

# V&V Reference Report

## L2 ASCDS Version : 10.9.2

Observation 19425 - L2 Version 3  
Chandra X-Ray Center

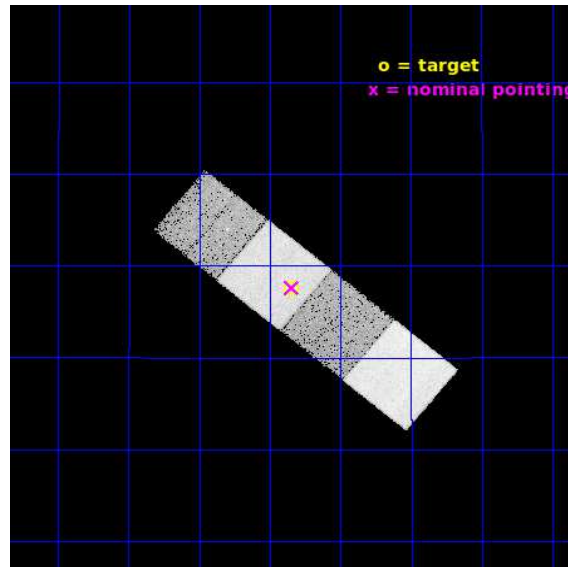
L2 Processing Date : Oct 25 2020

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# 1 Front

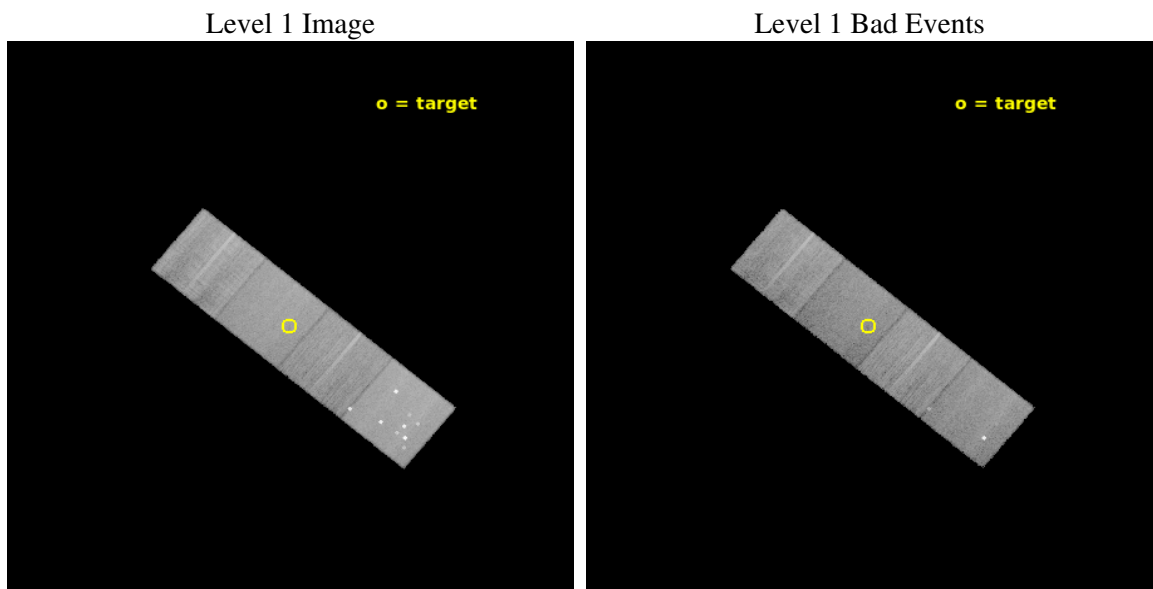
|           |                                      |                                             |
|-----------|--------------------------------------|---------------------------------------------|
| seq_num   | 601382                               | Sequence number                             |
| obs_id    | 19425                                | Observation id                              |
| title     | Spiral galaxies of the Virgo cluster | Proposal title                              |
| observer  | Roberto Soria                        | Principal investigator                      |
| object    | NGC 4390                             | Source name                                 |
| dtcycle   | 0                                    | &#160                                       |
| cycle     | P                                    | events from which exps?<br>Prim/Second/Both |
| ra_targ   | 186.46125                            | Observer's specified target RA [deg]        |
| dec_targ  | 10.459056                            | Observer's specified target Dec [deg]       |
| ra_nom    | 186.46108123308                      | Nominal RA [deg]                            |
| dec_nom   | 10.460315162126                      | Nominal Dec [deg]                           |
| roll_nom  | 219.45101556861                      | Nominal Roll [deg]                          |
| revision  | 3                                    | Processing version of data                  |
| ontime    | 15562.000119805                      | Sum of GTIs [s]                             |
| liveltime | 15358.671131662                      | Livetime [s]                                |
| ontime5   | 15562.000119805                      | Sum of GTIs [s]                             |
| ontime6   | 15562.000119805                      | Sum of GTIs [s]                             |
| ontime7   | 15562.000119805                      | Sum of GTIs [s]                             |
| ontime8   | 15555.717928767                      | Sum of GTIs [s]                             |
| l2events  | 170112                               | Number of level 2 events                    |



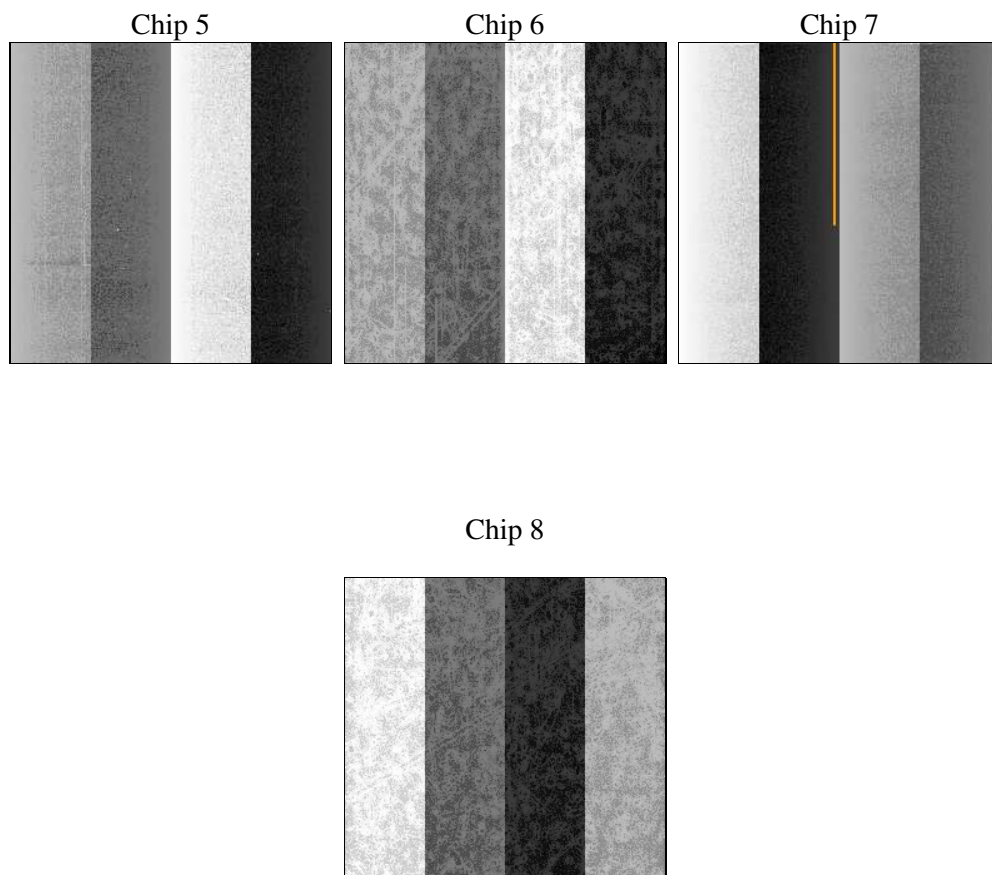
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 15500.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.9.2              | Processing system revision     | ontime         | 15562.000119805 | Sum of GTIs [s]                         |
| caldsver | 4.9.3               | &#160                          | ontime5        | 15562.000119805 | Sum of GTIs [s]                         |
| date     | 2020-10-25T12:29:49 | Date and time of file creation | ontime6        | 15562.000119805 | Sum of GTIs [s]                         |
| revision | 3                   | Processing version of data     | ontime7        | 15562.000119805 | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 15555.717928767 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 640777          | Number of level 1 events                |

