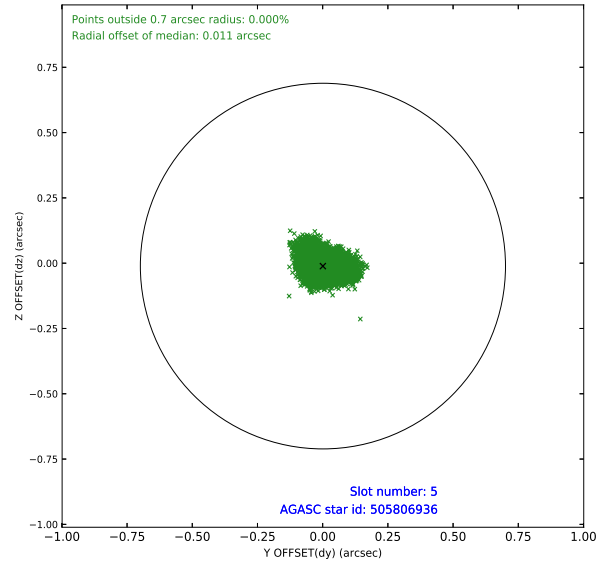
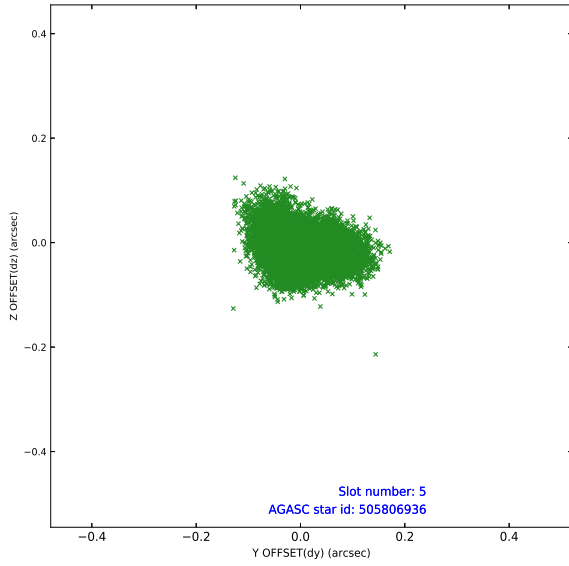
## 2.4.2 Slot 4



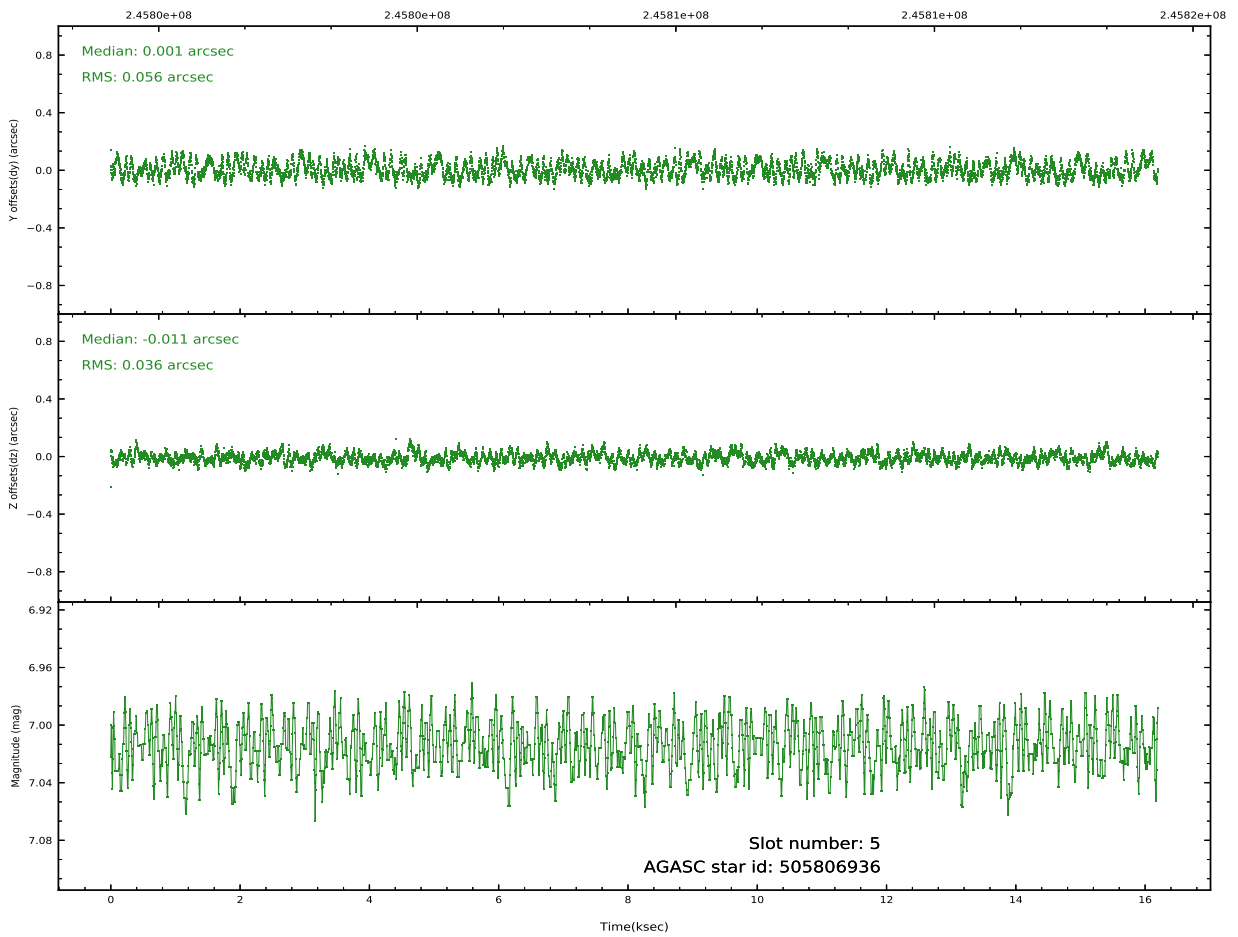
Time (s)



