

# V&V Reference Report

## L2 ASCDS Version : 7.6.7.2

Observation 5329 - L2 Version 001  
Chandra X-Ray Center

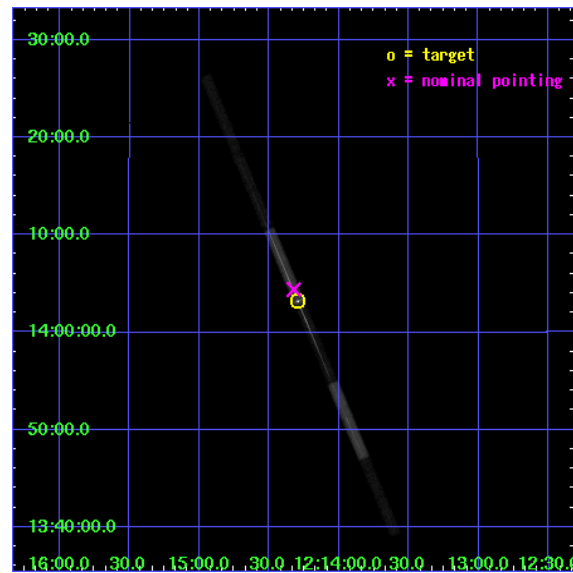
L2 Processing Date : May 23 2006

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# 1 Front

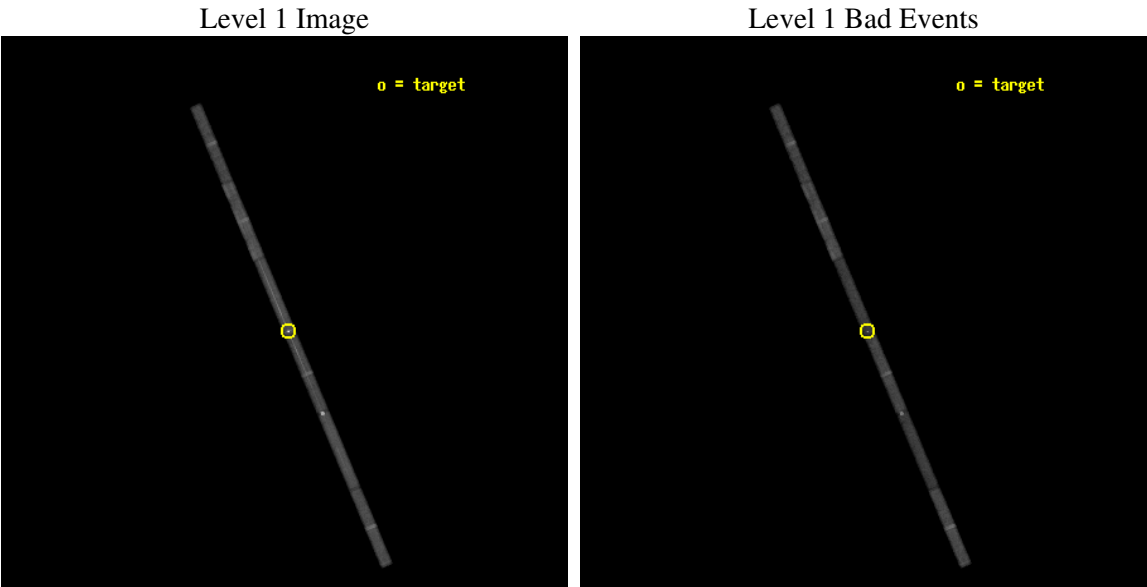
|          |  |
|----------|--|
| seq_num  | 700962   |
| obs_id   | 5329   |
| title    | Revealing the High Velocity Outflow in PG 1211+143 |
| observer | Dr James Reeves                                    |
| object   | PG 1211+143  |
| dtcycle  | 0  |
| cycle    | P  |
| ra_targ  | 183.57375  |
| dec_targ | 14.053611  |
| ra_nom   | 183.58063617475                                    |
| dec_nom  | 14.073582323378                                    |
| roll_nom | 247.09573709364                                    |
| revision | 2  |
| ontime   | 51064.999130368                                    |
| livetime | 48236.93645587                                     |
| ontime4  | 51064.999130368                                    |
| ontime5  | 51064.999130368                                    |
| ontime6  | 51064.999130368                                    |
| ontime7  | 51064.999130368                                    |
| ontime8  | 51064.999130368                                    |
| ontime9  | 51064.970087886                                    |
| l2events | 124088   |



