

# V&V Reference Report

## L2 ASCDS Version : 10

Observation 15632 - L2 Version 2  
Chandra X-Ray Center

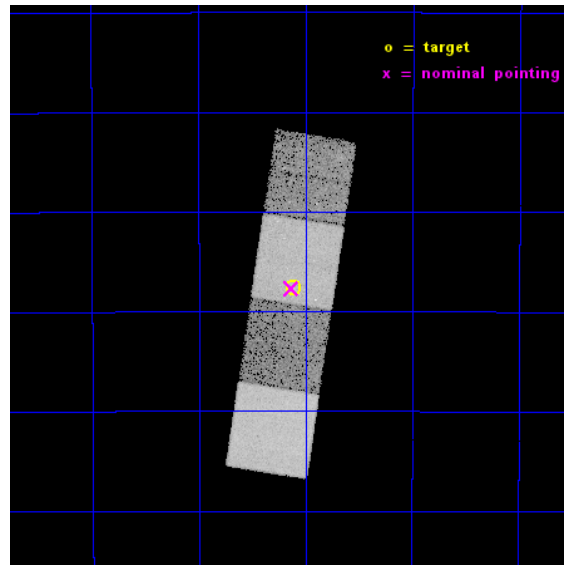
L2 Processing Date : Dec 6 2014

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# 1 Front

|          |                                                                                                                       |                                             |
|----------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| seq_num  | 502033                                                                                                                | Sequence number                             |
| obs_id   | 15632                                                                                                                 | Observation id                              |
| title    | A Study of Massive Star Evolution and Mass Loss With Multi-Wavelength Observations of Type II <sub>n</sub> Supernovae | Proposal title                              |
| observer | Ori Fox                                                                                                               | Principal investigator                      |
| object   | SN 2012ca                                                                                                             | Source name                                 |
| dtcycle  | 0                                                                                                                     | &#160                                       |
| cycle    | P                                                                                                                     | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 280.279417                                                                                                            | Observer's specified target RA<br>[deg]     |
| dec_targ | -41.793722                                                                                                            | Observer's specified target Dec<br>[deg]    |
| ra_nom   | 280.28310555872                                                                                                       | Nominal RA [deg]                            |
| dec_nom  | -41.794913744609                                                                                                      | Nominal Dec [deg]                           |
| roll_nom | 278.79306862952                                                                                                       | Nominal Roll [deg]                          |
| revision | 2                                                                                                                     | Processing version of data                  |
| ontime   | 20069.400154352                                                                                                       | Sum of GTIs [s]                             |
| livetime | 19807.178666458                                                                                                       | Livetime [s]                                |
| ontime5  | 20069.400154352                                                                                                       | Sum of GTIs [s]                             |
| ontime6  | 20069.400154352                                                                                                       | Sum of GTIs [s]                             |
| ontime7  | 20069.400154352                                                                                                       | Sum of GTIs [s]                             |
| ontime8  | 20069.400154352                                                                                                       | Sum of GTIs [s]                             |
| l2events | 152524                                                                                                                | Number of level 2 events                    |

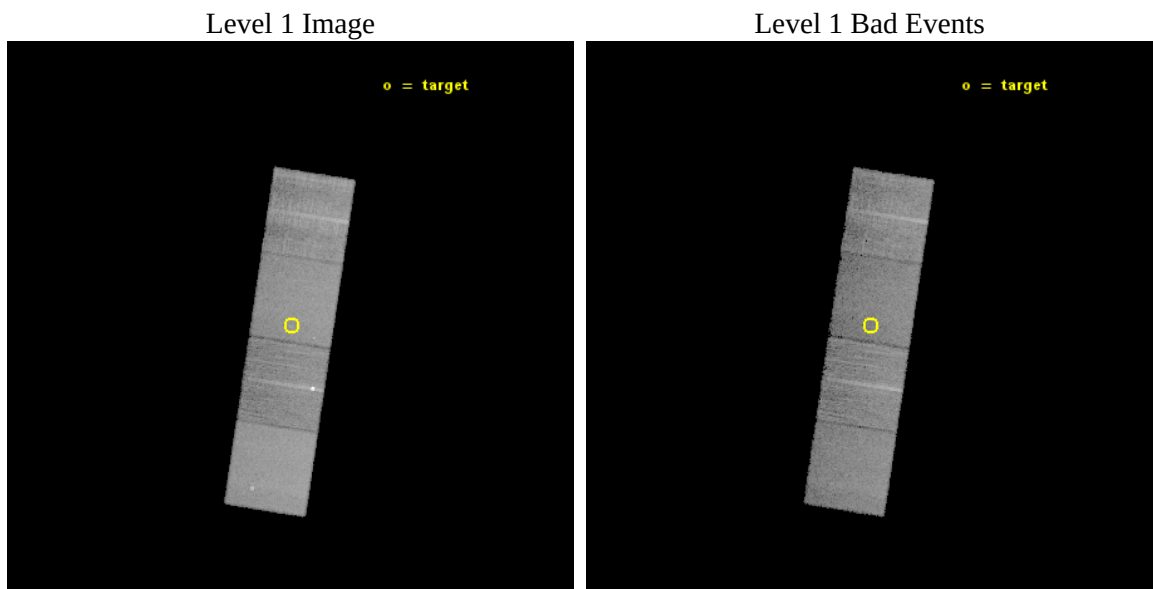




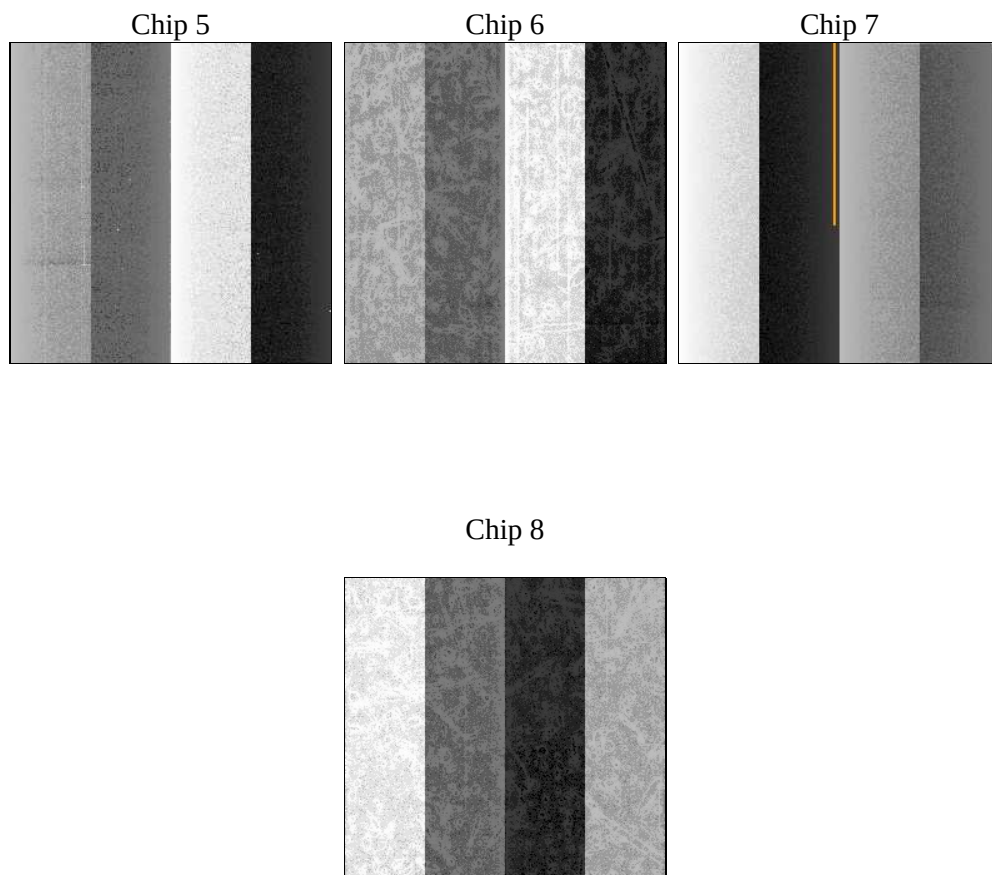
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 20000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.3.1              | Processing system revision     | ontime         | 20069.400154352 | Sum of GTIs [s]                         |
| caldsver | 4.6.4               | &#160                          | ontime5        | 20069.400154352 | Sum of GTIs [s]                         |
| date     | 2014-12-06T11:45:44 | Date and time of file creation | ontime6        | 20069.400154352 | Sum of GTIs [s]                         |
| revision | 2                   | Processing version of data     | ontime7        | 20069.400154352 | Sum of GTIs [s]                         |
|          |                     |                                | ontime8        | 20069.400154352 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 518379          | Number of level 1 events                |

