

# V&V Reference Report

## L2 ASCDS Version : 10.9.2

Observation 19777 - L2 Version 3  
Chandra X-Ray Center

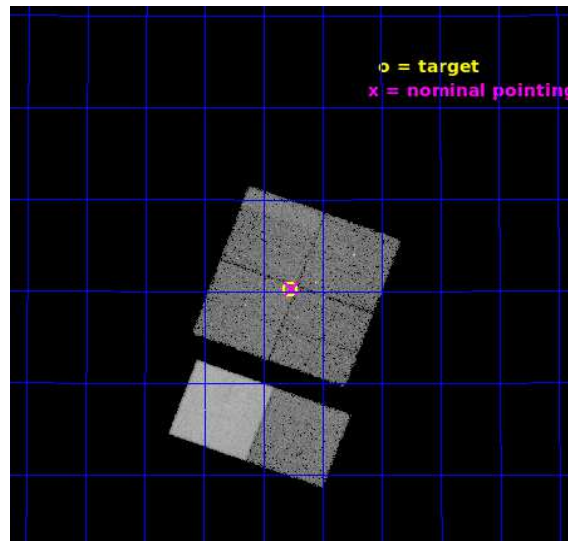
L2 Processing Date : Oct 25 2020

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# 1 Front

|          |                                                                                                 |                                             |
|----------|-------------------------------------------------------------------------------------------------|---------------------------------------------|
| seq_num  | 901393                                                                                          | Sequence number                             |
| obs_id   | 19777                                                                                           | Observation id                              |
| title    | An extended moderate-depth contiguous layer of the Chandra Bootes field -- additional pointings | Proposal title                              |
| observer | Ralph Kraft                                                                                     | Principal investigator                      |
| object   | XBootes                                                                                         | Source name                                 |
| dtcycle  | 0                                                                                               | &#160                                       |
| cycle    | P                                                                                               | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 217.56906                                                                                       | Observer's specified target RA [deg]        |
| dec_targ | 34.671368                                                                                       | Observer's specified target Dec [deg]       |
| ra_nom   | 217.56457004758                                                                                 | Nominal RA [deg]                            |
| dec_nom  | 34.67154643346                                                                                  | Nominal Dec [deg]                           |
| roll_nom | 200.2141982962                                                                                  | Nominal Roll [deg]                          |
| revision | 3                                                                                               | Processing version of data                  |
| ontime   | 22952.152107596                                                                                 | Sum of GTIs [s]                             |
| livetime | 22661.518137483                                                                                 | Livetime [s]                                |
| ontime0  | 22942.305996537                                                                                 | Sum of GTIs [s]                             |
| ontime1  | 22948.829126716                                                                                 | Sum of GTIs [s]                             |
| ontime2  | 22942.387986302                                                                                 | Sum of GTIs [s]                             |
| ontime3  | 22952.152107596                                                                                 | Sum of GTIs [s]                             |
| ontime6  | 22952.234227538                                                                                 | Sum of GTIs [s]                             |
| ontime7  | 22955.434177995                                                                                 | Sum of GTIs [s]                             |
| l2events | 170779                                                                                          | Number of level 2 events                    |

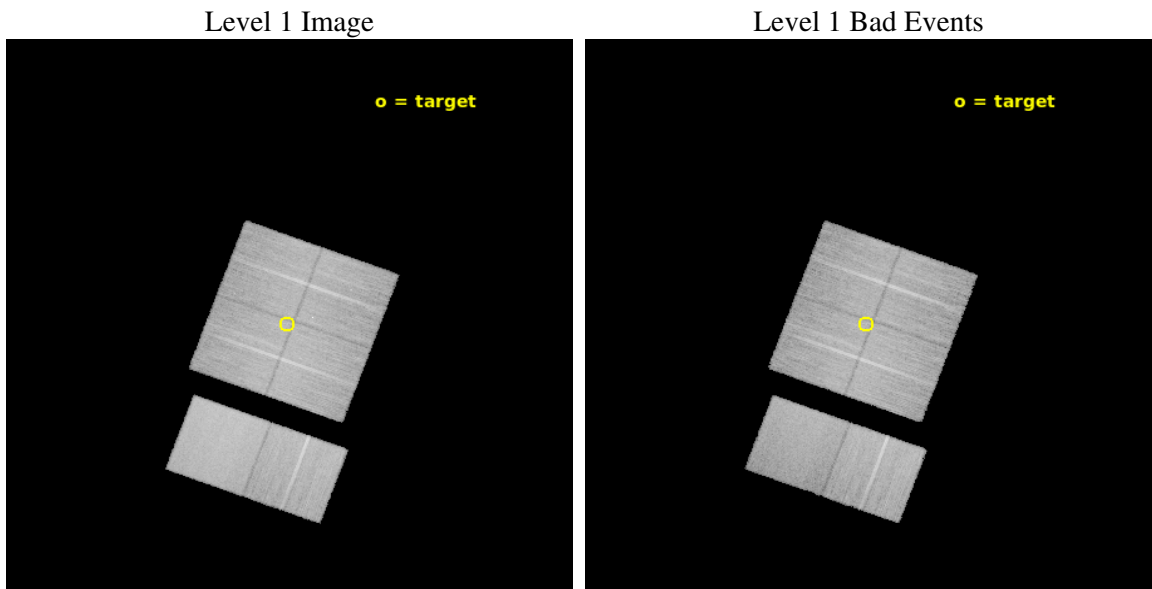




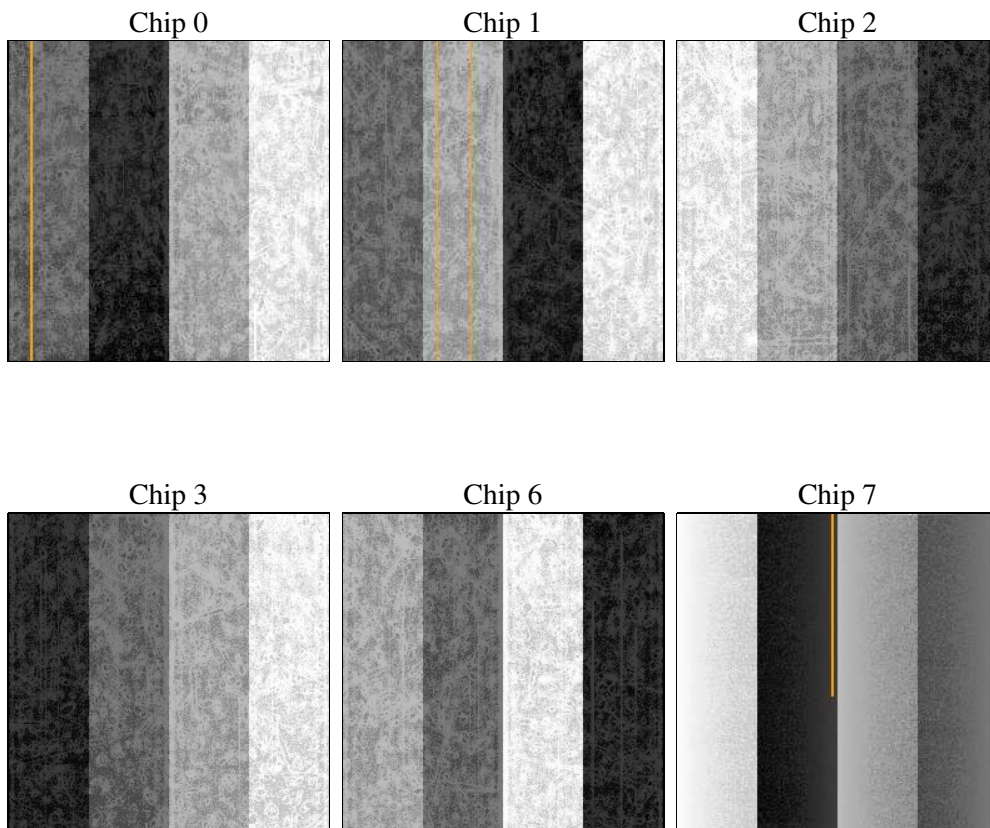
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 23000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.9.2              | Processing system revision     | ontime         | 22952.152107596 | Sum of GTIs [s]                         |
| caldsver | 4.9.3               | &#160                          | ontime0        | 22942.305996537 | Sum of GTIs [s]                         |
| date     | 2020-10-26T01:01:56 | Date and time of file creation | ontime1        | 22948.829126716 | Sum of GTIs [s]                         |
| revision | 3                   | Processing version of data     | ontime2        | 22942.387986302 | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 22952.152107596 | Sum of GTIs [s]                         |
|          |                     |                                | ontime6        | 22952.234227538 | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 22955.434177995 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 1028413         | Number of level 1 events                |

