

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 11839 - L2 Version 2  
Chandra X-Ray Center

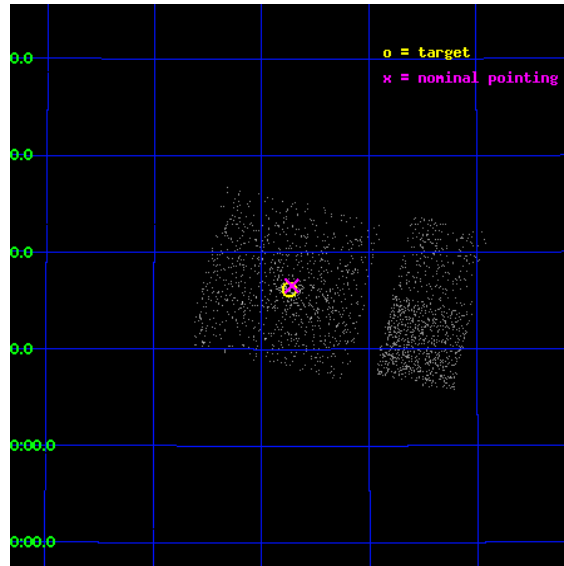
L2 Processing Date : Jun 28 2012

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# 1 Front

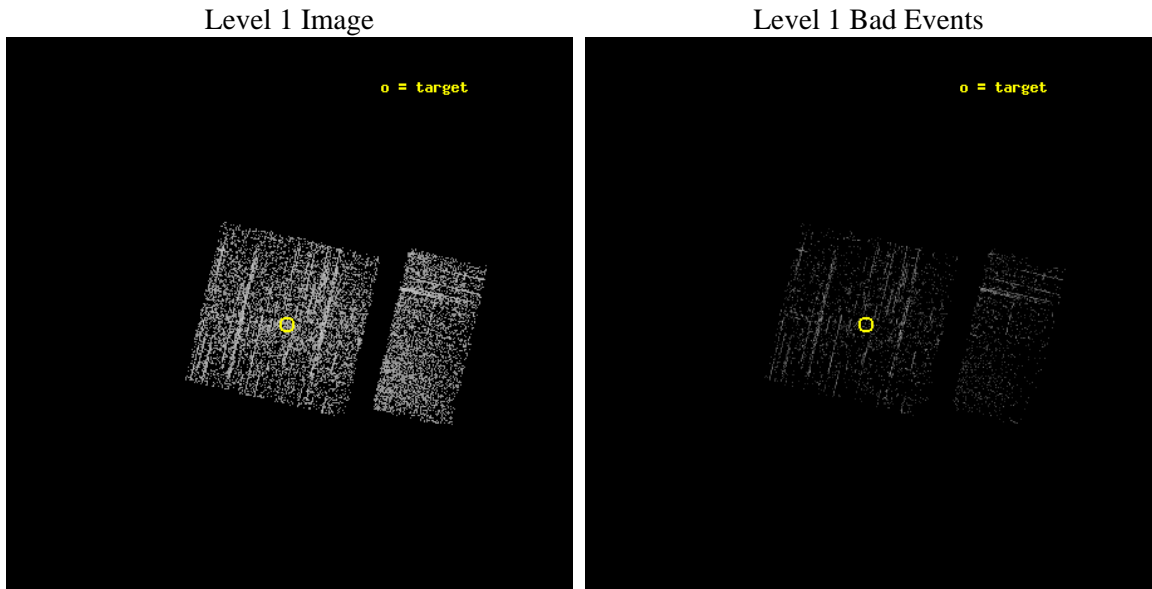
|          |                               |   |
|----------|-------------------------------|---|
| seq_num  | 600907                        | Sequence number                                     |
| obs_id   | 11839                         | Observation id                                      |
| title    | Black Hole X-ray Novae in M31 | Proposal title                                      |
| observer | Dr. Stephen Murray            | Principal investigator                              |
| object   | M31                           | Source name   |
| dtcycle  | 0                             | &#160   |
| cycle    | P                             | events are from which exps? P[primary]<br>S[econdar |
| ra_targ  | 10.685                        | Observer's specified target RA [deg]                |
| dec_targ | 41.268972                     | Observer's specified target Dec [deg]               |
| ra_nom   | 10.679644783234               | Nominal RA [deg]                                    |
| dec_nom  | 41.275974527654               | Nominal Dec [deg]                                   |
| roll_nom | 103.12349167553               | Nominal Roll [deg]                                  |
| revision | 2                             | Processing version of data                          |
| ontime   | 937.15470457077               | Sum of GTIs [s]                                     |
| livetime | 147.53075614543               | Livetime [s]  |
| ontime0  | 937.15468466282               | Sum of GTIs [s]                                     |
| ontime1  | 937.15470457077               | Sum of GTIs [s]                                     |
| ontime2  | 937.15468466282               | Sum of GTIs [s]                                     |
| ontime3  | 937.15470457077               | Sum of GTIs [s]                                     |
| ontime6  | 937.19480538368               | Sum of GTIs [s]                                     |
| ontime7  | 937.15468466282               | Sum of GTIs [s]                                     |
| l2events | 2431                          | Number of level 2 events                            |



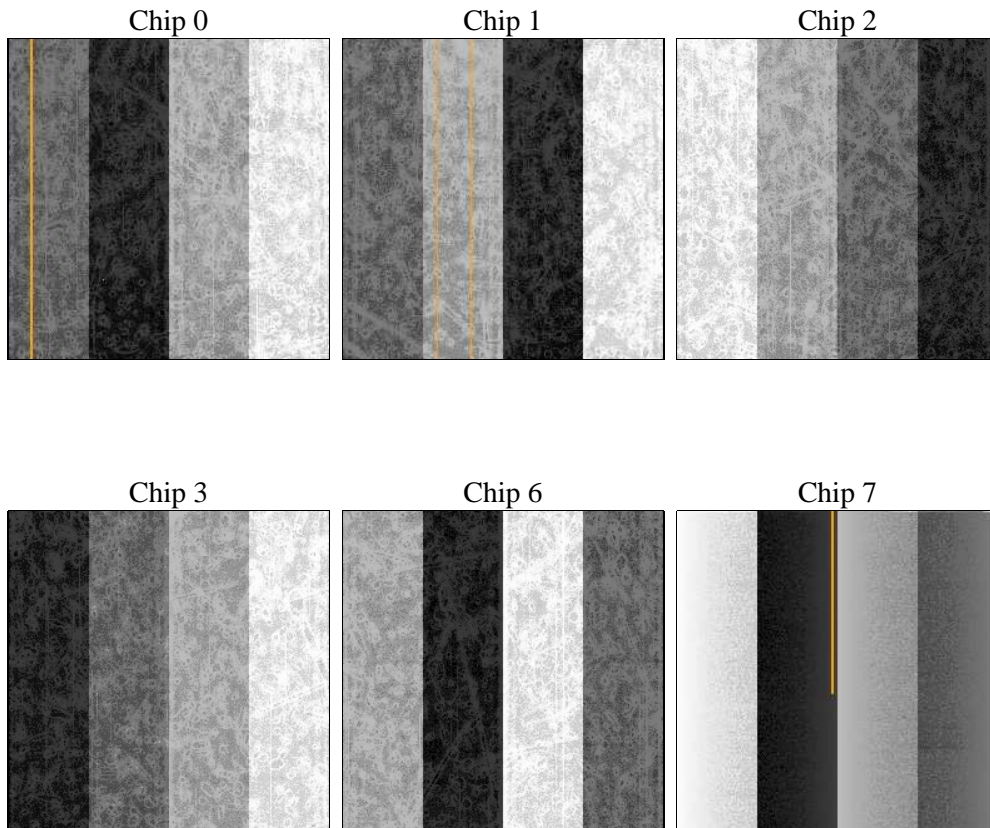
## 2 OBI Primary

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 5000.000000     | [s] Scheduled observation exposure time |
| ascdsver | 8.4.5               | Processing system revision     | ontime         | 937.15470457077 | Sum of GTIs [s]                         |
| caldsver | 4.5.0               | &#160                          | ontime0        | 937.15468466282 | Sum of GTIs [s]                         |
| date     | 2012-06-28T21:10:06 | Date and time of file creation | ontime1        | 937.15470457077 | Sum of GTIs [s]                         |
| revision | 2                   | Processing version of data     | ontime2        | 937.15468466282 | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 937.15470457077 | Sum of GTIs [s]                         |
|          |                     |                                | ontime6        | 937.19480538368 | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 937.15468466282 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 21756           | Number of level 1 events                |

### 2.1.4 Events

|                 | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 | ccd 7 |
|-----------------|-------|-------|-------|-------|-------|-------|
| level 1 events  | 3175  | 4082  | 4210  | 3453  | 3824  | 3012  |
| rejected events | 2839  | 3656  | 3886  | 2939  | 3515  | 2134  |
| rejected %      | 89%   | 89%   | 92%   | 85%   | 91%   | 70%   |