### 2.1.4 Events

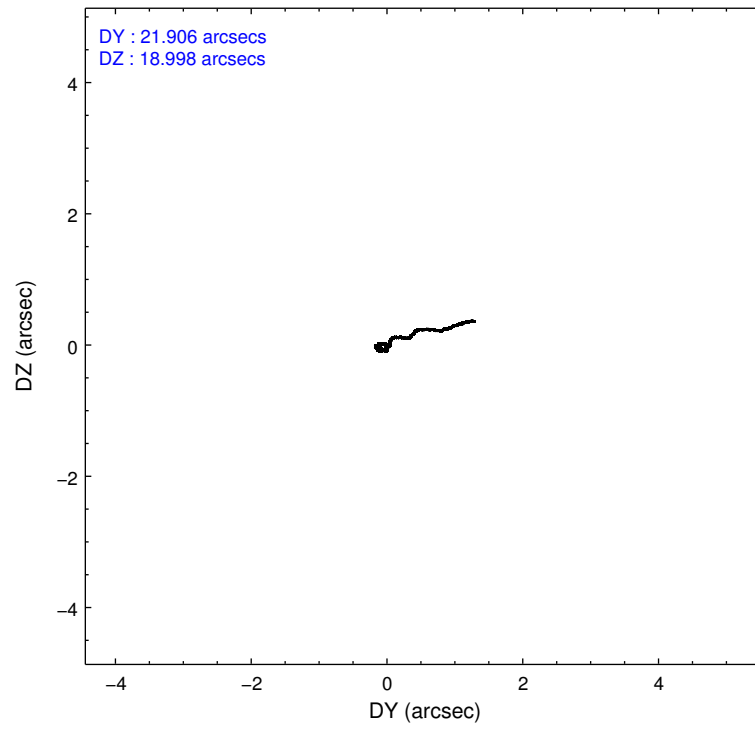
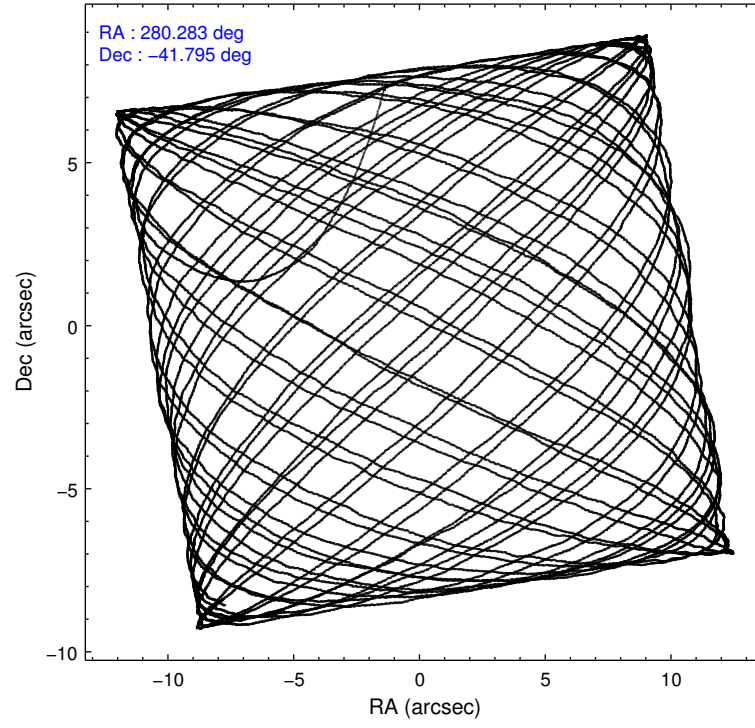
|                 | ccd 5  | ccd 6  | ccd 7  | ccd 8  |
|-----------------|--------|--------|--------|--------|
| level 1 events  | 157178 | 104694 | 130089 | 126418 |
| rejected events | 82345  | 86385  | 72488  | 92294  |
| rejected %      | 52%    | 82%    | 55%    | 73%    |

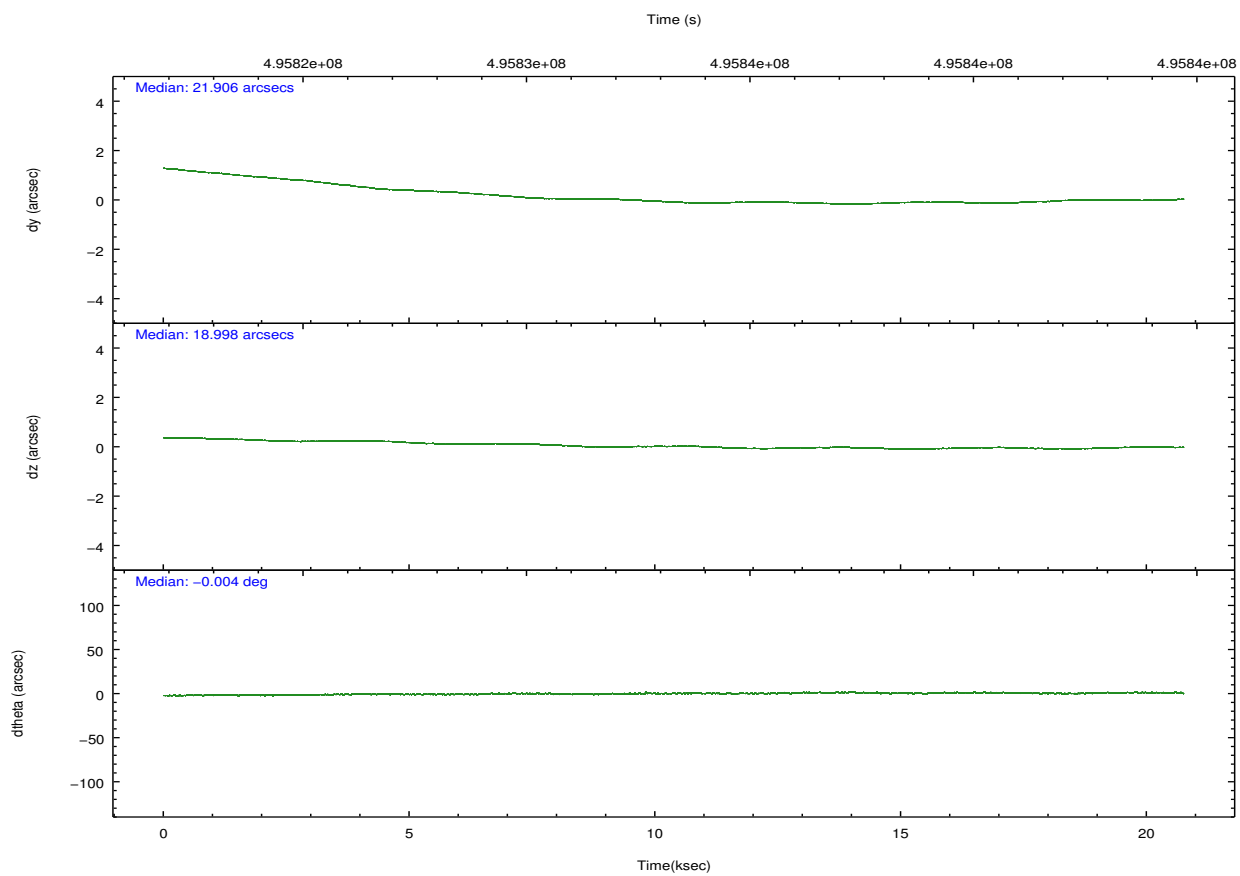
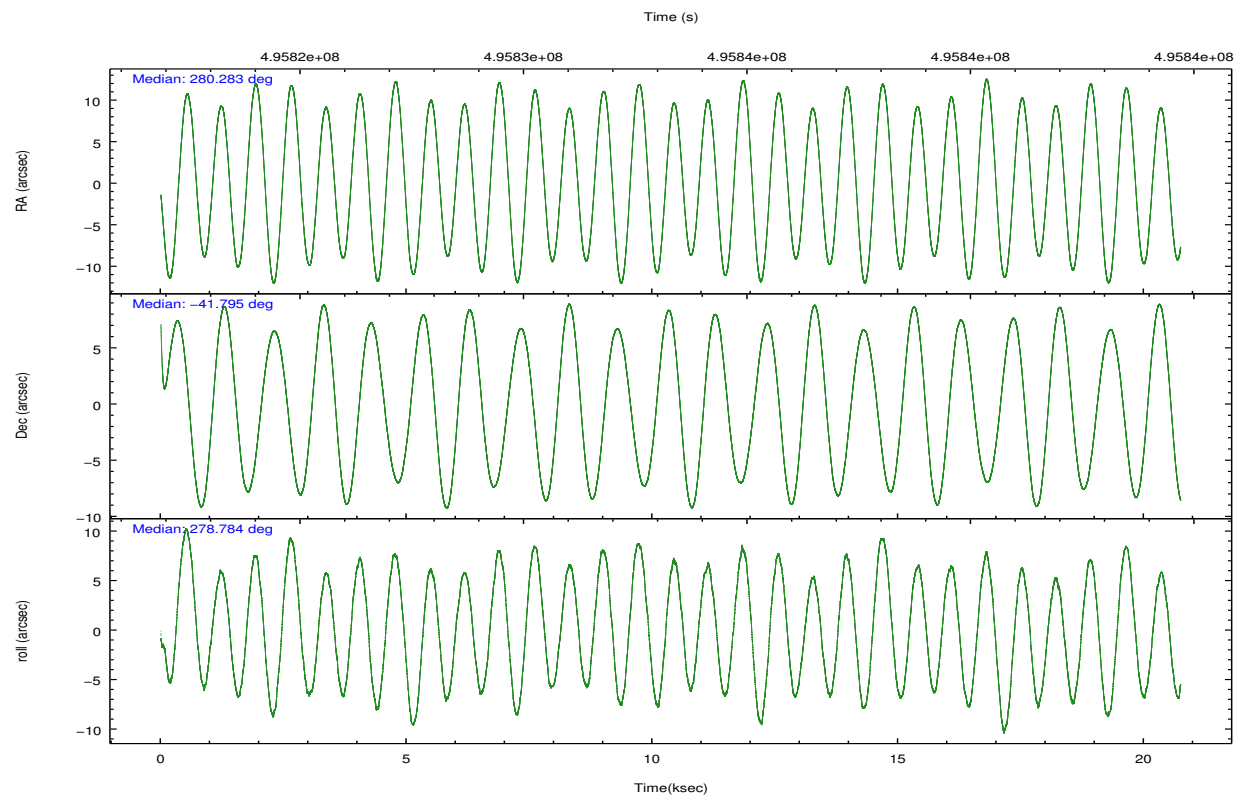
|                | ccd 5 | ccd 6 | ccd 7 | ccd 8 |
|----------------|-------|-------|-------|-------|
| grade 0 events | 5217  | 4445  | 5356  | 10359 |
|                | 3%    | 4%    | 4%    | 8%    |
| grade 1 events | 234   | 44    | 150   | 113   |
|                | 0%    | 0%    | 0%    | 0%    |
| grade 2 events | 22819 | 8706  | 12005 | 7850  |
|                | 14%   | 8%    | 9%    | 6%    |
| grade 3 events | 2654  | 1189  | 4929  | 3484  |
|                | 1%    | 1%    | 3%    | 2%    |
| grade 4 events | 2583  | 1214  | 4814  | 3366  |
|                | 1%    | 1%    | 3%    | 2%    |
| grade 5 events | 11597 | 5156  | 13200 | 7262  |
|                | 7%    | 4%    | 10%   | 5%    |
| grade 6 events | 41572 | 2758  | 30505 | 9067  |
|                | 26%   | 2%    | 23%   | 7%    |
| grade 7 events | 70502 | 81182 | 59130 | 84917 |
|                | 44%   | 77%   | 45%   | 67%   |