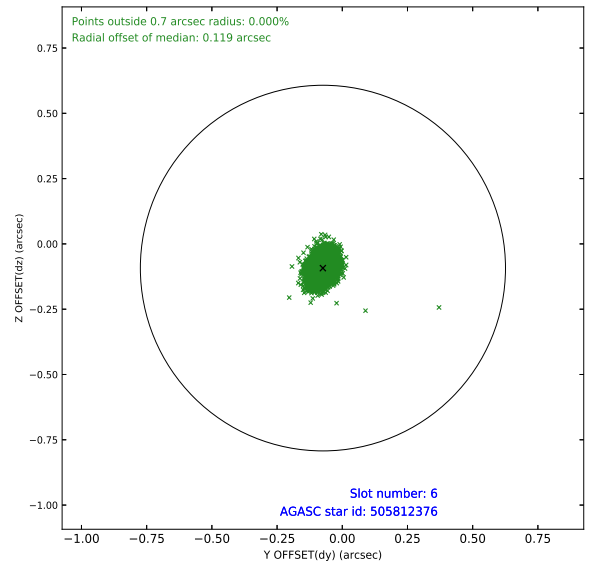
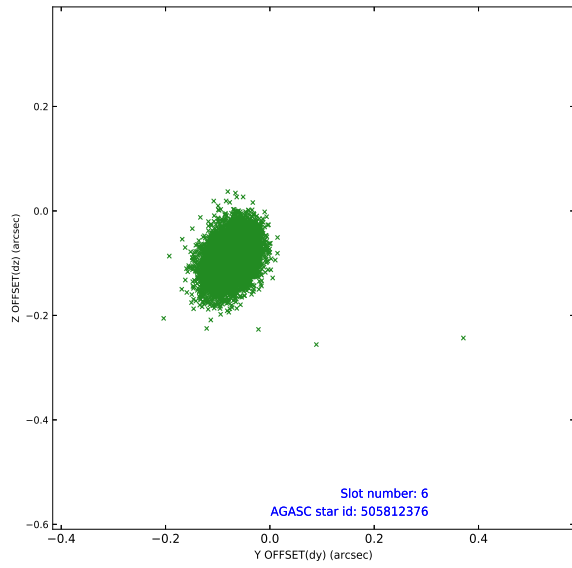
### 2.4.3 Slot 5