### 2.1.4 Events

|                 | ccd 5  | ccd 6  | ccd 7  | ccd 8  |
|-----------------|--------|--------|--------|--------|
| level 1 events  | 208363 | 126861 | 149591 | 155962 |
| rejected events | 101663 | 113743 | 85394  | 116627 |
| rejected %      | 48%    | 89%    | 57%    | 74%    |

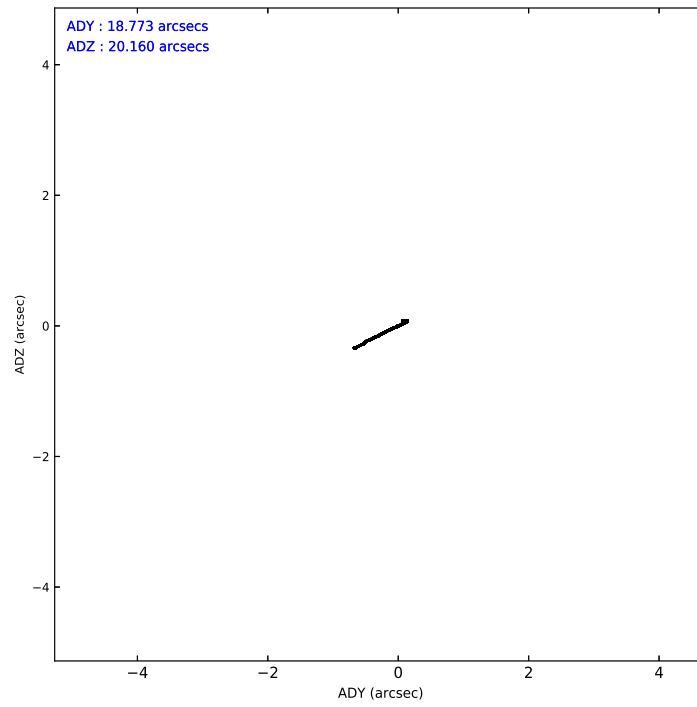
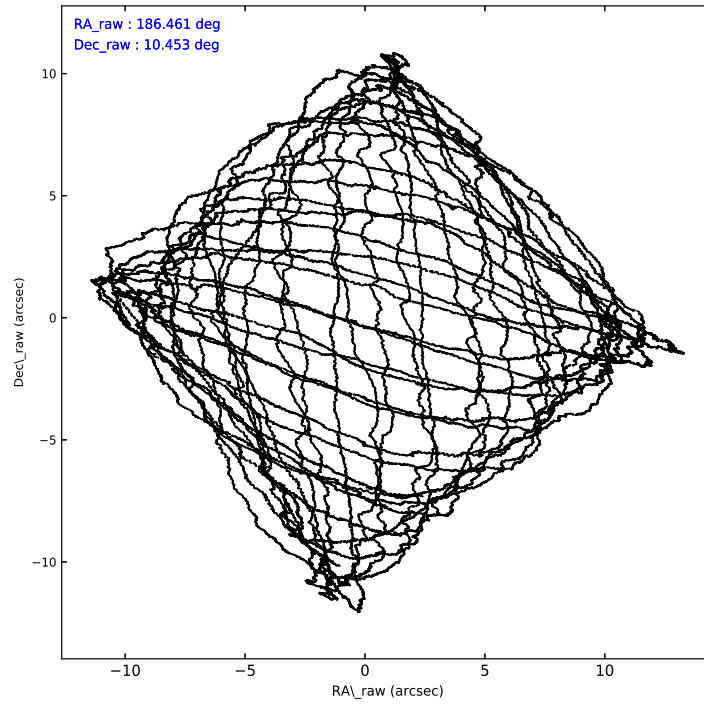
|                | ccd 5 | ccd 6  | ccd 7 | ccd 8  |
|----------------|-------|--------|-------|--------|
| grade 0 events | 20182 | 3939   | 5394  | 10905  |
|                | 9%    | 3%     | 3%    | 6%     |
| grade 1 events | 715   | 65     | 231   | 99     |
|                | 0%    | 0%     | 0%    | 0%     |
| grade 2 events | 29635 | 3356   | 13288 | 9849   |
|                | 14%   | 2%     | 8%    | 6%     |
| grade 3 events | 3019  | 1168   | 5181  | 4007   |
|                | 1%    | 0%     | 3%    | 2%     |
| grade 4 events | 3716  | 1211   | 5018  | 3674   |
|                | 1%    | 0%     | 3%    | 2%     |
| grade 5 events | 12553 | 5107   | 14586 | 7967   |
|                | 6%    | 4%     | 9%    | 5%     |
| grade 6 events | 50198 | 3449   | 35330 | 10906  |
|                | 24%   | 2%     | 23%   | 6%     |
| grade 7 events | 88345 | 108566 | 70563 | 108555 |
|                | 42%   | 85%    | 47%   | 69%    |