## 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                 | 280.259783          | 280.2831055587169    | Subarray requested                    | NONE      | NONE    |
| [deg] Pointing Dec                | -41.773863          | -41.79491374460934   | Alternating exposures requested       | N         | N       |
| [deg] Pointing Roll               | 278.620908          | 278.7930686295218    | [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         | -190.1400660498719   |                                       |           |         |
| [mm] SIM translation stage offset | 0                   | 0.00754346686406393  |                                       |           |         |
| [s] Observation start time (MET)  | 495823672.184000    | 495822058.87057      |                                       |           |         |
| Observation start date            | 2013-09-17T16:46:45 | 2013-09-17T16:20:58  |                                       |           |         |
| [s] Observation end time (MET)    | 495843672.184000    | 495844775.94681      |                                       |           |         |
| Observation end date              | 2013-09-17T22:20:05 | 2013-09-17T22:39:35  |                                       |           |         |
| Read mode                         | TIMED               | TIMED                |                                       |           |         |

## 2.3 Aspect



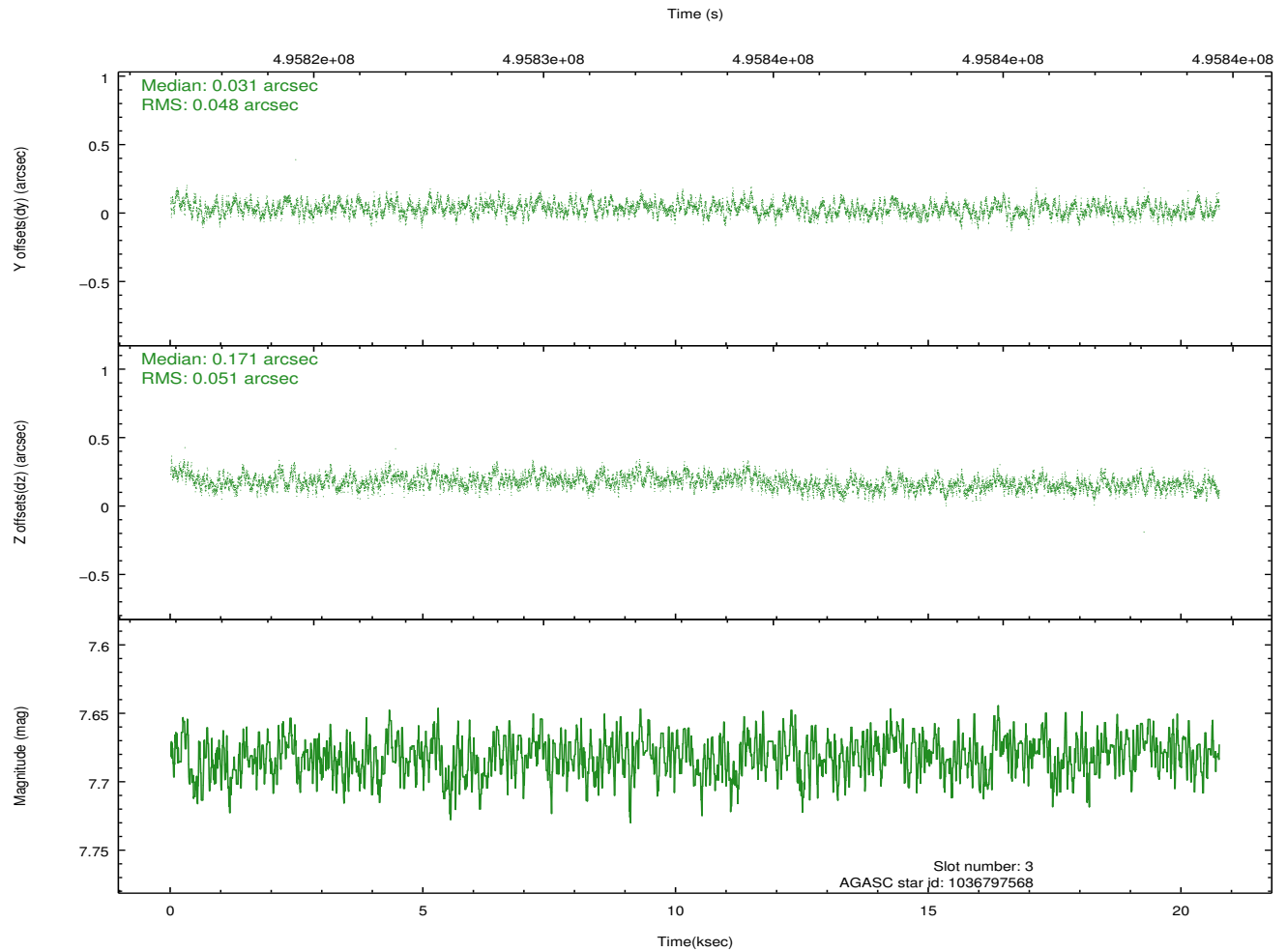
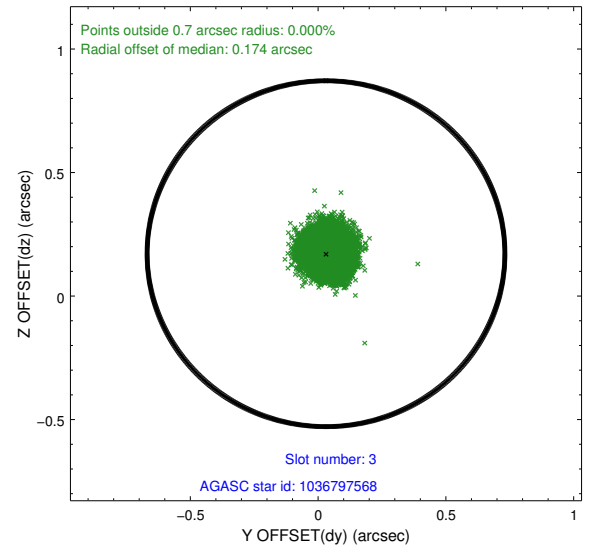
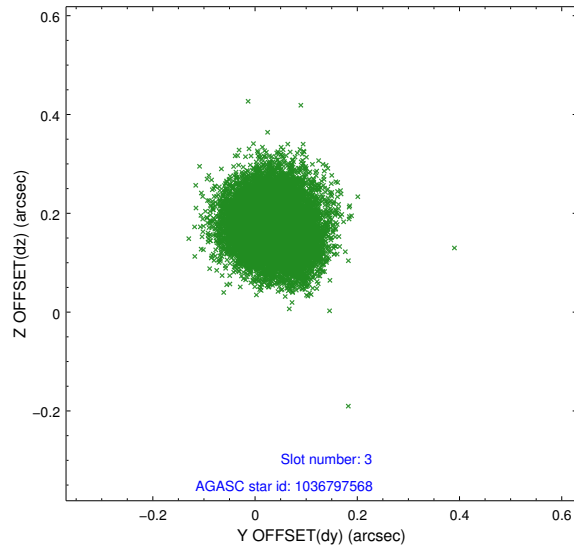