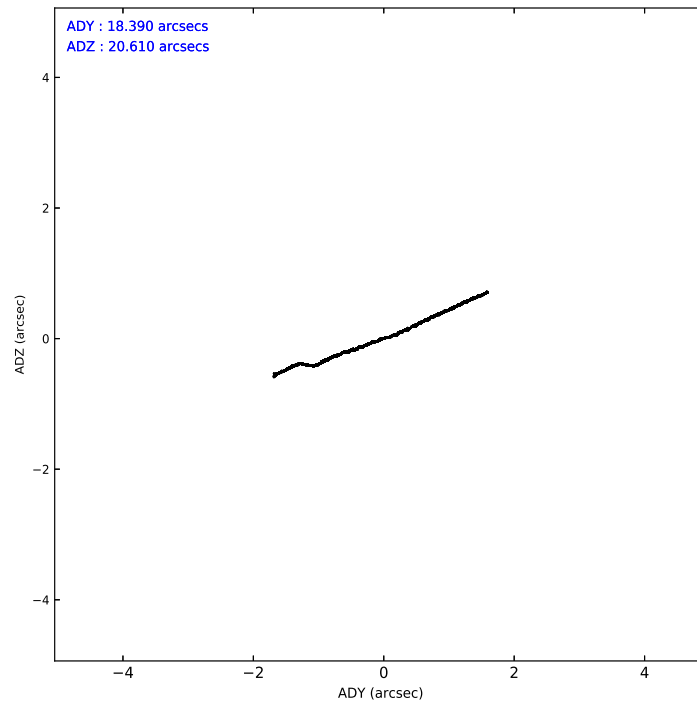
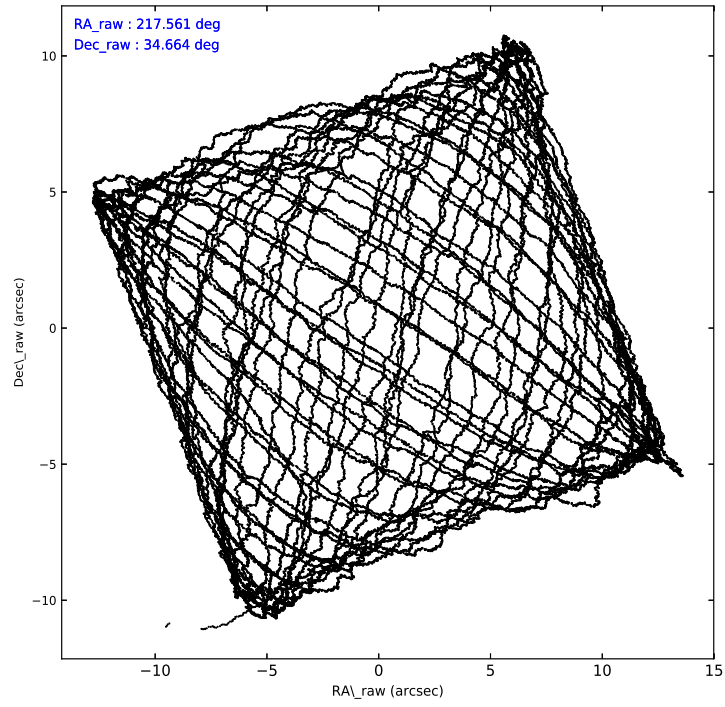
### 2.1.4 Events

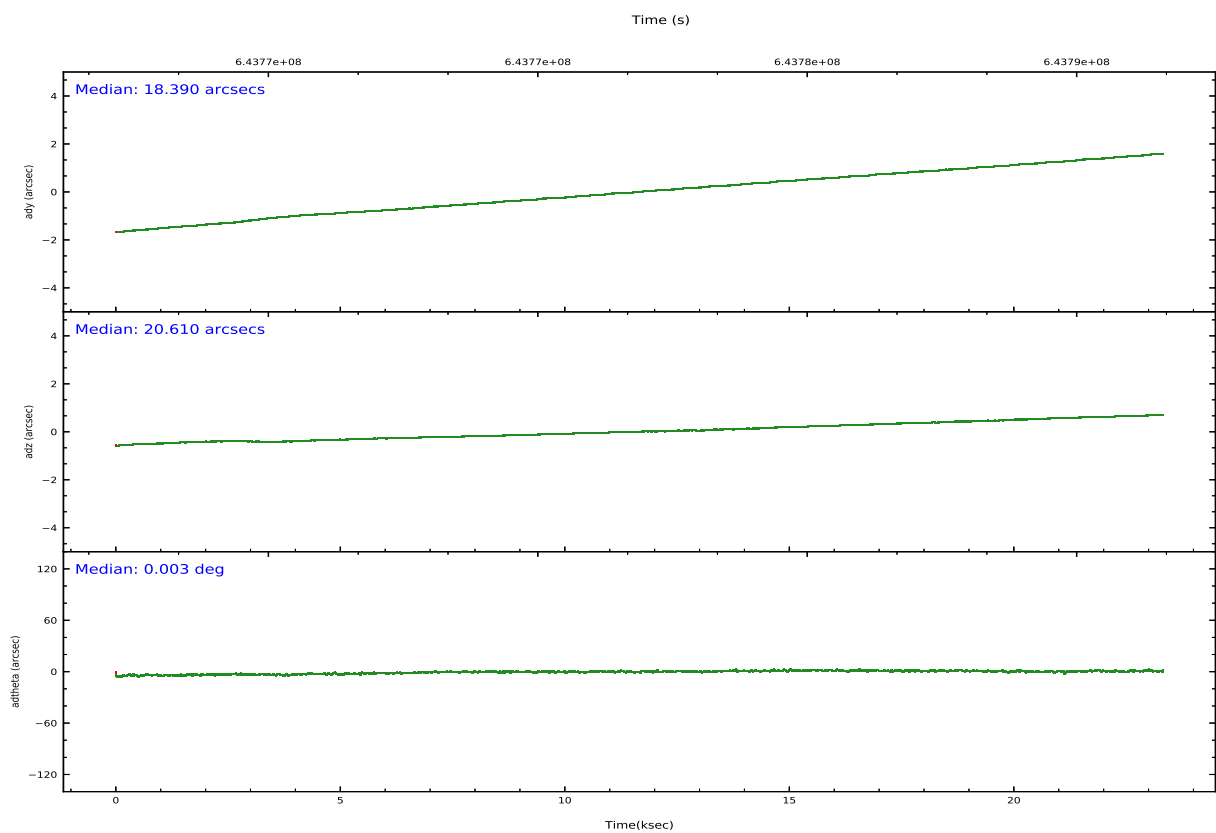
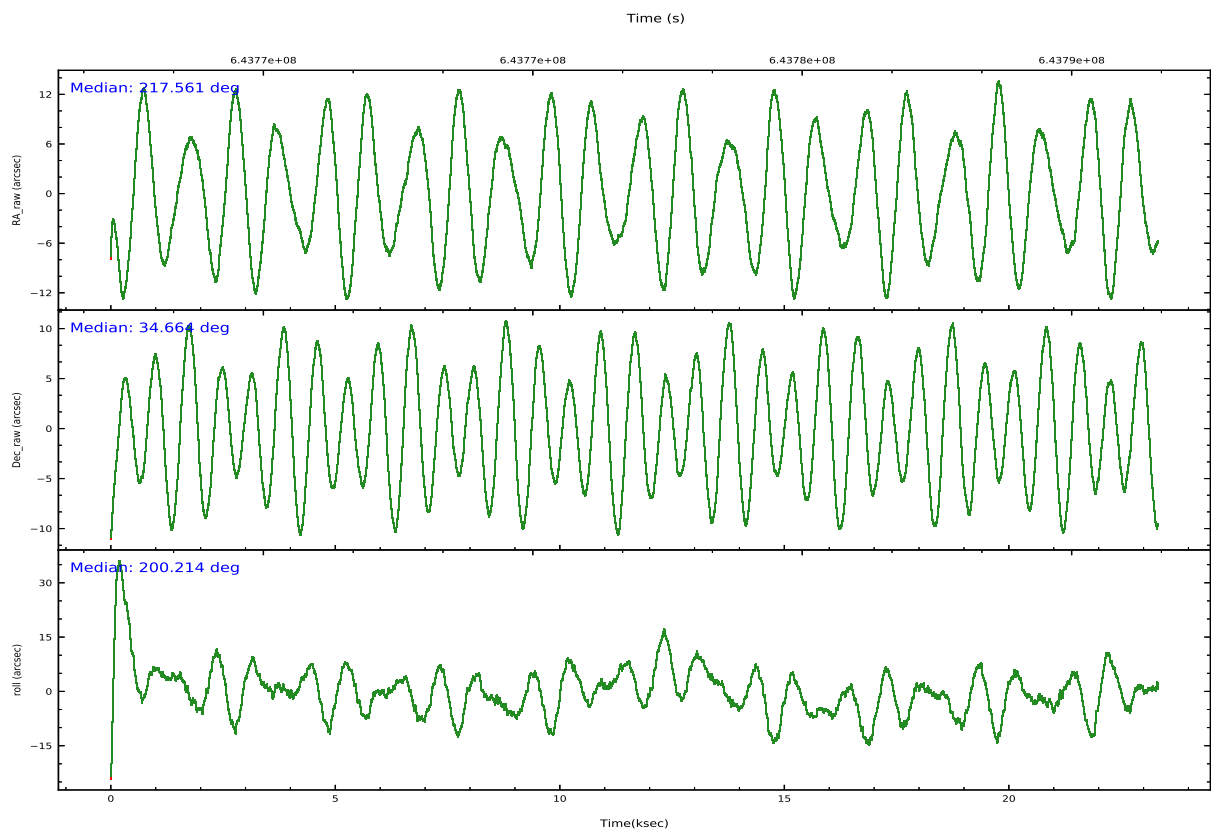
|                 | ccd 0  | ccd 1  | ccd 2  | ccd 3  | ccd 6  | ccd 7  |                | ccd 0  | ccd 1  | ccd 2  | ccd 3  | ccd 6  | ccd 7  |
|-----------------|--------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|
| level 1 events  | 152886 | 152427 | 172114 | 159003 | 175916 | 216067 | grade 0 events | 6687   | 6882   | 6453   | 6275   | 6242   | 7794   |
| rejected events | 133595 | 131971 | 153847 | 141316 | 156560 | 122154 |                | 4%     | 4%     | 3%     | 3%     | 3%     | 3%     |
| rejected %      | 87%    | 86%    | 89%    | 88%    | 88%    | 56%    | grade 1 events | 112    | 97     | 115    | 80     | 85     | 309    |
|                 |        |        |        |        |        |        |                | 0%     | 0%     | 0%     | 0%     | 0%     | 0%     |
|                 |        |        |        |        |        |        | grade 2 events | 4802   | 5262   | 4605   | 3977   | 4603   | 20173  |
|                 |        |        |        |        |        |        |                | 3%     | 3%     | 2%     | 2%     | 2%     | 9%     |
|                 |        |        |        |        |        |        | grade 3 events | 1920   | 1935   | 1717   | 1888   | 1920   | 7497   |
|                 |        |        |        |        |        |        |                | 1%     | 1%     | 0%     | 1%     | 1%     | 3%     |
|                 |        |        |        |        |        |        | grade 4 events | 1856   | 1908   | 1862   | 1865   | 1878   | 7344   |
|                 |        |        |        |        |        |        |                | 1%     | 1%     | 1%     | 1%     | 1%     | 3%     |
|                 |        |        |        |        |        |        | grade 5 events | 7249   | 7470   | 6714   | 8021   | 8148   | 21718  |
|                 |        |        |        |        |        |        |                | 4%     | 4%     | 3%     | 5%     | 4%     | 10%    |
|                 |        |        |        |        |        |        | grade 6 events | 4029   | 4476   | 3635   | 3685   | 4714   | 51119  |
|                 |        |        |        |        |        |        |                | 2%     | 2%     | 2%     | 2%     | 2%     | 23%    |
|                 |        |        |        |        |        |        | grade 7 events | 126231 | 124397 | 147013 | 133212 | 148326 | 100113 |
|                 |        |        |        |        |        |        |                | 82%    | 81%    | 85%    | 83%    | 84%    | 46%    |

## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual                | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|-----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                  | Obspar version number                 | 8         | 8       |
| Detector                          | ACIS-012367         | ACIS-012367           | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                           | NONE                | NONE                  | Obspar update status                  | NONE      | UPDATED |
| Data mode                         | VFAINT              | VFAINT                | CCD I0 on                             | Y         | Y       |
| Observation mode                  | POINTING            | POINTING              | CCD I1 on                             | Y         | Y       |
| [deg] Pointing RA                 | 217.582254          | 217.56457004758       | CCD I2 on                             | Y         | Y       |
| [deg] Pointing Dec                | 34.685348           | 34.67154643346        | CCD I3 on                             | Y         | Y       |
| [deg] Pointing Roll               | 199.992487          | 200.2141982962        | CCD S0 on                             | N         | N       |
| [mm] SIM focus pos                | -0.782348           | -0.7809083437167272   | CCD S1 on                             | N         | N       |
| [mm] SIM defocus                  | 0                   | 0.001439871863259334  | CCD S2 on                             | O2        | Y       |
| [mm] SIM translation stage pos    | -233.592463         | -233.5874344608287    | CCD S3 on                             | O1        | Y       |
| [mm] SIM translation stage offset | 0                   | -0.005018542100998502 | CCD S4 on                             | N         | N       |
| [s] Observation start time (MET)  | 643764926.184000    | 643763896.28324       | CCD S5 on                             | N         | N       |
| Observation start date            | 2018-05-26T23:34:17 | 2018-05-26T23:18:16   | Number of optional ACIS chips dropped | 0         | 0       |
| [s] Observation end time (MET)    | 643787926.184000    | 643789069.25973       | On-chip summing requested             | N         | N       |
| Observation end date              | 2018-05-27T05:57:37 | 2018-05-27T06:17:49   | Subarray requested                    | NONE      | NONE    |
| Read mode                         | TIMED               | TIMED                 | Alternating exposures requested       | N         | N       |
|                                   |                     |                       | [s] Primary exposure time             | 0.000000  | 3.2     |