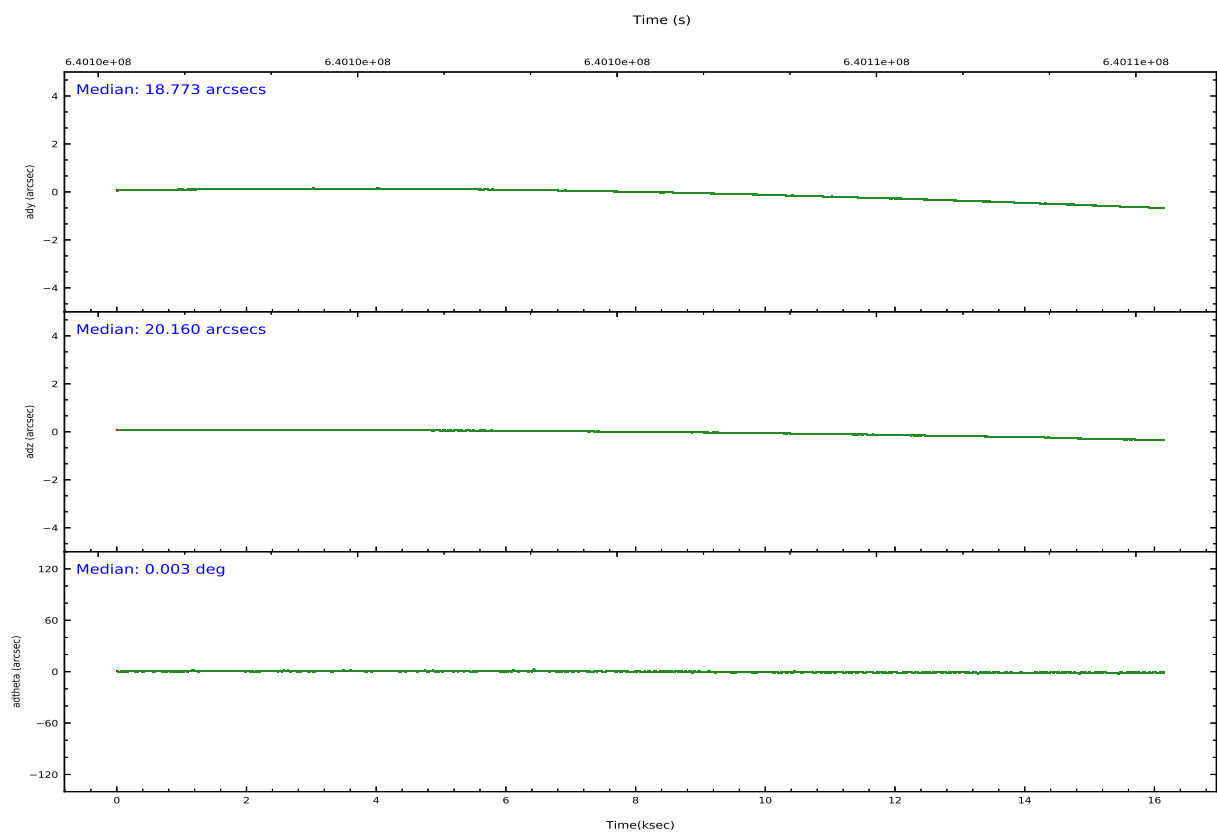
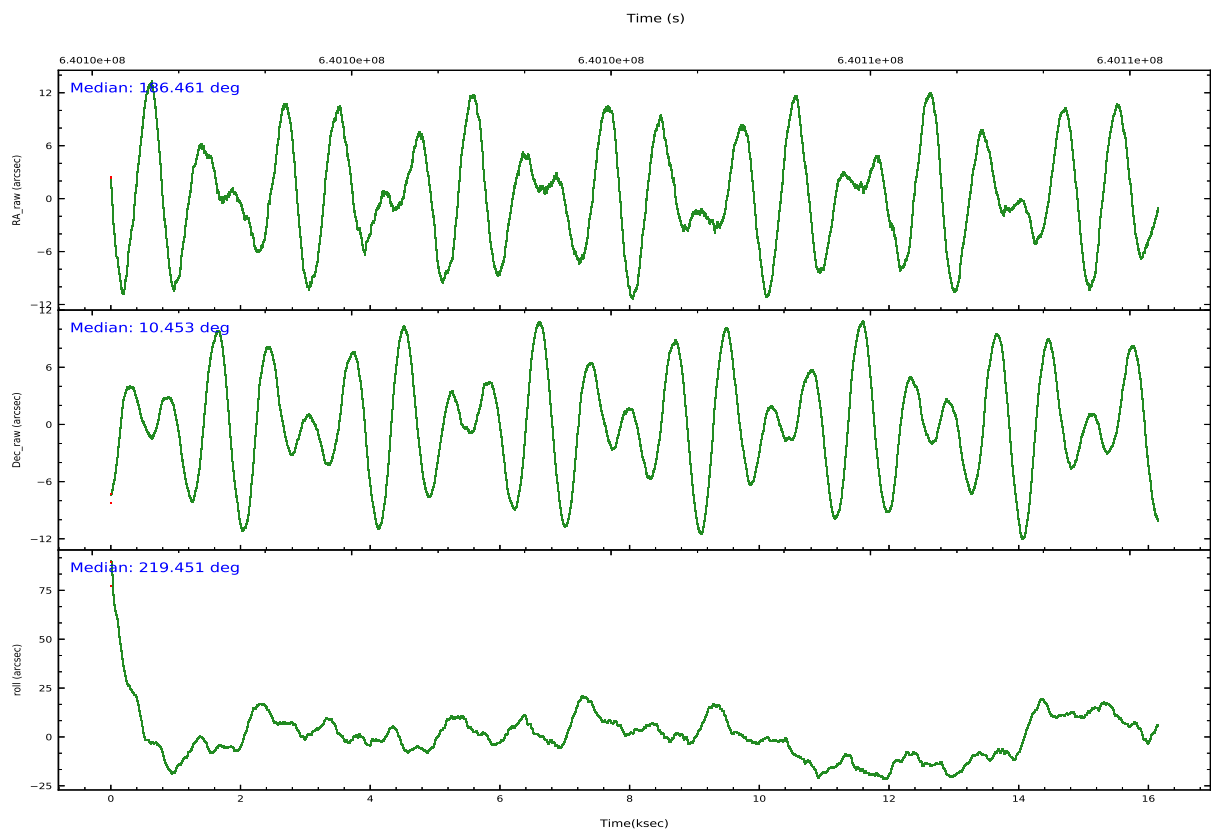


## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar version number                 | 8         | 8       |
| Detector                          | ACIS-5678           | ACIS-5678            | 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                 | 186.470092          | 186.46108123308      | Subarray requested                    | NONE      | NONE    |
| [deg] Pointing Dec                | 10.478192           | 10.460315162126      | Alternating exposures requested       | N         | N       |
| [deg] Pointing Roll               | 219.317238          | 219.45101556861      | [s] Primary exposure time             | 0.000000  | 3.1     |
| [mm] SIM focus pos                | -0.684267           | -0.6828225247311905  |                                       |           |         |
| [mm] SIM defocus                  | 0                   | 0.001444936568705701 |                                       |           |         |
| [mm] SIM translation stage pos    | -190.132523         | -190.1425803651734   |                                       |           |         |
| [mm] SIM translation stage offset | 0                   | 0.01005778216563158  |                                       |           |         |
| [s] Observation start time (MET)  | 640096935.184000    | 640095822.86654      |                                       |           |         |
| Observation start date            | 2018-04-14T12:41:06 | 2018-04-14T12:23:42  |                                       |           |         |
| [s] Observation end time (MET)    | 640112435.184000    | 640113120.76756      |                                       |           |         |
| Observation end date              | 2018-04-14T16:59:26 | 2018-04-14T17:12:00  |                                       |           |         |
| Read mode                         | TIMED               | TIMED                |                                       |           |         |

## 2.3 Aspect



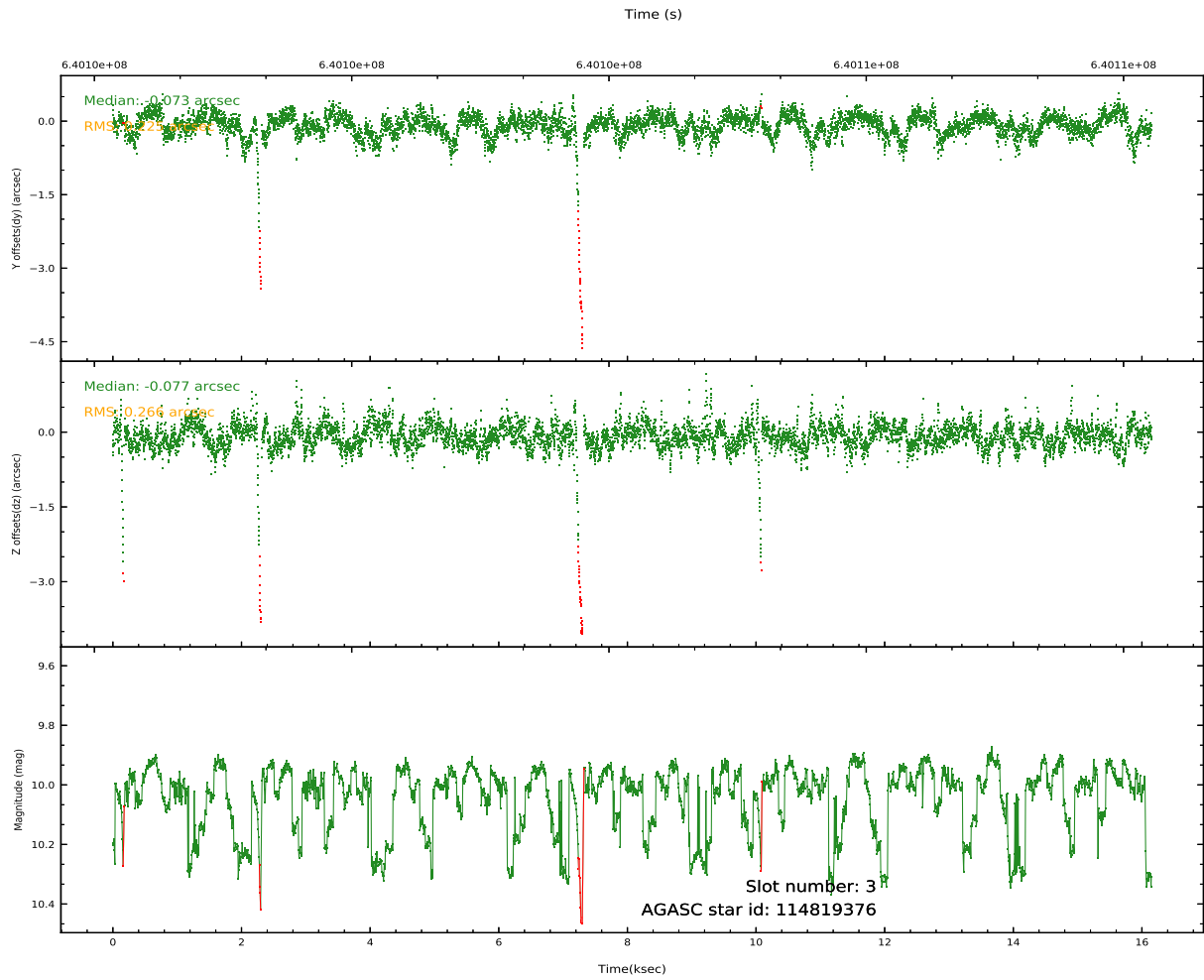
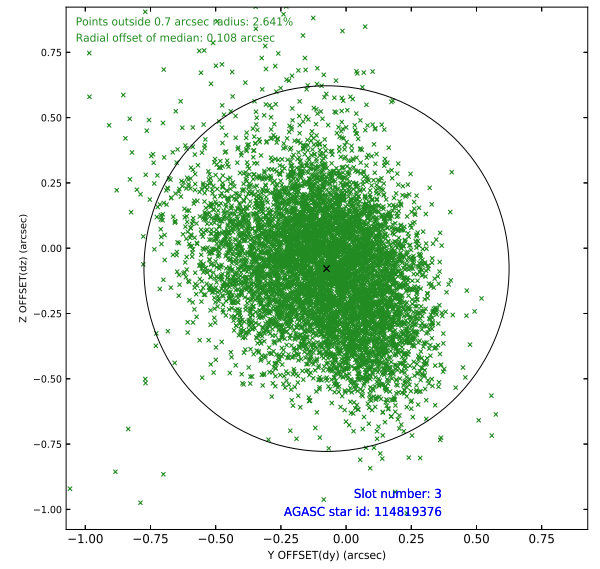
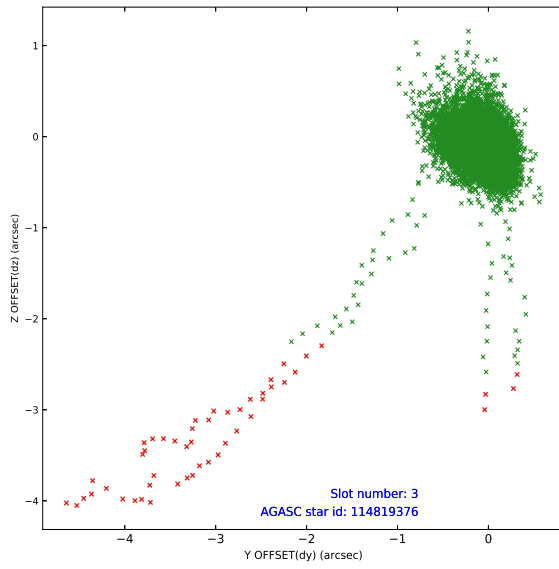


