

# V&V Reference Report

## L2 ASCDS Version : 10.7.1

Observation 22026 - L2 Version 1  
Chandra X-Ray Center

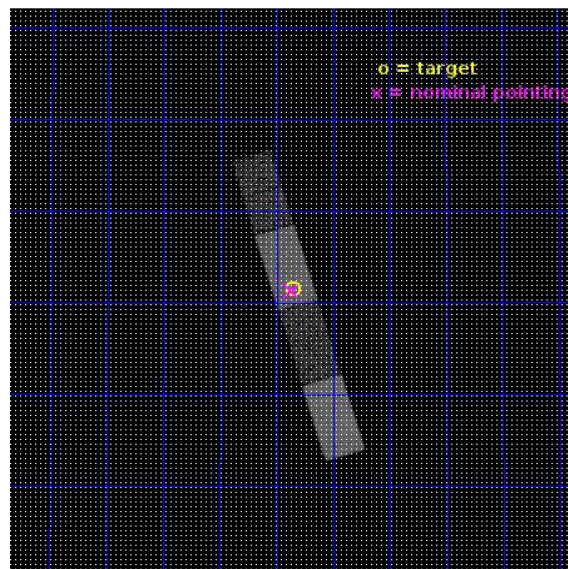
L2 Processing Date : Jan 7 2019

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# 1 Front

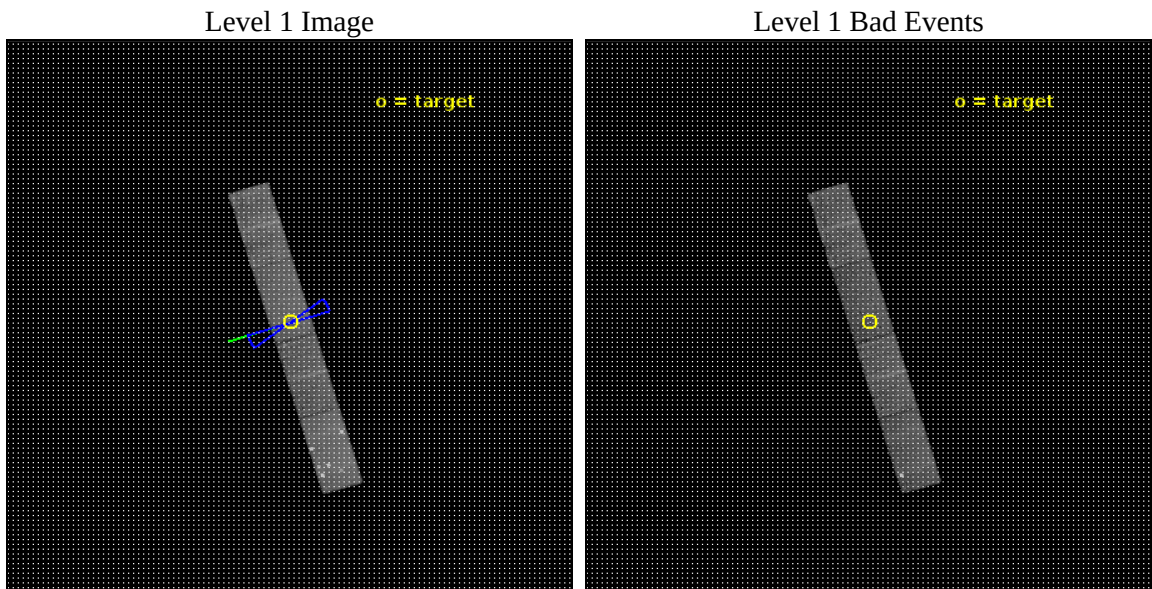
|          |                                                            |                                             |
|----------|------------------------------------------------------------|---------------------------------------------|
| seq_num  | 703413                                                     | Sequence number                             |
| obs_id   | 22026                                                      | Observation id                              |
| title    | The 3C111 Jet: X-ray Variability, Spectrum & Broadband SED | Proposa                                     |
| observer | Eric Perlman                                               | Principal investigator                      |
| object   | 3C 111                                                     | Source name                                 |
| dtcycle  | 0                                                          | &#160                                       |
| cycle    | P                                                          | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 64.58875                                                   | Observer's specified target RA [deg]        |
| dec_targ | 38.026667                                                  | Observer's specified target Dec [deg]       |
| ra_nom   | 64.592514672835                                            | Nominal RA [deg]                            |
| dec_nom  | 38.023018156882                                            | Nominal Dec [deg]                           |
| roll_nom | 253.15429535962                                            | Nominal Roll [deg]                          |
| revision | 1                                                          | Processing version of data                  |
| ontime   | 13067.900366545                                            | Sum of GTIs [s]                             |
| livetime | 12759.862279515                                            | Livetime [s]                                |
| ontime5  | 13067.900366545                                            | Sum of GTIs [s]                             |
| ontime6  | 13066.159306526                                            | Sum of GTIs [s]                             |
| ontime7  | 13067.900366545                                            | Sum of GTIs [s]                             |
| ontime8  | 13066.159326434                                            | Sum of GTIs [s]                             |
| l2events | 83434                                                      | Number of level 2 events                    |



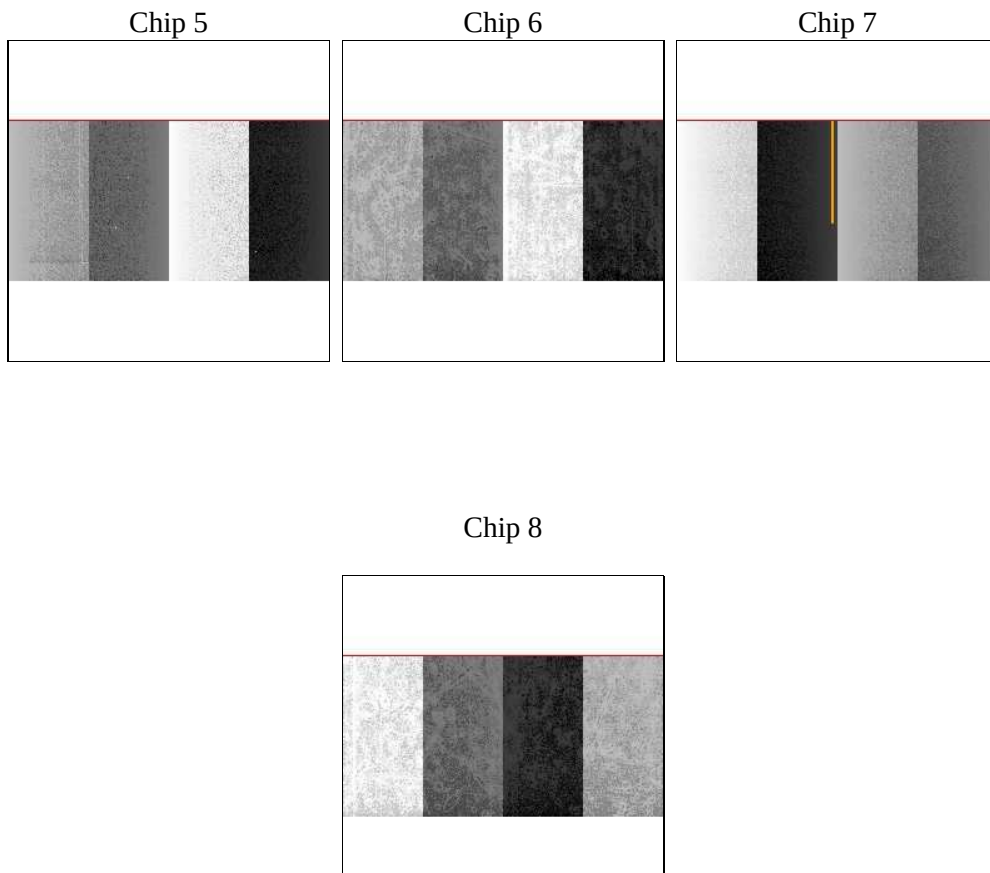
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 1                   | Obi number                     | sched_exp_time | 13000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.7.1              | Processing system revision     | ontime         | 13067.900366545 | Sum of GTIs [s]                         |
| caldbver | 4.8.2               | &#160                          | ontime5        | 13067.900366545 | Sum of GTIs [s]                         |
| date     | 2019-01-07T14:27:16 | Date and time of file creation | ontime6        | 13066.159306526 | Sum of GTIs [s]                         |
| revision | 1                   | Processing version of data     | ontime7        | 13067.900366545 | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 13066.159326434 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 314474          | Number of level 1 events                |