## 2.3 Aspect



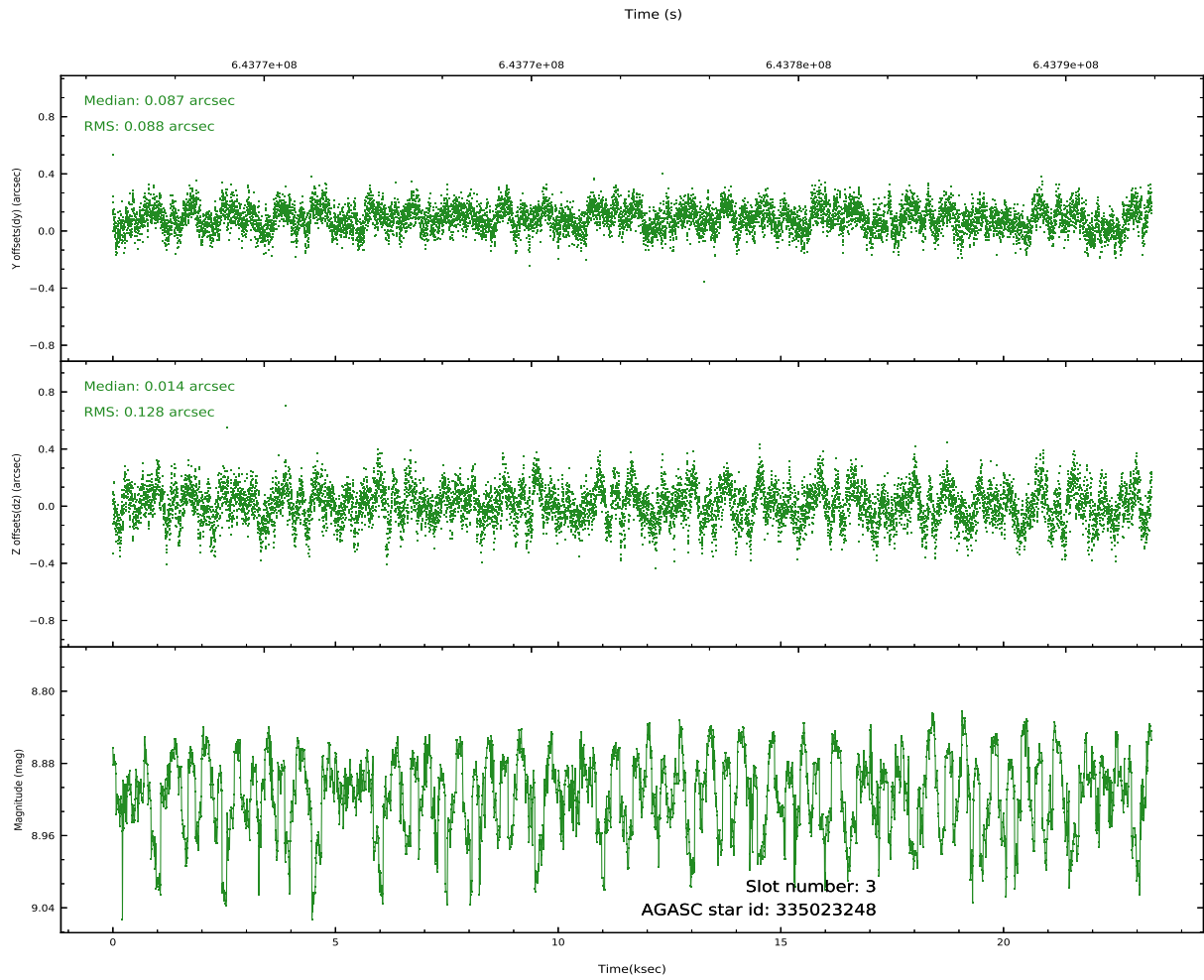
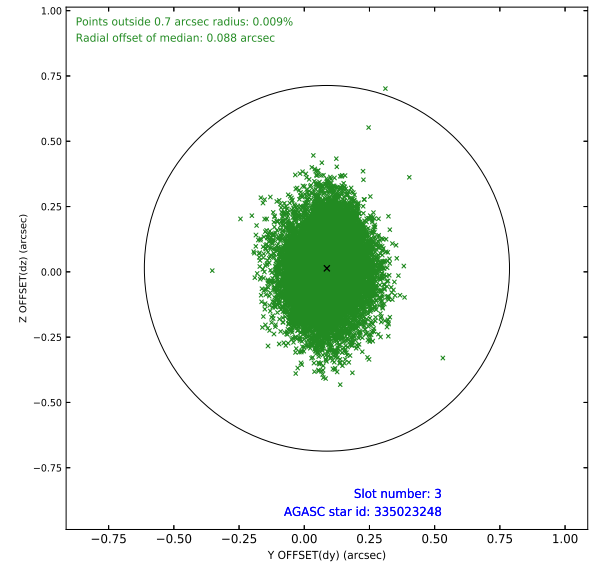
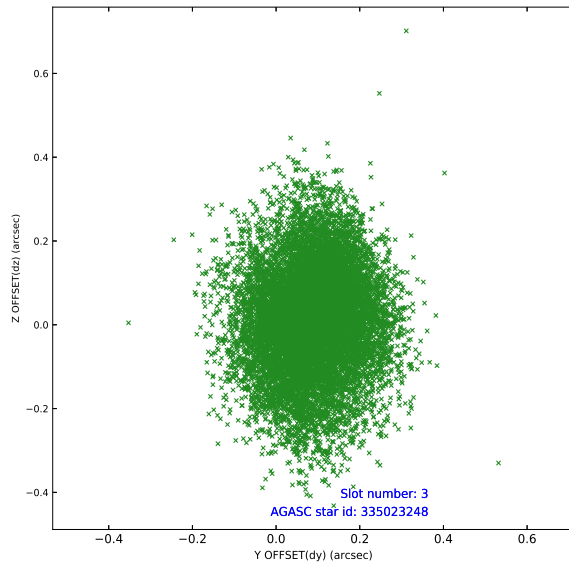


Slot Statistics

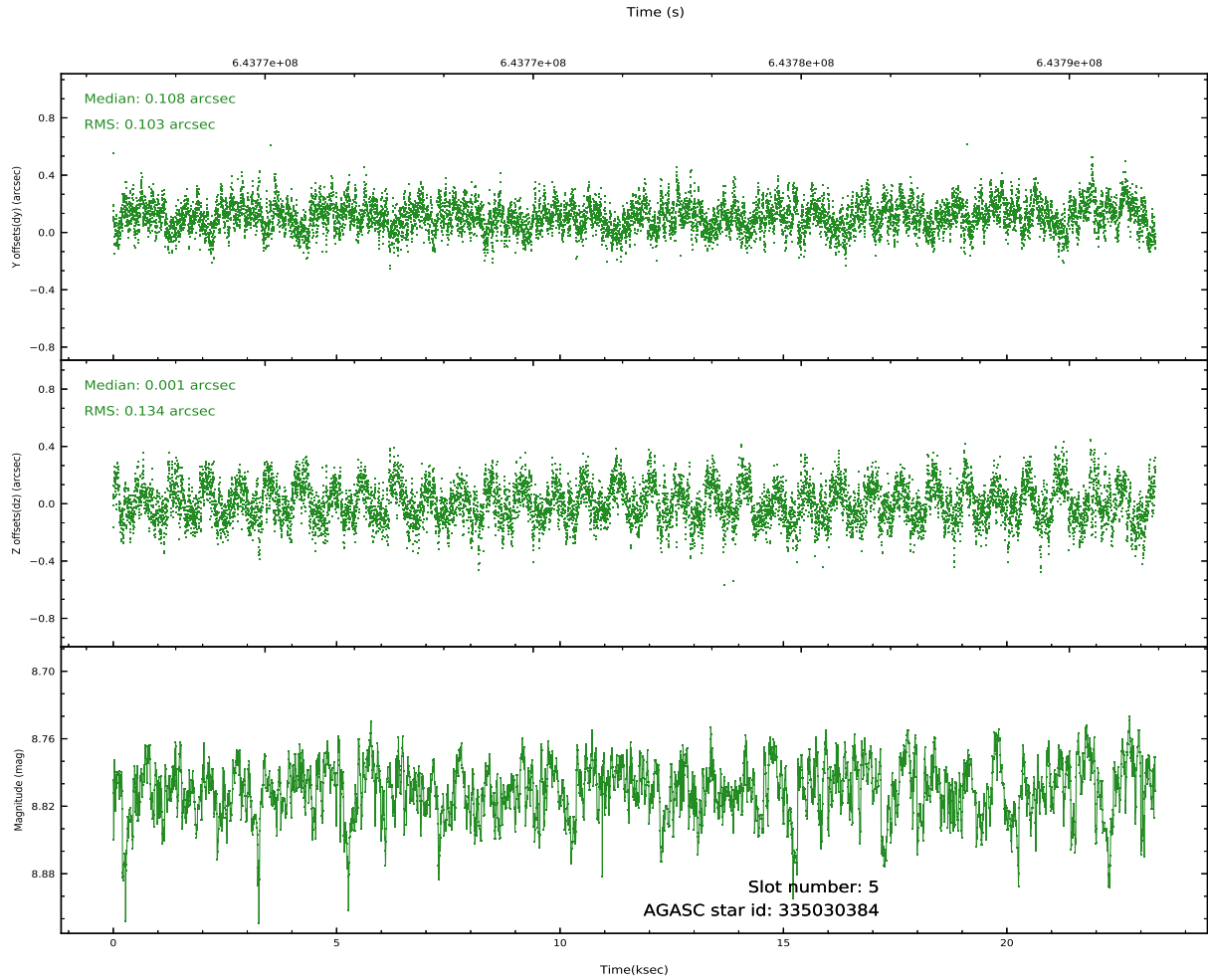
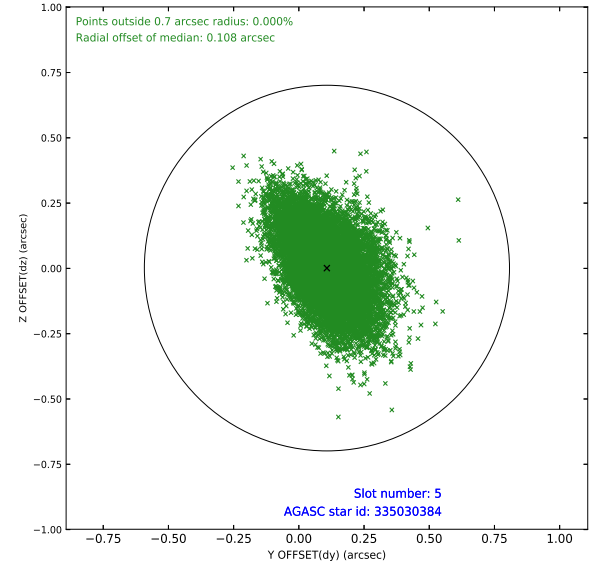
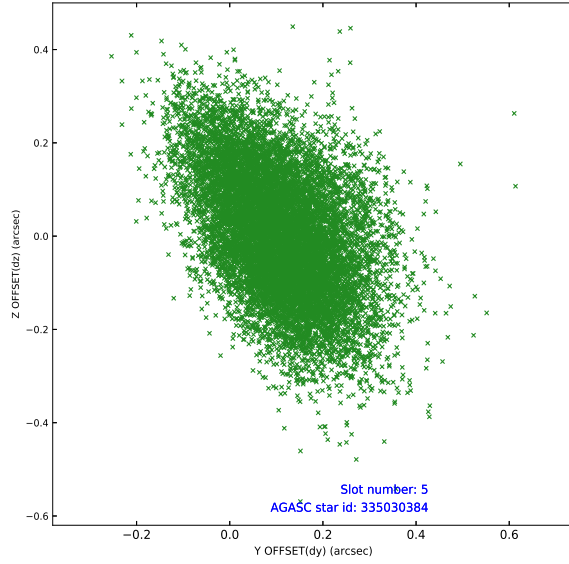
| pt | status  | used | id        | mag  | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec       | mean_y   | mea   |
|----|---------|------|-----------|------|-------|----------|--------|--------|-------|-------|------------|-----------|----------|-------|
| 0  | FID     |      | ACIS-I-1  | 7.16 | 5689  | 1.000    | 0.144  | -0.153 | 0.039 | 0.056 | 0.000000   | 0.000000  | 921.05   | -844  |
| 1  | FID     |      | ACIS-I-4  | 7.10 | 5690  | 1.000    | 0.134  | 0.061  | 0.028 | 0.043 | 0.000000   | 0.000000  | 2141.31  | 1055  |
| 2  | FID     |      | ACIS-I-5  | 7.15 | 5690  | 1.000    | -0.380 | 0.161  | 0.020 | 0.033 | 0.000000   | 0.000000  | -1827.14 | 1053  |
| 3  | GUIDE   | used | 335023248 | 8.91 | 11370 | 1.000    | 0.087  | 0.014  | 0.164 | 0.267 | 217.634832 | 34.944512 | -464.12  | -823  |
| 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 | 335030384 | 8.80 | 11367 | 1.000    | 0.108  | 0.001  | 0.177 | 0.298 | 216.806407 | 34.722197 | 2109.70  | -917  |
| 6  | GUIDE   | used | 335415168 | 9.69 | 11364 | 1.000    | 0.027  | -0.089 | 0.219 | 0.359 | 217.681296 | 35.301767 | -1029.33 | -1986 |
| 7  | GUIDE   | used | 335417968 | 9.35 | 11358 | 1.000    | -0.221 | 0.068  | 0.227 | 0.381 | 217.358149 | 35.055285 | 165.79   | -1477 |