2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias

Chip 4

Chip 5

Chip 6



Chip 7

Chip 8

Chip 9



### 2.1.3 Parameters

|          |                     |
|----------|---------------------|
| obi_num  | 0                   |
| ascdsver | 7.6.7.2             |
| caldbver | 3.2.2               |
| date     | 2006-05-23T17:44:40 |
| revision | 2                   |

|                |                 |
|----------------|-----------------|
| sched_exp_time | 51000.000000    |
| ontime         | 51065.934631646 |
| ontime4        | 51065.934631646 |
| ontime5        | 51065.934631646 |
| ontime6        | 51065.934631646 |
| ontime7        | 51065.934631646 |
| ontime8        | 51066.675641716 |
| ontime9        | 51066.675641716 |
| l1events       | 471256          |

### 2.1.4 Events

|                 | ccd 4 | ccd 5 | ccd 6 | ccd 7 | ccd 8 | ccd 9 |
|-----------------|-------|-------|-------|-------|-------|-------|
| level 1 events  | 70607 | 87382 | 68939 | 99429 | 87223 | 57676 |
| rejected events | 62864 | 41608 | 54185 | 39575 | 70700 | 50706 |
| rejected %      | 89%   | 47%   | 78%   | 39%   | 81%   | 87%   |

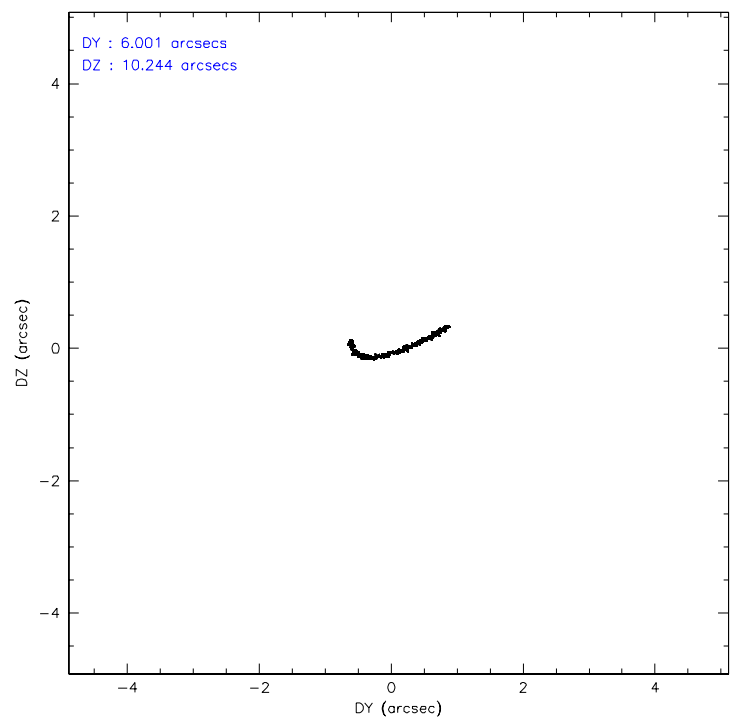
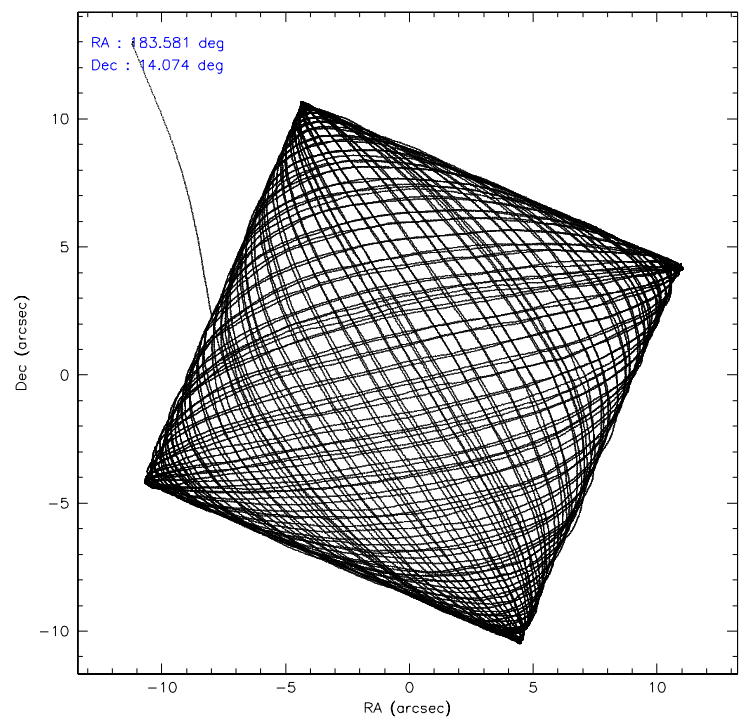
|                | ccd 4 | ccd 5 | ccd 6 | ccd 7 | ccd 8 | ccd 9 |
|----------------|-------|-------|-------|-------|-------|-------|
| grade 0 events | 2762  | 12079 | 8804  | 11857 | 4560  | 2512  |
|                | 3%    | 13%   | 12%   | 11%   | 5%    | 4%    |
| grade 1 events | 23    | 2485  | 25    | 187   | 25    | 15    |
|                | 0%    | 2%    | 0%    | 0%    | 0%    | 0%    |
| grade 2 events | 1494  | 10680 | 1879  | 14649 | 3069  | 1085  |
|                | 2%    | 12%   | 2%    | 14%   | 3%    | 1%    |
| grade 3 events | 1209  | 2593  | 1346  | 6197  | 2115  | 1131  |
|                | 1%    | 2%    | 1%    | 6%    | 2%    | 1%    |
| grade 4 events | 1093  | 2354  | 1322  | 6212  | 1960  | 1074  |
|                | 1%    | 2%    | 1%    | 6%    | 2%    | 1%    |
| grade 5 events | 1979  | 5109  | 1998  | 5911  | 2599  | 2003  |
|                | 2%    | 5%    | 2%    | 5%    | 2%    | 3%    |
| grade 6 events | 1185  | 18068 | 1403  | 20939 | 4819  | 1168  |
|                | 1%    | 20%   | 2%    | 21%   | 5%    | 2%    |
| grade 7 events | 60862 | 34014 | 52162 | 33477 | 68076 | 48688 |
|                | 86%   | 38%   | 75%   | 33%   | 78%   | 84%   |

