

# V&V Reference Report

## L2 ASCDS Version : 10.6

Observation 19377 - L2 Version 2  
Chandra X-Ray Center

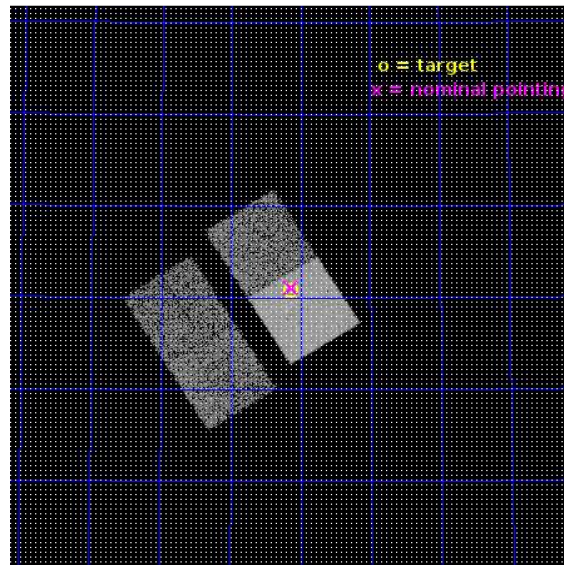
L2 Processing Date : Aug 28 2017

## Contents

|          |                               |           |
|----------|-------------------------------|-----------|
| <b>1</b> | <b>Front</b>                  | <b>2</b>  |
| <b>2</b> | <b>OBI</b>                    | <b>3</b>  |
| 2.1      | OBI . . . . .                 | 3         |
| 2.1.1    | Images . . . . .              | 3         |
| 2.1.2    | Bias . . . . .                | 3         |
| 2.1.3    | Parameters . . . . .          | 4         |
| 2.1.4    | Events . . . . .              | 4         |
| 2.2      | Compared Parameters . . . . . | 5         |
| 2.3      | Aspect . . . . .              | 6         |
| 2.4      | Star Slots . . . . .          | 9         |
| 2.4.1    | Slot 3 . . . . .              | 9         |
| 2.4.2    | Slot 4 . . . . .              | 10        |
| 2.4.3    | Slot 5 . . . . .              | 11        |
| 2.4.4    | Slot 7 . . . . .              | 12        |
| 2.5      | FID Slots . . . . .           | 13        |
| 2.5.1    | Slot 0 . . . . .              | 13        |
| 2.5.2    | Slot 1 . . . . .              | 14        |
| 2.5.3    | Slot 2 . . . . .              | 15        |
| <b>A</b> | <b>Summary</b>                | <b>16</b> |
| A.1      | Status . . . . .              | 16        |
| A.2      | Comments . . . . .            | 16        |

# 1 Front

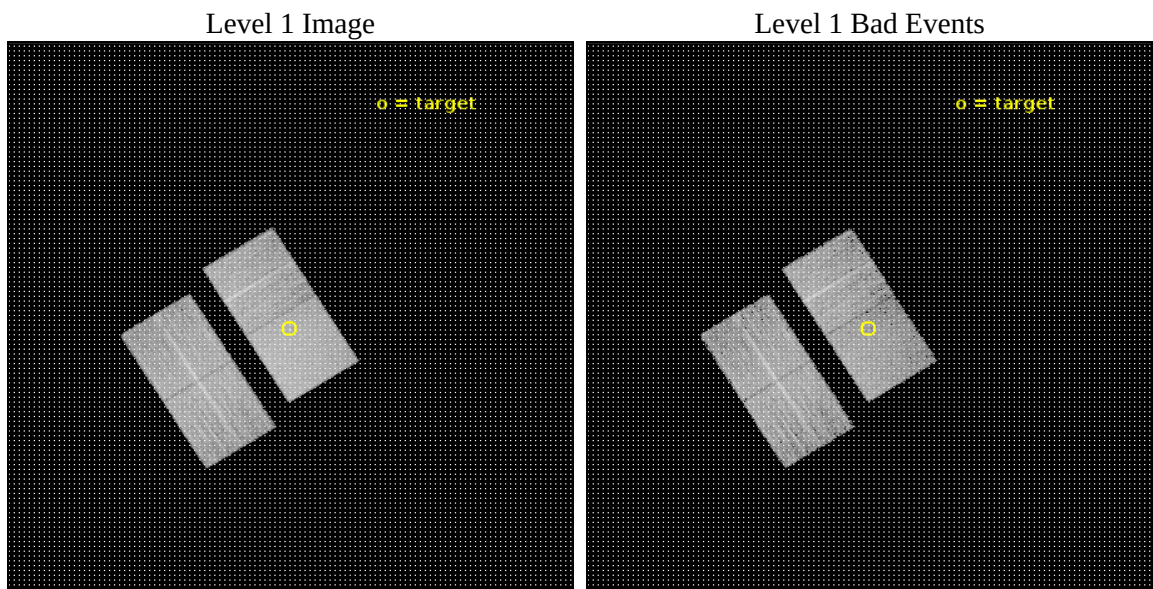
|          |                                                                                                                   |                                             |
|----------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| seq_num  | 601334                                                                                                            | Sequence number                             |
| obs_id   | 19377                                                                                                             | Observation id                              |
| title    | A Statistically Complete High Resolution Chandra and Radio (eMERLIN) Survey of the Palomar Nearby Galaxies Sample | Proposal title                              |
| observer | Ian McHardy                                                                                                       | Principal investigator                      |
| object   | NGC 2273                                                                                                          | Source name                                 |
| dtcycle  | 0                                                                                                                 | &#160                                       |
| cycle    | P                                                                                                                 | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 102.53625                                                                                                         | Observer's specified target RA [deg]        |
| dec_targ | 60.845694                                                                                                         | Observer's specified target Dec [deg]       |
| ra_nom   | 102.53295217519                                                                                                   | Nominal RA [deg]                            |
| dec_nom  | 60.851984434114                                                                                                   | Nominal Dec [deg]                           |
| roll_nom | 58.15955989689                                                                                                    | Nominal Roll [deg]                          |
| revision | 2                                                                                                                 | Processing version of data                  |
| ontime   | 10068.800077558                                                                                                   | Sum of GTIs [s]                             |
| livetime | 9937.2437920015                                                                                                   | Livetime [s]                                |
| ontime2  | 10068.800077558                                                                                                   | Sum of GTIs [s]                             |
| ontime3  | 10065.659117341                                                                                                   | Sum of GTIs [s]                             |
| ontime6  | 10065.6590873                                                                                                     | Sum of GTIs [s]                             |
| ontime7  | 10068.800077558                                                                                                   | Sum of GTIs [s]                             |
| l2events | 59245                                                                                                             | Number of level 2 events                    |