## 2.4 Star Slots

### 2.4.1 Slot 3

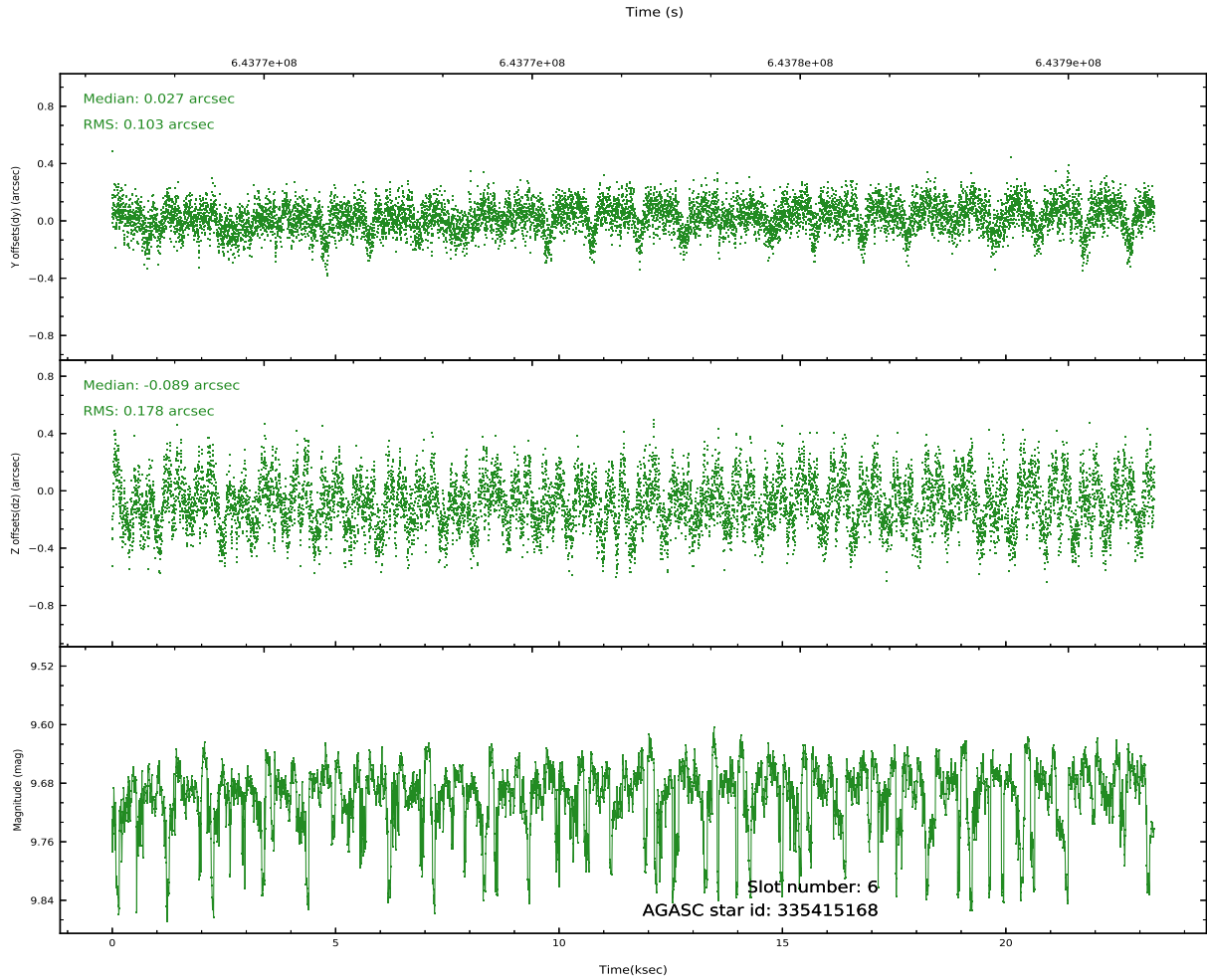
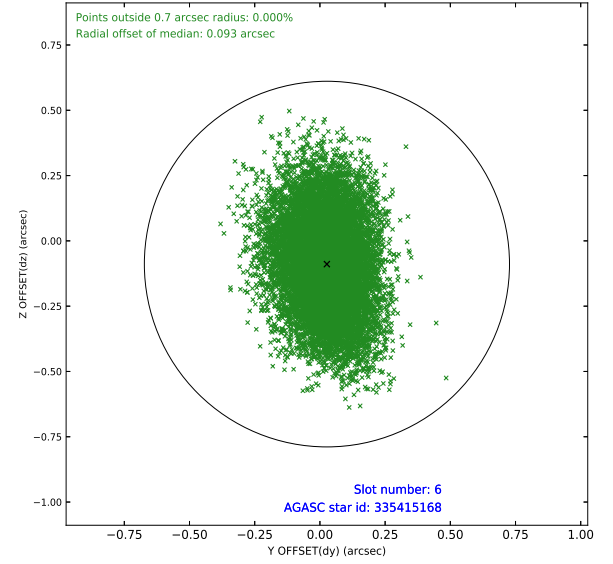
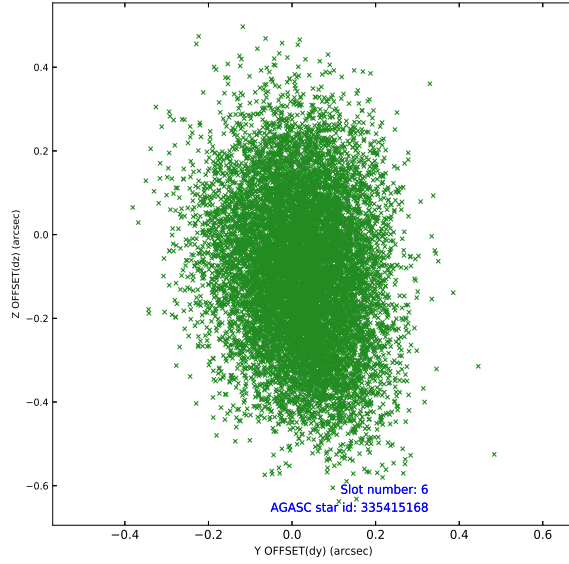