# Slot Statistics

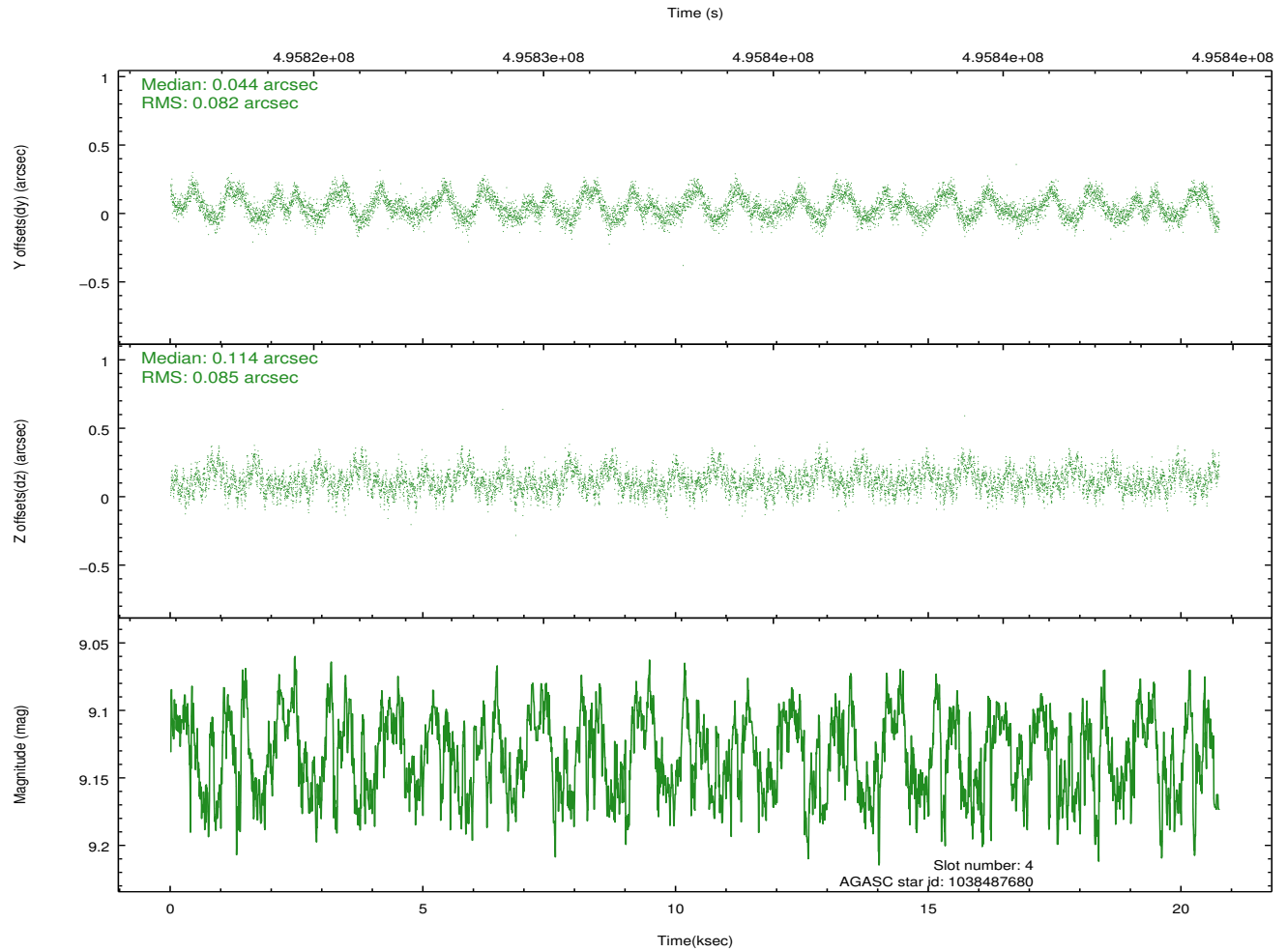
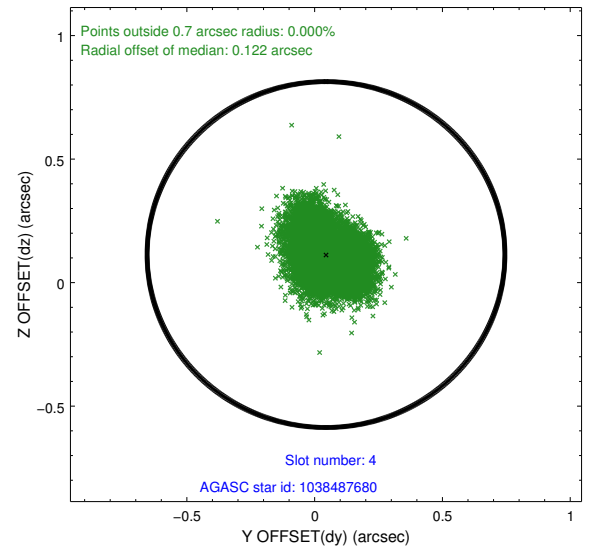
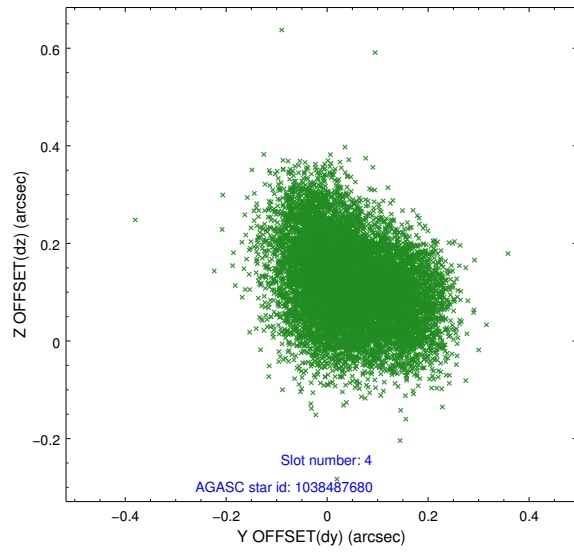
| slot | status | used | id         | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec        | mean_y   | mean_z   |
|------|--------|------|------------|------|-------|--------|--------|-------|-------|------------|------------|----------|----------|
| 0    | FID    |      | ACIS-S-2   | 7.02 | 5061  | -0.120 | -0.050 | 0.011 | 0.018 | 0.000000   | 0.000000   | -775.38  | -1740.59 |
| 1    | FID    |      | ACIS-S-4   | 7.11 | 5060  | 0.269  | 0.072  | 0.011 | 0.056 | 0.000000   | 0.000000   | 2138.22  | 167.83   |
| 2    | FID    |      | ACIS-S-5   | 7.13 | 5061  | -0.182 | -0.013 | 0.014 | 0.040 | 0.000000   | 0.000000   | -1828.06 | 161.61   |
| 3    | GUIDE  | used | 1036797568 | 7.68 | 10122 | 0.031  | 0.171  | 0.076 | 0.118 | 279.433391 | -41.614214 | -889.99  | -2114.78 |
| 4    | GUIDE  | used | 1038487680 | 9.13 | 10054 | 0.044  | 0.114  | 0.127 | 0.199 | 280.809263 | -41.852818 | 506.70   | 1413.59  |
| 5    | GUIDE  | used | 1038493200 | 7.38 | 10120 | 0.001  | -0.096 | 0.105 | 0.172 | 280.542930 | -41.907658 | 593.02   | 676.46   |
| 6    | GUIDE  | used | 1038499176 | 7.52 | 10122 | -0.101 | -0.112 | 0.084 | 0.131 | 281.040461 | -41.507636 | -622.69  | 2223.08  |
| 7    | GUIDE  | used | 1038493440 | 8.58 | 10109 | 0.010  | -0.079 | 0.082 | 0.129 | 281.127171 | -42.046961 | 1331.28  | 2143.99  |