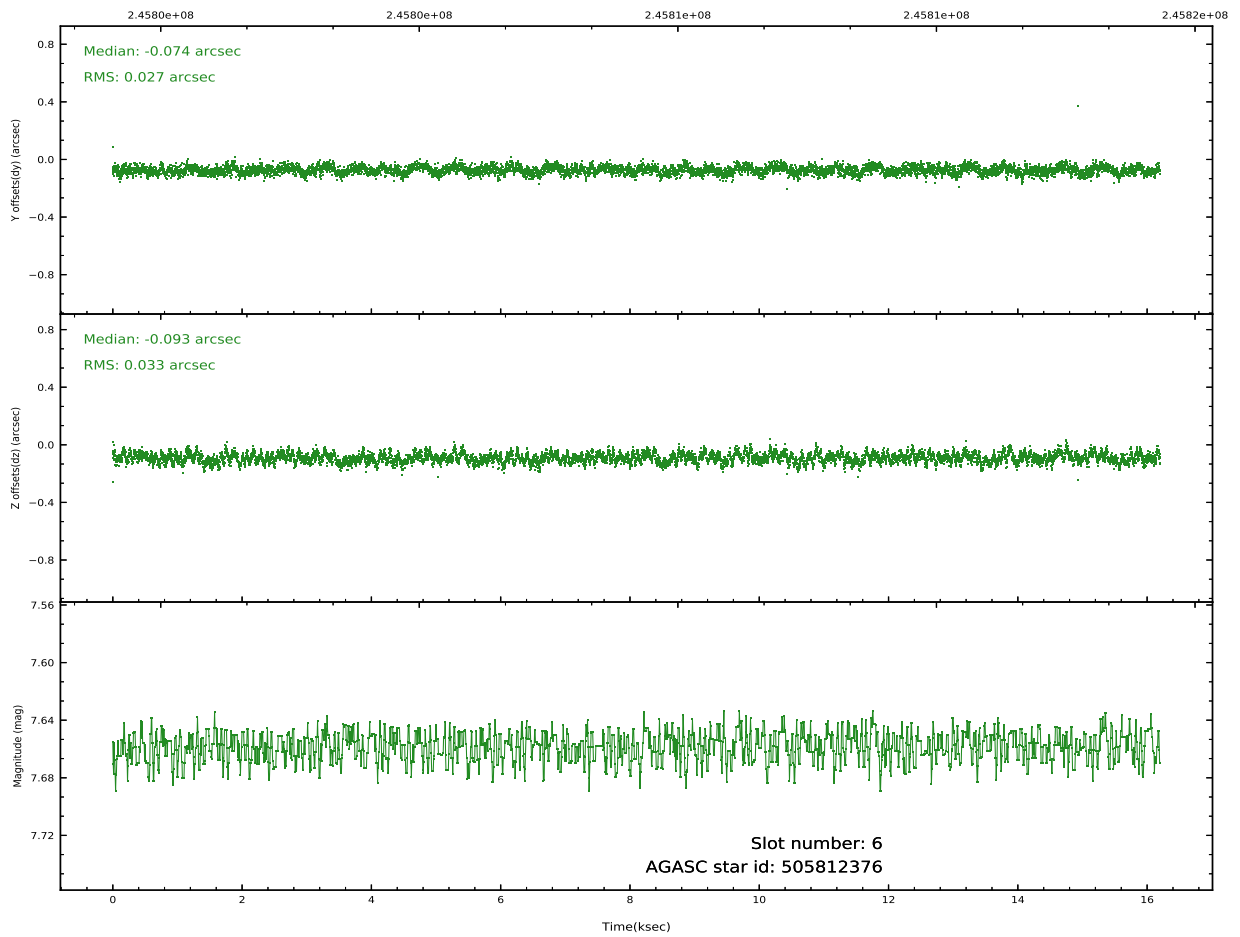
Time (s)



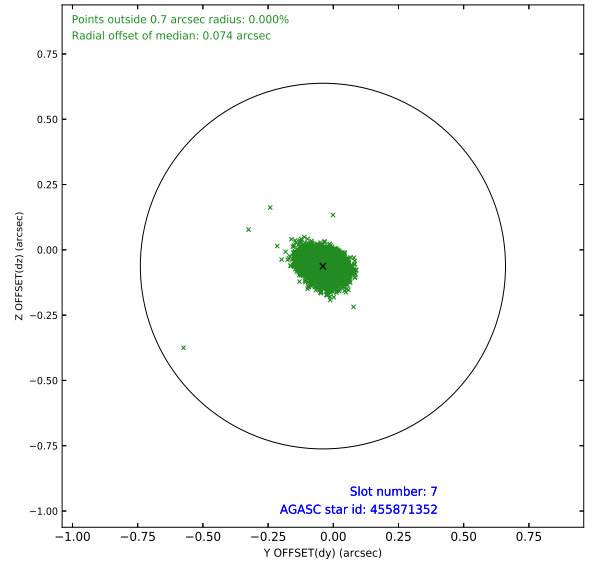
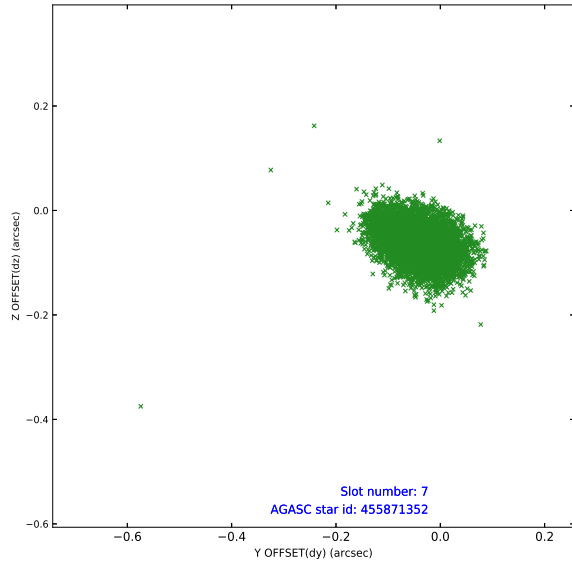
## 2.4.4 Slot 6