### 2.1.4 Events

|                 | ccd 5  | ccd 6 | ccd 7 | ccd 8 |
|-----------------|--------|-------|-------|-------|
| level 1 events  | 112679 | 55624 | 78037 | 68134 |
| rejected events | 49396  | 48999 | 41042 | 50789 |
| rejected %      | 43%    | 88%   | 52%   | 74%   |

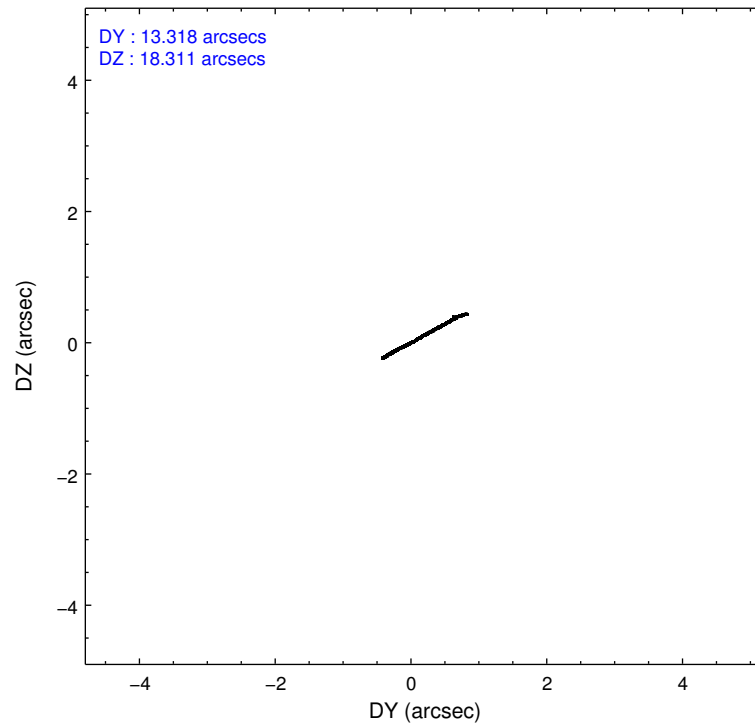
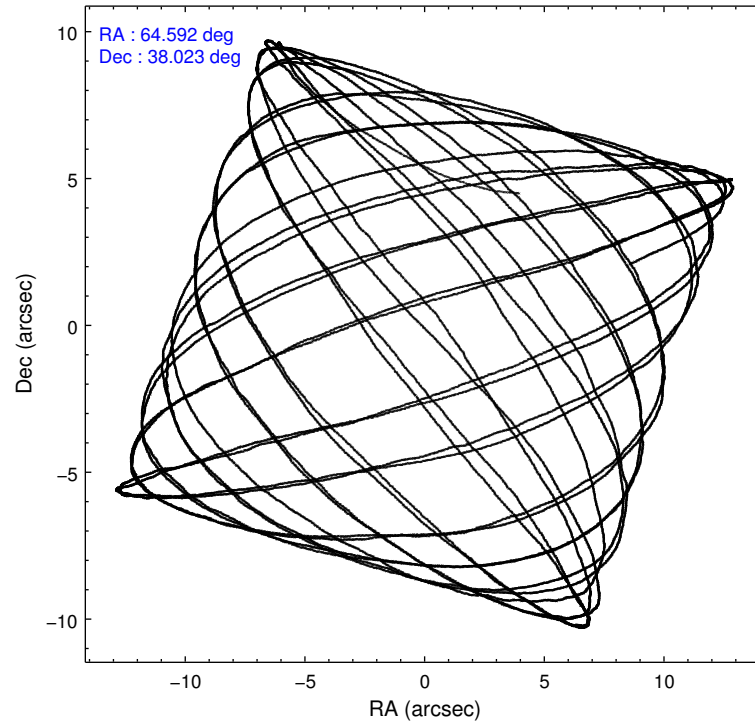
|                | ccd 5 | ccd 6 | ccd 7 | ccd 8 |
|----------------|-------|-------|-------|-------|
| grade 0 events | 25470 | 1870  | 3814  | 4567  |
|                | 22%   | 3%    | 4%    | 6%    |
| grade 1 events | 341   | 25    | 284   | 40    |
|                | 0%    | 0%    | 0%    | 0%    |
| grade 2 events | 13814 | 1890  | 7518  | 4200  |
|                | 12%   | 3%    | 9%    | 6%    |
| grade 3 events | 1527  | 655   | 3280  | 1833  |
|                | 1%    | 1%    | 4%    | 2%    |
| grade 4 events | 1197  | 678   | 3262  | 1714  |
|                | 1%    | 1%    | 4%    | 2%    |
| grade 5 events | 6102  | 2132  | 7420  | 3286  |
|                | 5%    | 3%    | 9%    | 4%    |
| grade 6 events | 21280 | 1533  | 19126 | 5033  |
|                | 18%   | 2%    | 24%   | 7%    |
| grade 7 events | 42948 | 46841 | 33333 | 47461 |
|                | 38%   | 84%   | 42%   | 69%   |

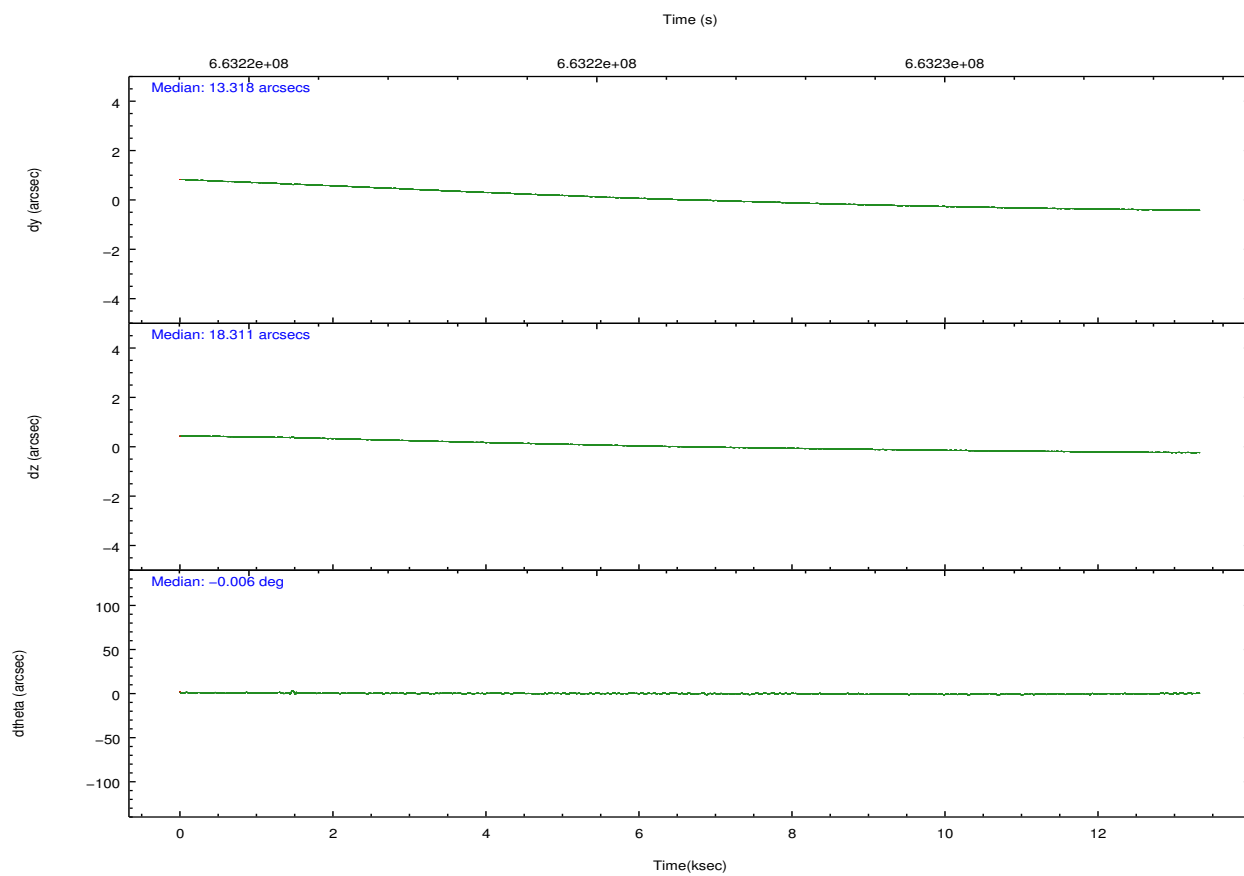
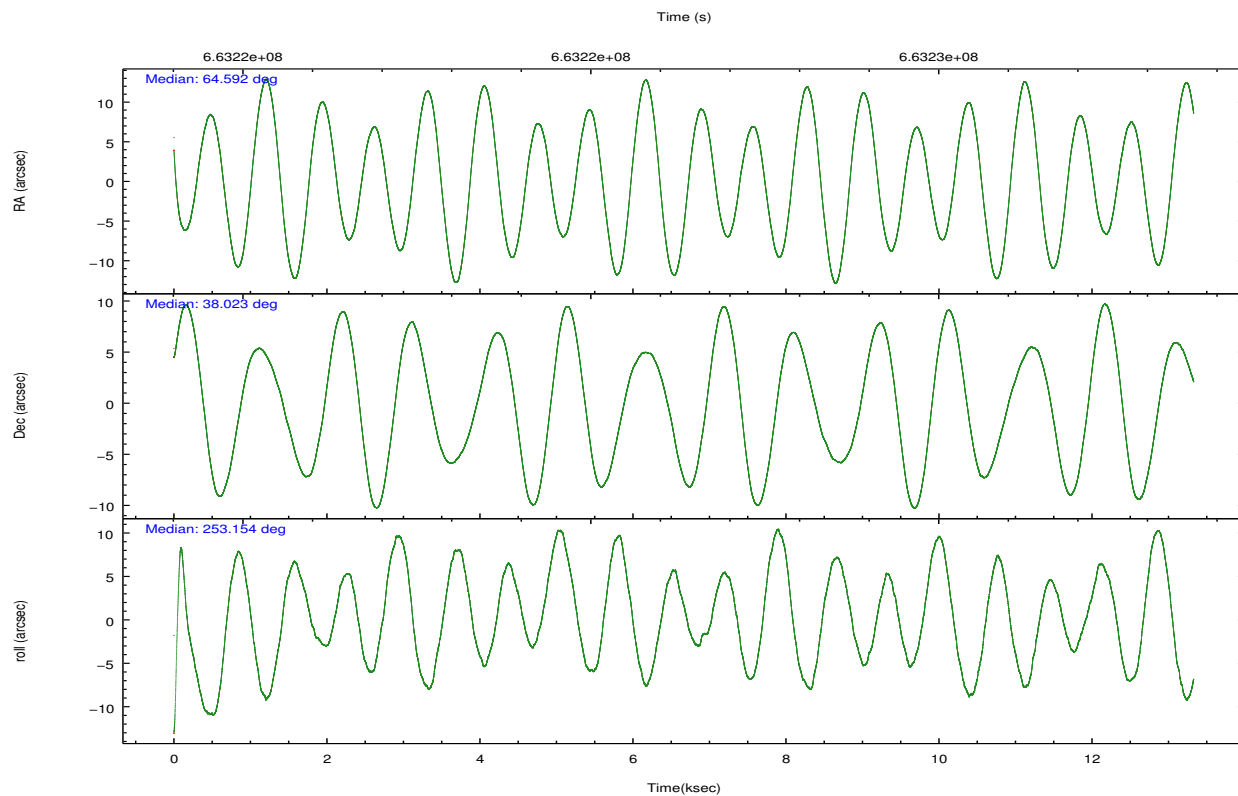