## 2.4 Star Slots

### 2.4.1 Slot 3

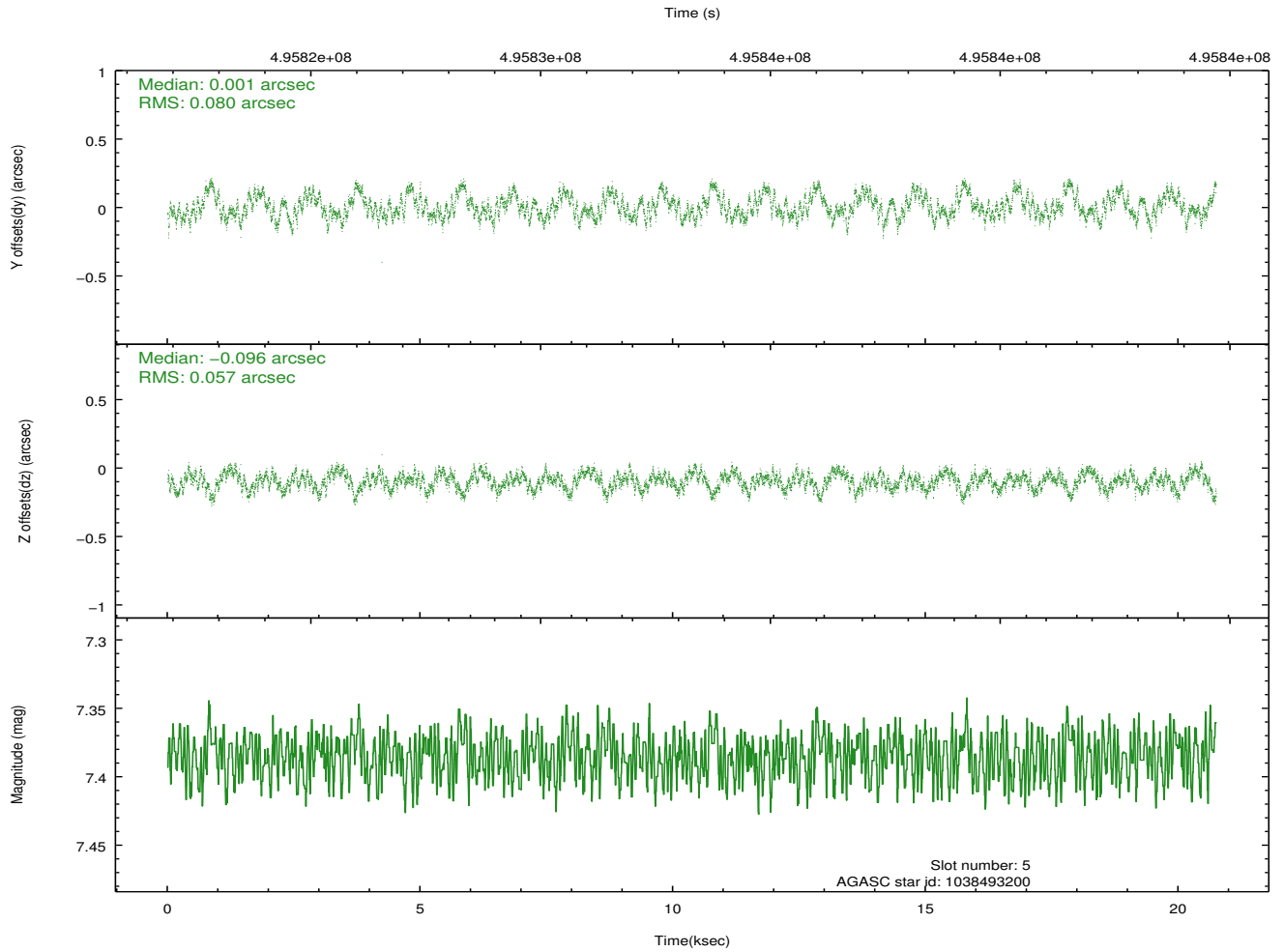
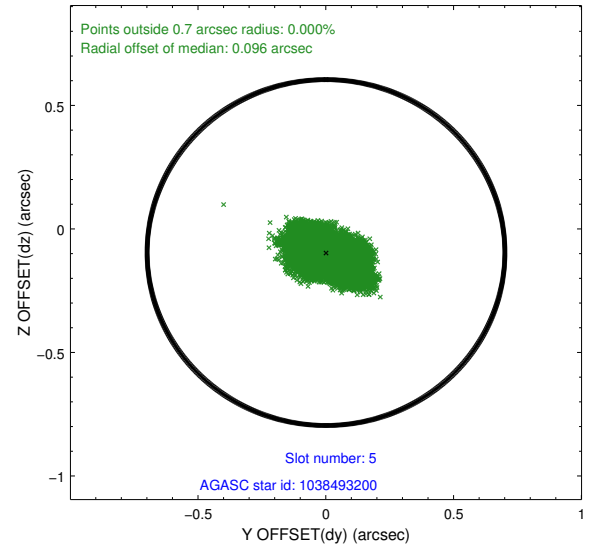
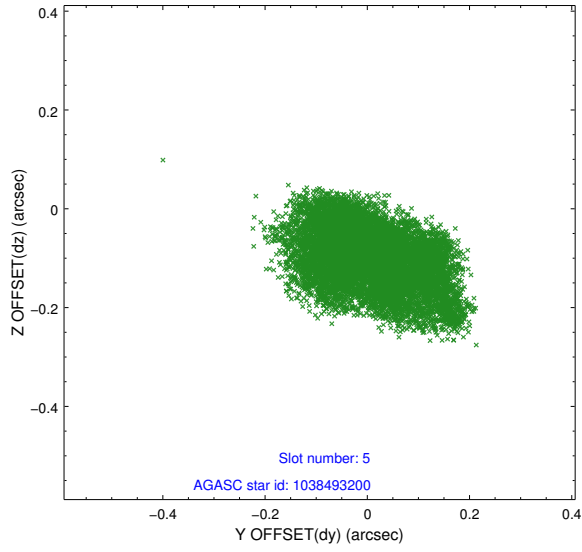