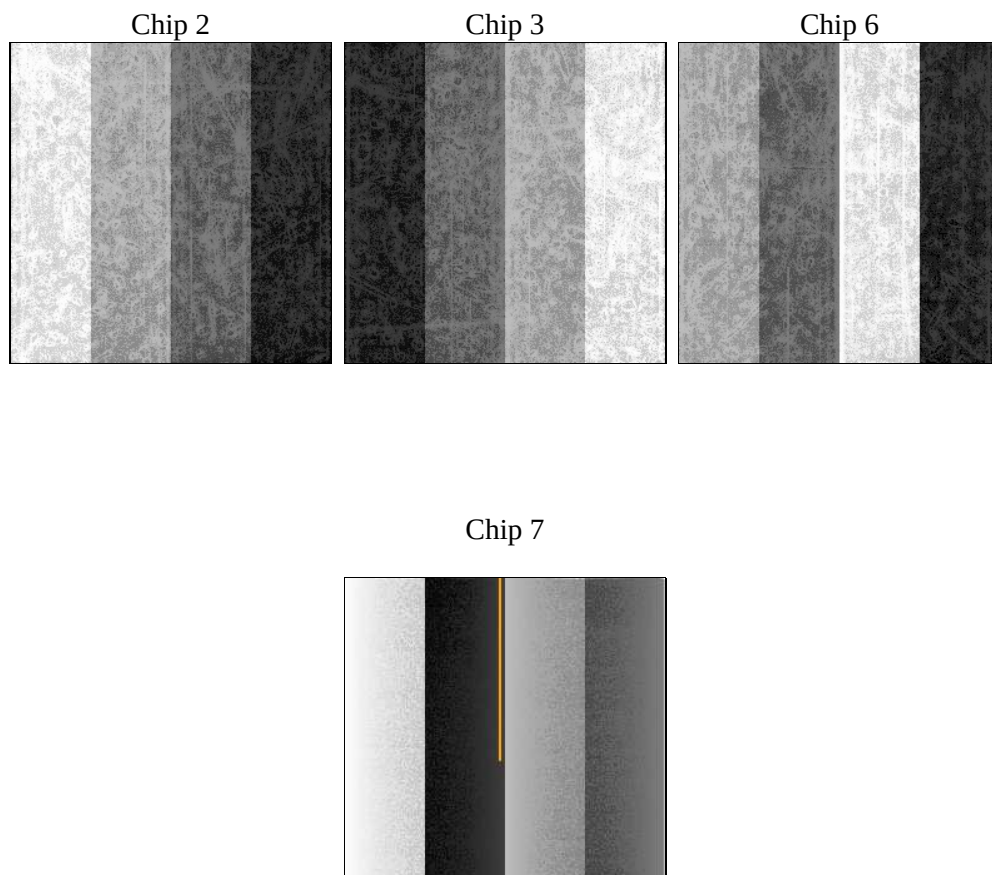
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 10000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.6                | Processing system revision     | ontime         | 10068.800077558 | Sum of GTIs [s]                         |
| caldsver | 4.7.6               | &#160                          | ontime2        | 10068.800077558 | Sum of GTIs [s]                         |
| date     | 2017-08-28T16:20:13 | Date and time of file creation | ontime3        | 10065.659117341 | Sum of GTIs [s]                         |
| revision | 2                   | Processing version of data     | ontime6        | 10065.6590873   | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 10068.800077558 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 295326          | Number of level 1 events                |

### 2.1.4 Events

|                 | ccd 2 | ccd 3 | ccd 6 | ccd 7 |
|-----------------|-------|-------|-------|-------|
| level 1 events  | 67479 | 67984 | 69125 | 90738 |
| rejected events | 60019 | 60147 | 61119 | 50671 |
| rejected %      | 88%   | 88%   | 88%   | 55%   |

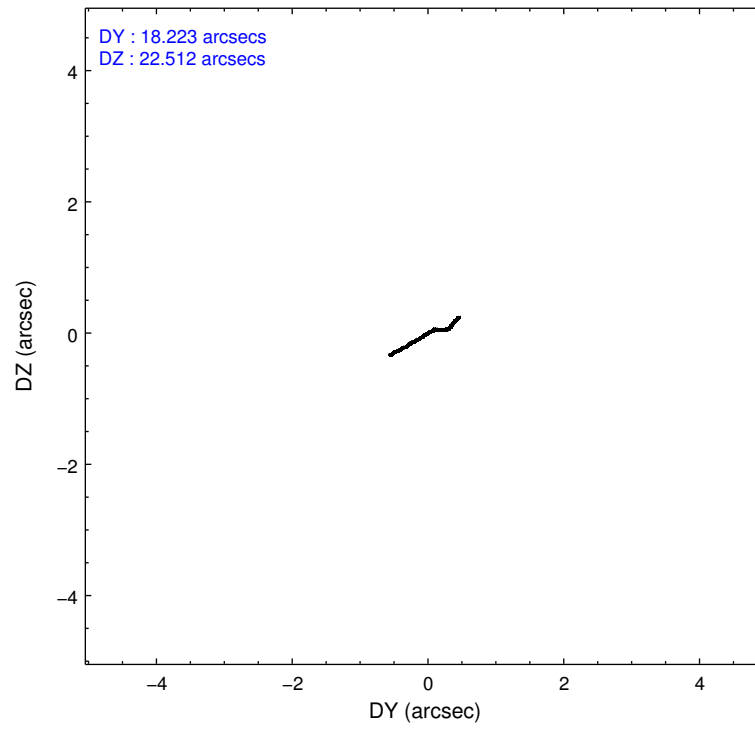
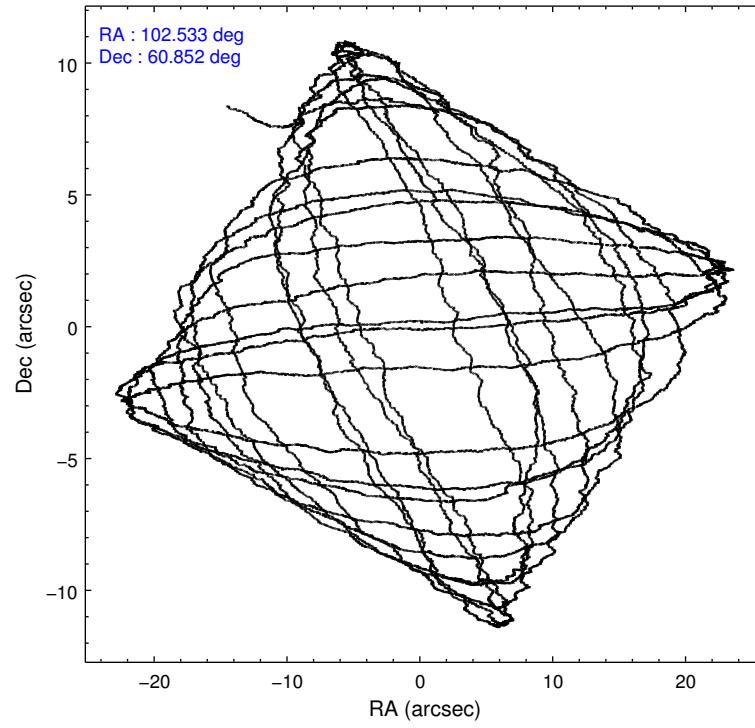
|                | ccd 2 | ccd 3 | ccd 6 | ccd 7 |
|----------------|-------|-------|-------|-------|
| grade 0 events | 2702  | 2981  | 2711  | 3522  |
|                | 4%    | 4%    | 3%    | 3%    |
| grade 1 events | 48    | 38    | 19    | 116   |
|                | 0%    | 0%    | 0%    | 0%    |
| grade 2 events | 1883  | 1716  | 1872  | 8466  |
|                | 2%    | 2%    | 2%    | 9%    |
| grade 3 events | 697   | 802   | 804   | 3322  |
|                | 1%    | 1%    | 1%    | 3%    |
| grade 4 events | 700   | 799   | 776   | 3298  |
|                | 1%    | 1%    | 1%    | 3%    |
| grade 5 events | 2712  | 3336  | 3283  | 9231  |
|                | 4%    | 4%    | 4%    | 10%   |
| grade 6 events | 1485  | 1544  | 1848  | 21492 |
|                | 2%    | 2%    | 2%    | 23%   |
| grade 7 events | 57252 | 56768 | 57812 | 41291 |
|                | 84%   | 83%   | 83%   | 45%   |