## 2.2 Compared Parameters

| Parameter                            | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|--------------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                           | ACIS                | ACIS                 | Obspar format version number          | 7         | 7       |
| 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                    | 64.584103           | 64.59251467283511    | Subarray requested                    | CUSTOM    | 1/2     |
| [deg] Pointing Dec                   | 38.049616           | 38.02301815688196    | Subarray start row                    | 257       | 257     |
| [deg] Pointing Roll                  | 253.002868          | 253.1542953596214    | Subarray row count                    | 512       | 512     |
| [deg] Roll angle                     | 63.500000           | 63.500000            | Alternating exposures requested       | N         | N       |
| [deg] Roll tolerance                 | 10.000000           | 10.000000            | [s] Primary exposure time             | 0.000000  | 1.7     |
| Roll constraint allows 180D rotation | Y                   | Y                    |                                       |           |         |
| [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)     | 663220016.184000    | 663219221.61886      |                                       |           |         |
| Observation start date               | 2019-01-07T03:45:47 | 2019-01-07T03:33:41  |                                       |           |         |
| [s] Observation end time (MET)       | 663233016.184000    | 663233920.11974      |                                       |           |         |
| Observation end date                 | 2019-01-07T07:22:27 | 2019-01-07T07:38:40  |                                       |           |         |
| Read mode                            | TIMED               | TIMED                |                                       |           |         |

## 2.3 Aspect



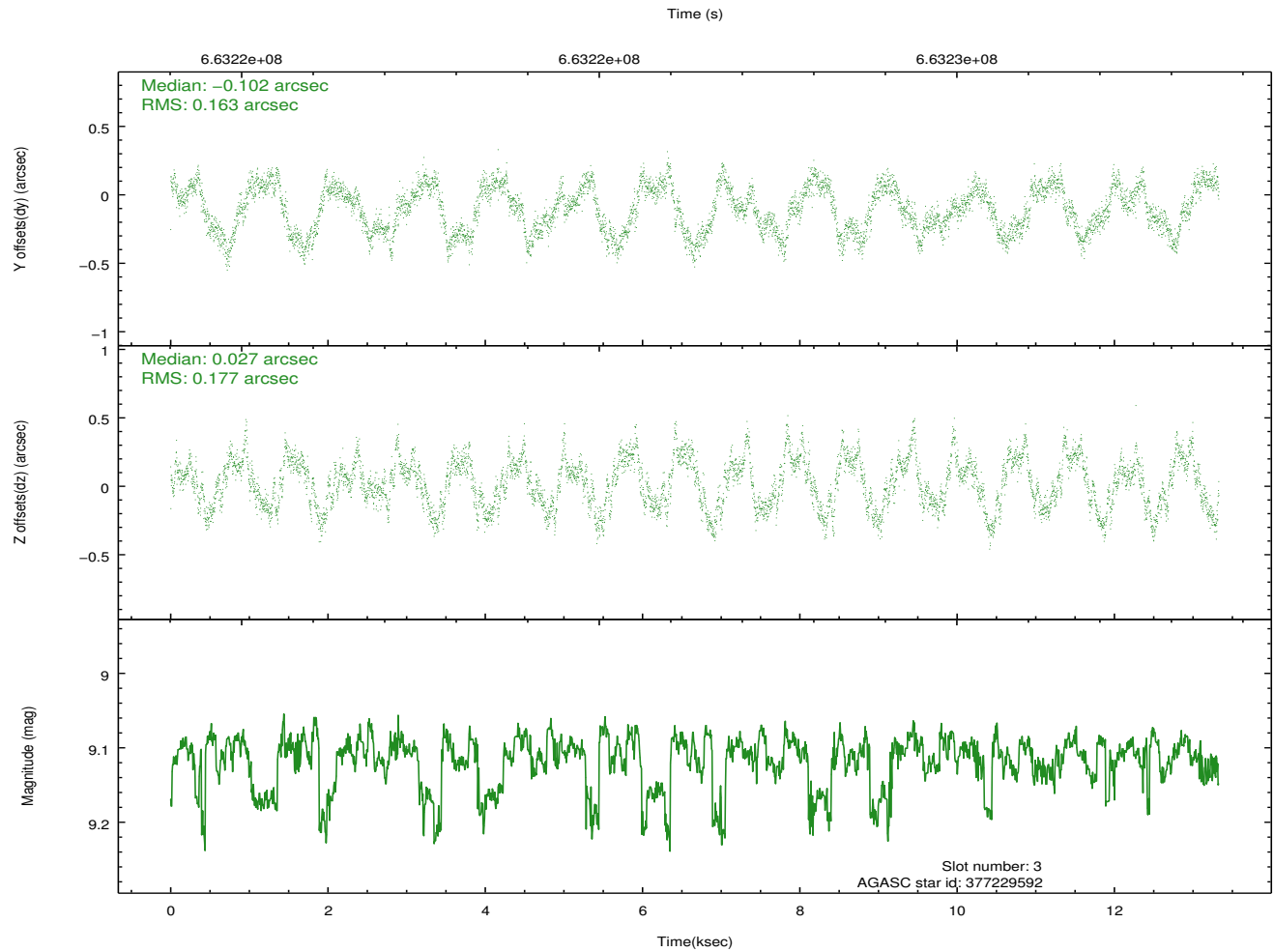
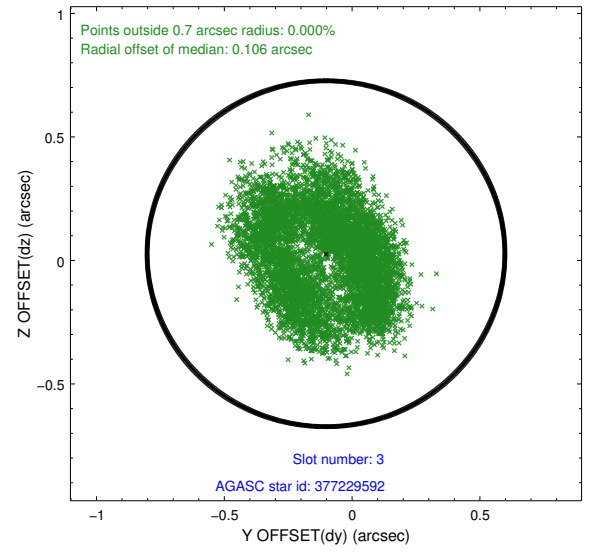
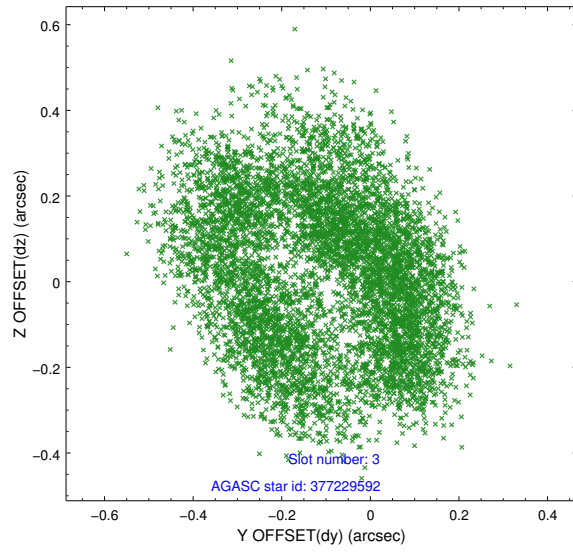