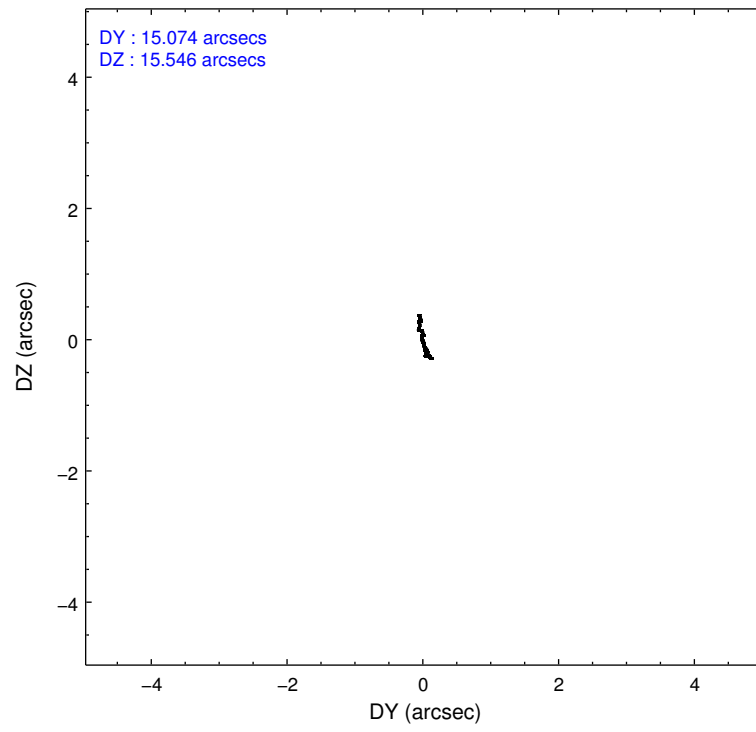
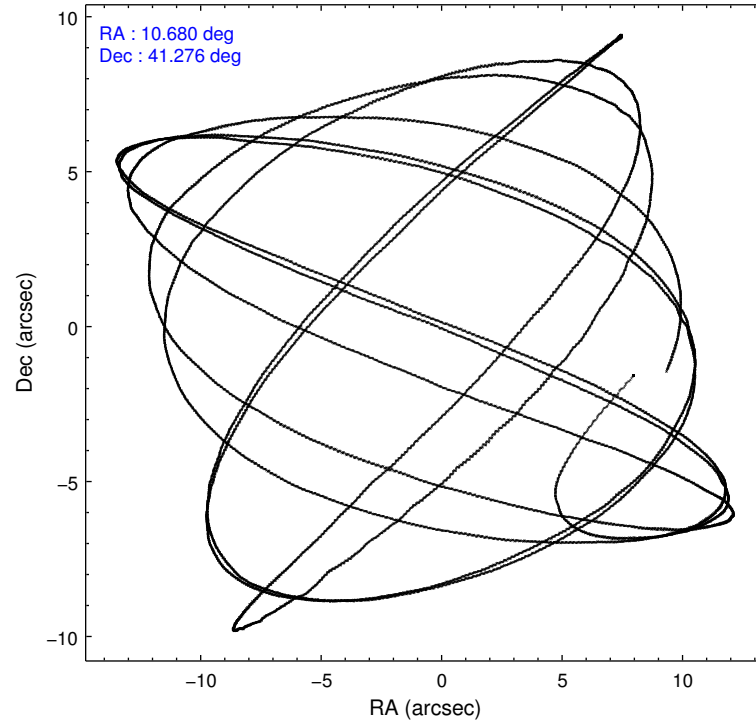
|                | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 | ccd 7 |
|----------------|-------|-------|-------|-------|-------|-------|
| grade 0 events | 111   | 182   | 131   | 275   | 74    | 78    |
|                | 3%    | 4%    | 3%    | 7%    | 1%    | 2%    |
| grade 1 events | 2     | 1     | 1     | 4     | 4     | 5     |
|                | 0%    | 0%    | 0%    | 0%    | 0%    | 0%    |
| grade 2 events | 65    | 87    | 67    | 91    | 75    | 224   |
|                | 2%    | 2%    | 1%    | 2%    | 1%    | 7%    |
| grade 3 events | 60    | 46    | 43    | 45    | 51    | 71    |
|                | 1%    | 1%    | 1%    | 1%    | 1%    | 2%    |
| grade 4 events | 48    | 55    | 36    | 44    | 47    | 71    |
|                | 1%    | 1%    | 0%    | 1%    | 1%    | 2%    |
| grade 5 events | 104   | 105   | 128   | 137   | 154   | 283   |
|                | 3%    | 2%    | 3%    | 3%    | 4%    | 9%    |
| grade 6 events | 61    | 60    | 55    | 68    | 63    | 452   |
|                | 1%    | 1%    | 1%    | 1%    | 1%    | 15%   |
| grade 7 events | 2724  | 3546  | 3749  | 2789  | 3356  | 1828  |
|                | 85%   | 86%   | 89%   | 80%   | 87%   | 60%   |

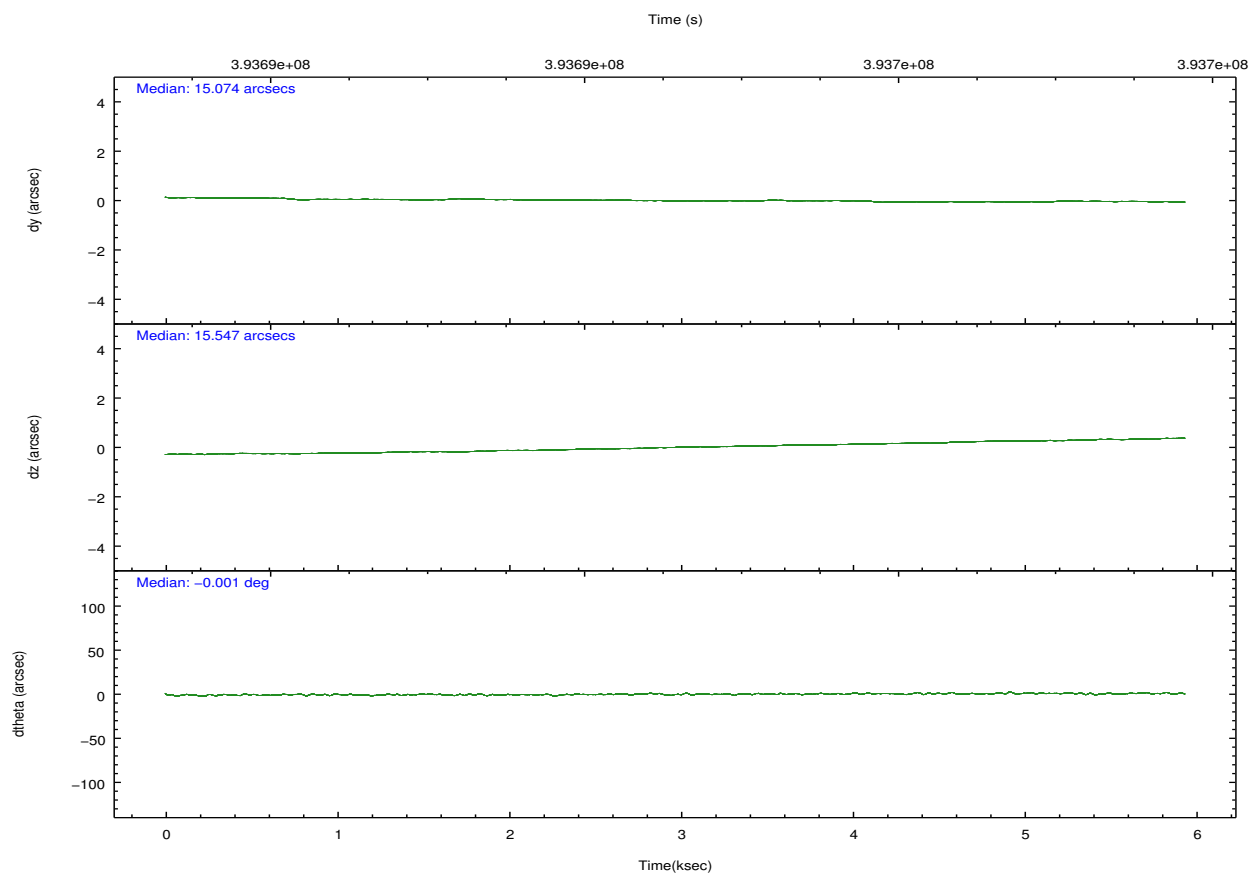
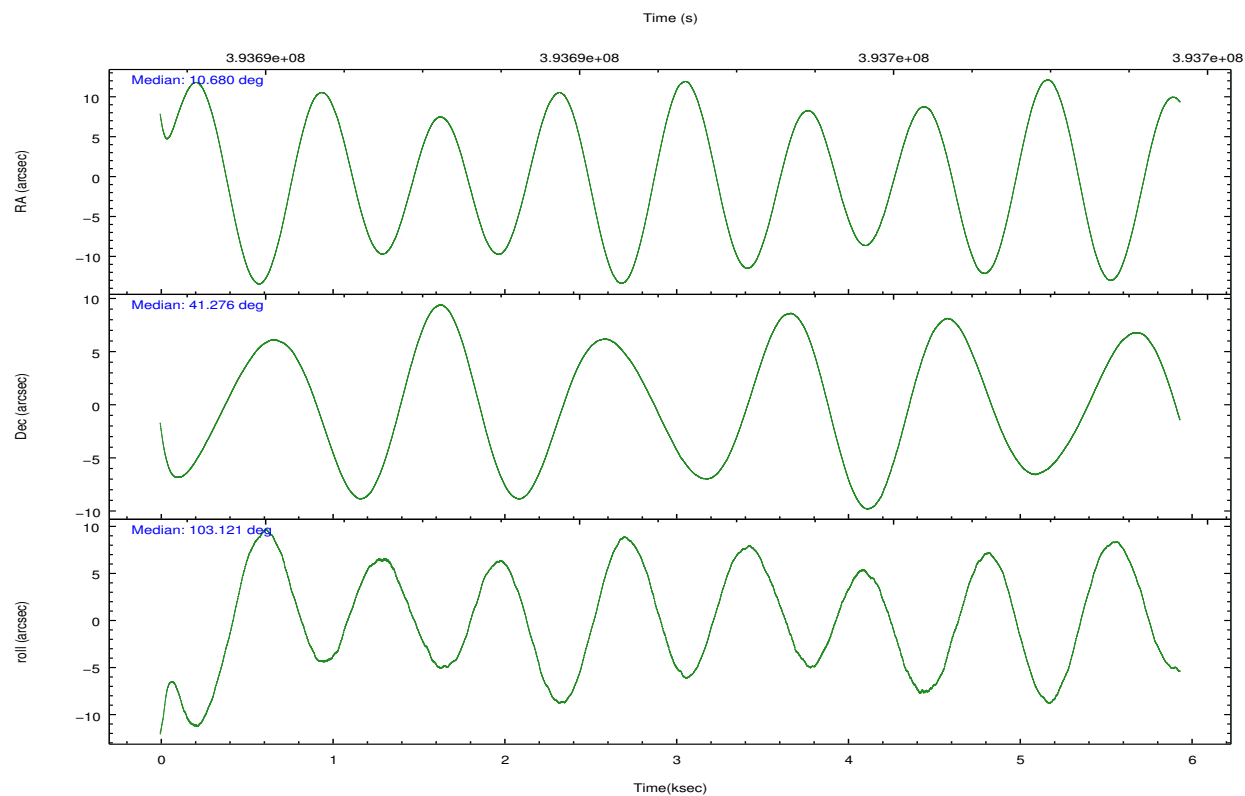


## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual                | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|-----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                  | Obspar format version number          | 7         | 7       |
| 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                 | 10.704663           | 10.67964478323427     | CCD I2 on                             | Y         | Y       |
| [deg] Pointing Dec                | 41.255950           | 41.27597452765398     | CCD I3 on                             | Y         | Y       |
| [deg] Pointing Roll               | 102.898327          | 103.1234916755291     | 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)  | 393692545.184000    | 393690582.56097       | CCD S5 on                             | N         | N       |
| Observation start date            | 2010-06-23T15:01:19 | 2010-06-23T14:29:42   | Number of optional ACIS chips dropped | 0         | 0       |
| [s] Observation end time (MET)    | 393697545.184000    | 393698590.88638       | On-chip summing requested             | N         | N       |
| Observation end date              | 2010-06-23T16:24:39 | 2010-06-23T16:43:10   | Subarray requested                    | NONE      | NONE    |
| Read mode                         | TIMED               | TIMED                 | Alternating exposures requested       | Y         | Y       |
|                                   |                     |                       | [s] Primary exposure time             | 0.600000  | 0.6     |
|                                   |                     |                       | [s] Secondary exposure time           | 0.000000  | 3.2     |
|                                   |                     |                       | Duty cycle                            | 5         | 5       |

## 2.3 Aspect



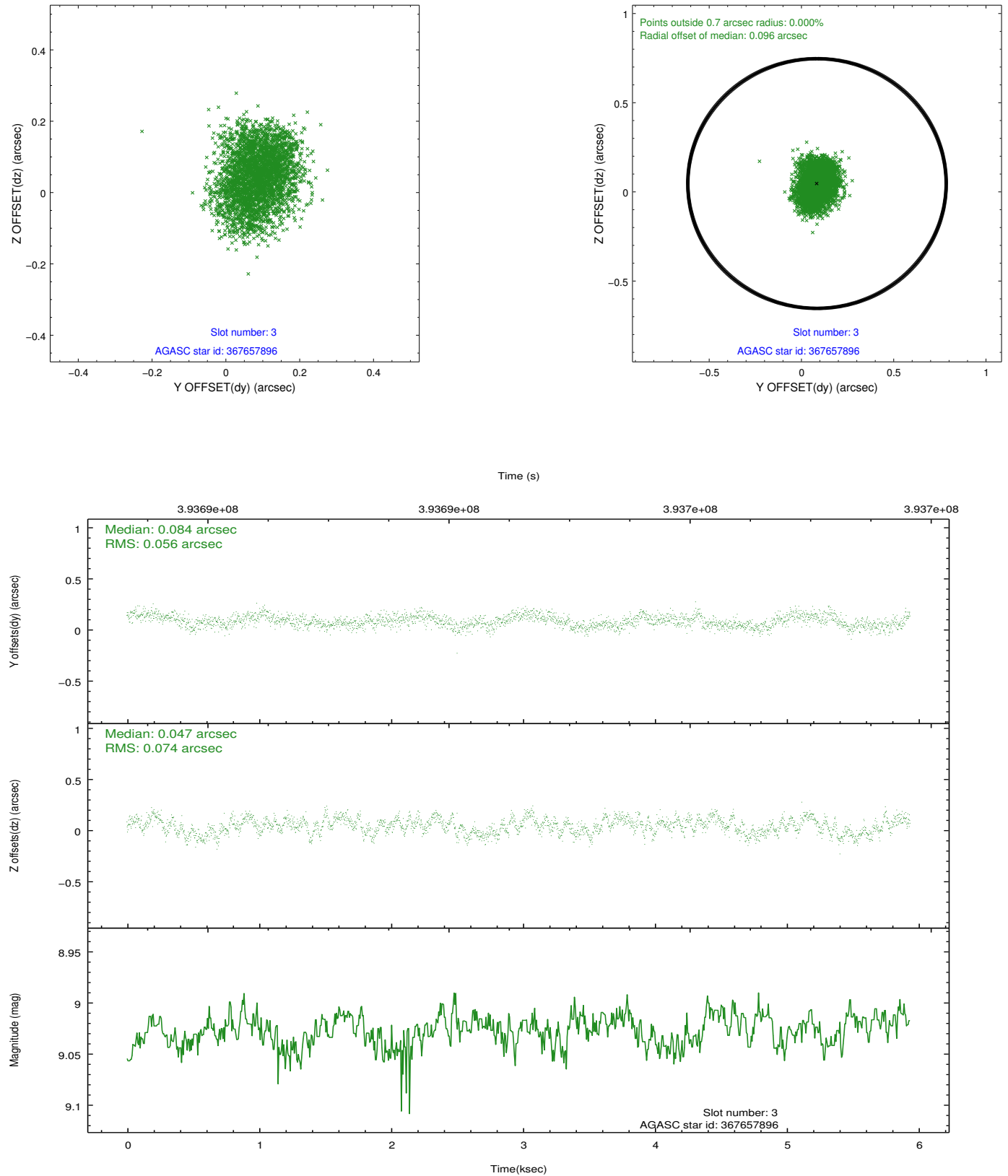


### Slot Statistics

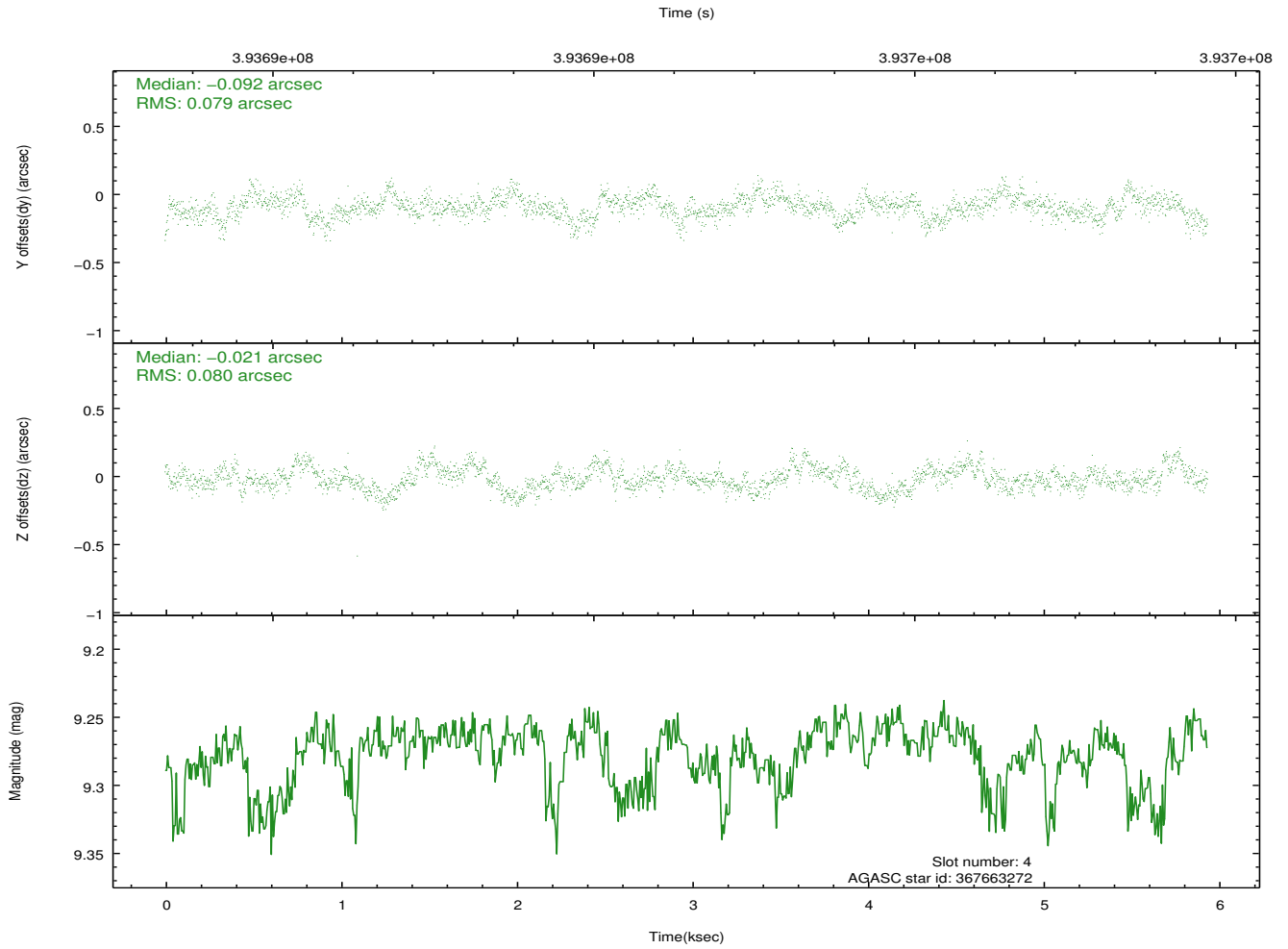
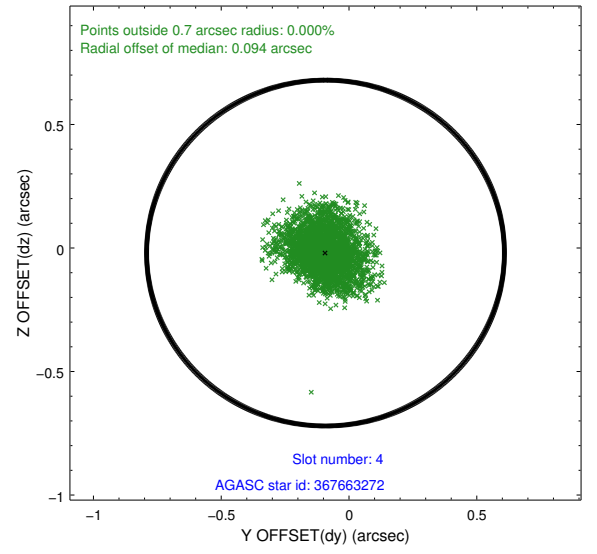
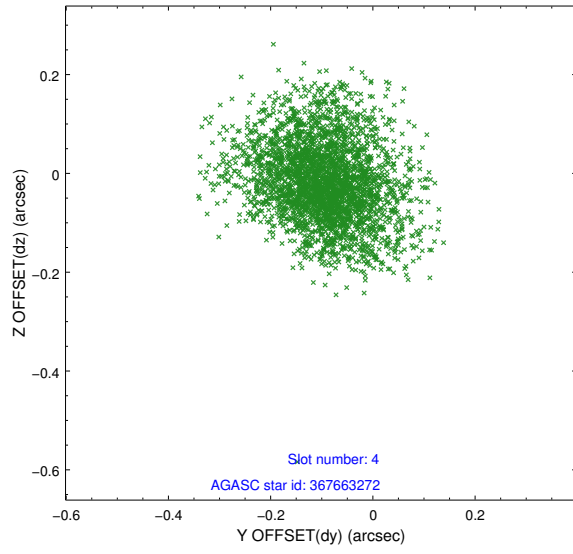
| slot | status | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec       | mean_y   | mean_z   |
|------|--------|-----------|------|-------|--------|--------|-------|-------|-----------|-----------|----------|----------|
| 0    | FID    | ACIS-I-2  | 6.96 | 1448  | -0.020 | -0.083 | 0.009 | 0.018 | 0.000000  | 0.000000  | -769.84  | -845.60  |
| 1    | FID    | ACIS-I-5  | 7.04 | 1448  | -0.191 | 0.048  | 0.008 | 0.015 | 0.000000  | 0.000000  | -1824.53 | 1057.90  |
| 2    | FID    | ACIS-I-6  | 7.04 | 1448  | 0.118  | 0.104  | 0.007 | 0.012 | 0.000000  | 0.000000  | 388.97   | 1703.55  |
| 3    | GUIDE  | 367657896 | 9.03 | 2892  | 0.084  | 0.047  | 0.101 | 0.155 | 11.197765 | 41.313576 | -91.19   | -1346.32 |
| 4    | GUIDE  | 367663272 | 9.28 | 2893  | -0.092 | -0.021 | 0.120 | 0.196 | 10.656279 | 41.699429 | 1585.39  | -228.64  |
| 5    | GUIDE  | 367674552 | 8.84 | 2896  | -0.174 | 0.050  | 0.087 | 0.137 | 11.016238 | 41.570845 | 919.87   | -1071.01 |
| 6    | GUIDE  | 367148872 | 7.21 | 2897  | 0.125  | -0.257 | 0.071 | 0.123 | 10.505940 | 40.688258 | -1870.24 | 984.93   |
| 7    | GUIDE  | 367138920 | 7.71 | 2896  | 0.058  | 0.174  | 0.090 | 0.134 | 11.513485 | 40.808909 | -2051.70 | -1791.23 |