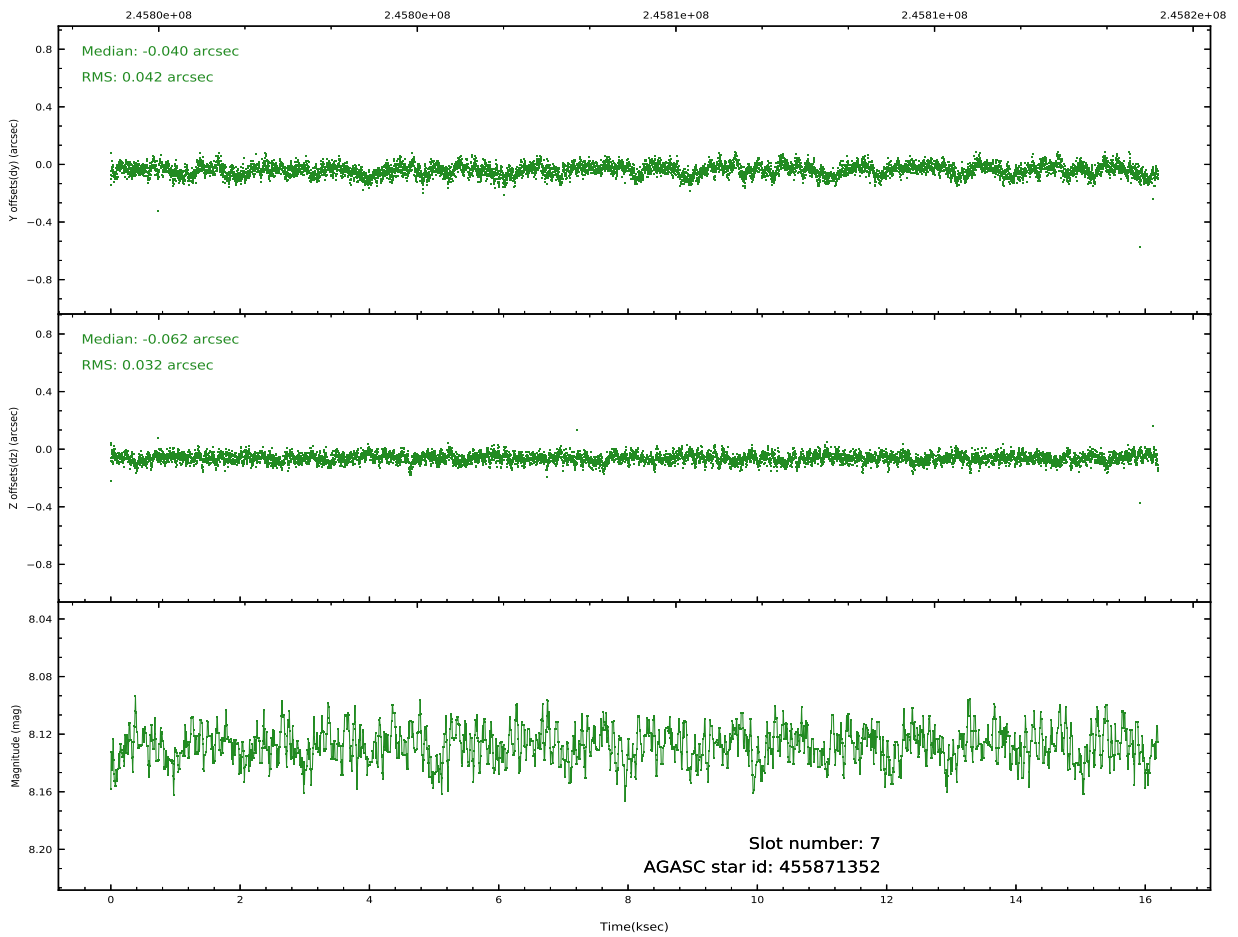
Time (s)