## 2.4.2 Slot 5

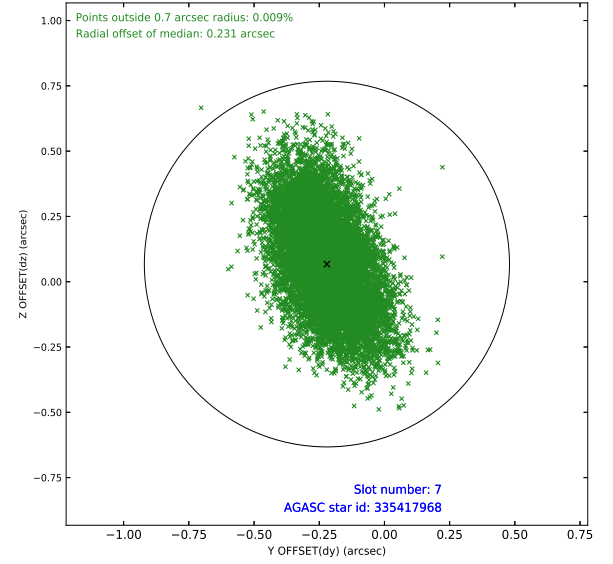
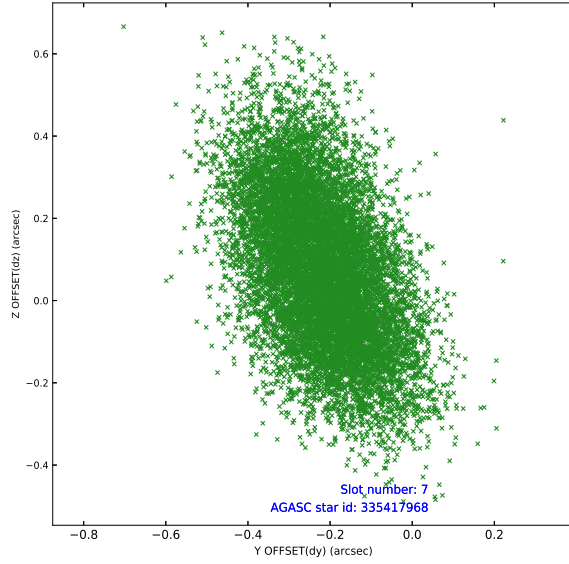