## 2.4 Star Slots

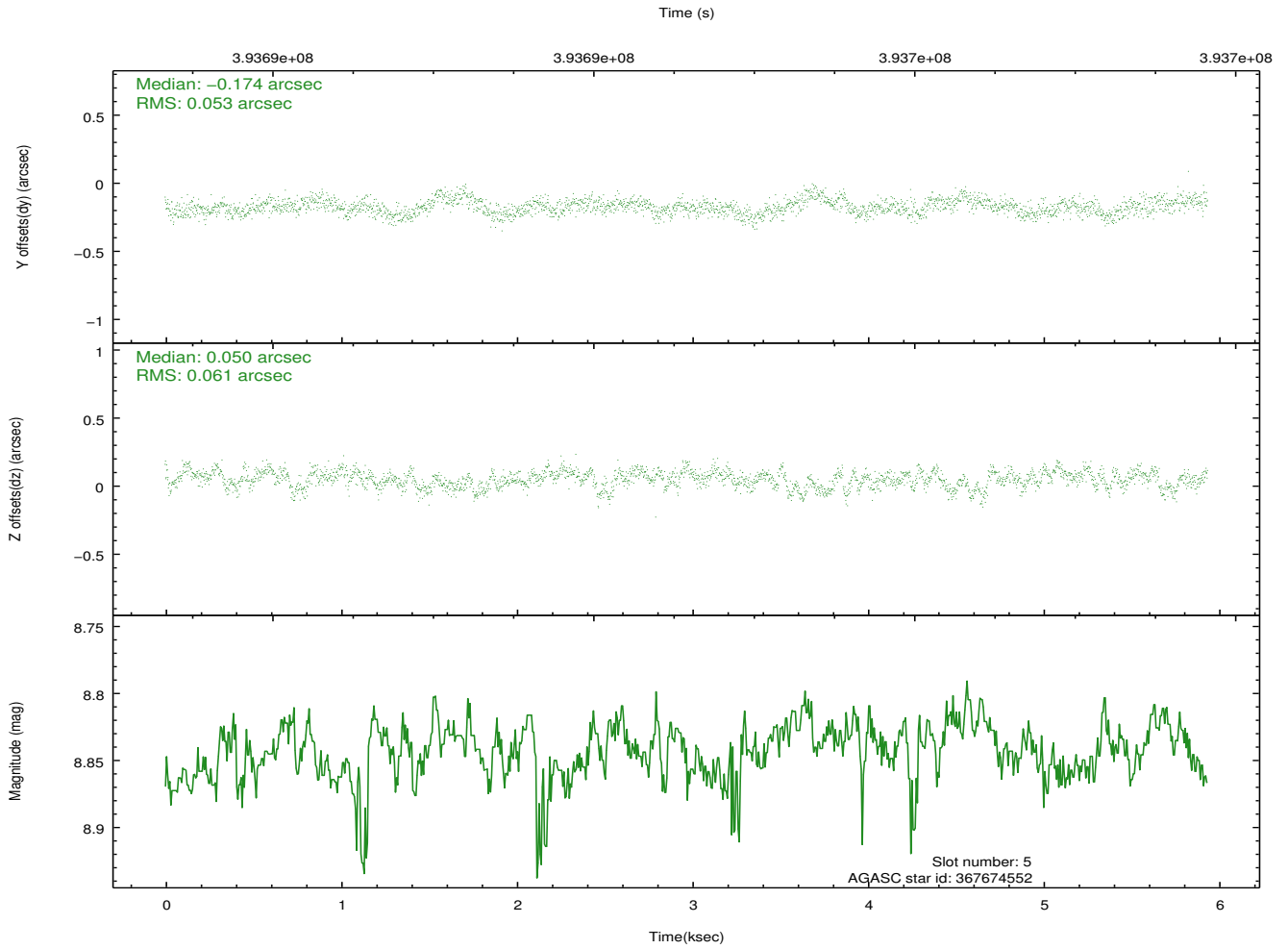
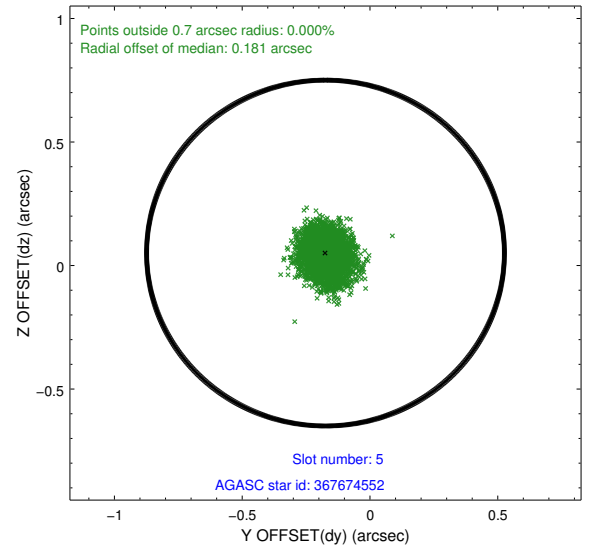
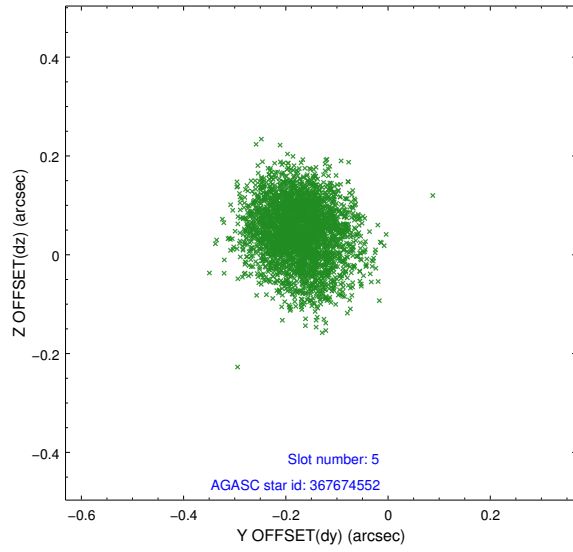
### 2.4.1 Slot 3



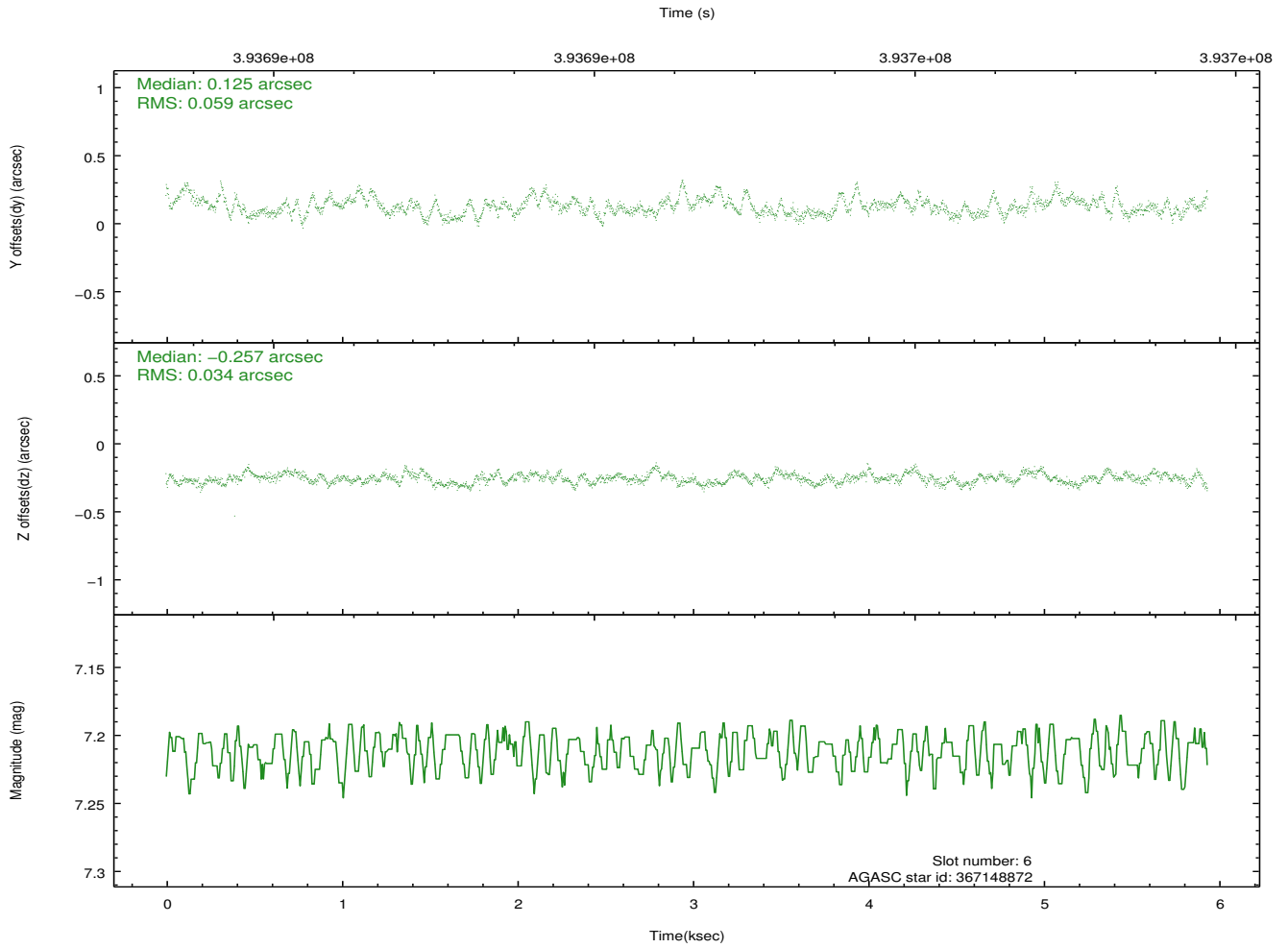
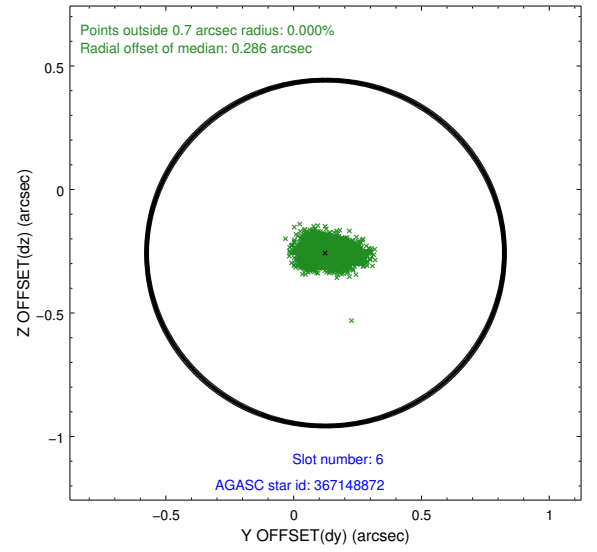
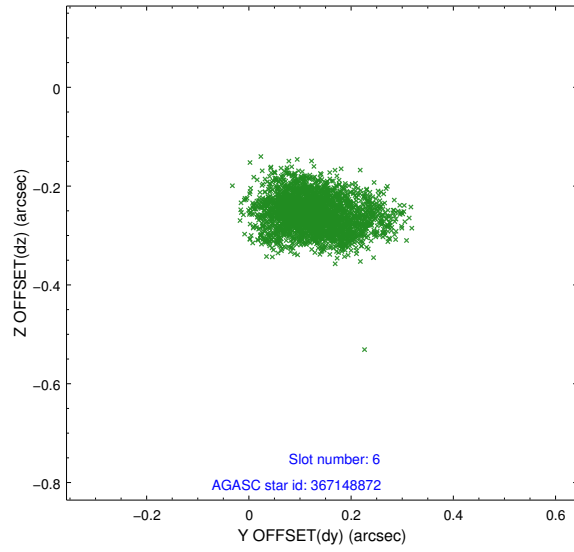
## 2.4.2 Slot 4