## 2.4.5 Slot 7

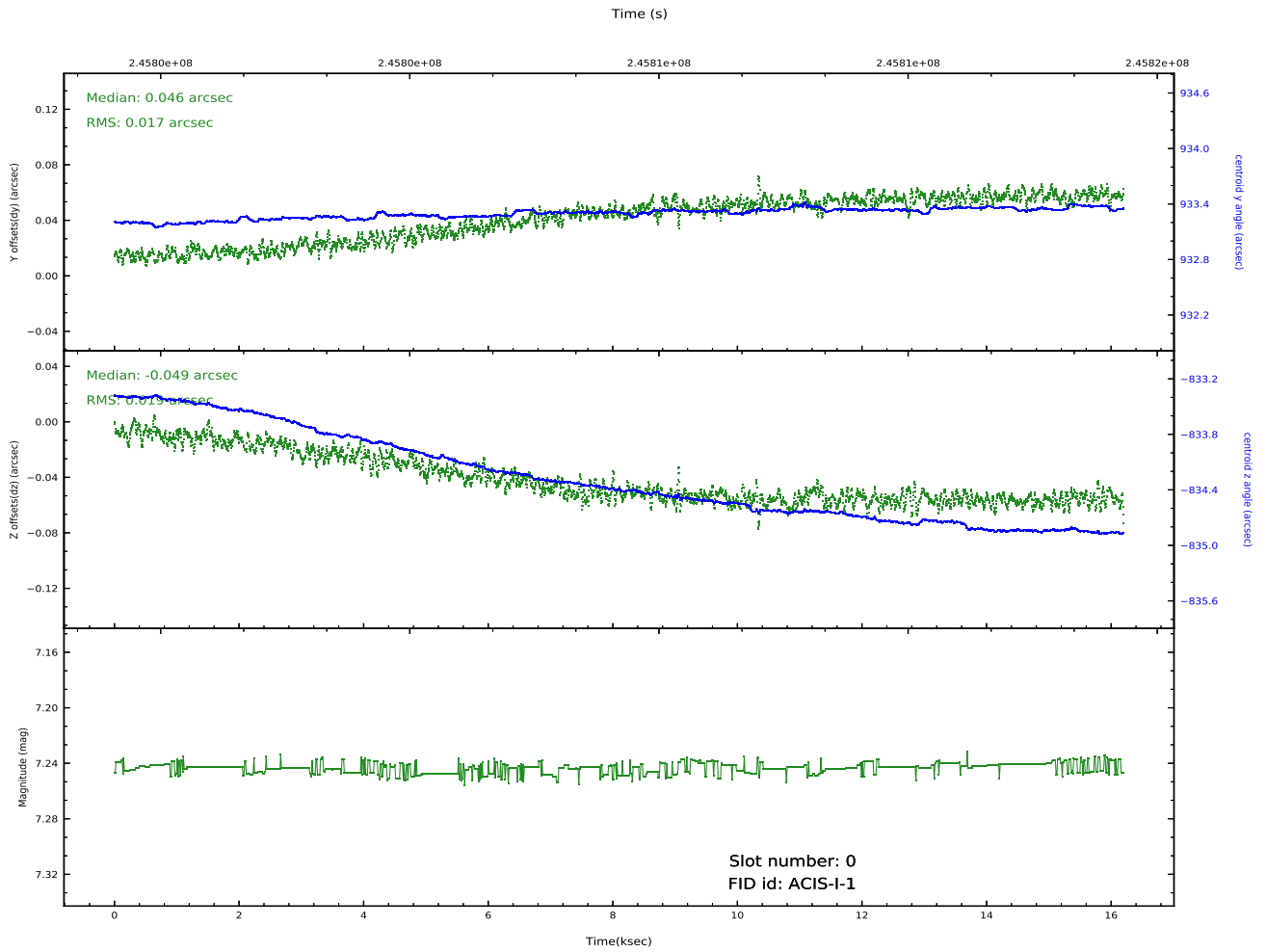
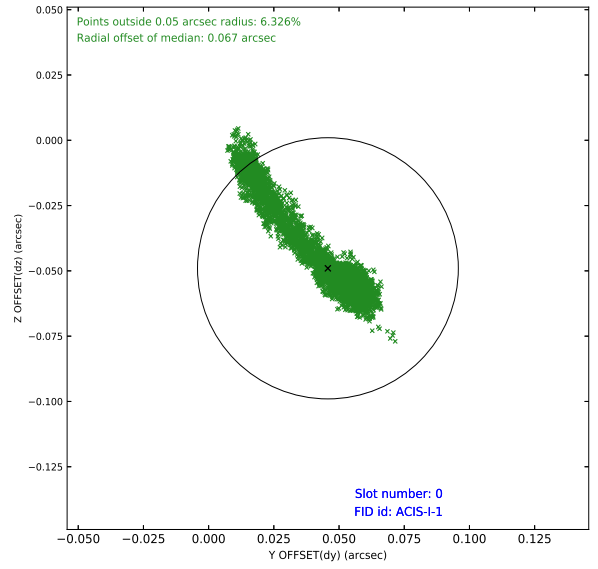
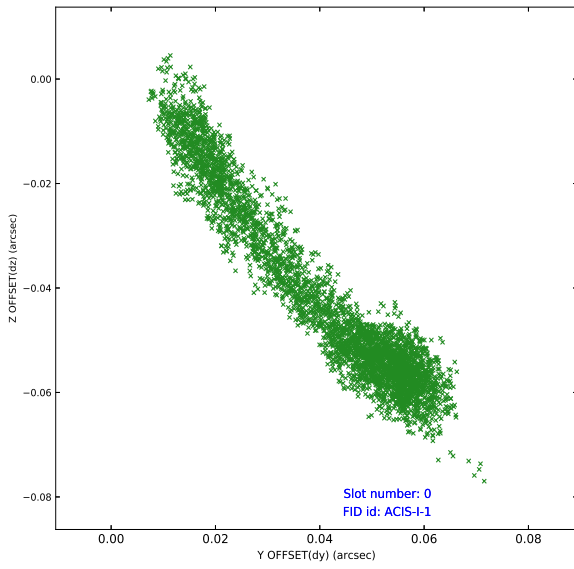