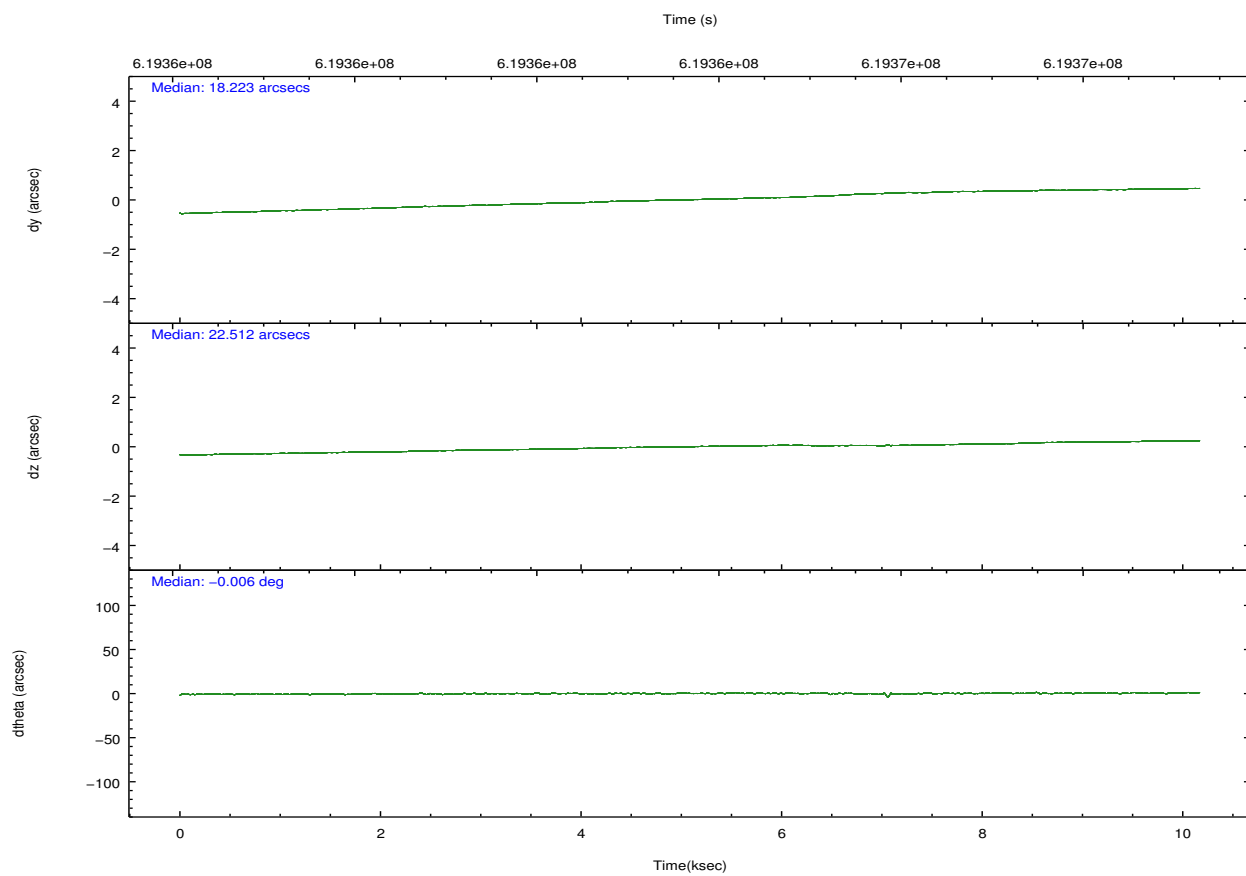
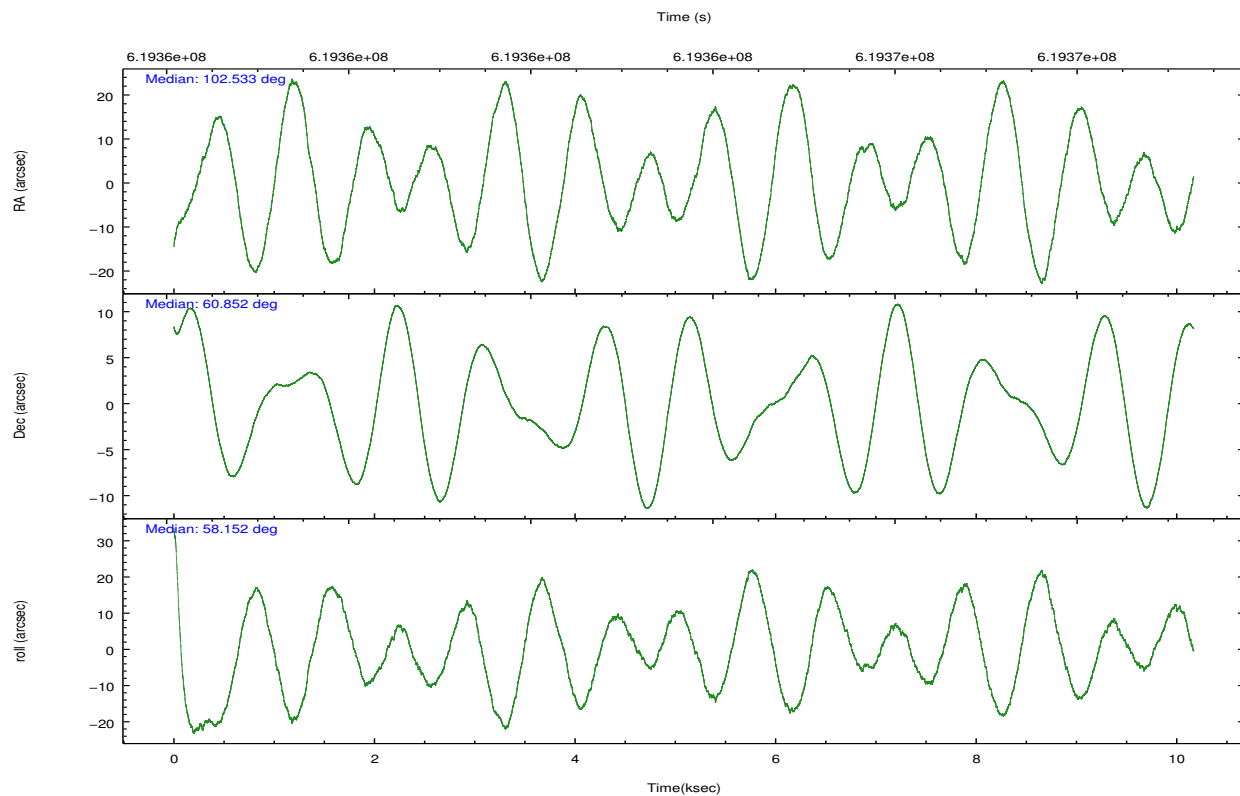


## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                             | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar format version number          | 7         | 7       |
| Detector                          | ACIS-2367           | ACIS-2367            | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                           | NONE                | NONE                 | Obspar update status                  | NONE      | UPDATED |
| Data mode                         | FAINT               | FAINT                | Number of optional ACIS chips dropped | 0         | 0       |
| Observation mode                  | POINTING            | POINTING             | On-chip summing requested             | N         | N       |
| [deg] Pointing RA                 | 102.531959          | 102.5329521751934    | Subarray requested                    | NONE      | NONE    |
| [deg] Pointing Dec                | 60.824489           | 60.85198443411377    | Alternating exposures requested       | N         | N       |
| [deg] Pointing Roll               | 58.003748           | 58.15955989688959    | [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)  | 619358743.184000    | 619357577.82322      |                                       |           |         |
| Observation start date            | 2017-08-17T12:04:34 | 2017-08-17T11:46:17  |                                       |           |         |
| [s] Observation end time (MET)    | 619368743.184000    | 619369841.94894      |                                       |           |         |
| Observation end date              | 2017-08-17T14:51:14 | 2017-08-17T15:10:41  |                                       |           |         |
| Read mode                         | TIMED               | TIMED                |                                       |           |         |