Slot Statistics

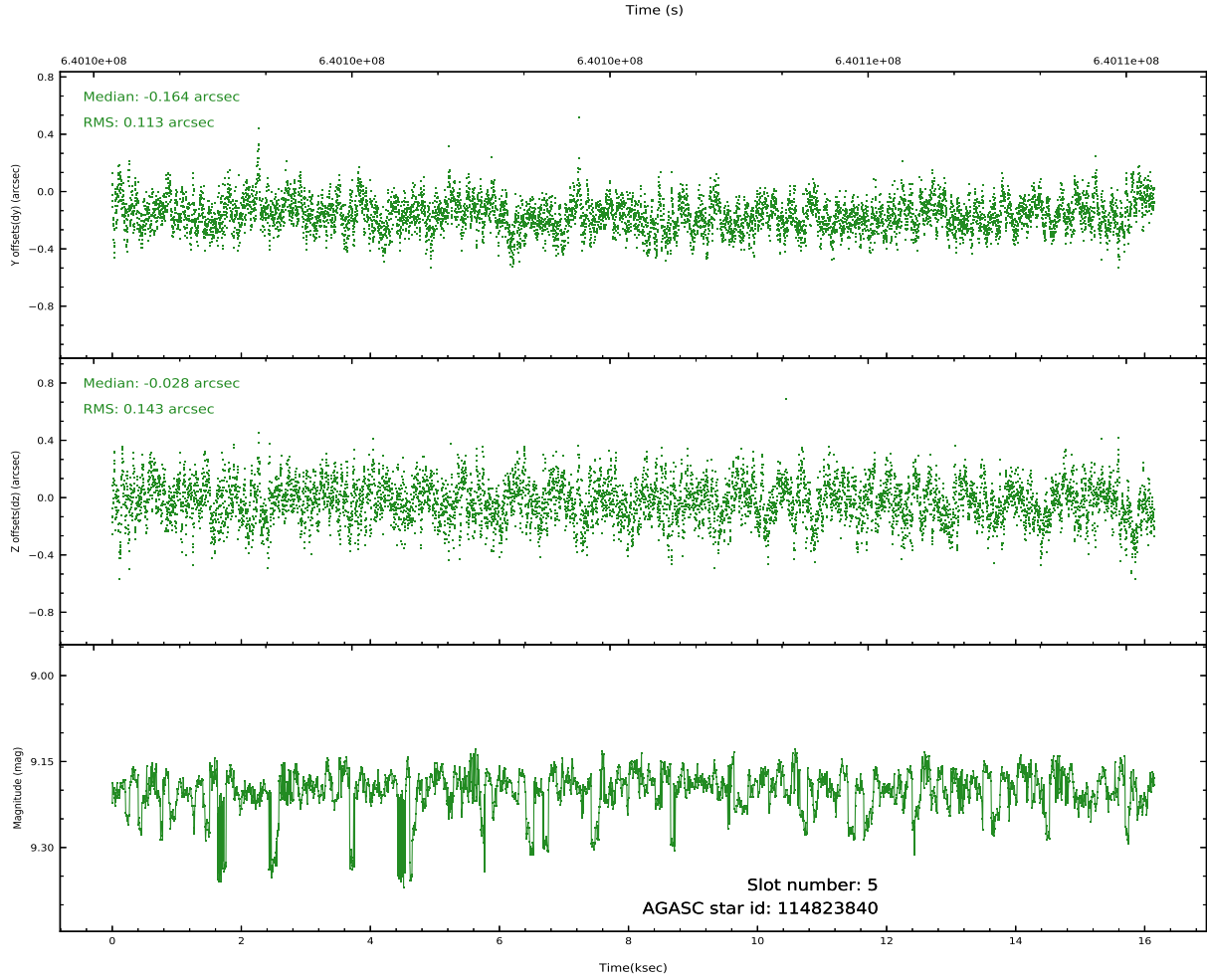
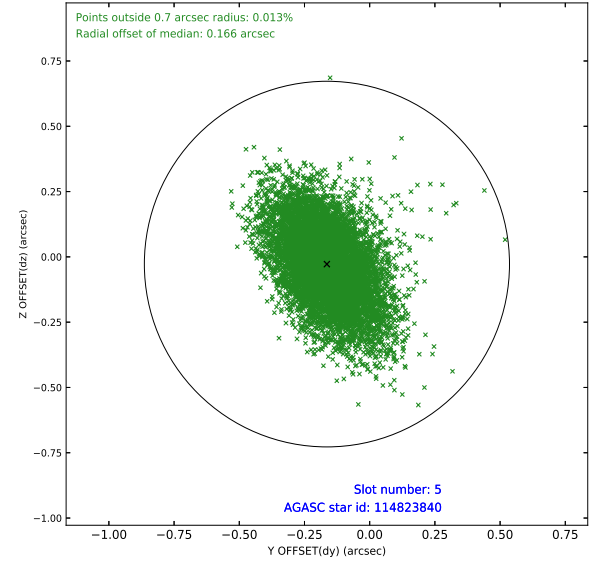
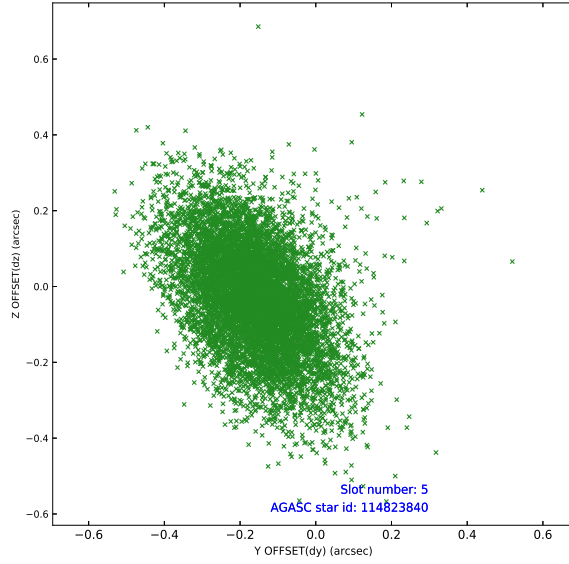
| pt | status  | used | id        | mag   | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec       | mean_y   | mea   |
|----|---------|------|-----------|-------|-------|----------|--------|--------|-------|-------|------------|-----------|----------|-------|
| 0  | FID     |      | ACIS-S-2  | 7.12  | 3940  | 1.000    | 0.102  | -0.096 | 0.009 | 0.015 | 0.000000   | 0.000000  | -771.85  | -1741 |
| 1  | FID     |      | ACIS-S-4  | 7.22  | 3940  | 1.000    | 0.160  | -0.023 | 0.007 | 0.012 | 0.000000   | 0.000000  | 2141.59  | 166   |
| 2  | FID     |      | ACIS-S-5  | 7.21  | 3940  | 1.000    | -0.294 | 0.128  | 0.009 | 0.016 | 0.000000   | 0.000000  | -1824.52 | 160   |
| 3  | GUIDE   | used | 114819376 | 10.01 | 7675  | 0.994    | -0.073 | -0.077 | 0.329 | 0.578 | 186.227227 | 10.265992 | 1149.97  | 46    |
| 4  | OMITTED |      |           | 0.00  | 0     | 0.000    | 0.000  | 0.000  | 0.000 | 0.000 | 0.000000   | 0.000000  | 0.00     | 0     |
| 5  | GUIDE   | used | 114823840 | 9.20  | 7871  | 1.000    | -0.164 | -0.028 | 0.188 | 0.327 | 186.195871 | 10.717151 | 208.04   | -1279 |
| 6  | GUIDE   | used | 114823912 | 9.84  | 7820  | 1.000    | 0.237  | -0.000 | 0.346 | 0.558 | 185.751629 | 10.448807 | 2034.43  | -1531 |
| 7  | GUIDE   | used | 114957648 | 9.53  | 7862  | 1.000    | 0.030  | 0.127  | 0.229 | 0.395 | 186.459555 | 10.641928 | -340.96  | -480  |