Time (s)

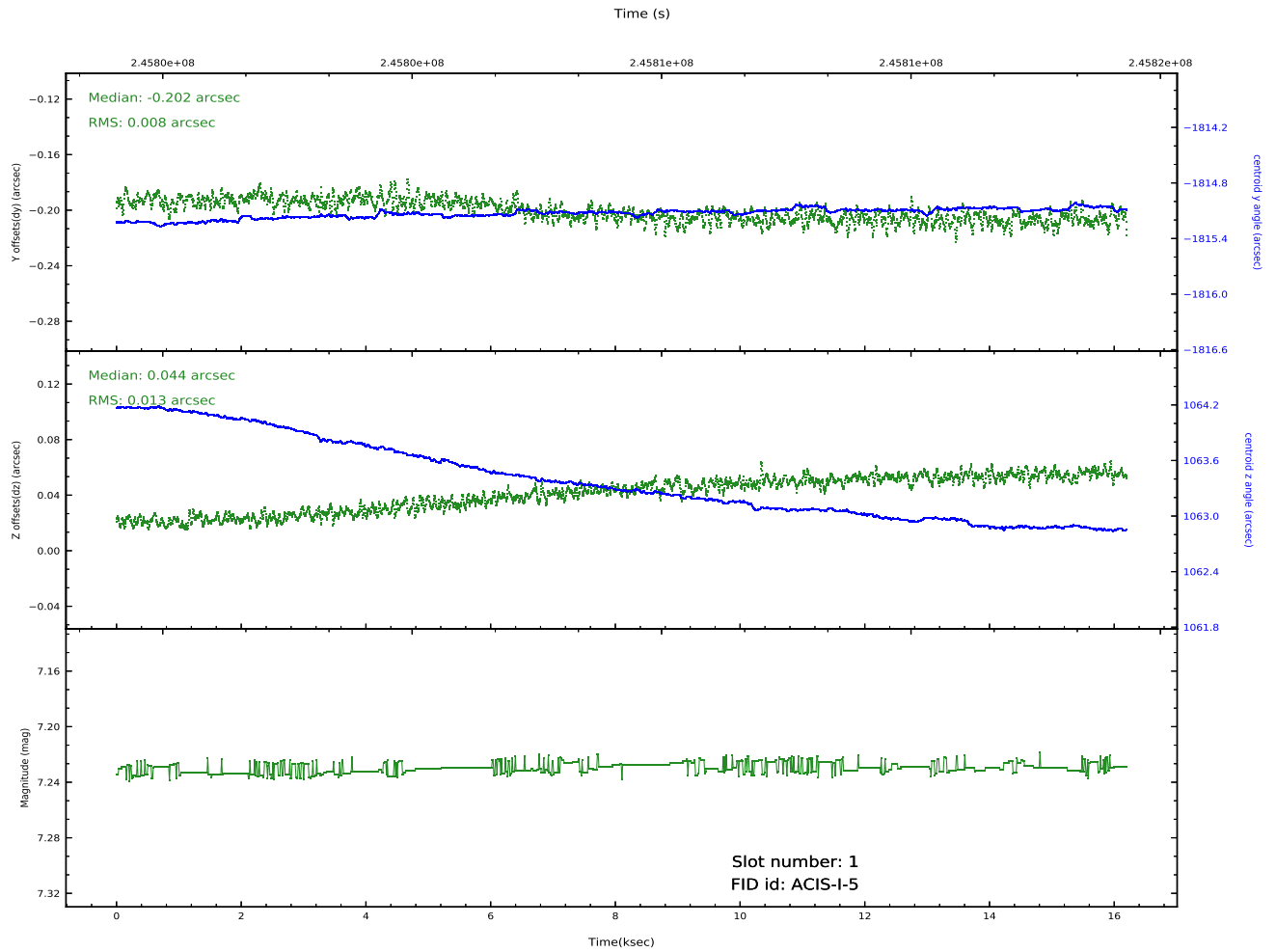
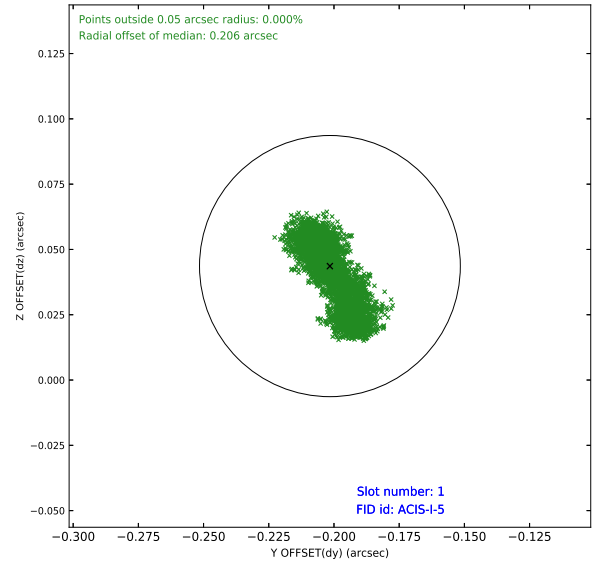
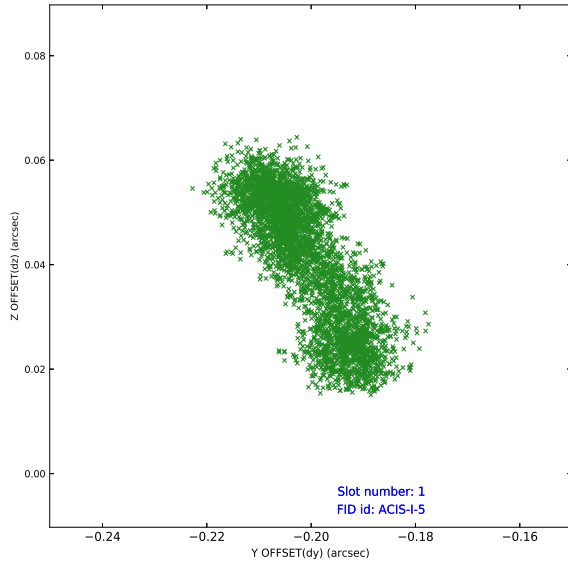