# Slot Statistics

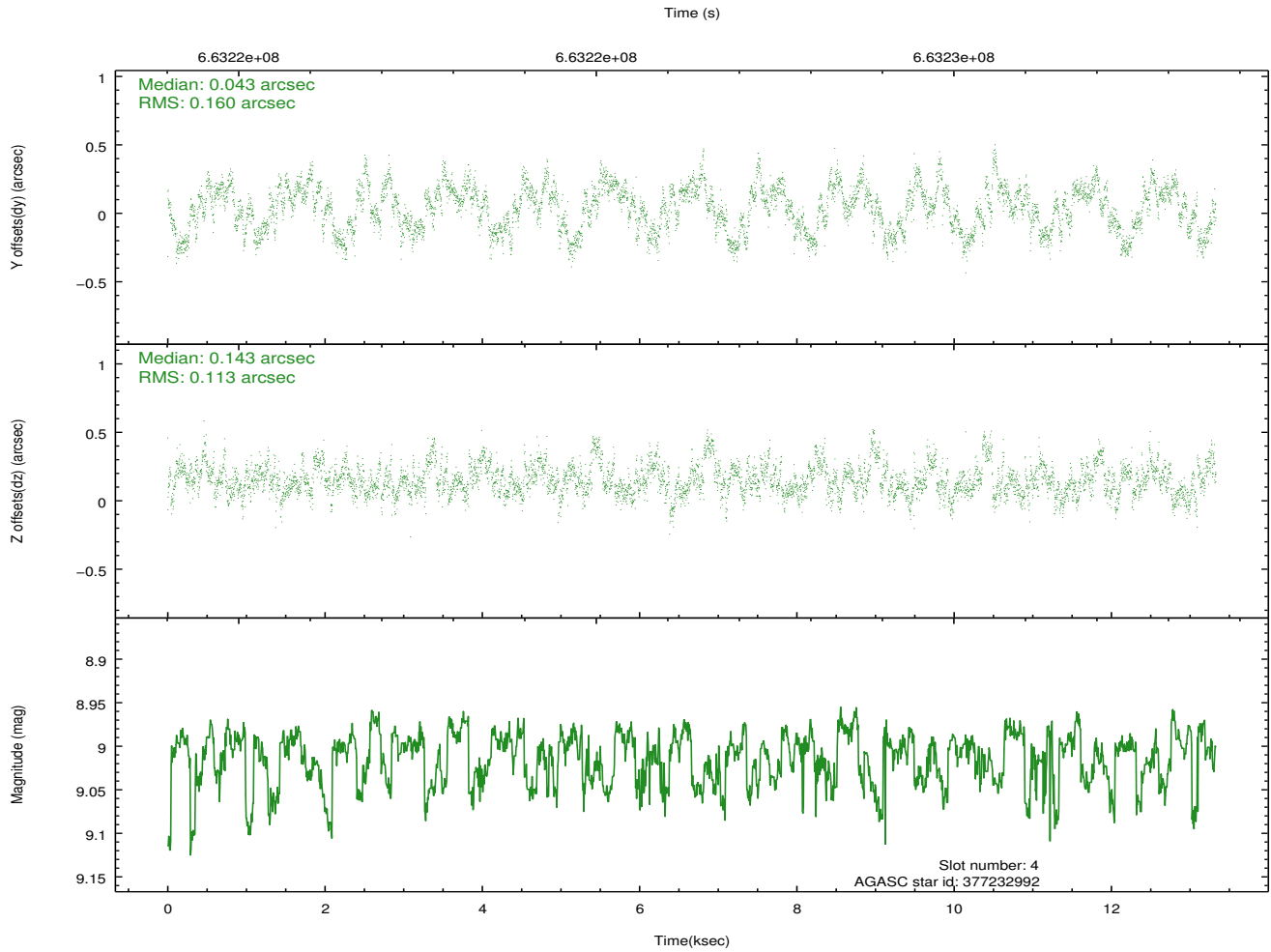
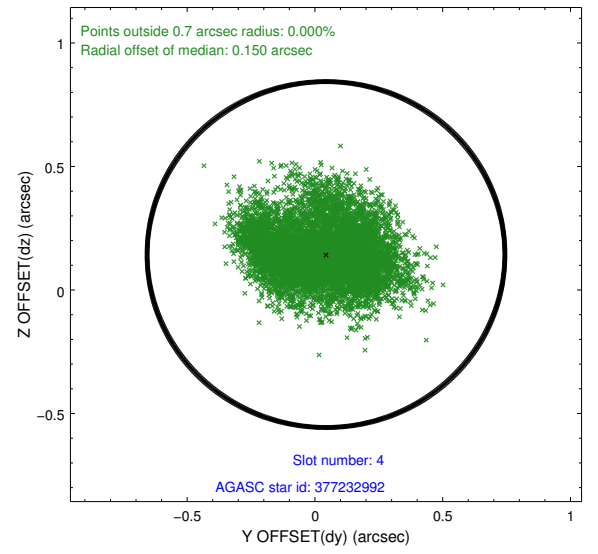
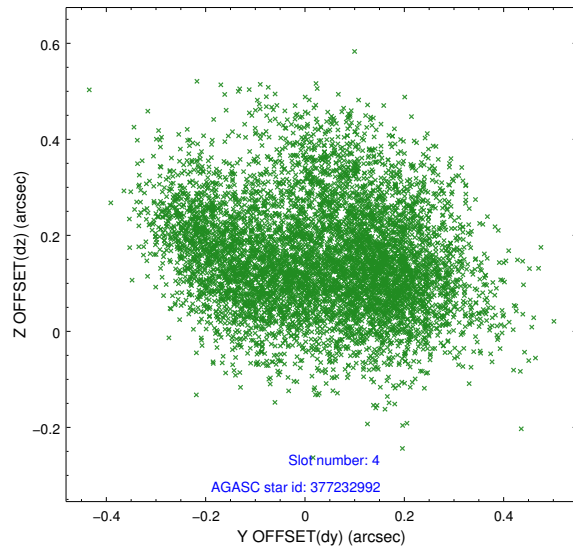
| pt | status | used | id        | mag  | n_pts | frac_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec       | mean_y   | mea   |
|----|--------|------|-----------|------|-------|----------|--------|--------|-------|-------|-----------|-----------|----------|-------|
| 0  | FID    |      | ACIS-S-2  | 7.12 | 3252  | 1.000    | -0.271 | -0.228 | 0.016 | 0.030 | 0.000000  | 0.000000  | -766.54  | -1740 |
| 1  | FID    |      | ACIS-S-4  | 7.26 | 3252  | 1.000    | 0.768  | 0.191  | 0.018 | 0.040 | 0.000000  | 0.000000  | 2147.56  | 168   |
| 2  | FID    |      | ACIS-S-5  | 7.23 | 3252  | 1.000    | -0.528 | 0.043  | 0.009 | 0.014 | 0.000000  | 0.000000  | -1819.23 | 162   |
| 3  | GUIDE  | used | 377229592 | 9.11 | 6492  | 1.000    | -0.102 | 0.027  | 0.266 | 0.372 | 64.771333 | 38.350817 | -1190.98 | 188   |
| 4  | GUIDE  | used | 377232992 | 9.01 | 6497  | 1.000    | 0.043  | 0.143  | 0.214 | 0.325 | 63.776678 | 37.815935 | 1466.88  | -1952 |
| 5  | GUIDE  | used | 377363032 | 9.35 | 6452  | 1.000    | 0.093  | -0.079 | 0.212 | 0.384 | 65.027918 | 38.365214 | -1454.63 | 865   |
| 6  | GUIDE  | used | 377365280 | 7.12 | 6501  | 1.000    | -0.330 | 0.207  | 0.139 | 0.211 | 65.229745 | 38.577157 | -2353.33 | 1181  |
| 7  | GUIDE  | used | 377233080 | 6.32 | 6502  | 1.000    | 0.296  | -0.303 | 0.172 | 0.333 | 63.716955 | 37.542672 | 2458.59  | -1836 |