## 2.3 Aspect



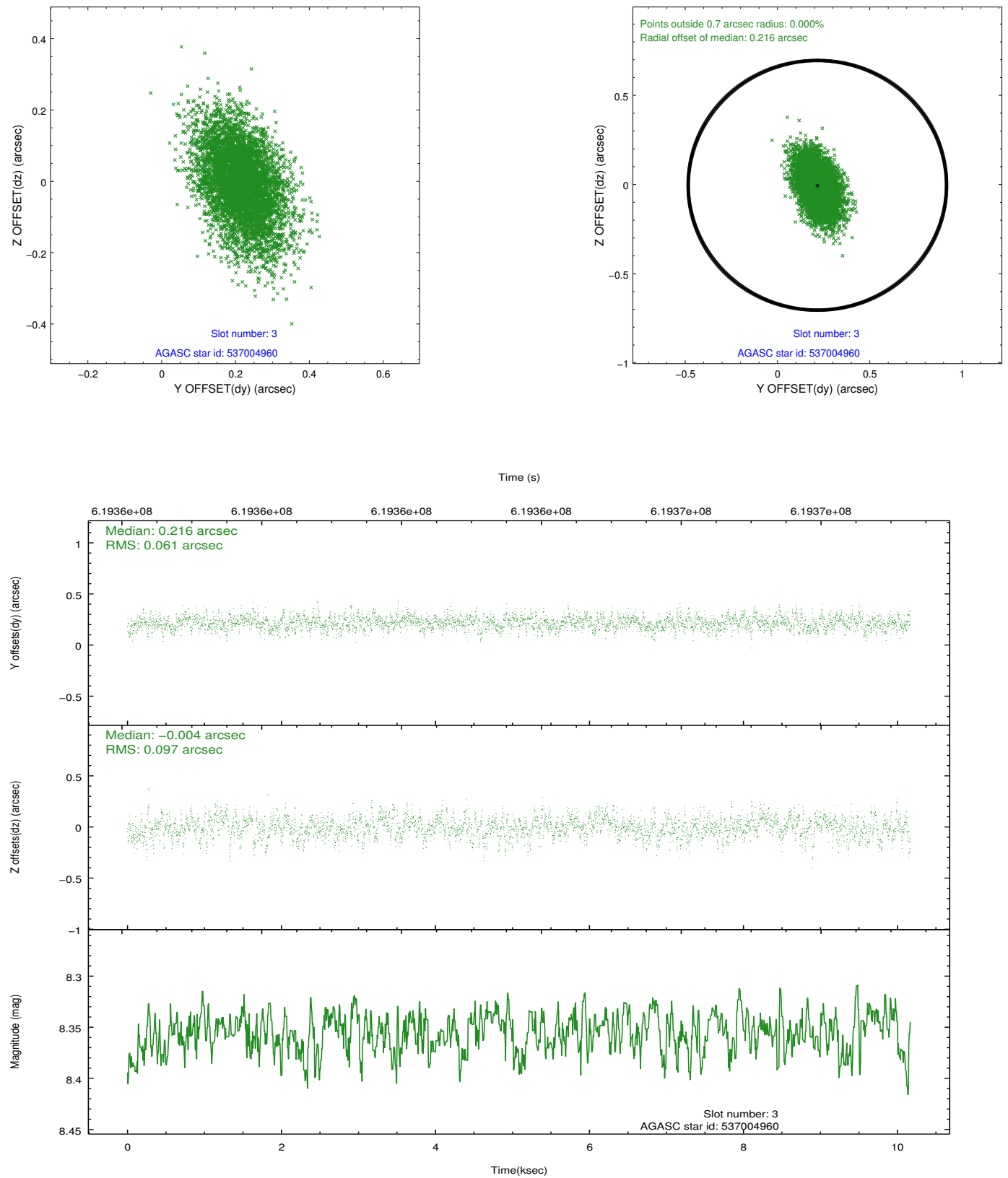


# Slot Statistics

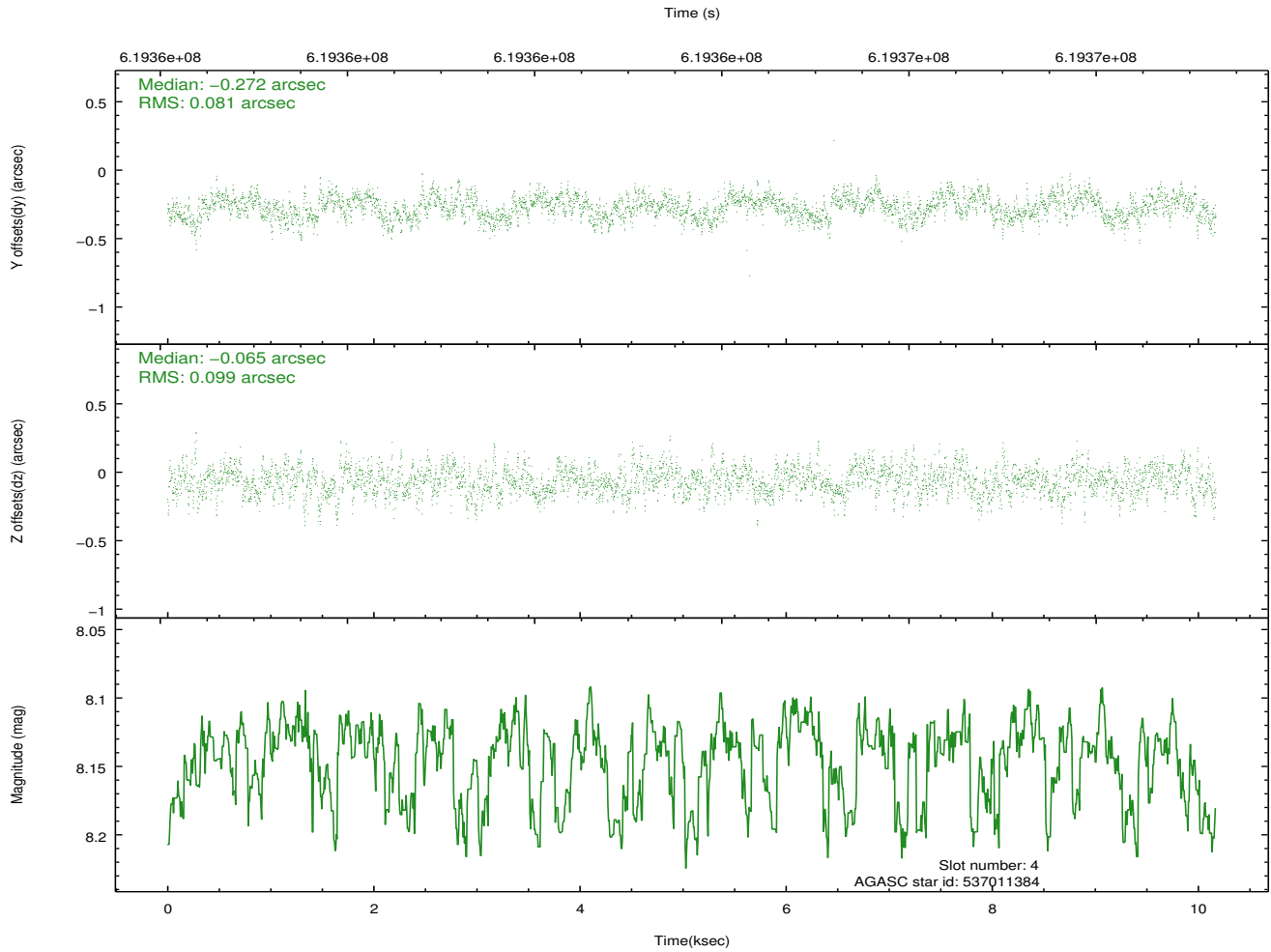
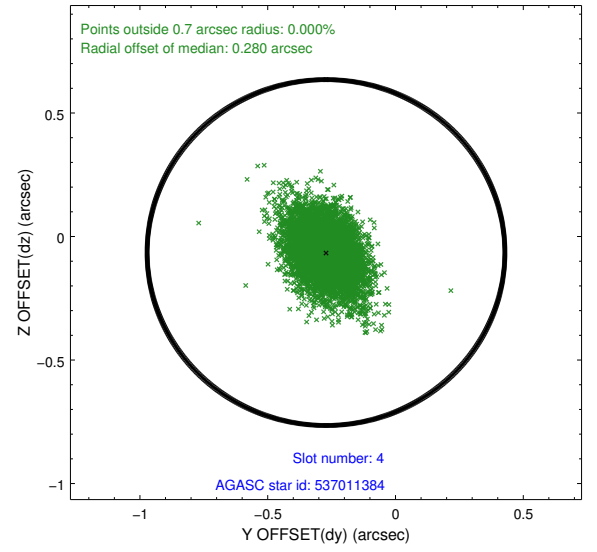
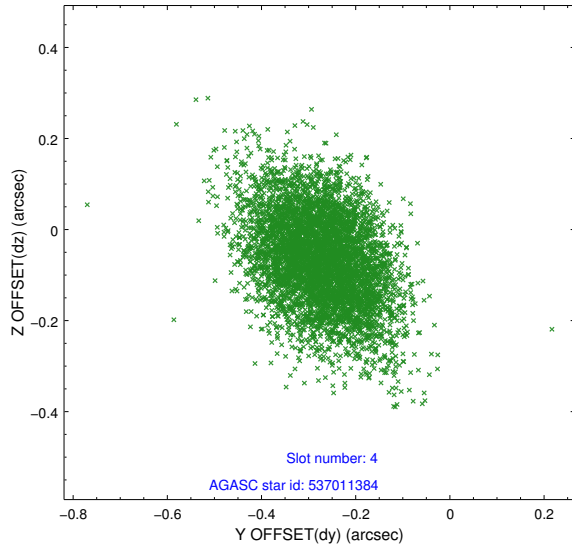
| slot | status  | used | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec       | mean_y   | mean_z   |
|------|---------|------|-----------|------|-------|--------|--------|-------|-------|------------|-----------|----------|----------|
| 0    | FID     |      | ACIS-S-1  | 7.05 | 2481  | 0.063  | -0.037 | 0.010 | 0.017 | 0.000000   | 0.000000  | 924.84   | -1739.67 |
| 1    | FID     |      | ACIS-S-4  | 7.06 | 2481  | 0.349  | -0.000 | 0.014 | 0.021 | 0.000000   | 0.000000  | 2142.78  | 164.01   |
| 2    | FID     |      | ACIS-S-5  | 7.06 | 2481  | -0.440 | 0.050  | 0.011 | 0.019 | 0.000000   | 0.000000  | -1823.91 | 158.17   |