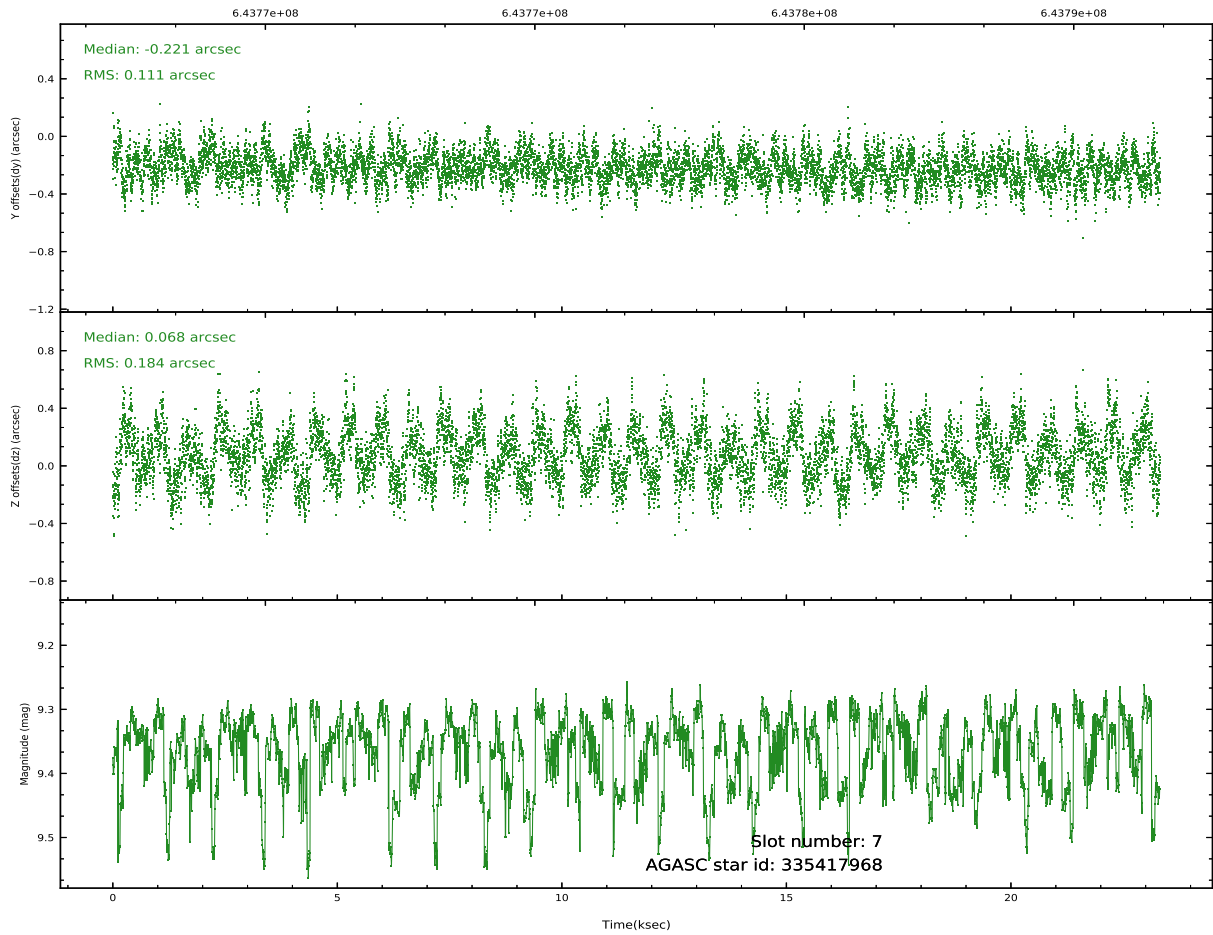
### 2.4.3 Slot 6



## 2.4.4 Slot 7

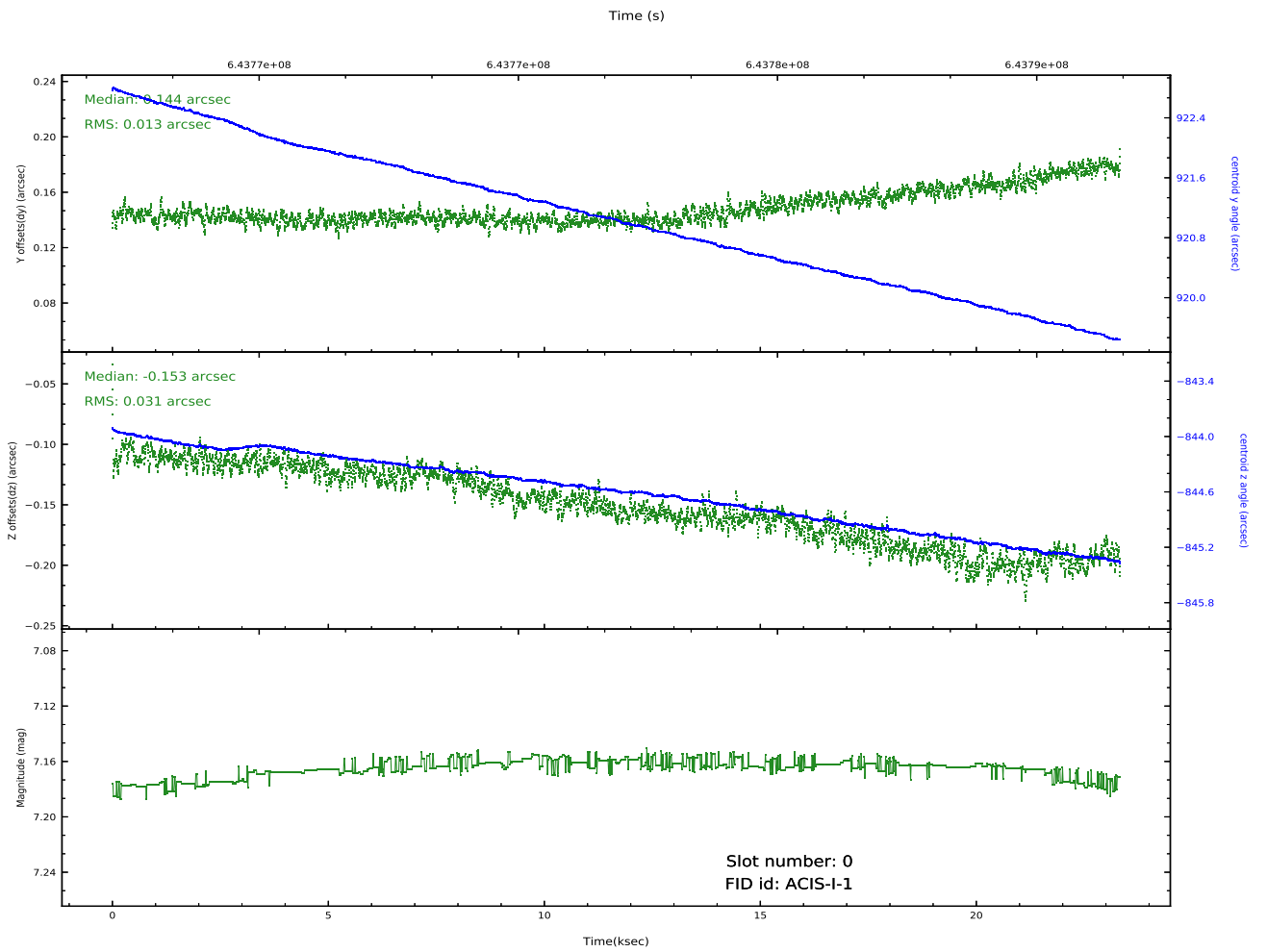
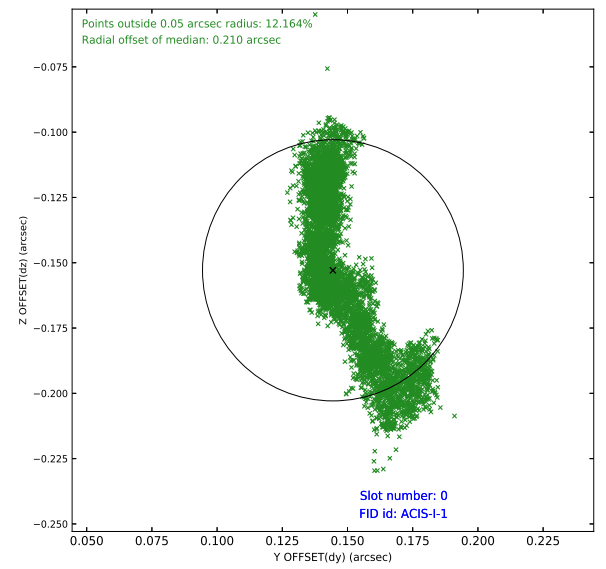
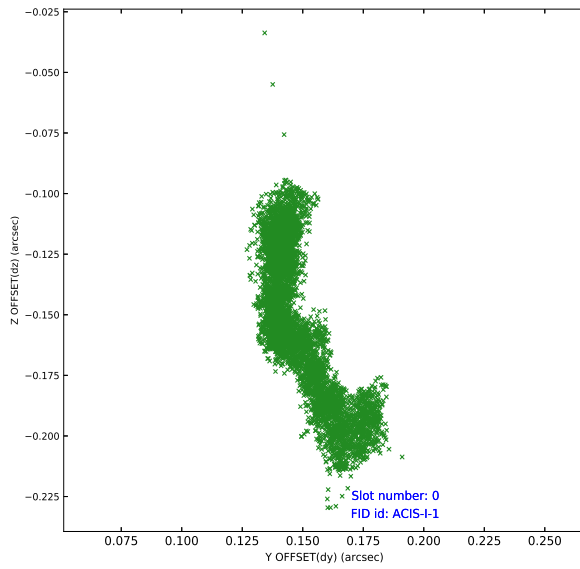


Time (s)

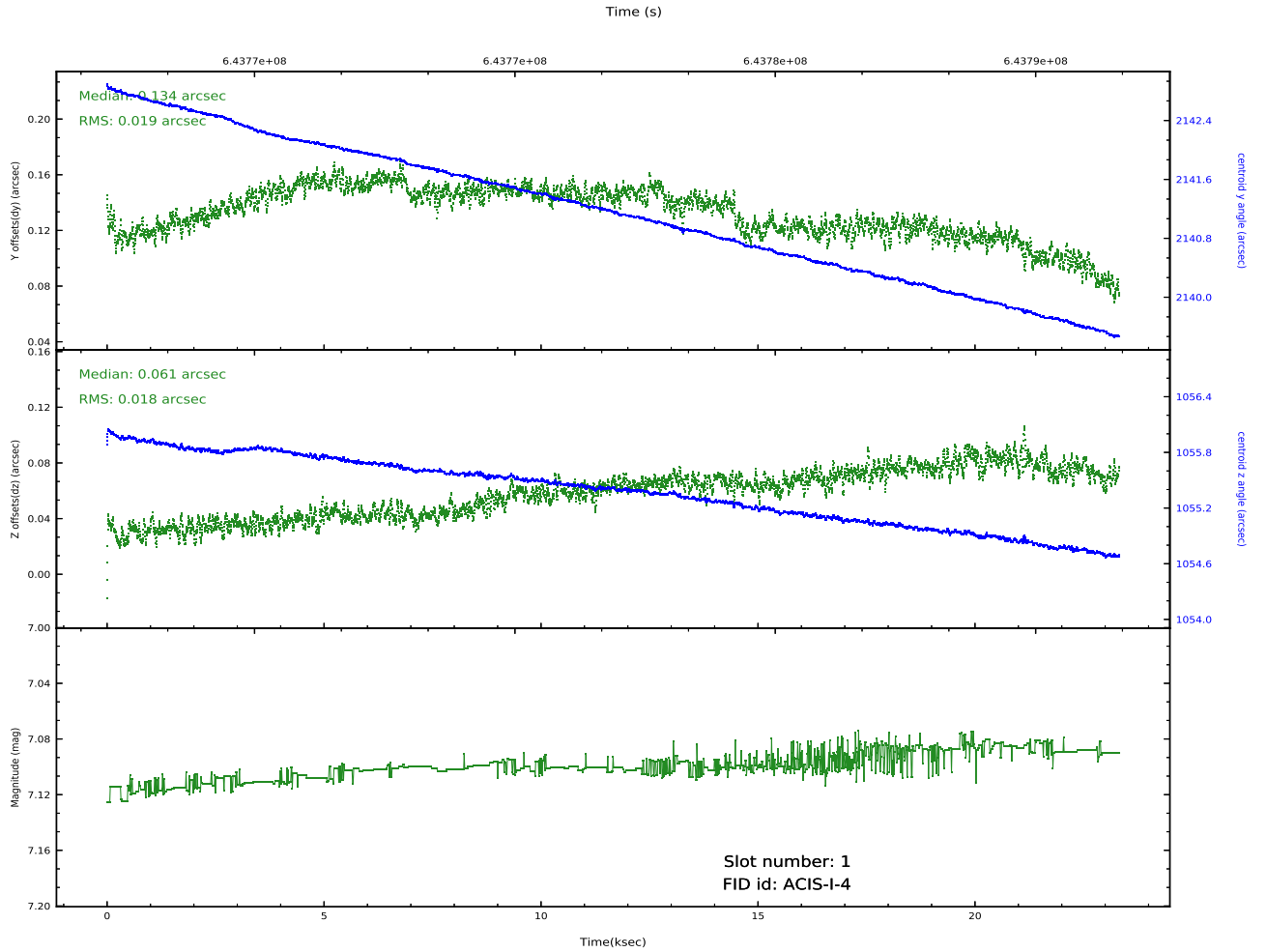
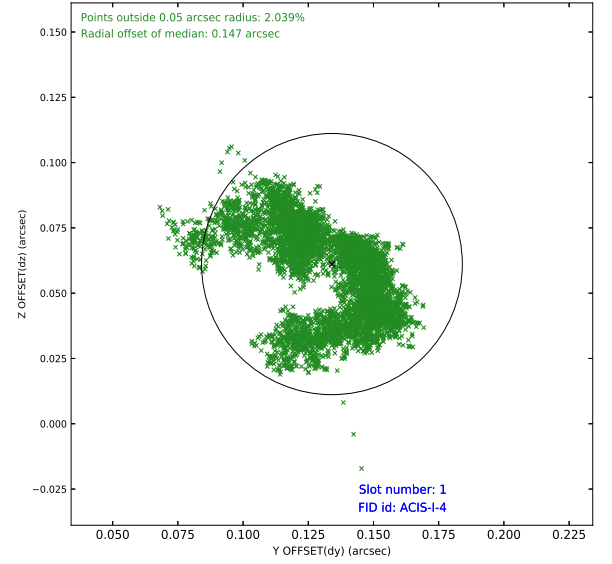
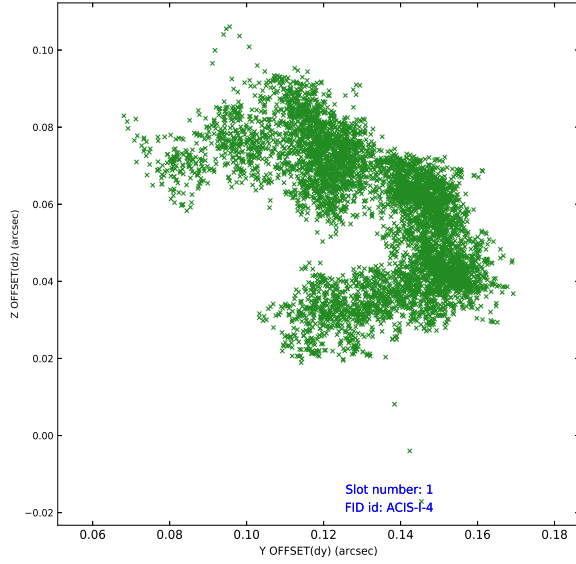