## 2.4 Star Slots

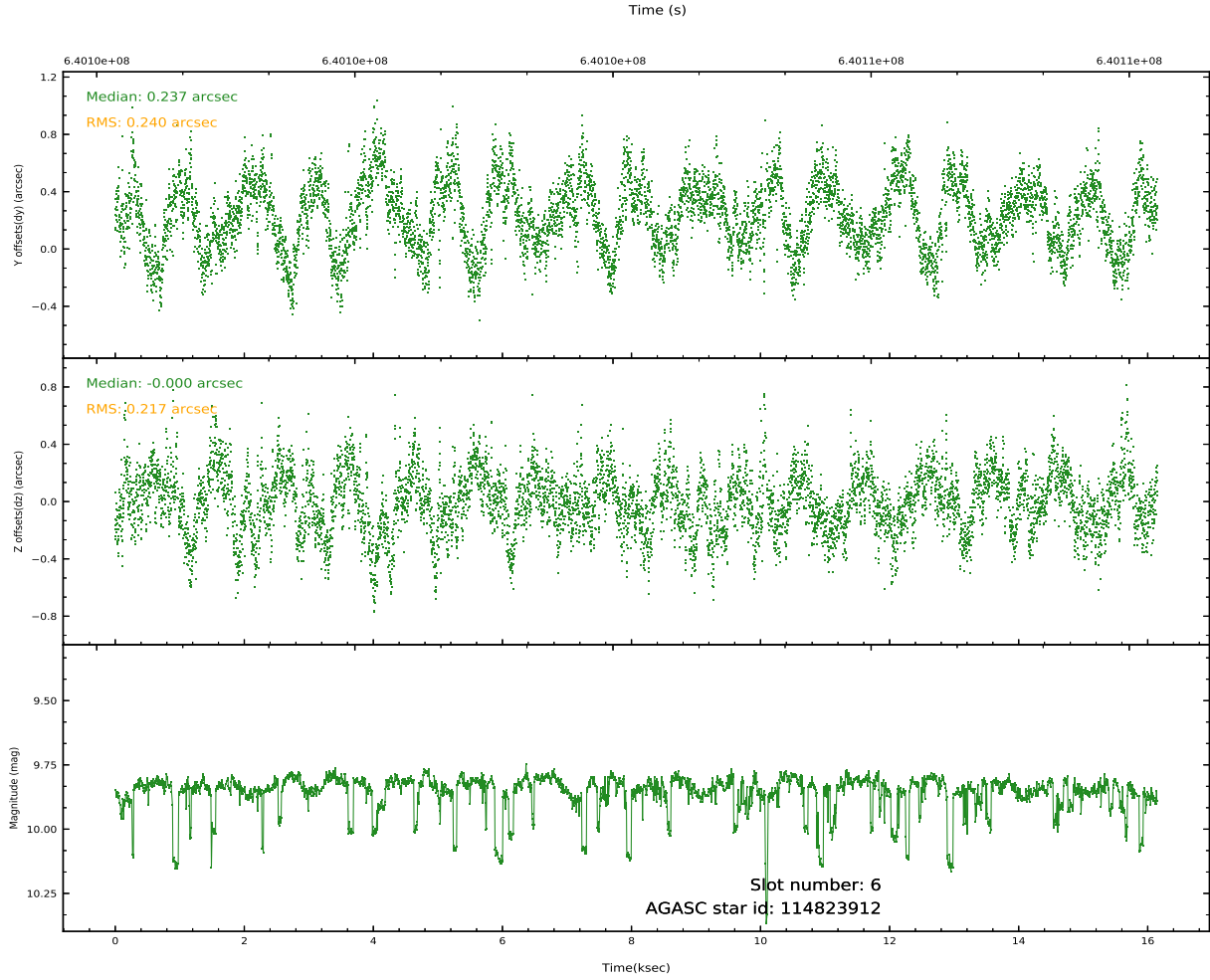
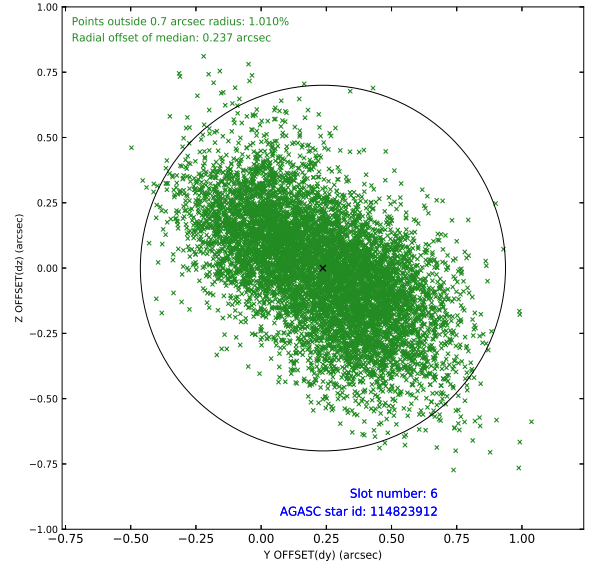
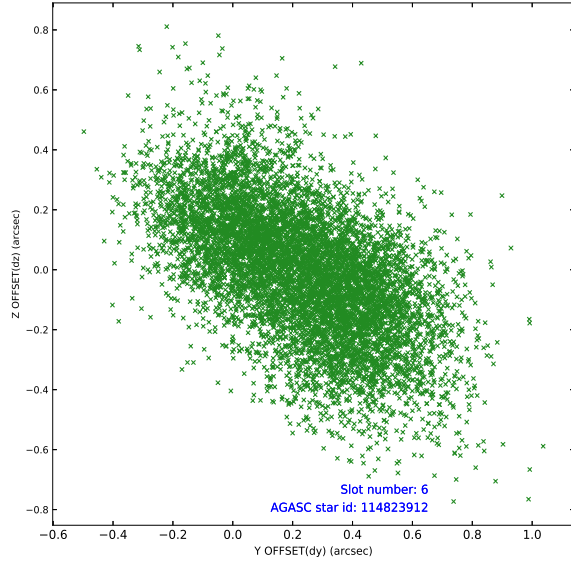
### 2.4.1 Slot 3