## 2.4 Star Slots

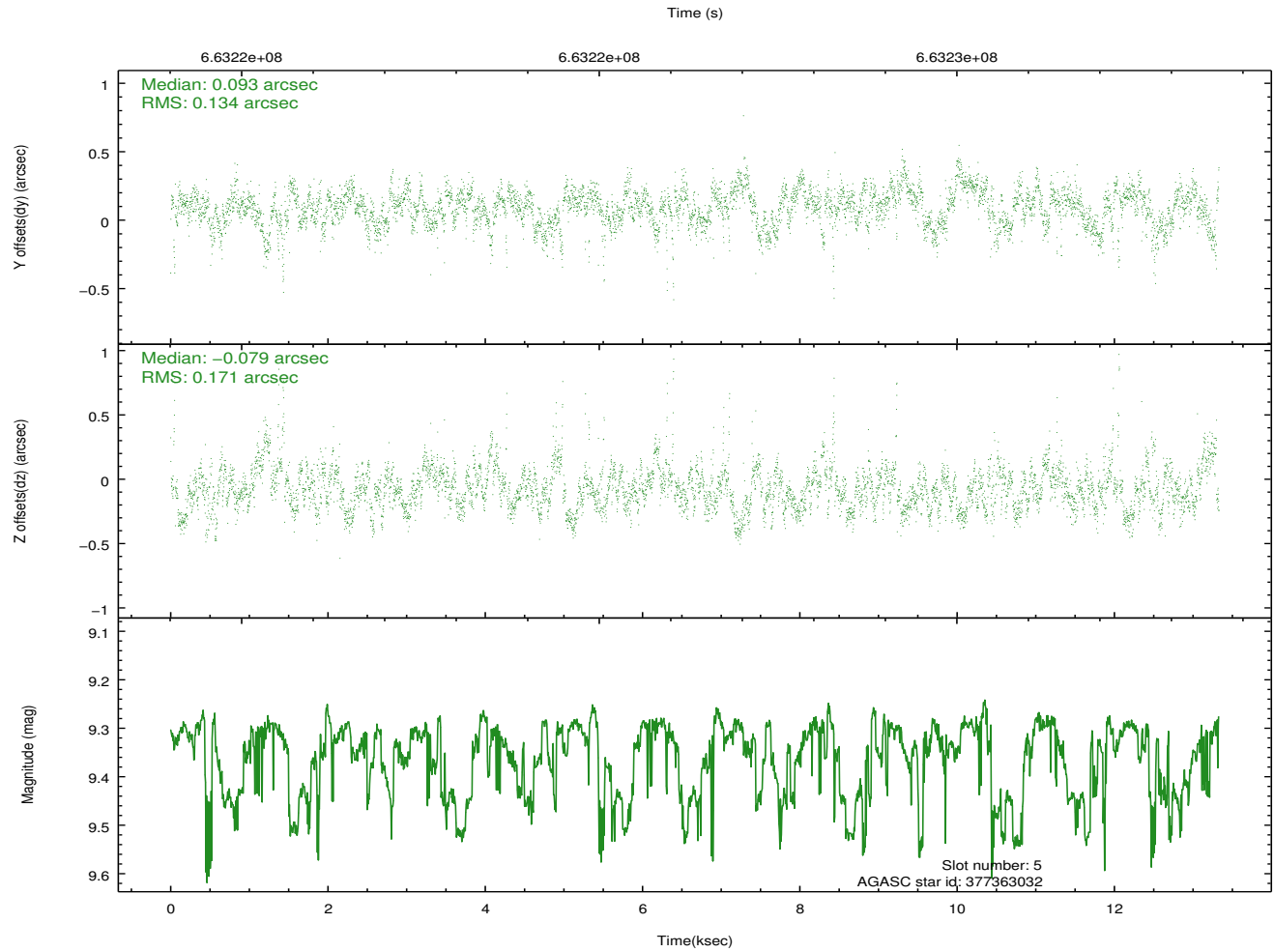
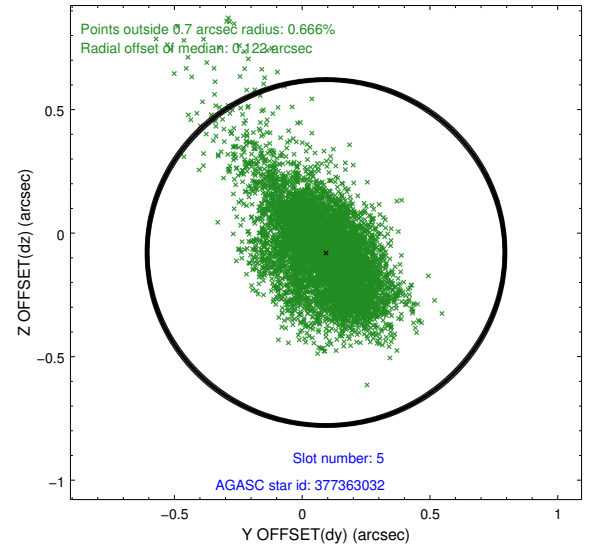
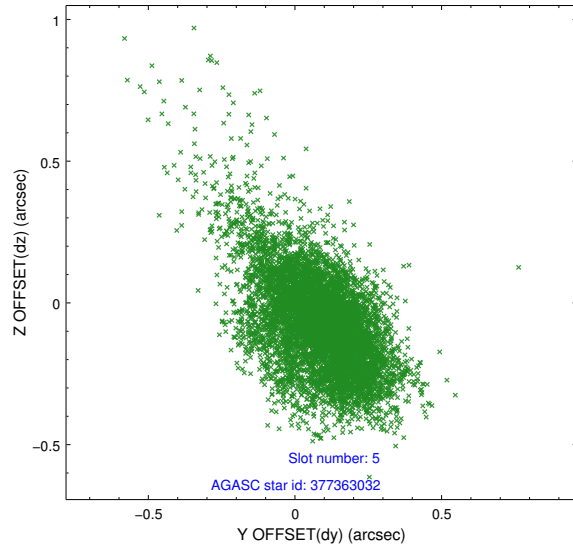
### 2.4.1 Slot 3