### 2.4.3 Slot 5

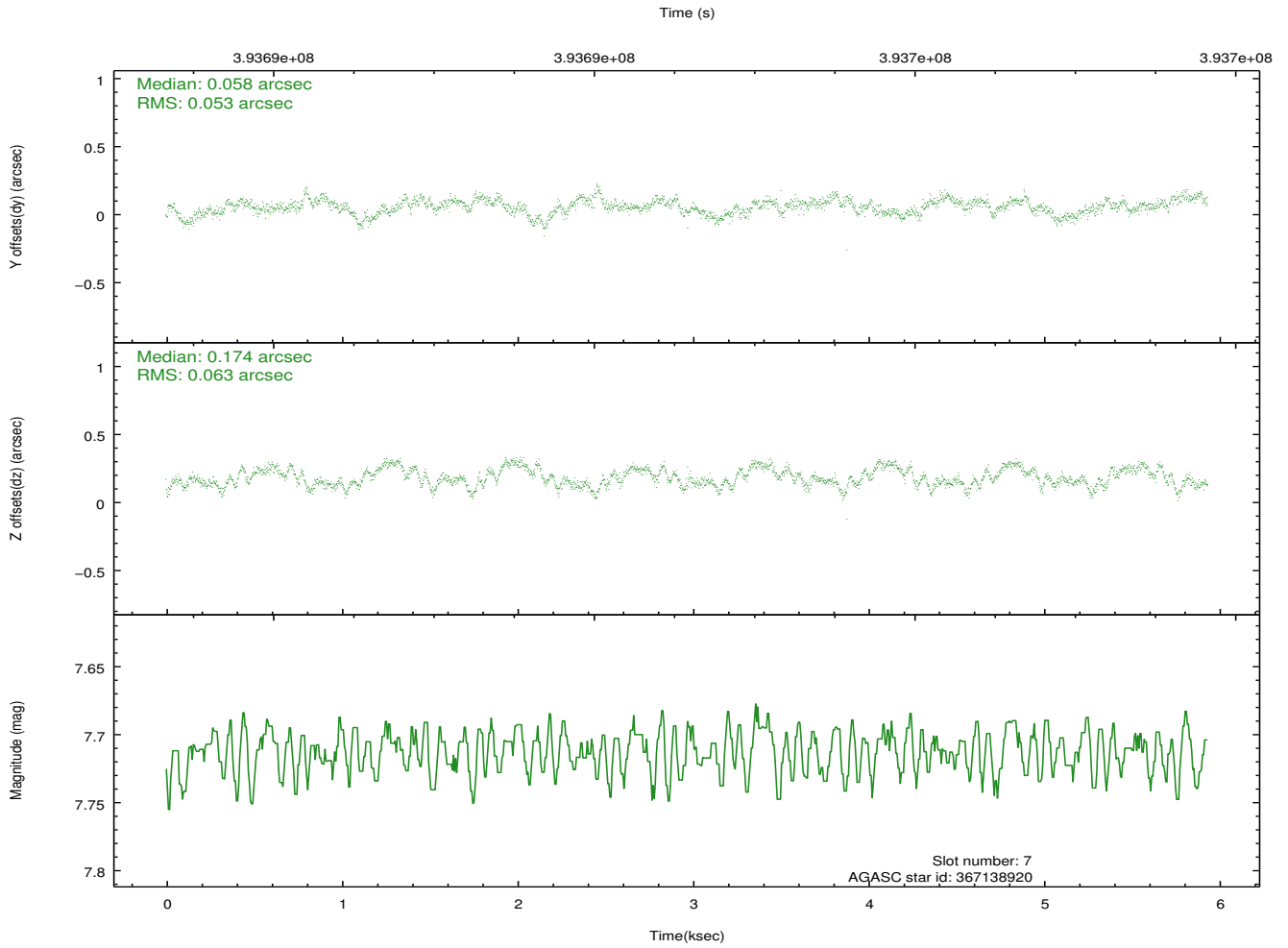
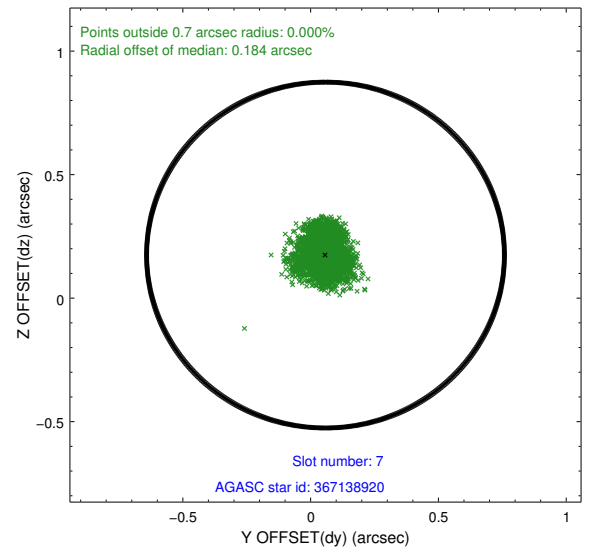
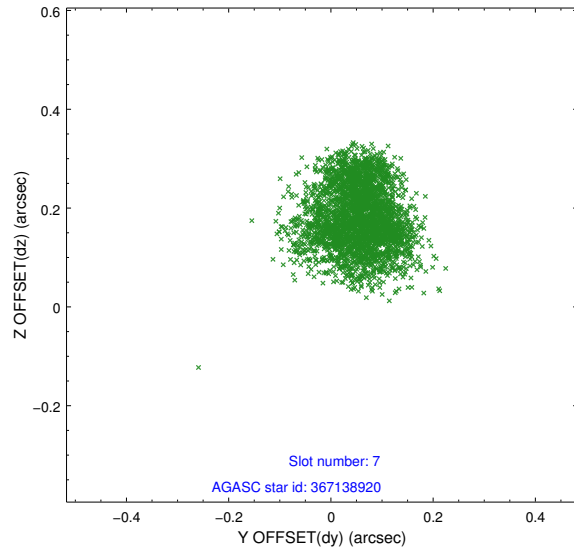