## 2.5 FID Slots

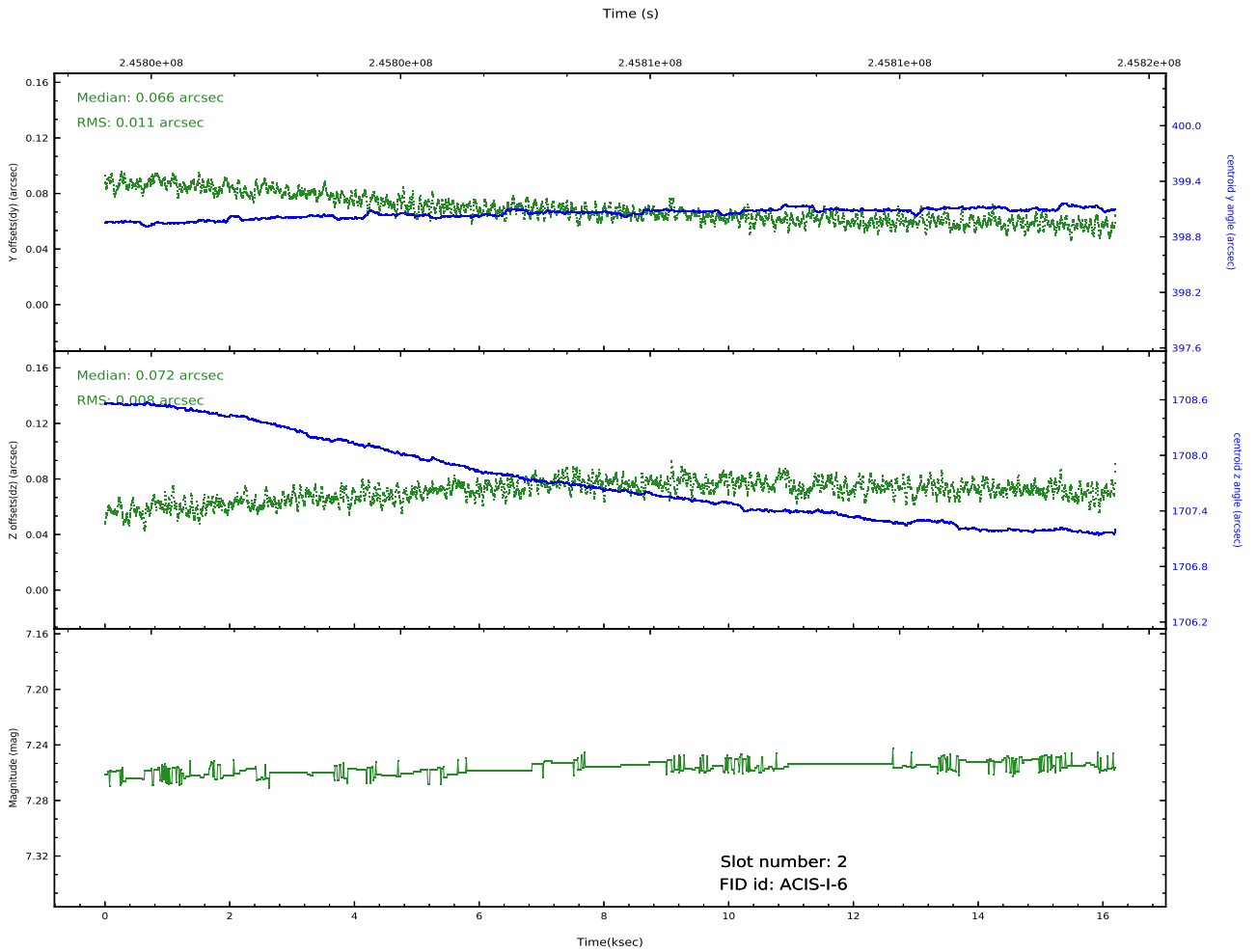
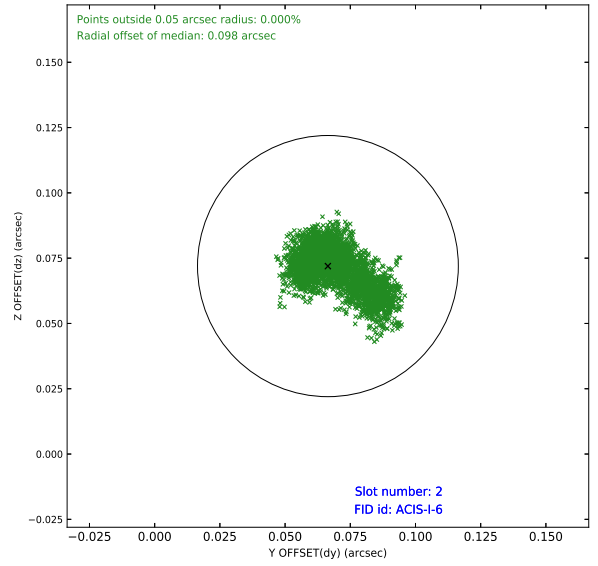
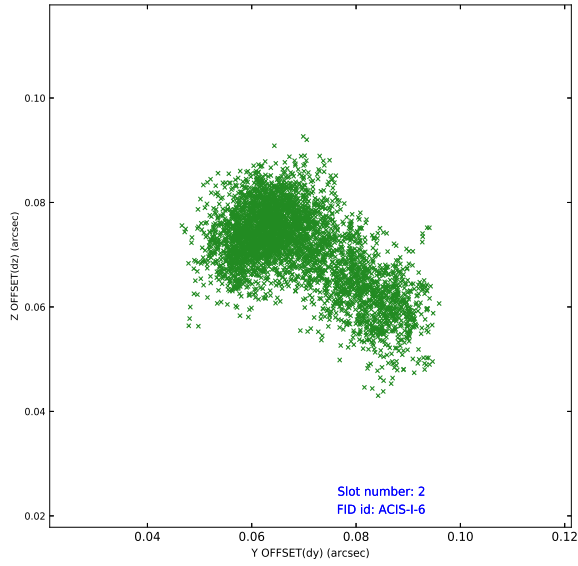
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# A Summary

## A.1 Status

|                            |               |
|----------------------------|---------------|
| V&V Scientist              | Beth Sundheim |
| V&V Date (YYYY-MM-DD)      | 2020.10.22    |
| V&V Edition                | 1             |
| V&V Disposition and Status | Repr+DD       |
| V&V Charge Time            | 16.19439      |

## A.2 Comments

SAP Team: please reprocess using replacement bias file for chip 6.

===

The bias map for CCD\_ID = 6 suffers from anomalously high bias values in an 'exacto-knife'-shaped area of the bias file. Pixels in the event data that have been bias-corrected by one of the affected bias pixels may have an apparent energy shift. While the change in energy is expected to be small (~20 eV), it depends on many parameters that have not yet been fully explored for this bias anomaly. The bias map for CCD\_ID = 6 will be recreated to remove this anomaly and the data will be reprocessed.

===

As a consequence of the DEA-A shutdown anomaly on Sep 15th (DOY258), the reported value of the ACIS FP temperature was ~1.3 degrees warmer than the actual temperature. The value for FP temperature reported in the headers of the Level 2 event file and the Mission Timeline files ARE INCORRECT by this amount for this processing. However, the temperature is corrected in the processing in order to obtain the correct temperature for the CTI correction. So the calibrated data are correct.

===

Roll constraint was met.