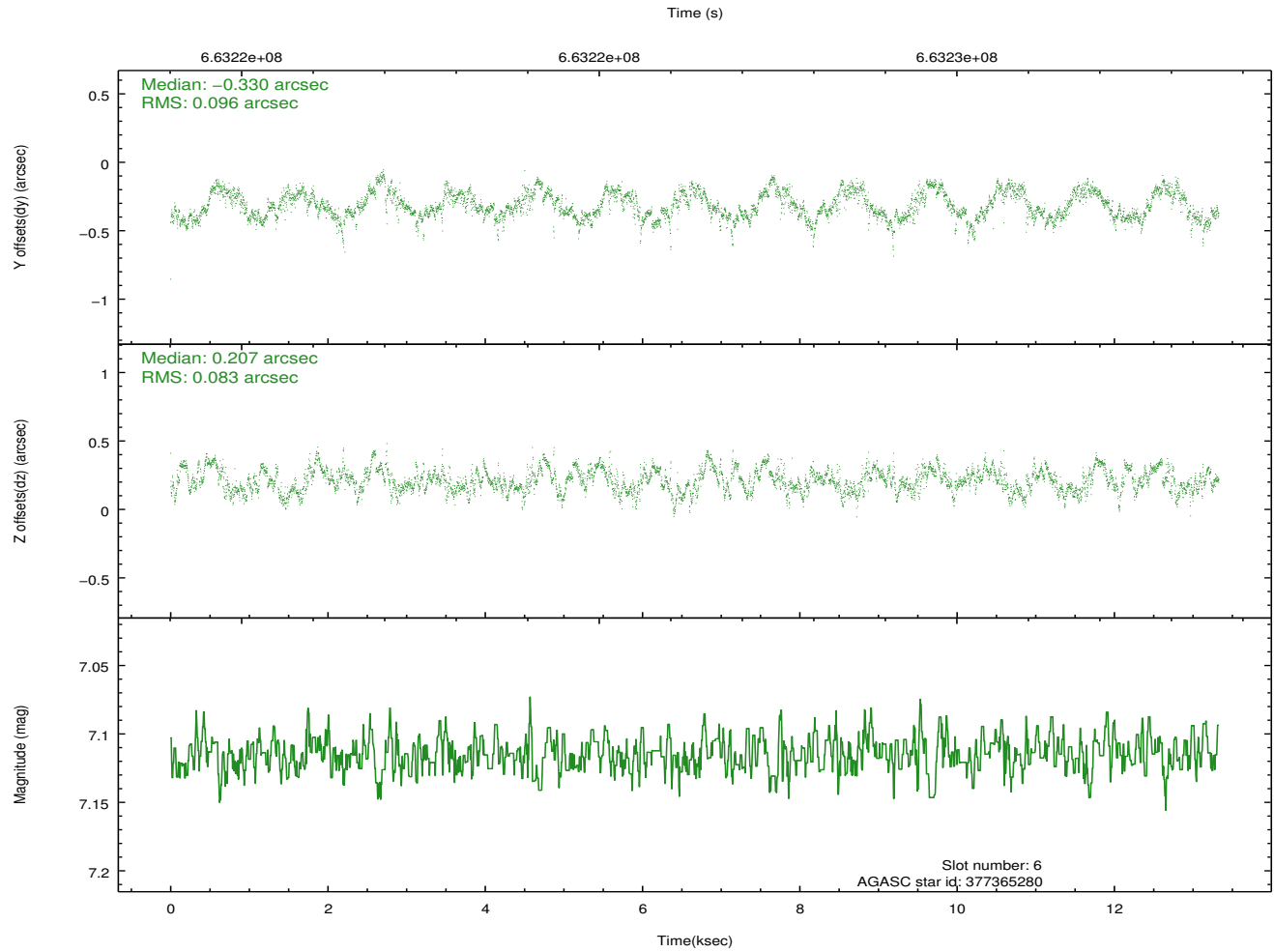
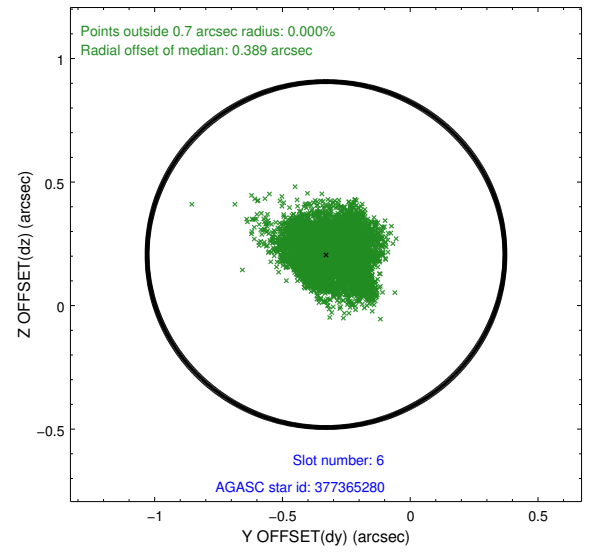
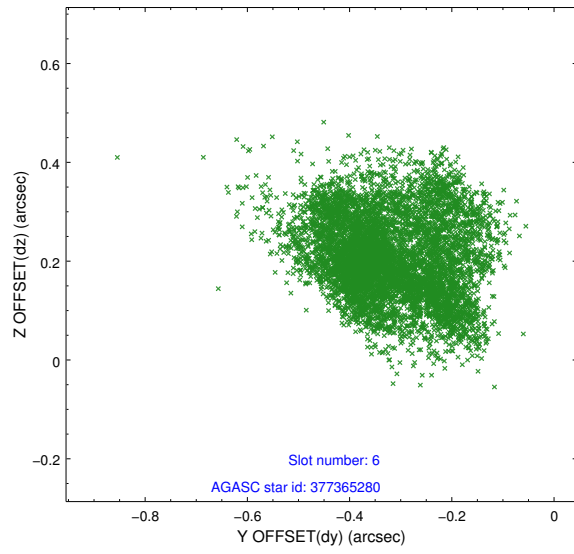
## 2.4.2 Slot 4



### 2.4.3 Slot 5

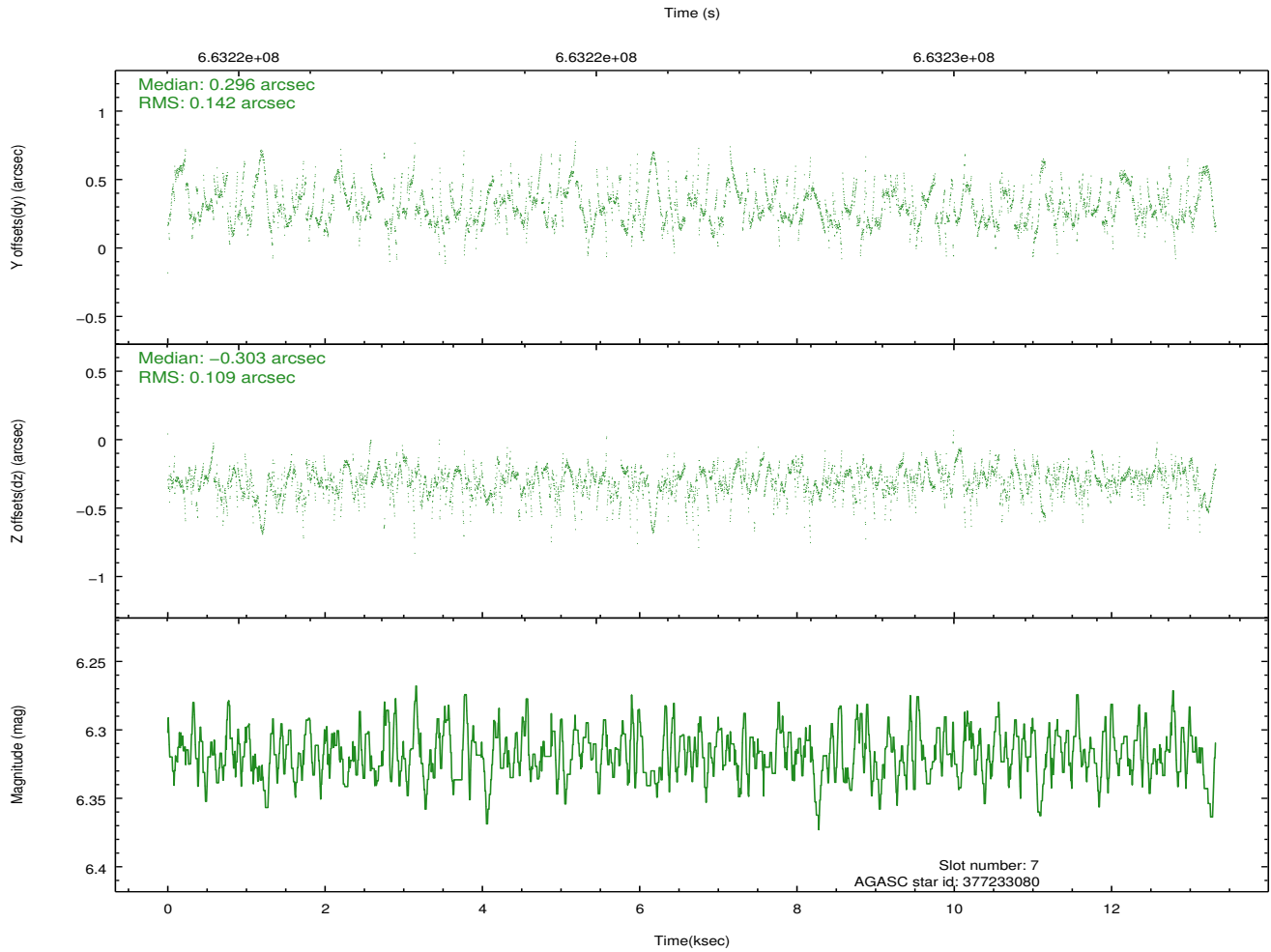
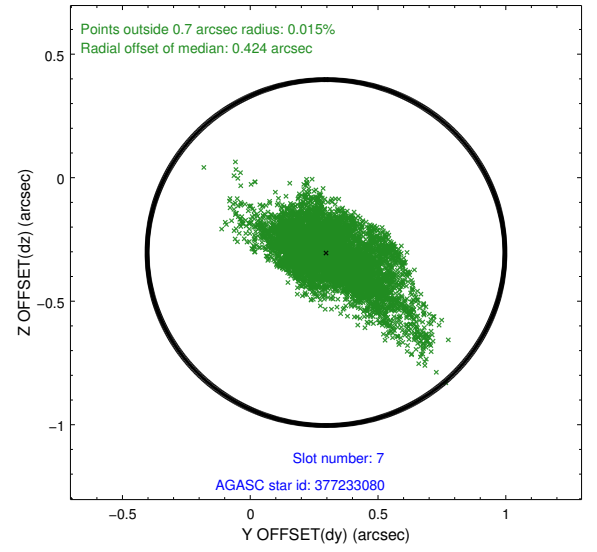
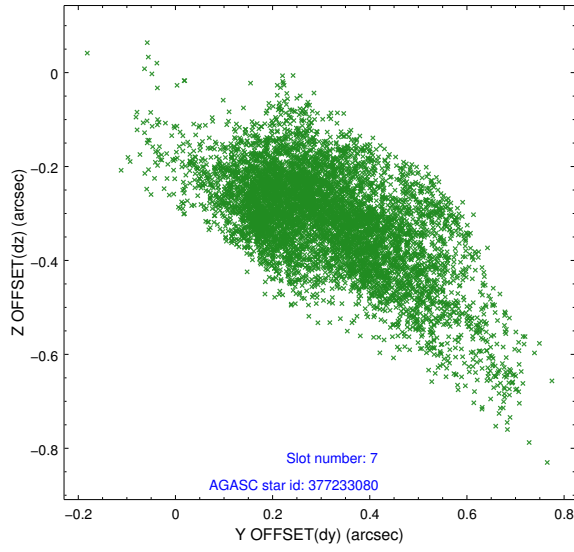