## 2.4.4 Slot 6



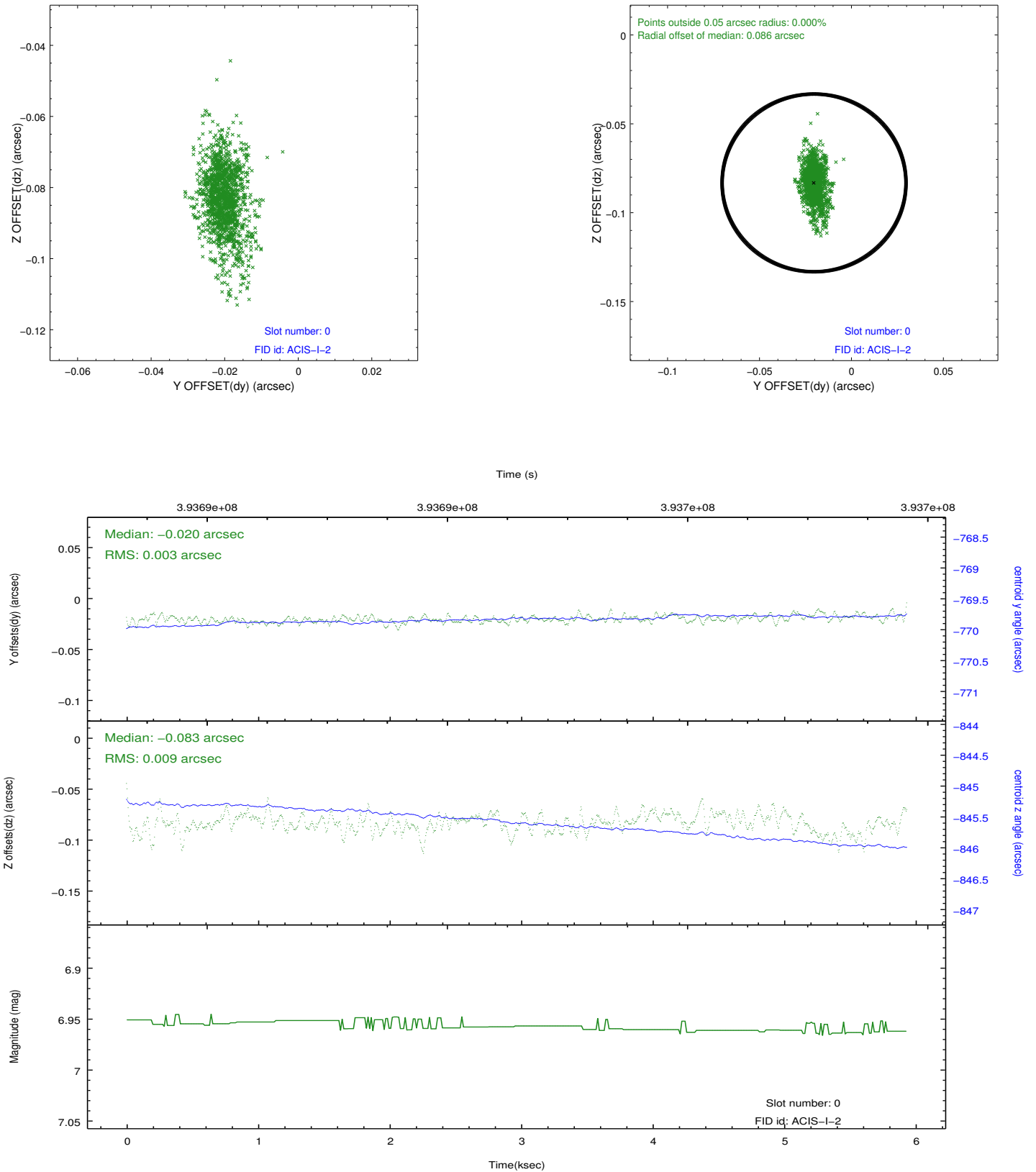


## 2.4.5 Slot 7

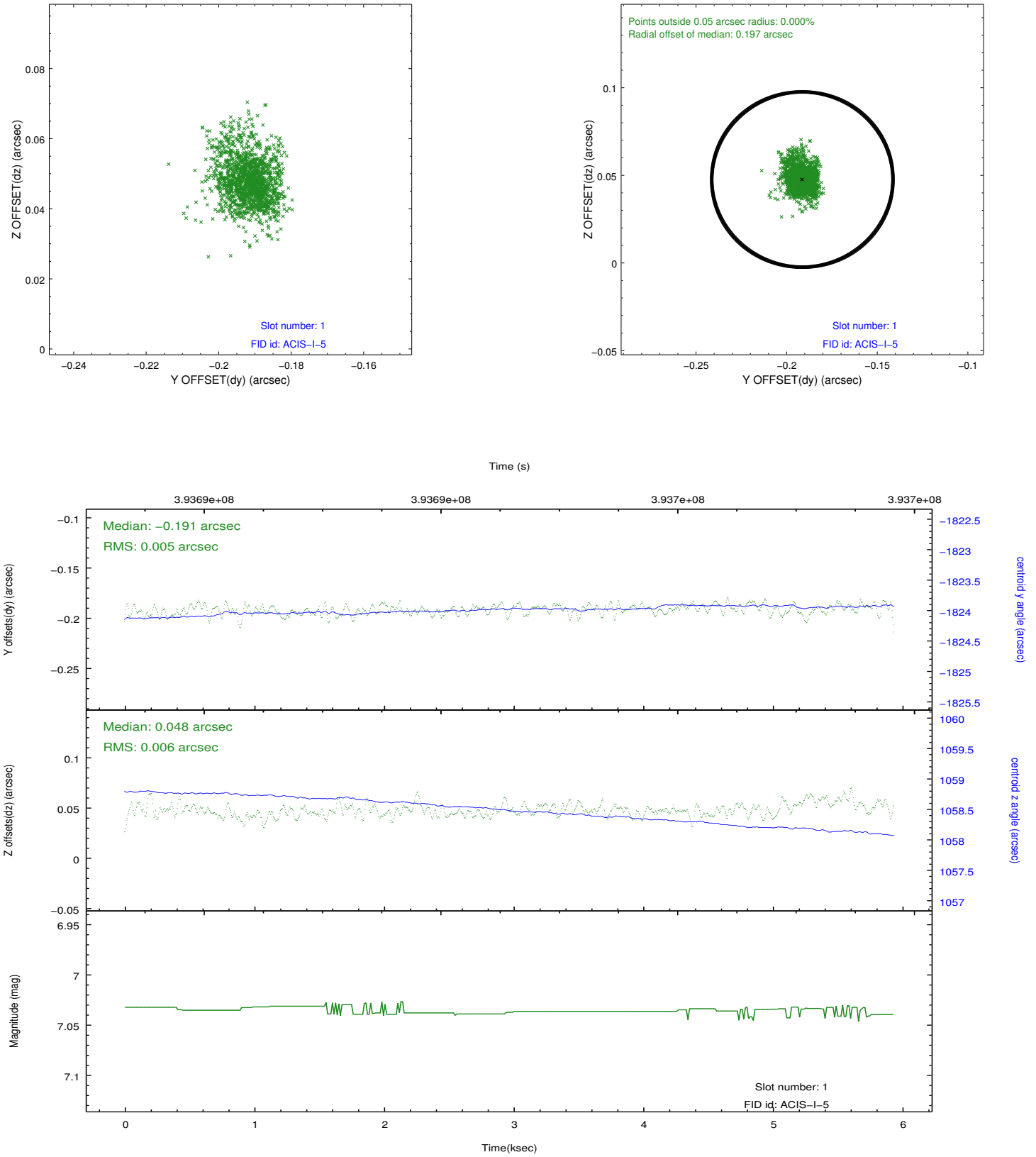


## 2.5 FID Slots

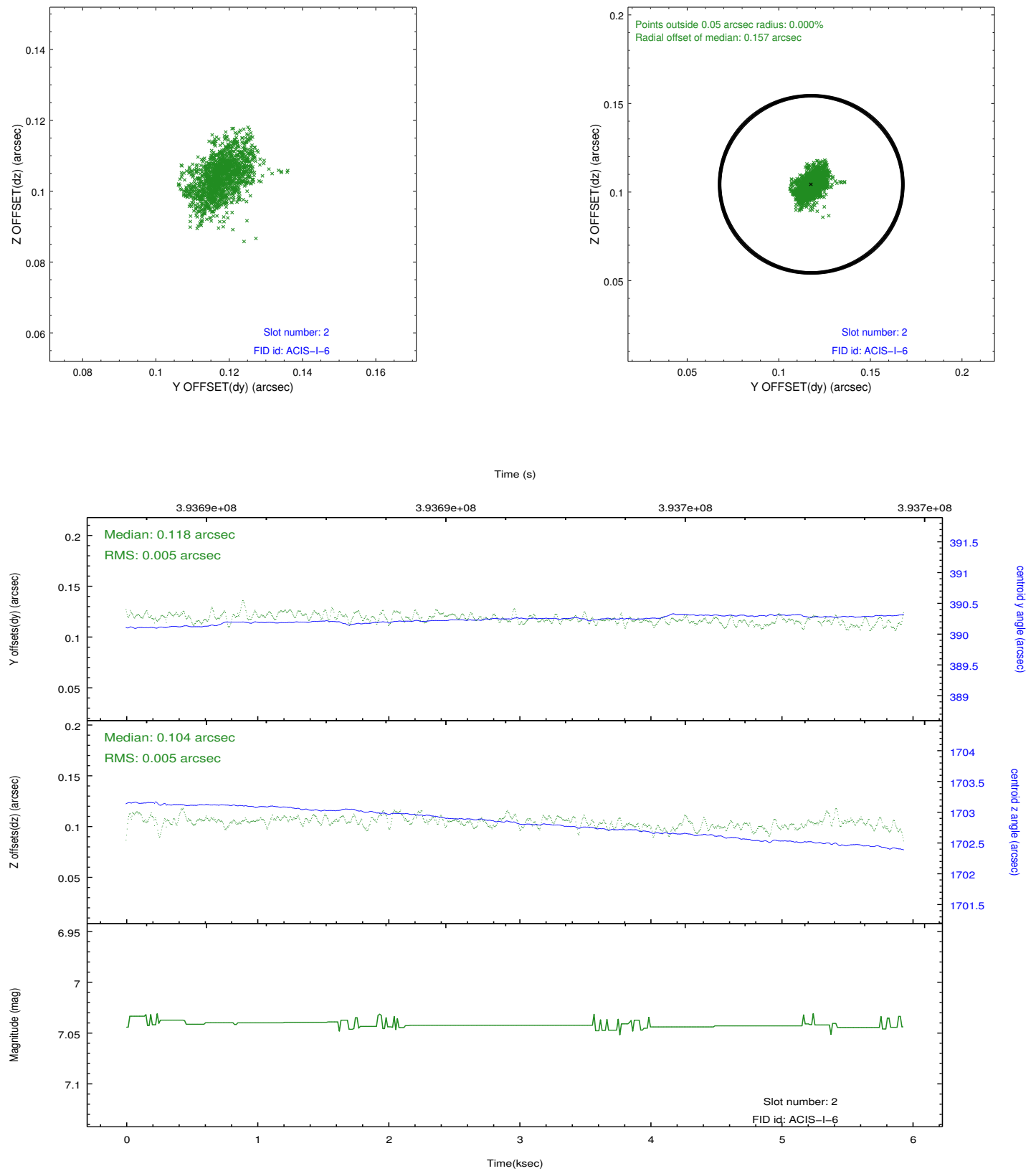
### 2.5.1 Slot 0



## 2.5.2 Slot 1



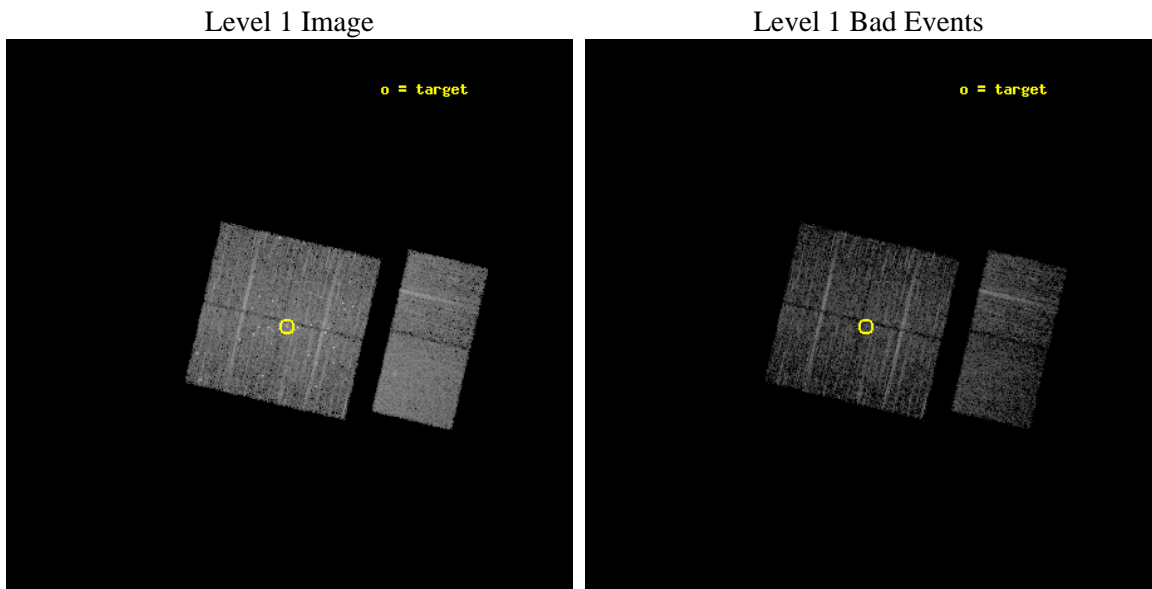
### 2.5.3 Slot 2



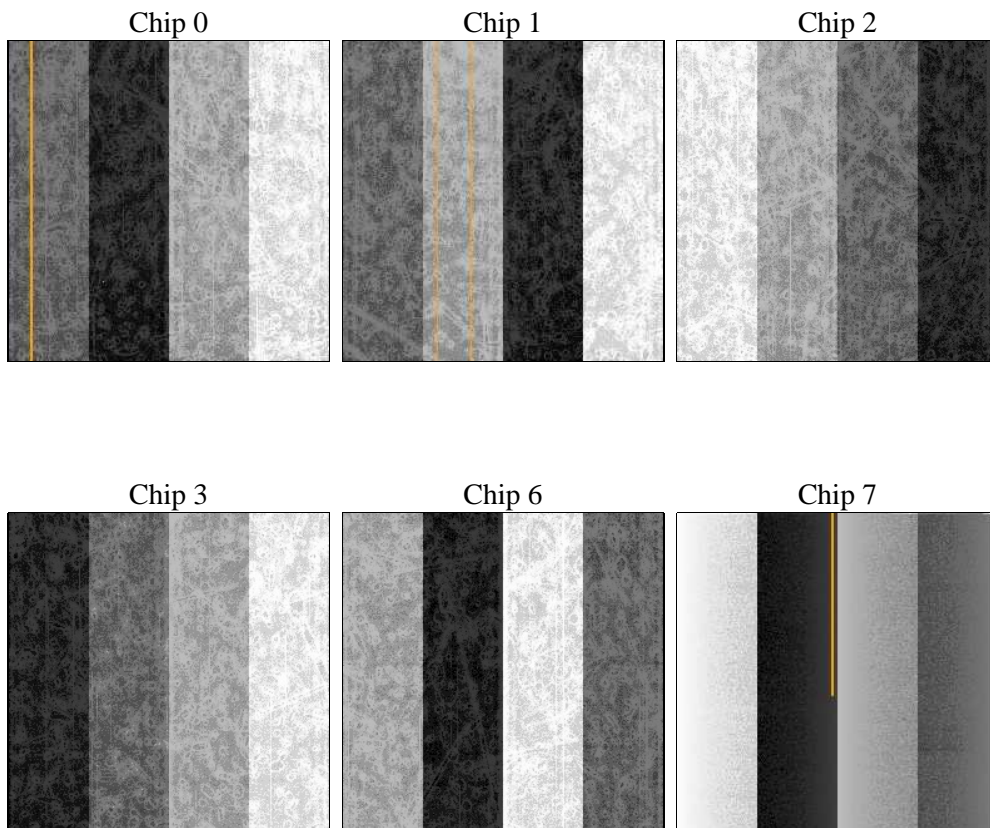
## 3 OBI Secondary

### 3.1 OBI

#### 3.1.1 Images



#### 3.1.2 Bias



### 3.1.3 Parameters

|          |                     |                                |                |                 |   |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 5000.000000     | [s] Scheduled observation exposure time |
| ascdsver | 8.4.5               | Processing system revision     | ontime         | 4022.1948958039 | Sum of GTIs [s]                         |
| caldsver | 4.5.0               | &#160                          | ontime0        | 4018.9538453221 | Sum of GTIs [s]                         |
| date     | 2012-06-28T21:12:19 | Date and time of file creation | ontime1        | 4022.1951646209 | Sum of GTIs [s]                         |
| revision | 2                   | Processing version of data     | ontime2        | 4022.1946873069 | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 4022.1948958039 | Sum of GTIs [s]                         |
|          |                     |                                | ontime6        | 4022.194914937  | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 4022.1948465109 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 191763          | Number of level 1 events                |

### 3.1.4 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  | 28875 | 29753 | 32611 | 34624 | 29667 | 36233 | grade 0 events | 2353  | 3371  | 2769  | 4876  | 1183  | 1482  |
| rejected events | 24177 | 23587 | 27463 | 26711 | 26300 | 19821 |                | 8%    | 11%   | 8%    | 14%   | 3%    | 4%    |
| rejected %      | 83%   | 79%   | 84%   | 77%   | 88%   | 54%   | grade 1 events | 24    | 32    | 33    | 231   | 15    | 45    |