| 3    | GUIDE   | used | 537004960 | 8.35 | 4956  | 0.216  | -0.004 | 0.118 | 0.208 | 102.253869 | 60.195745 | -2181.83 | -776.97  |
| 4    | GUIDE   | used | 537011384 | 8.14 | 4960  | -0.272 | -0.065 | 0.133 | 0.222 | 102.757071 | 60.873685 | 359.19   | -240.78  |
| 5    | GUIDE   | used | 537016488 | 7.36 | 4962  | -0.159 | -0.088 | 0.129 | 0.233 | 102.417885 | 60.464629 | -1205.88 | -515.22  |
| 6    | OMITTED |      |           | 0.00 | 0     | 0.000  | 0.000  | 0.000 | 0.000 | 0.000000   | 0.000000  | 0.00     | 0.00     |
| 7    | GUIDE   | used | 537005104 | 8.49 | 4955  | 0.216  | 0.163  | 0.117 | 0.203 | 102.399809 | 60.162914 | -2145.82 | -1061.47 |

## 2.4 Star Slots

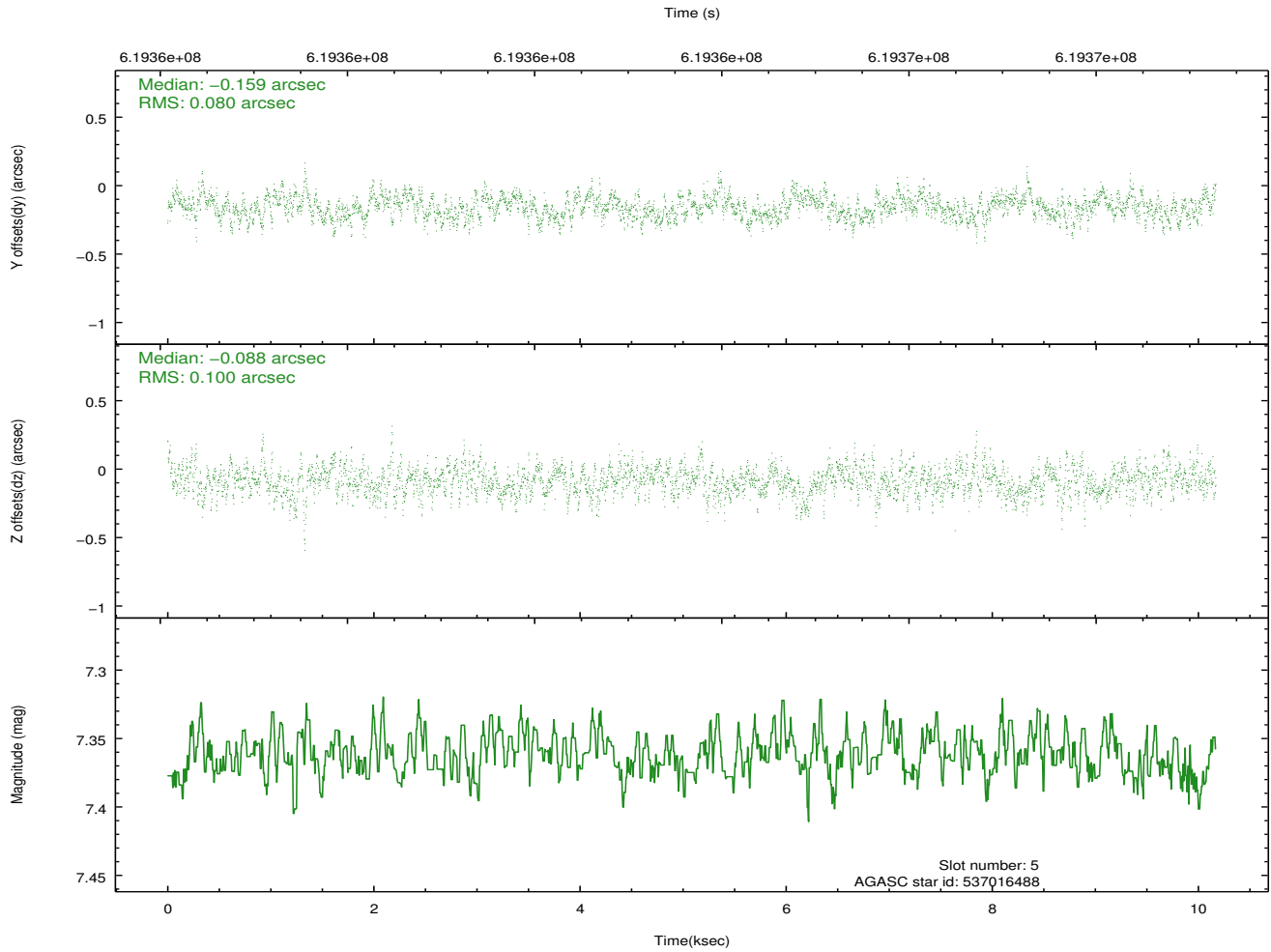
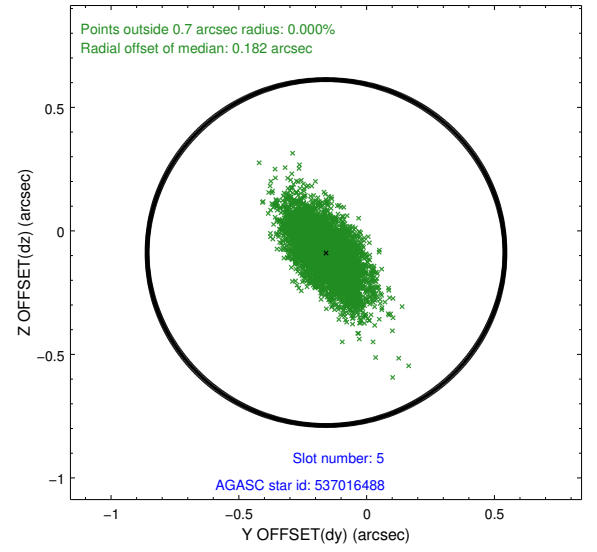
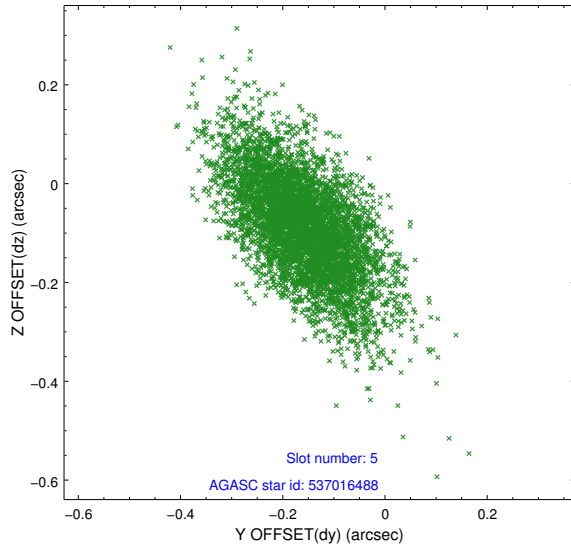
### 2.4.1 Slot 3