## 2.4.4 Slot 6



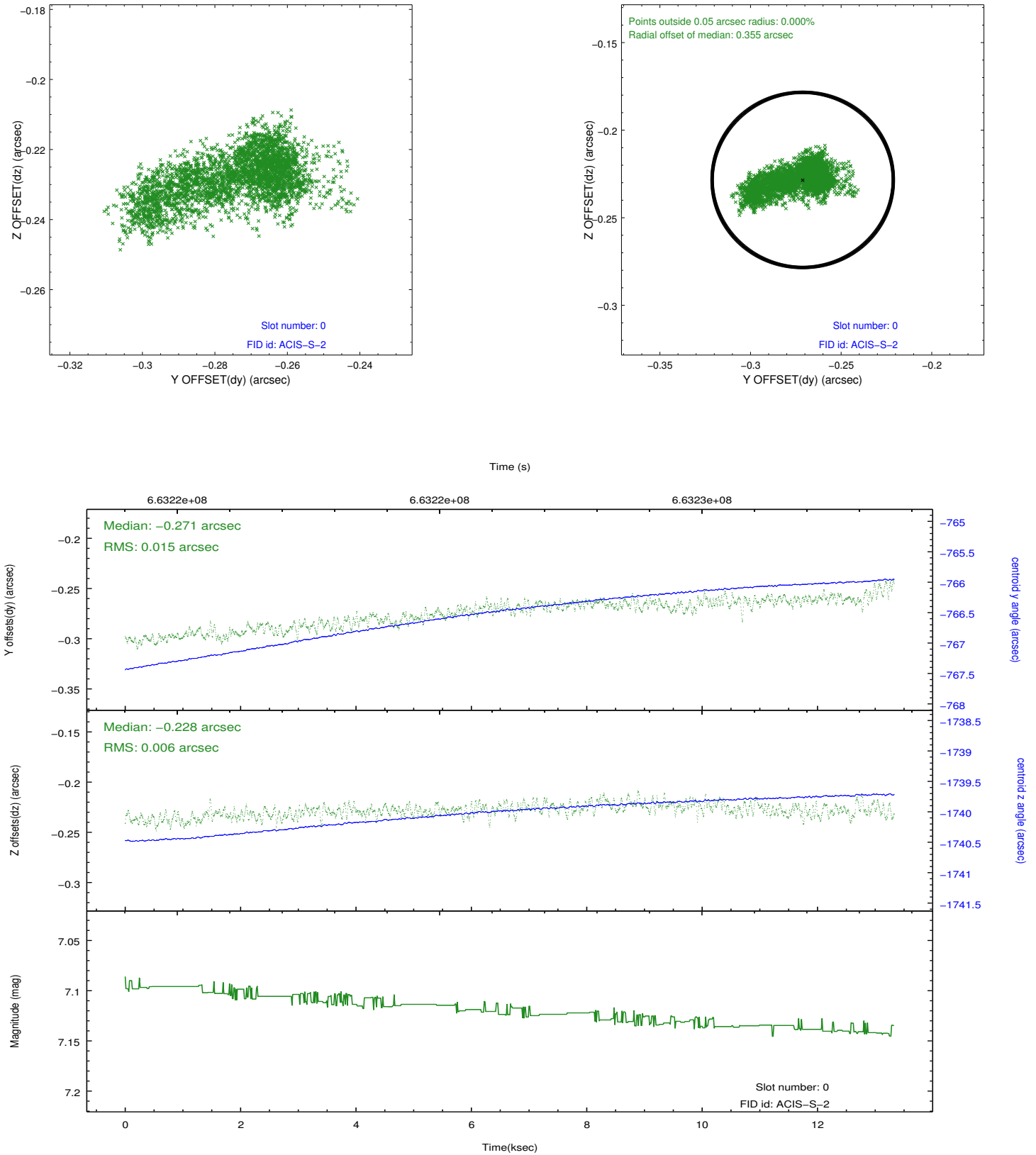


## 2.4.5 Slot 7

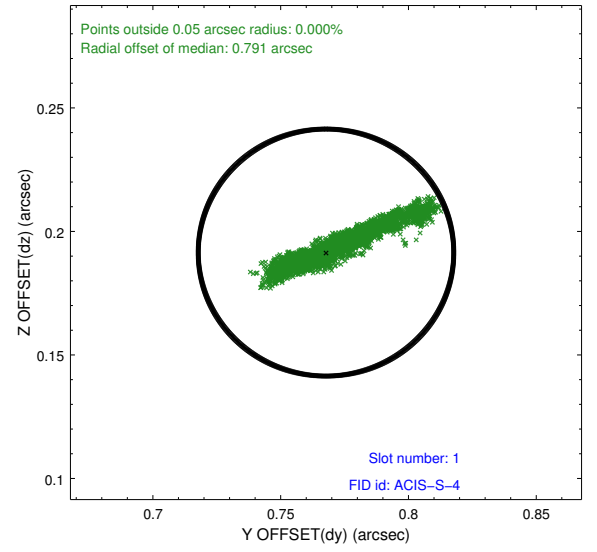
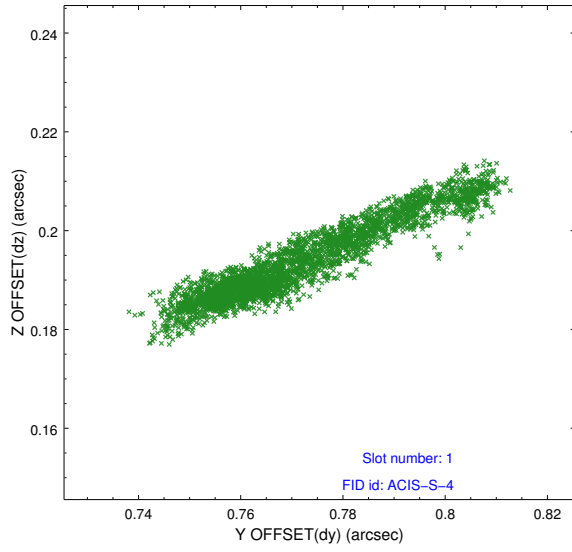