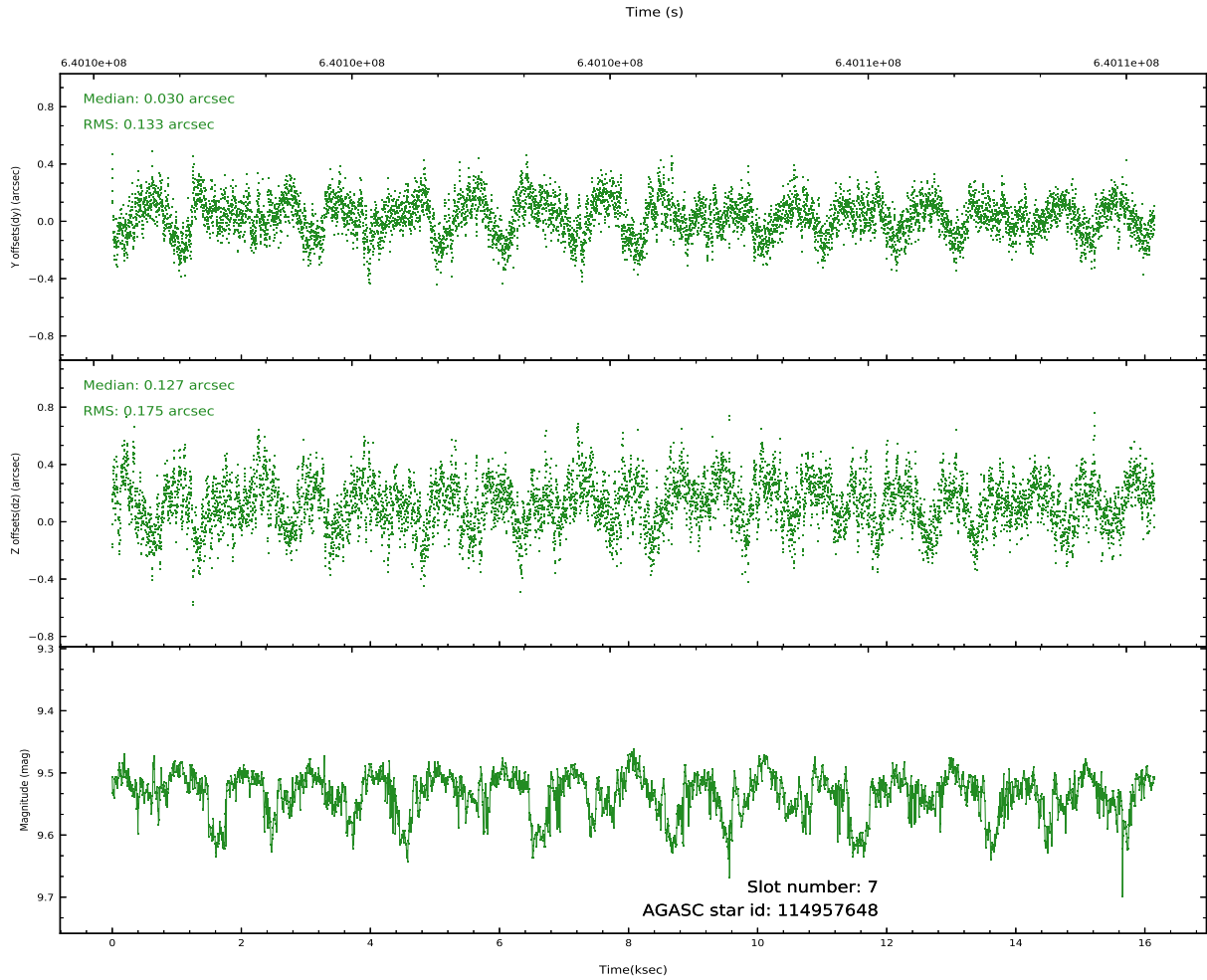
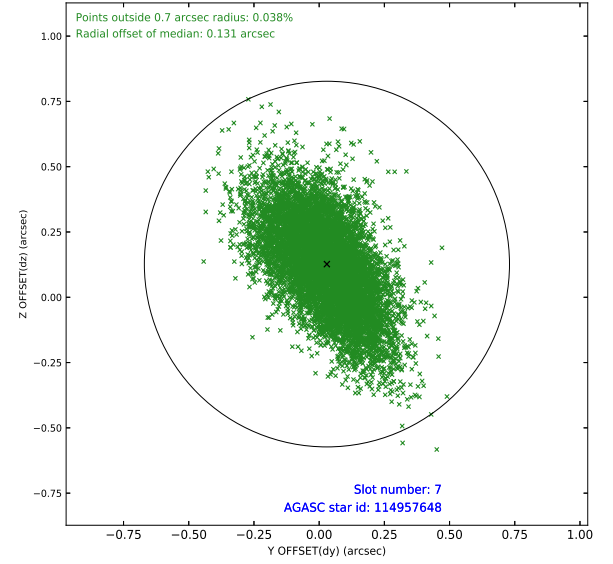
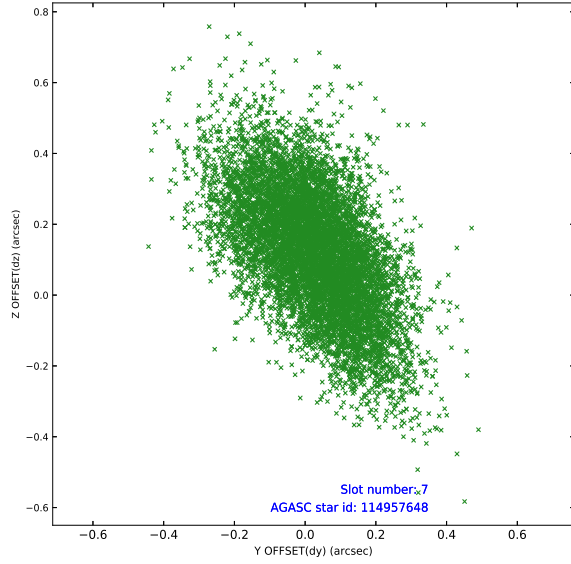
## 2.4.2 Slot 5