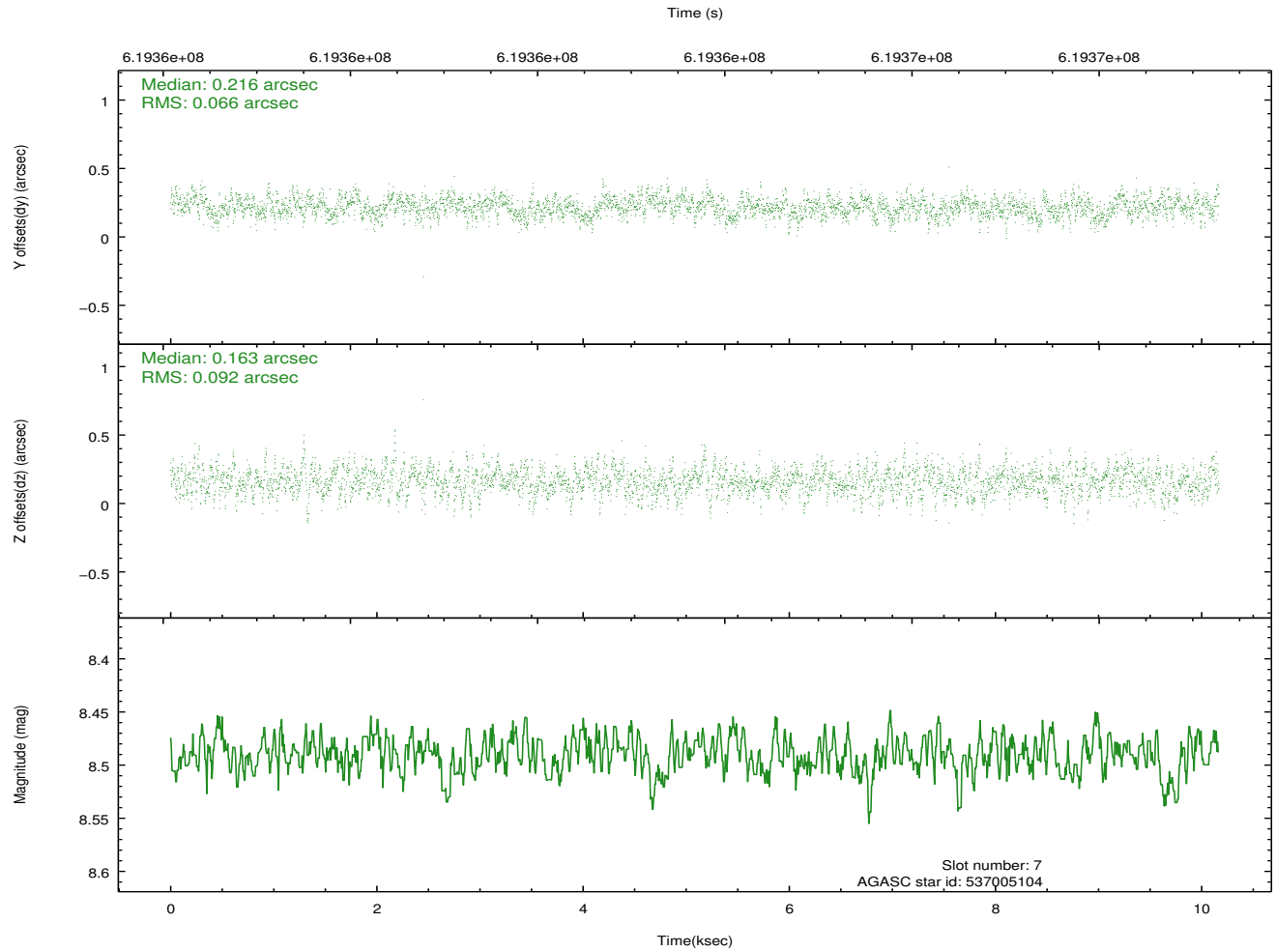
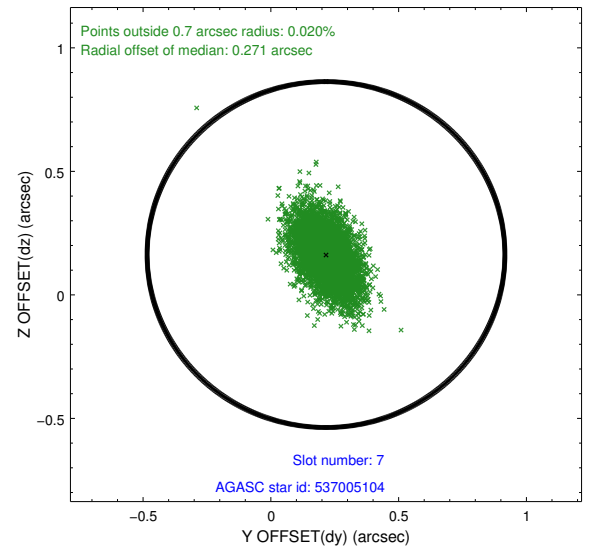
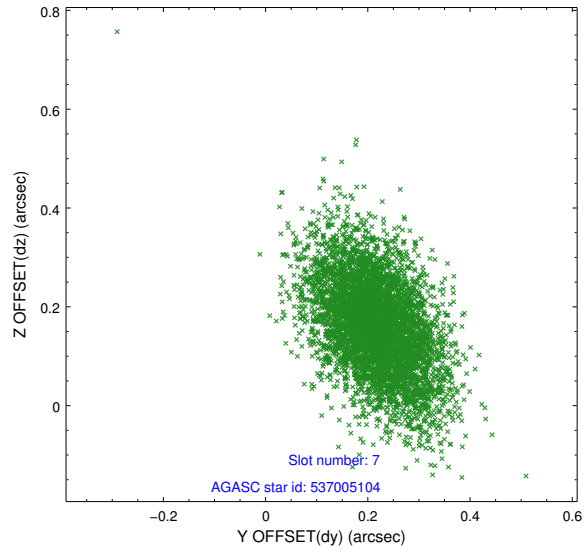
## 2.4.2 Slot 4