|                 |       |       |       |       |       |       |                | 0%    | 0%    | 0%    | 0%    | 0%    | 0%    |
|                 |       |       |       |       |       |       | grade 2 events | 864   | 1169  | 941   | 1171  | 712   | 3398  |
|                 |       |       |       |       |       |       |                | 2%    | 3%    | 2%    | 3%    | 2%    | 9%    |
|                 |       |       |       |       |       |       | grade 3 events | 402   | 429   | 396   | 488   | 334   | 1387  |
|                 |       |       |       |       |       |       |                | 1%    | 1%    | 1%    | 1%    | 1%    | 3%    |
|                 |       |       |       |       |       |       | grade 4 events | 374   | 438   | 396   | 533   | 339   | 1401  |
|                 |       |       |       |       |       |       |                | 1%    | 1%    | 1%    | 1%    | 1%    | 3%    |
|                 |       |       |       |       |       |       | grade 5 events | 1239  | 1244  | 1120  | 1500  | 1373  | 3685  |
|                 |       |       |       |       |       |       |                | 4%    | 4%    | 3%    | 4%    | 4%    | 10%   |
|                 |       |       |       |       |       |       | grade 6 events | 712   | 769   | 652   | 856   | 803   | 8772  |
|                 |       |       |       |       |       |       |                | 2%    | 2%    | 1%    | 2%    | 2%    | 24%   |
|                 |       |       |       |       |       |       | grade 7 events | 22907 | 22301 | 26304 | 24969 | 24908 | 16063 |
|                 |       |       |       |       |       |       |                | 79%   | 74%   | 80%   | 72%   | 83%   | 44%   |

## A Summary

### A.1 Status

|                            |                  |
|----------------------------|------------------|
| V&V Scientist              | Jen Lauer        |
| V&V Date (YYYY-MM-DD)      | 2012.07.05       |
| V&V Edition                | 1                |
| V&V Disposition and Status | OK               |
| V&V Charge Time            | 4.95934959948065 |

### A.2 Comments