### 2.4.3 Slot 6



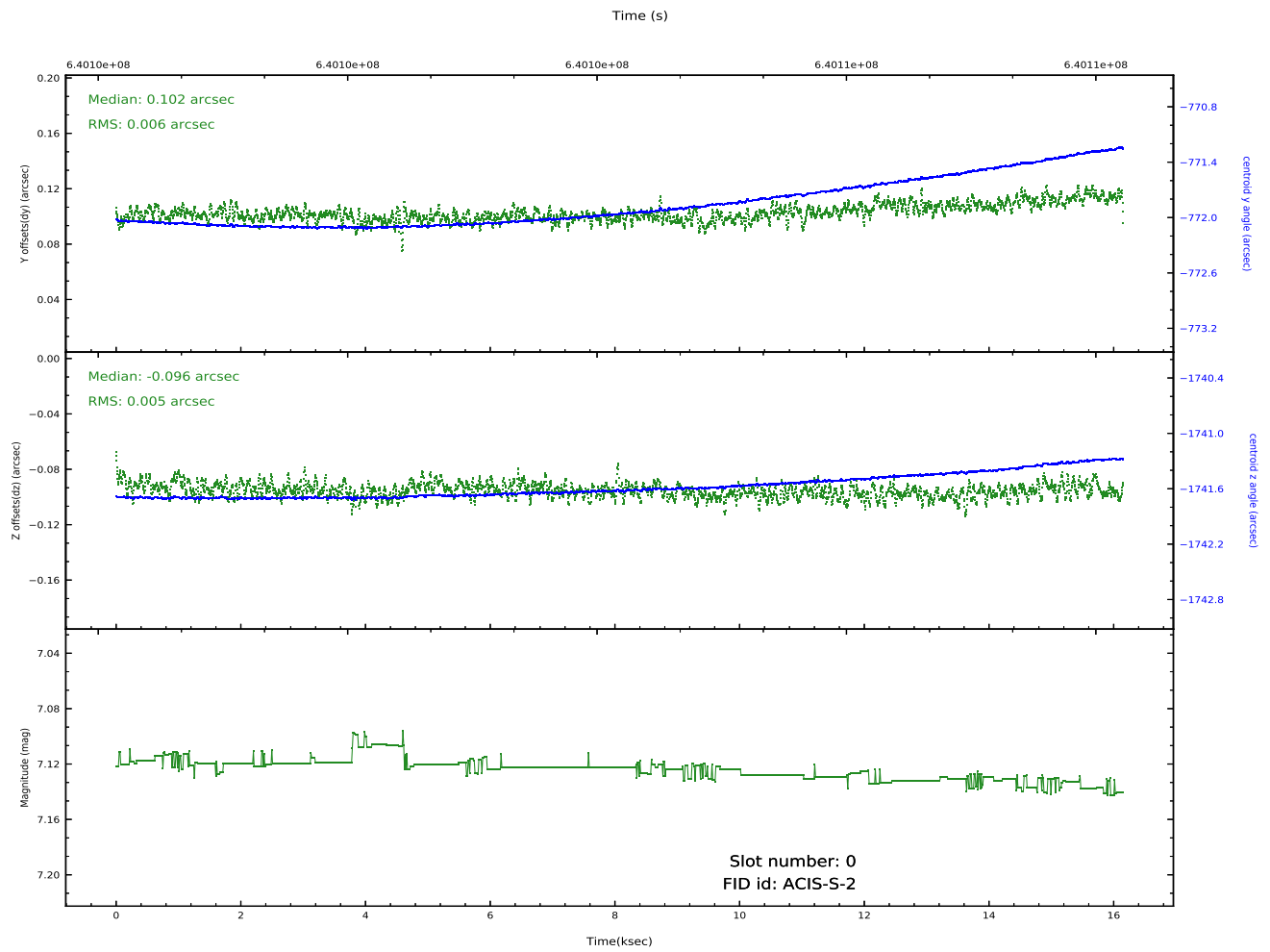
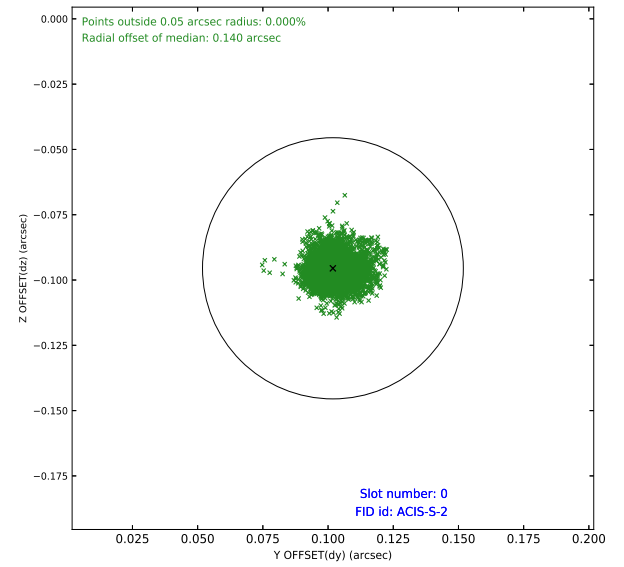
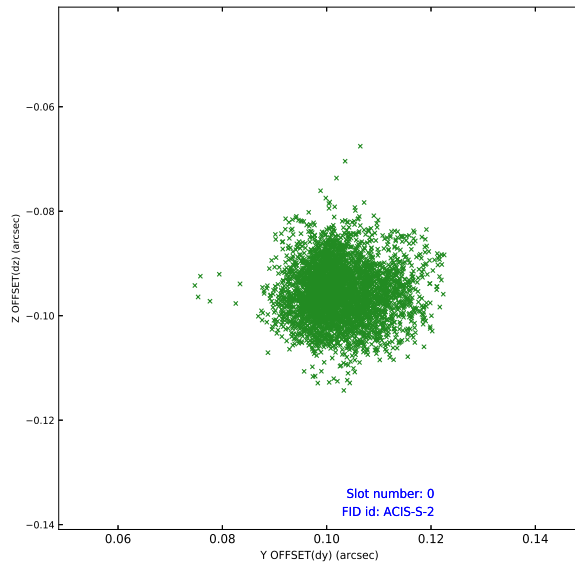
## 2.4.4 Slot 7



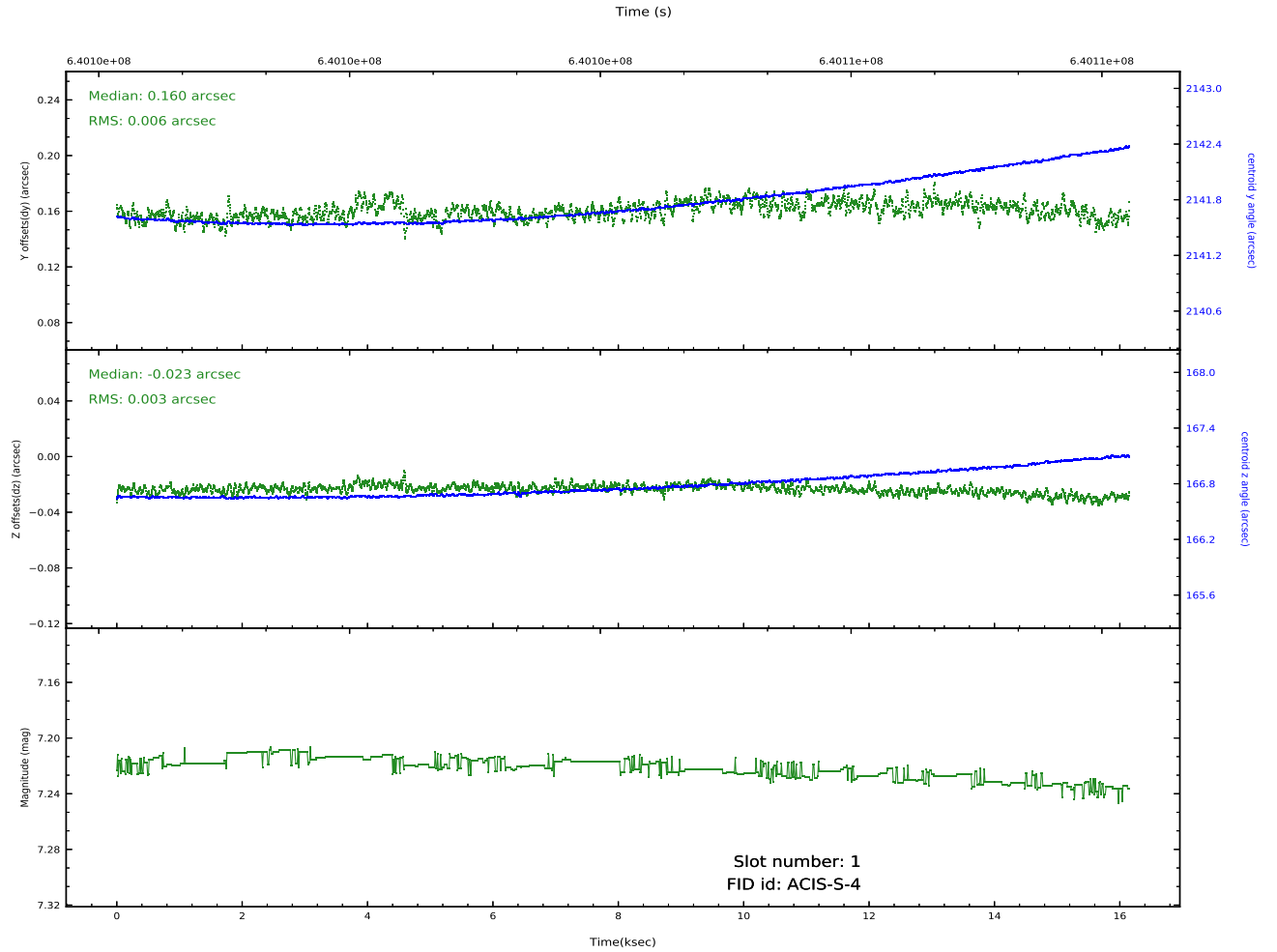
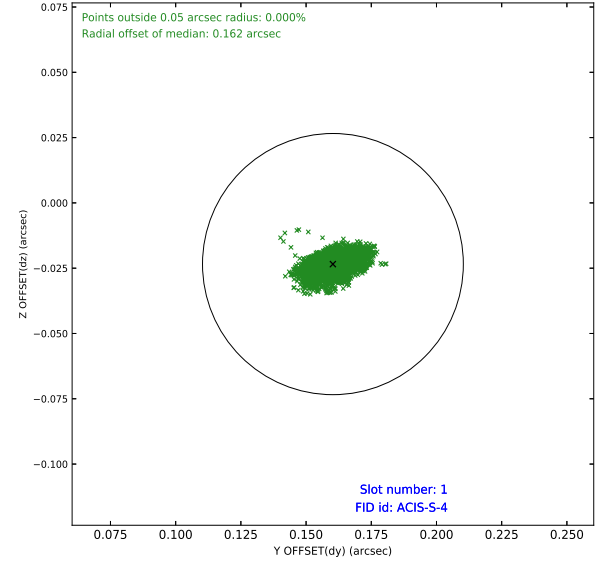
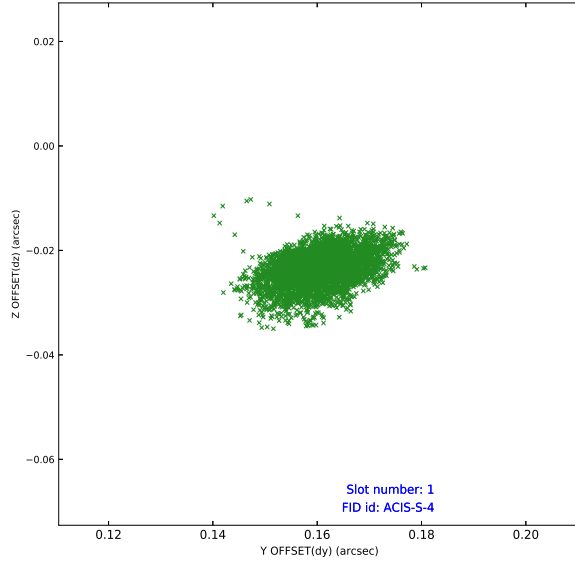