### 2.4.3 Slot 5



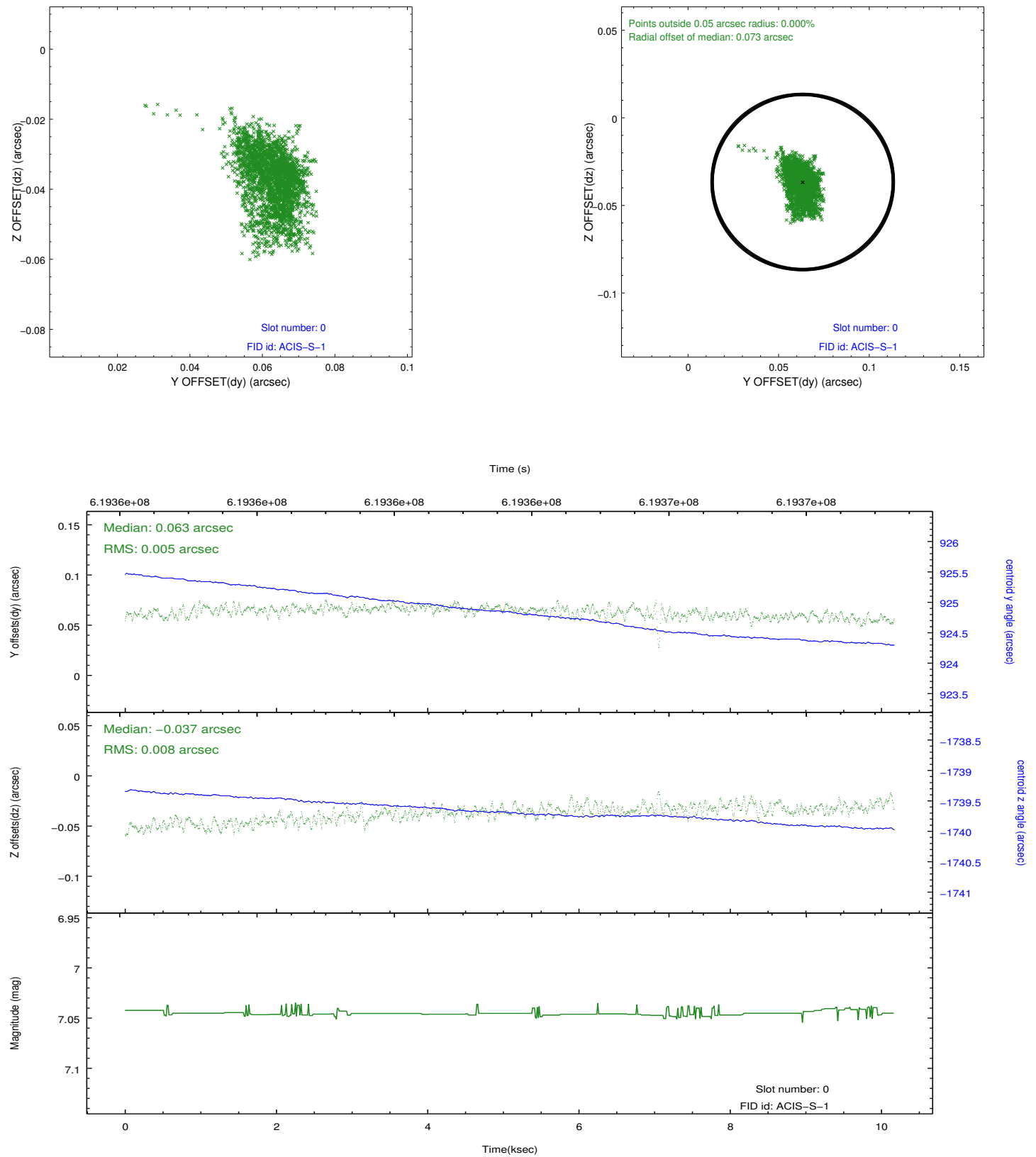
## 2.4.4 Slot 7



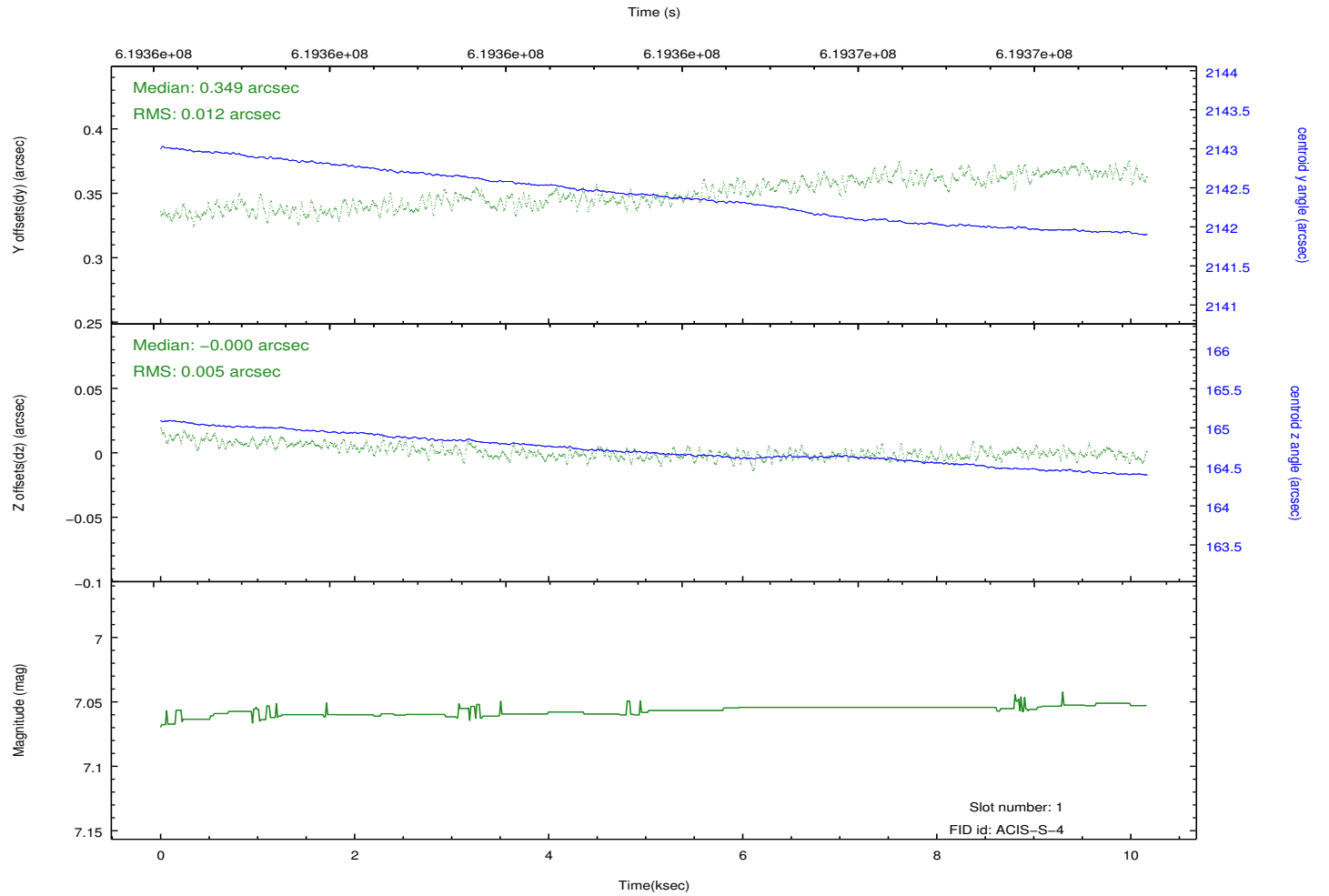
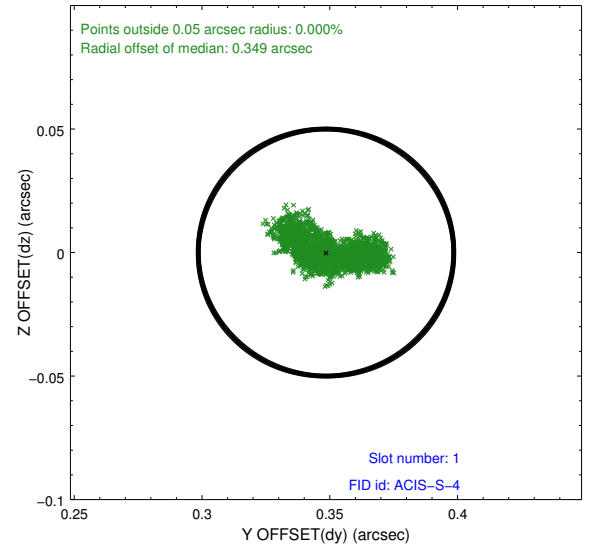
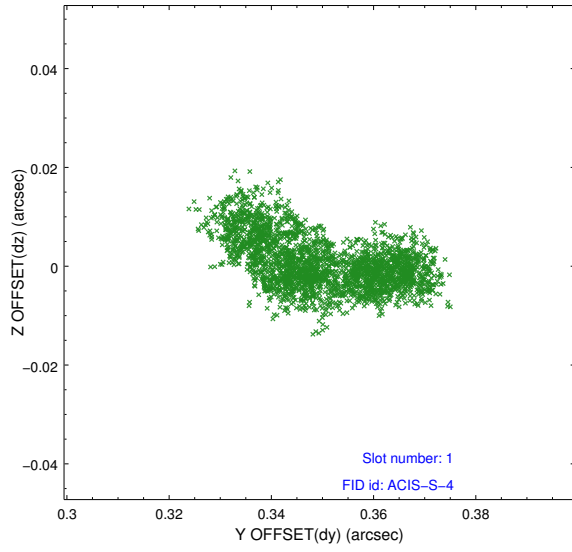