## 2.5 FID Slots

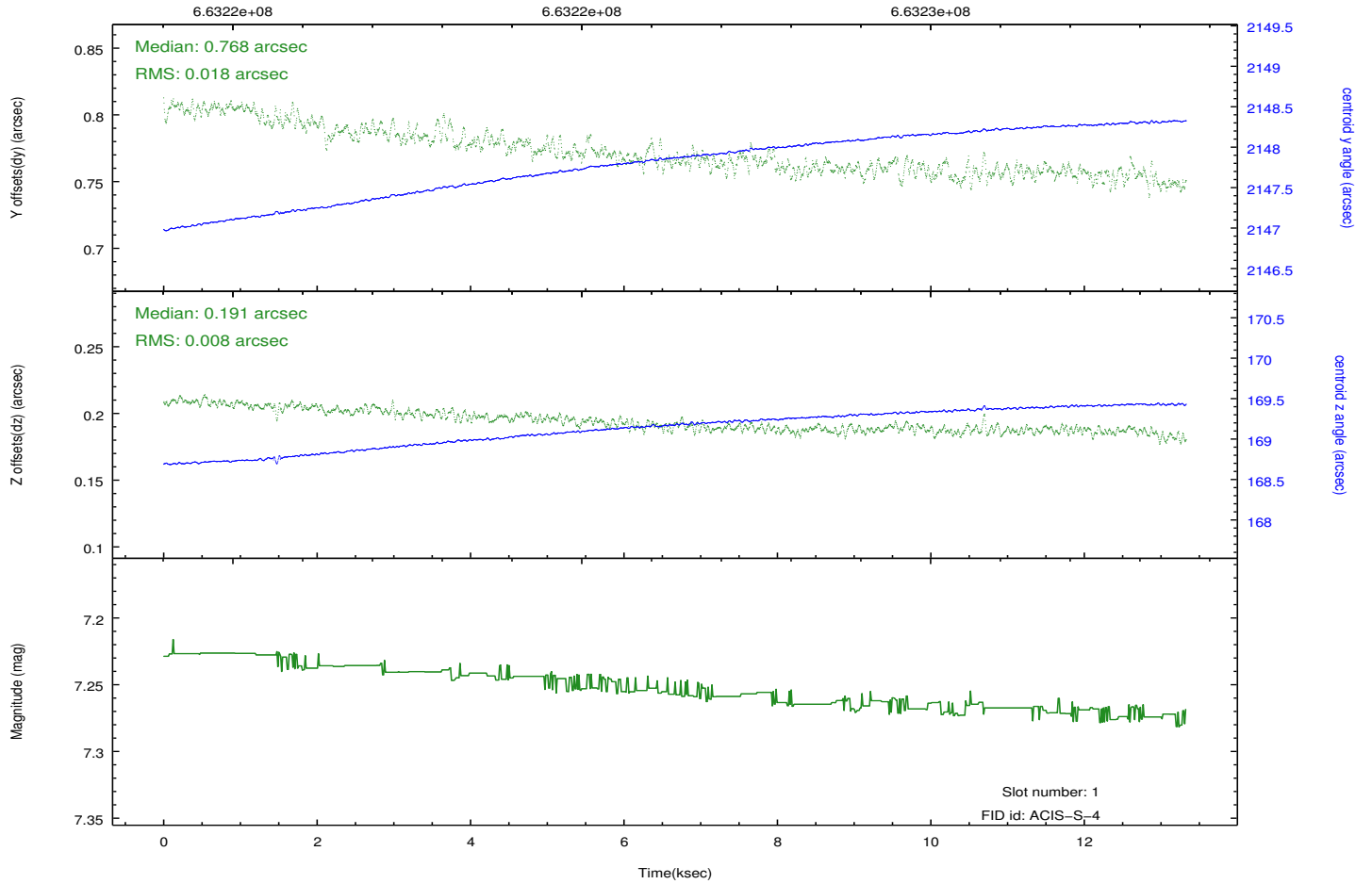
### 2.5.1 Slot 0



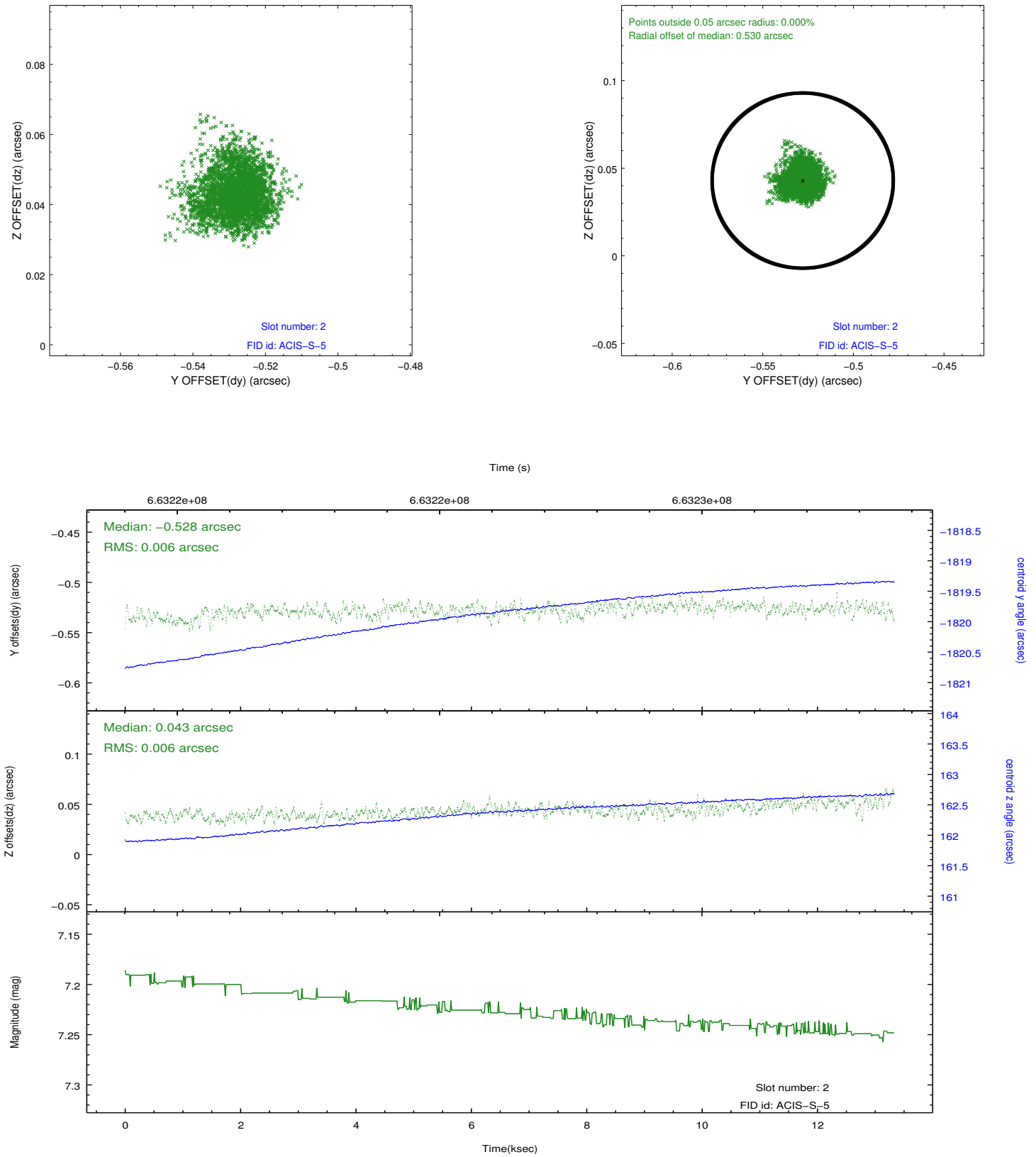
## 2.5.2 Slot 1



Time (s)



### 2.5.3 Slot 2



# A Summary

## A.1 Status

|                            |                 |
|----------------------------|-----------------|
| V&V Scientist              | Beth Sundheim   |
| V&V Date (YYYY-MM-DD)      | 2019.01.07      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 13.067900366545 |

## A.2 Comments

Joint proposal with HST and NuSTAR.

Observation coordinated with HST and NuSTAR.

Roll preference met.