## 2.4.2 Slot 4

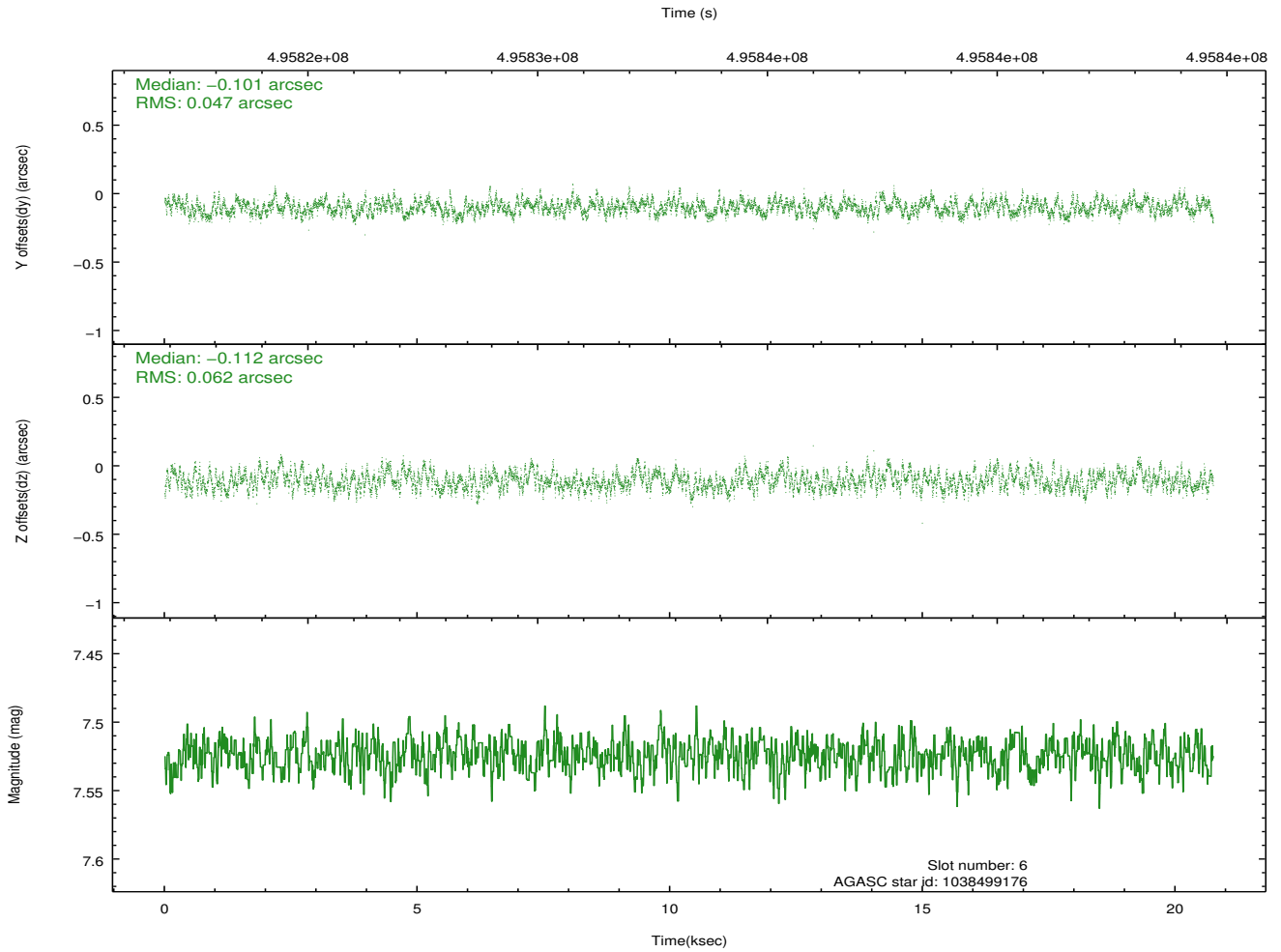
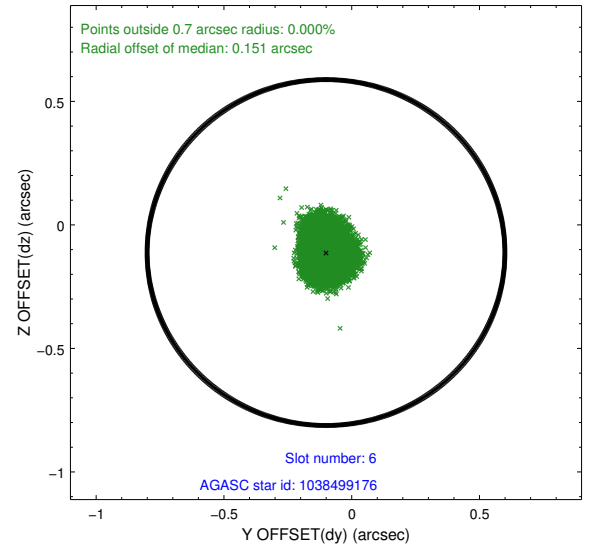
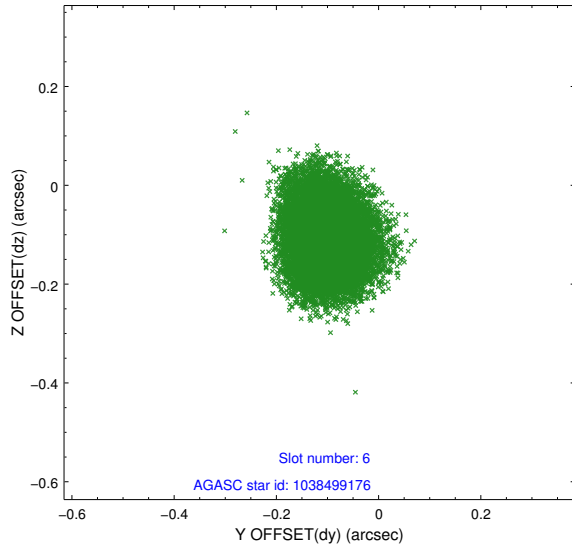




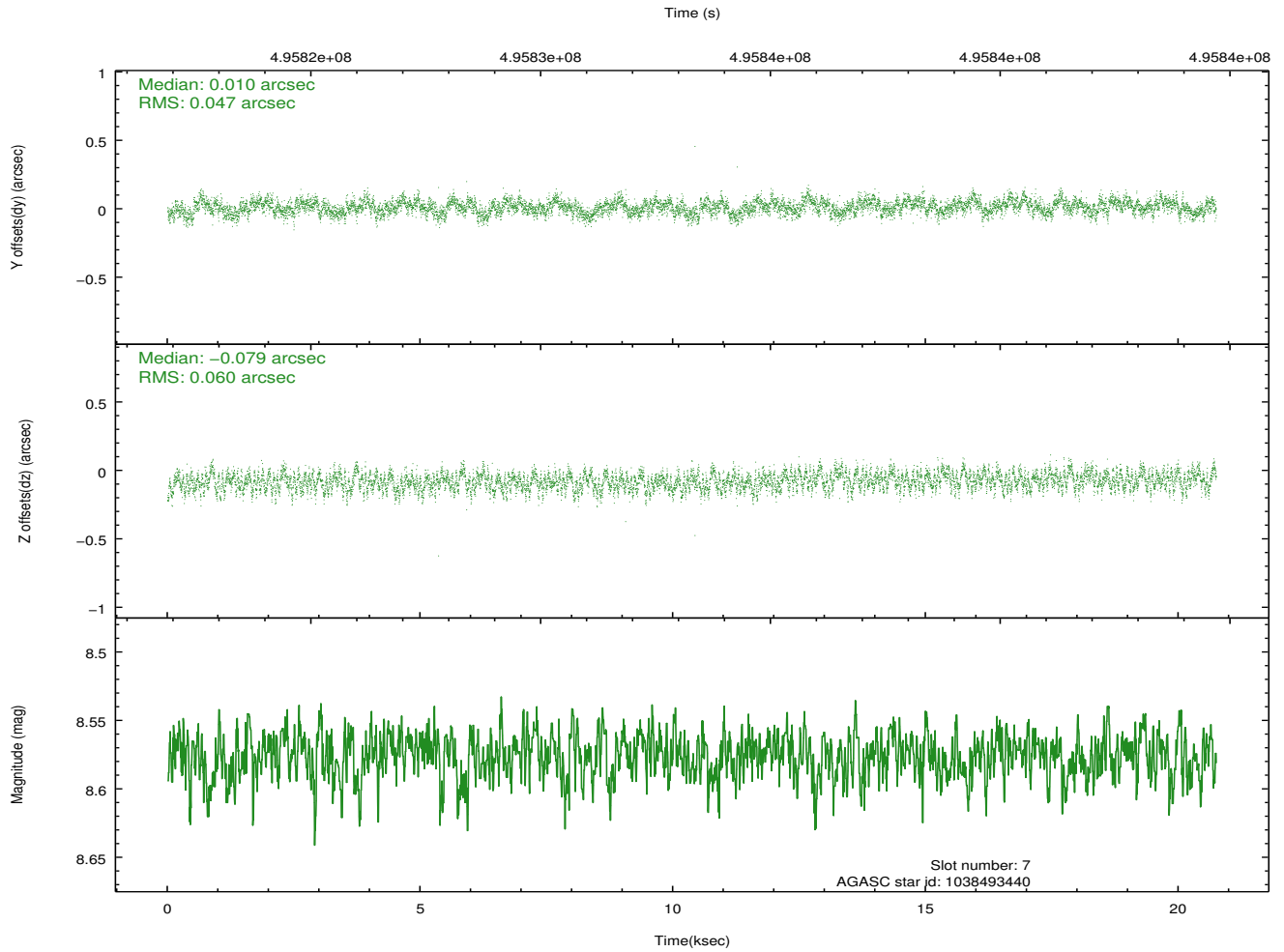
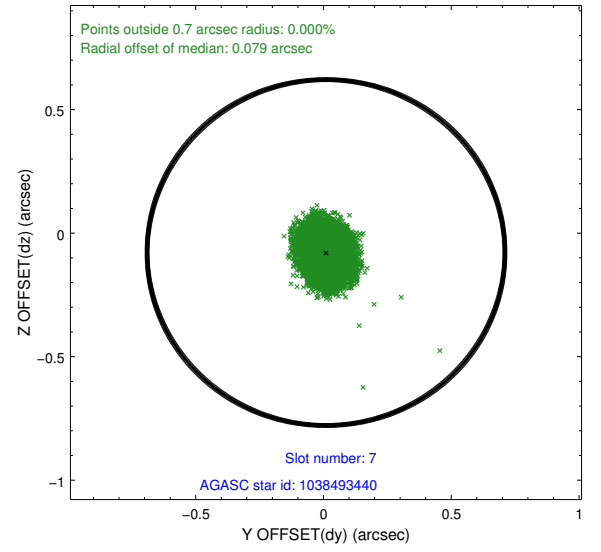
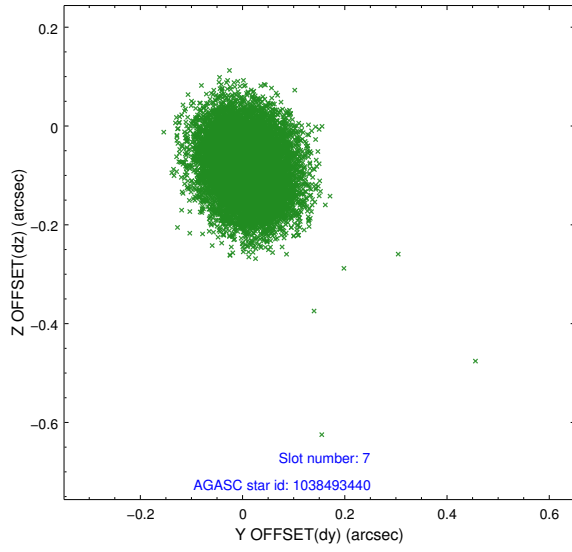
### 2.4.3 Slot 5