## 2.5 FID Slots

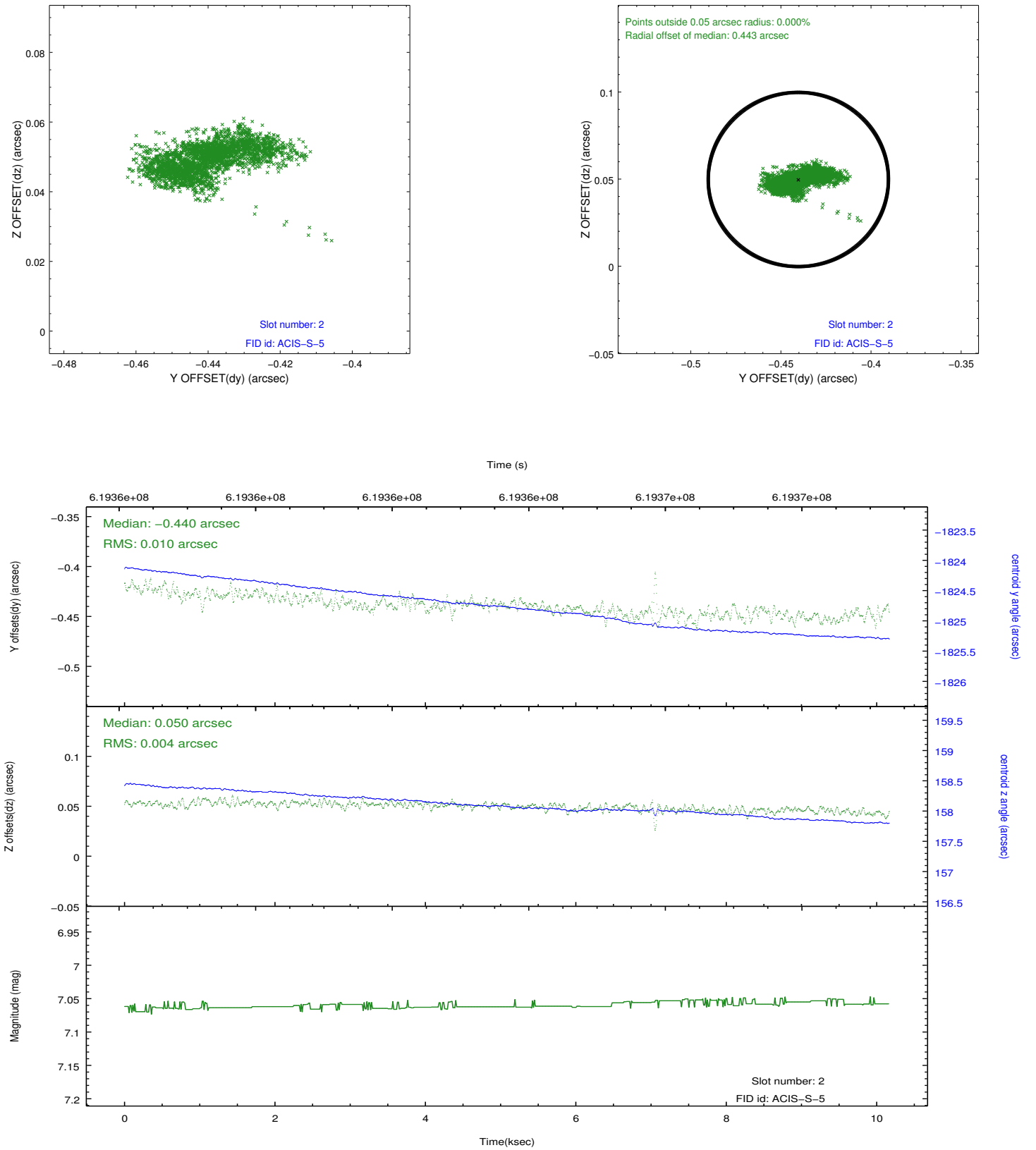
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# A Summary

## A.1 Status

|                            |                 |
|----------------------------|-----------------|
| V&V Scientist              | Beth Sundheim   |
| V&V Date (YYYY-MM-DD)      | 2017.08.28      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 10.068800077558 |

## A.2 Comments

The guide star in slot 6 was removed from the aspect solution due to poor data quality. The aspect solution is improved by the removal of this star from the solution.

A spatial region of the original bias map for CCD = 3 suffered from anomalously high data values. Pixels in the event data that were bias-corrected by one of the original affected bias pixels may have an apparent energy shift. While the change in energy is expected to be small ( $\sim 20$  eV), it depends on many parameters that have not yet been fully explored for this bias anomaly. The bias map for CCD = 3 has been reconstructed for this processing to remove this anomaly using scaled data from a comparable bias map from another observation. The pixels affected by the anomaly are bounded by sky coords: (102.81198,60.60109), (102.83006,60.59550), (102.98148,60.71358), (102.96336,60.71919).