## 2.5 FID Slots

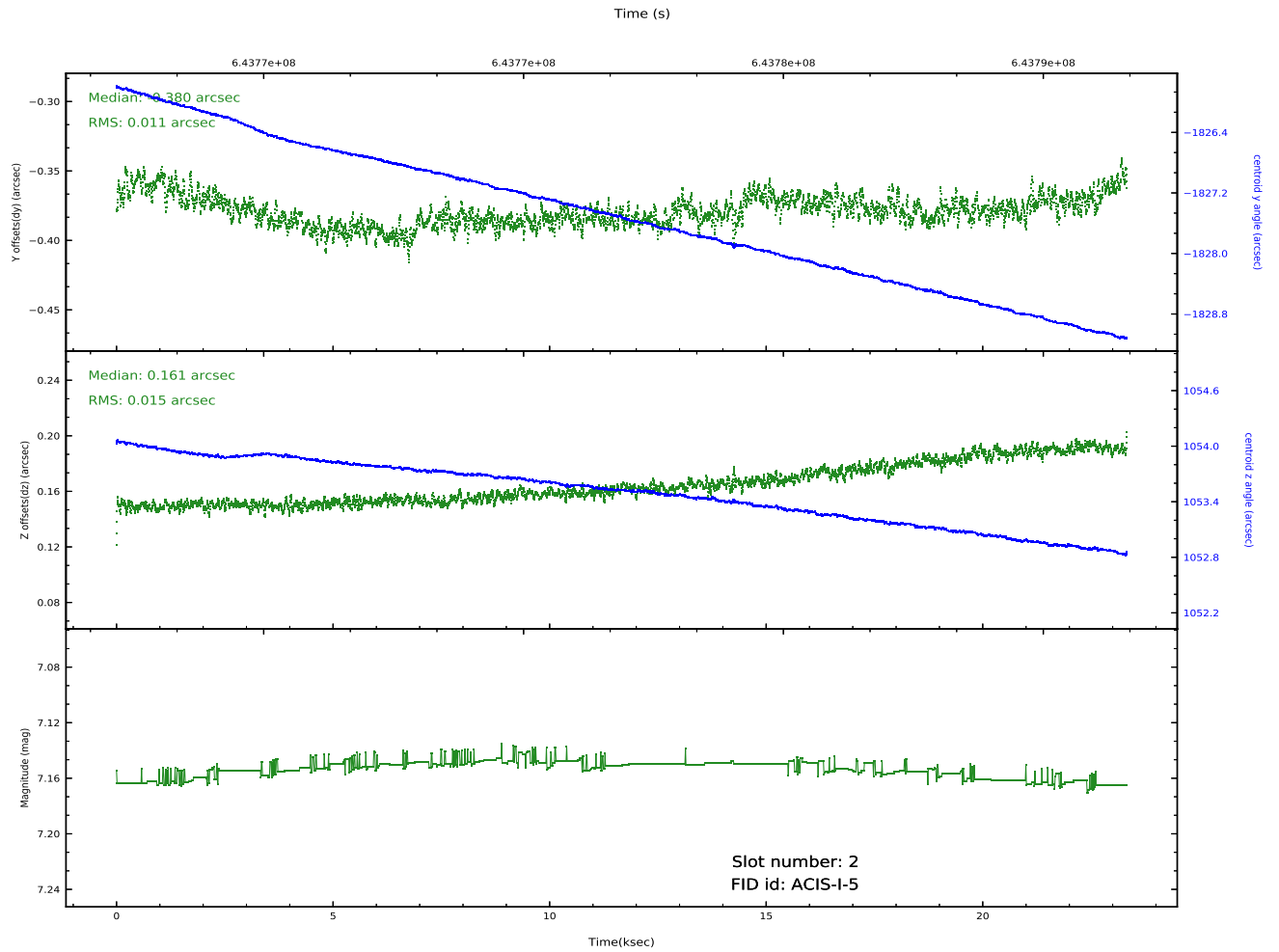
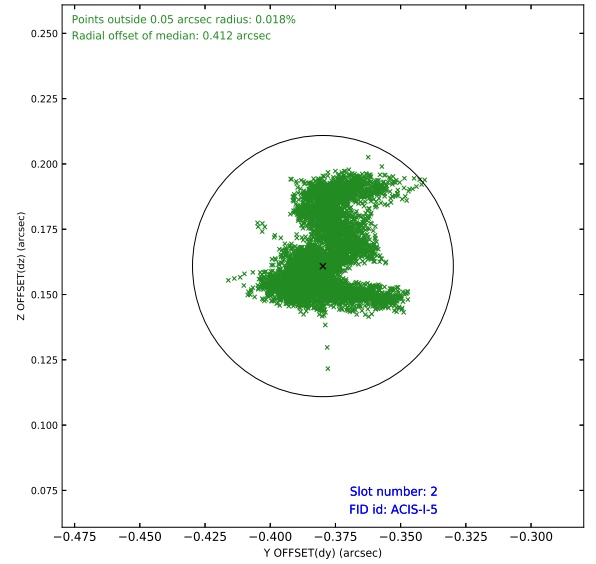
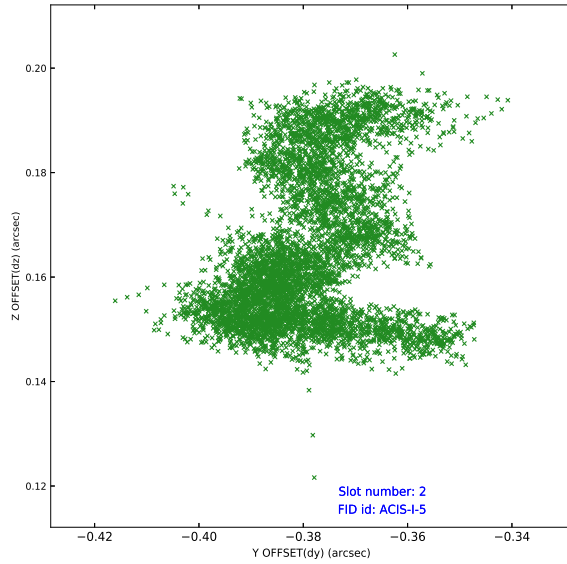
### 2.5.1 Slot 0



## 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)      | 2020.10.27      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 22.952152103901 |

## 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.