## 2.4.4 Slot 6

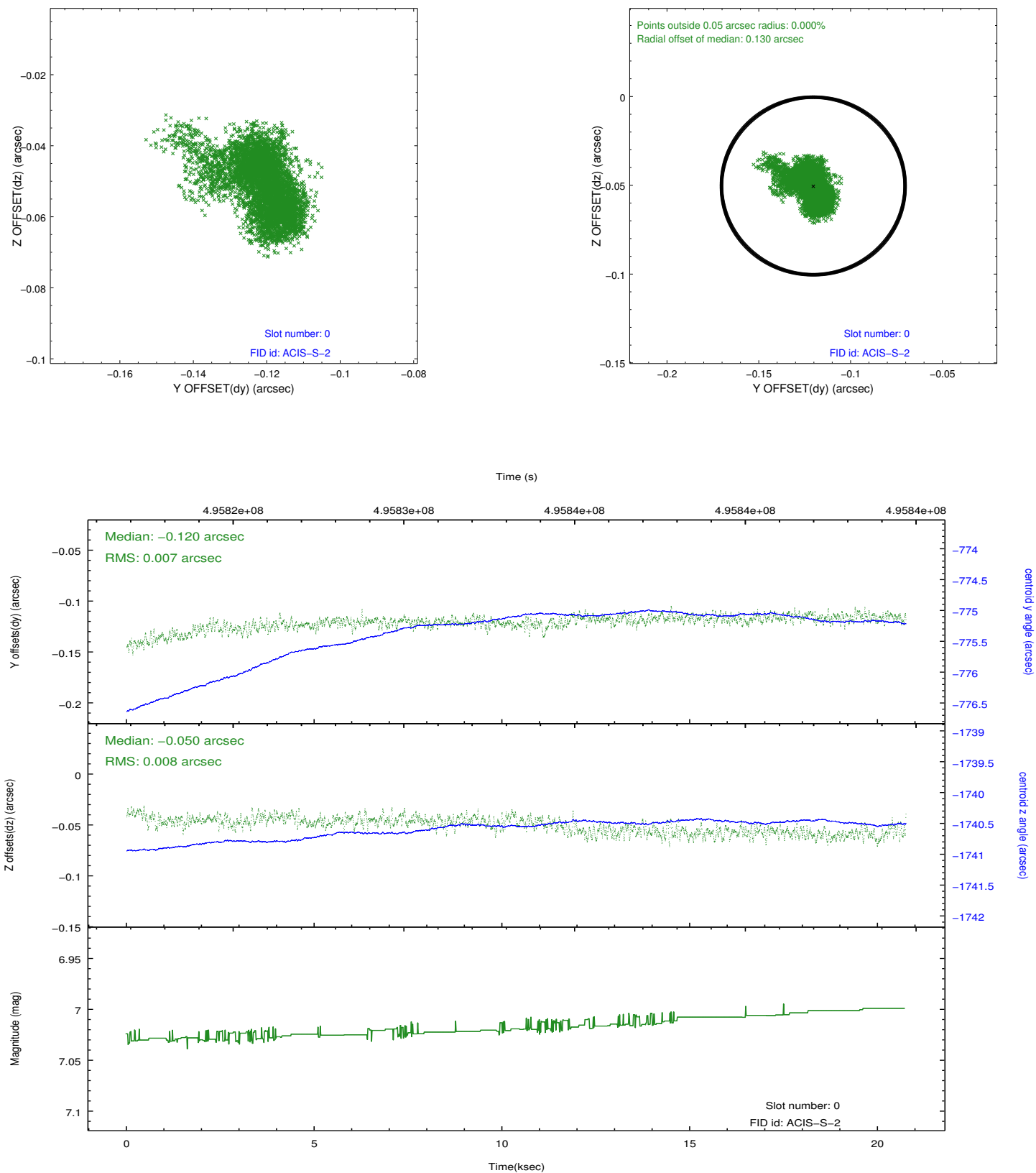


## 2.4.5 Slot 7

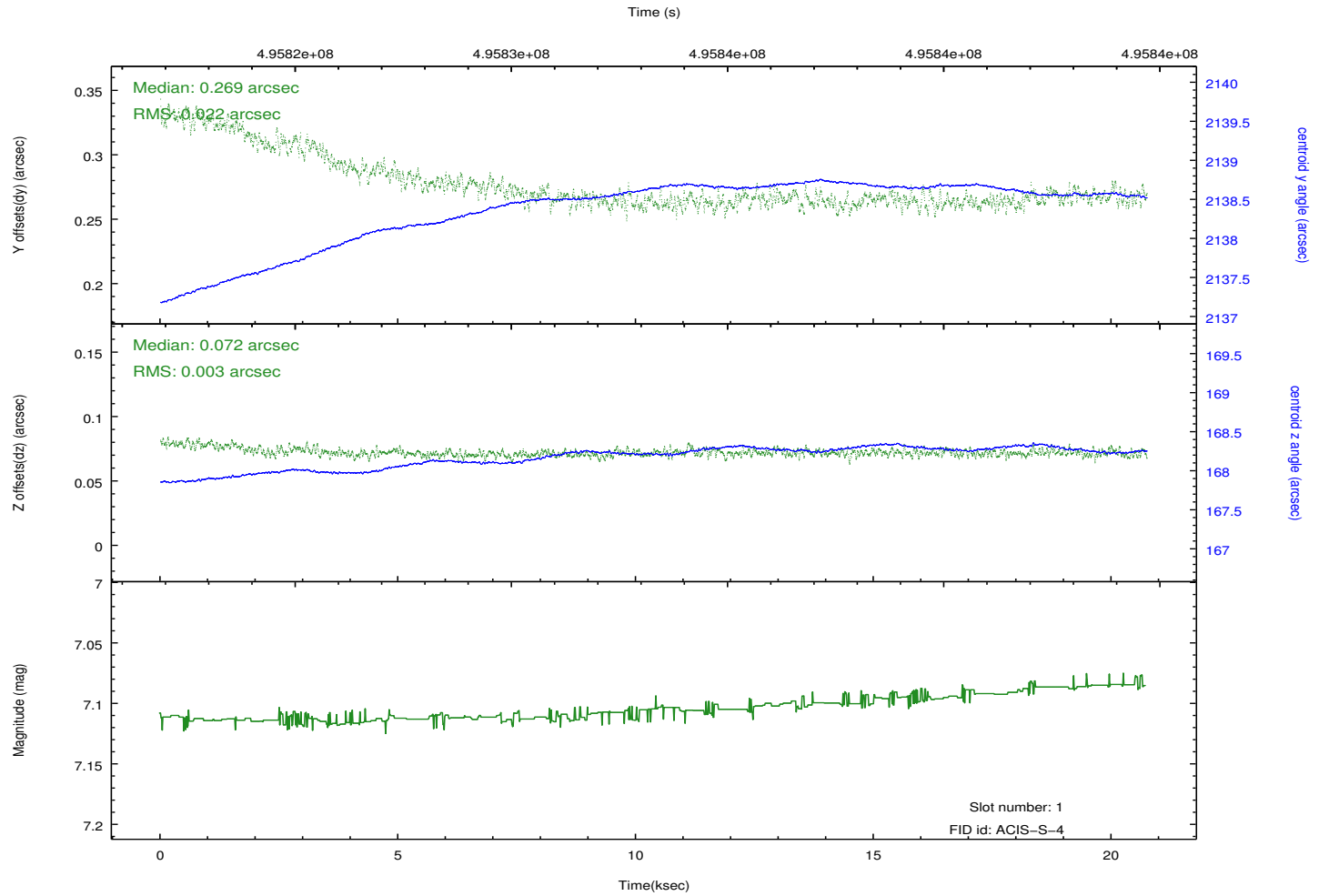
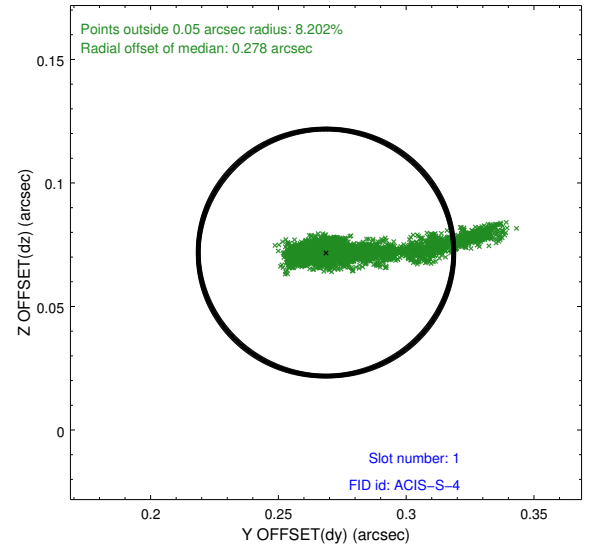
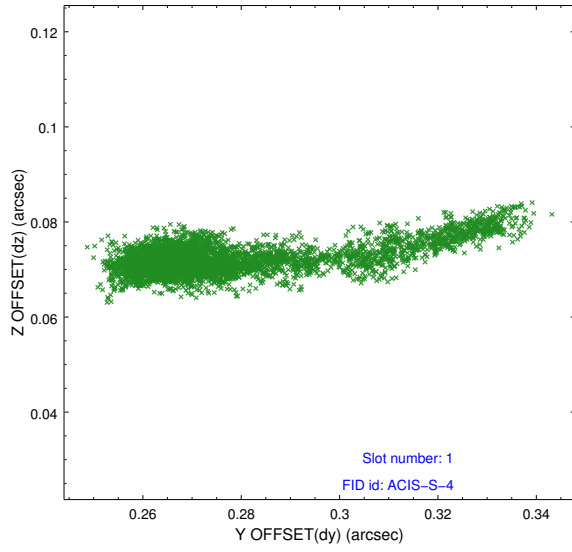


## 2.5 FID Slots

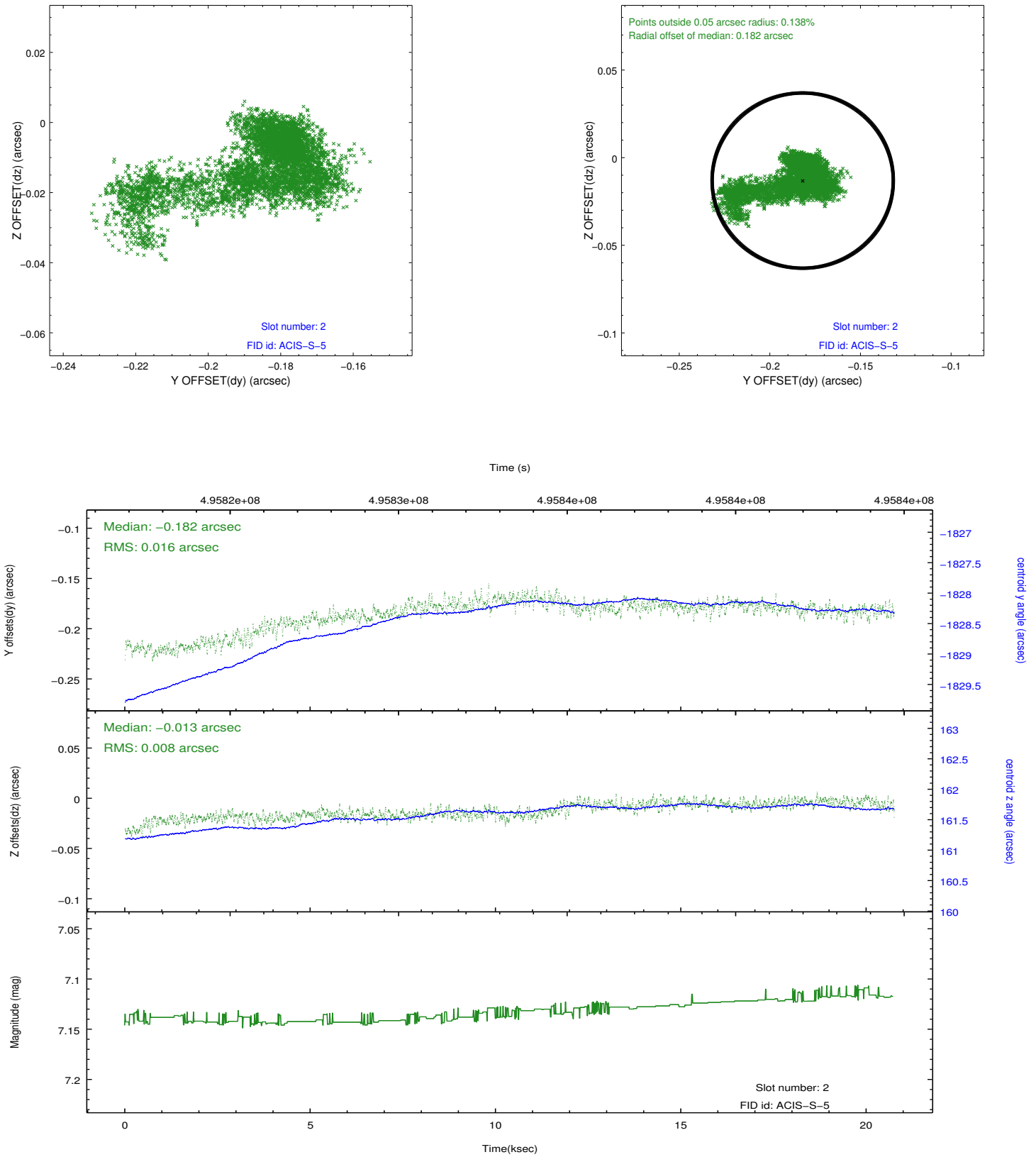
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# A Summary

## A.1 Status

|                            |                 |
|----------------------------|-----------------|
| V&V Scientist              | Beth Sundheim   |
| V&V Date (YYYY-MM-DD)      | 2014.12.12      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 20.069400154352 |

## A.2 Comments

Joint proposal with Spitzer.

These data have been reprocessed with new aspect alignment calibration files that correct small mean offsets (up to 0.4 arcsecs) and improve overall astrometric accuracy. The new calibration was determined using data from the time period being reprocessed and was performed using cross-correlation of X-ray sources with radio and optical counterparts.