## 2.5 FID Slots

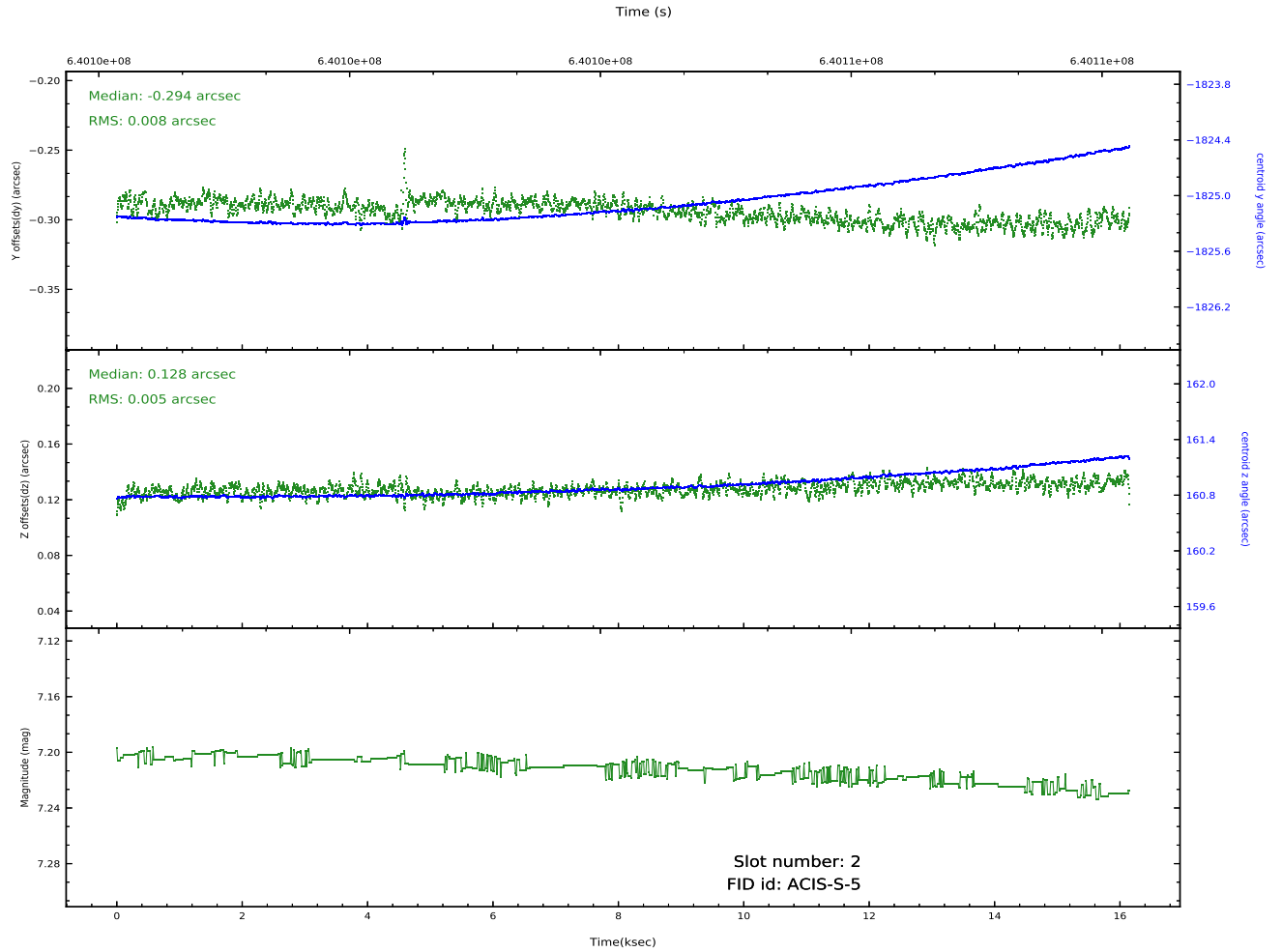
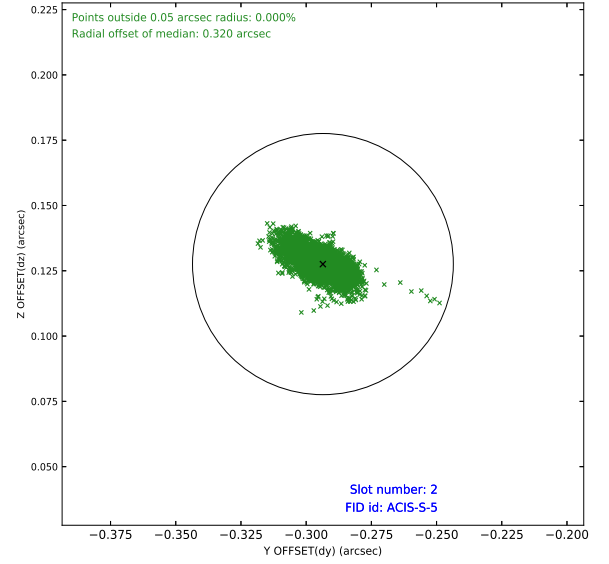
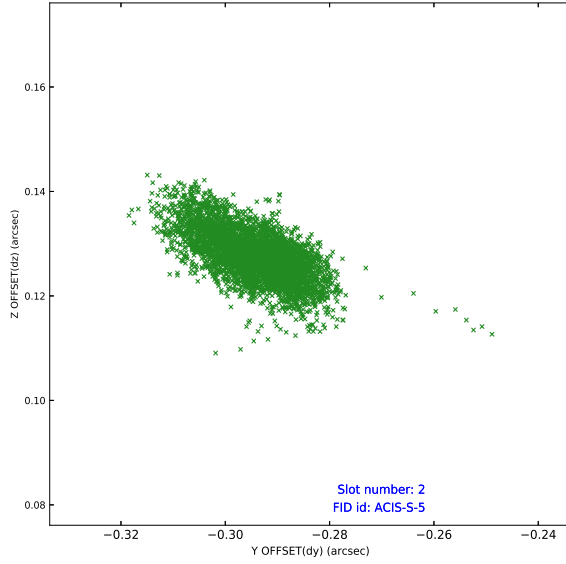
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# A Summary

## A.1 Status

|                            |                 |
|----------------------------|-----------------|
| V&V Scientist              | Jen Lauer       |
| V&V Date (YYYY-MM-DD)      | 2020.10.26      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 15.562000119805 |

## A.2 Comments

The guide star in slot 4 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.