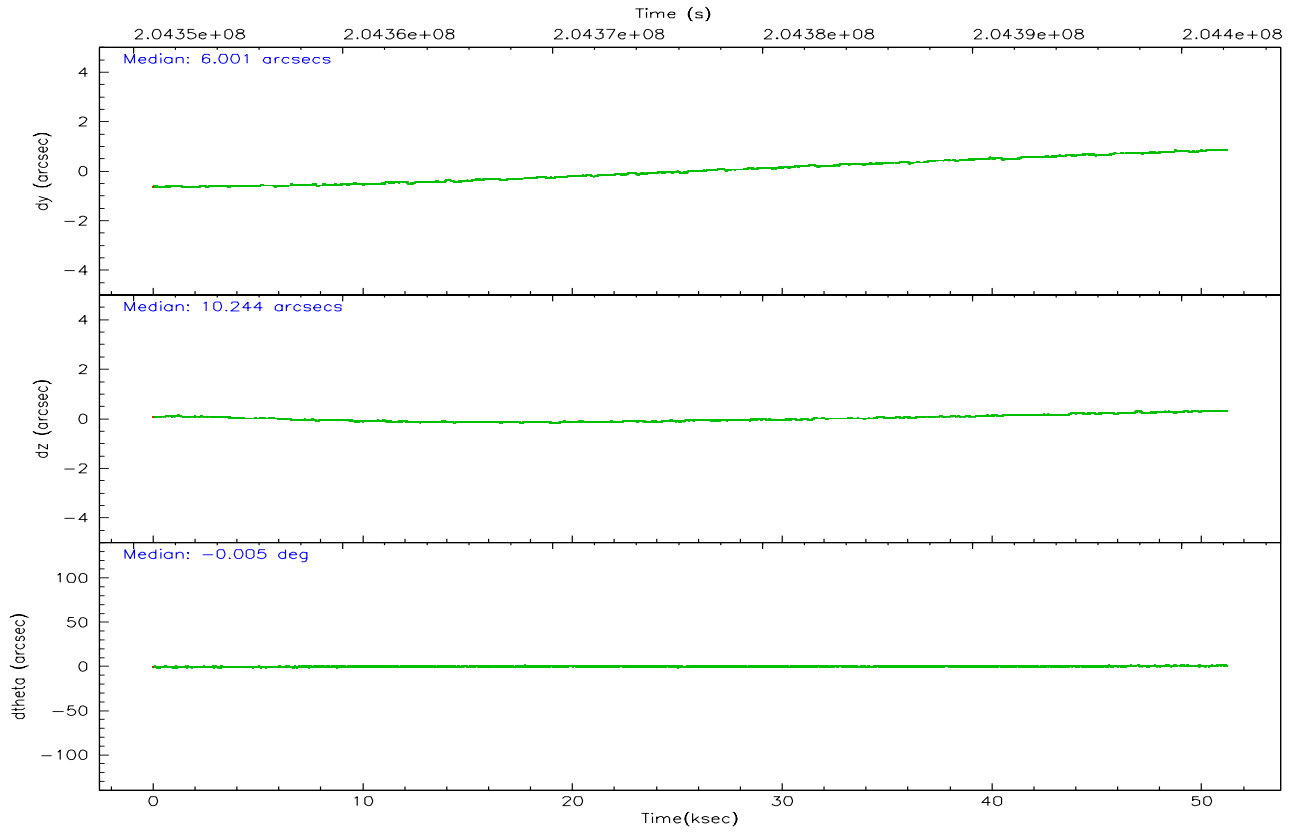
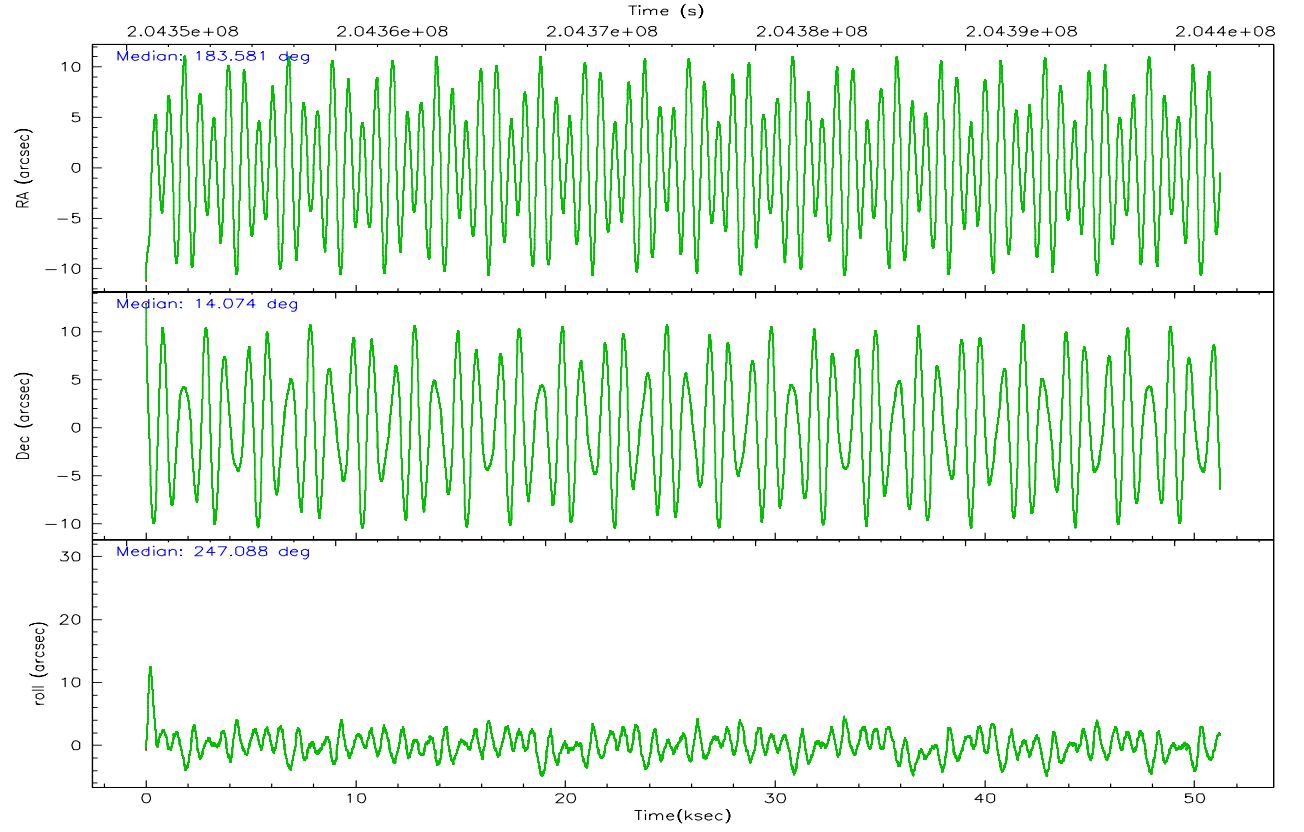


## 2.2 Compared Parameters

| Parameter                         | Planned             | Actual               | Parameter                       | Planned   | Actual  |
|-----------------------------------|---------------------|----------------------|---------------------------------|-----------|---------|
| Instrument                        | ACIS                | ACIS                 | Obspar format version number    | 6         | 6       |
| Detector                          | ACIS-456789         | ACIS-456789          | Obspar file type                | PREDICTED | ACTUAL  |
| Grating                           | LETG                | LETG                 | Obspar update status            | NONE      | UPDATED |
| Data mode                         | FAINT               | FAINT                | On-chip summing requested       | N         | N       |
| Observation mode                  | POINTING            | POINTING             | Subarray requested              | CUSTOM    | 1/8     |
| Pointing RA                       | 183.576790          | 183.5806361747478    | Subarray start row              | 113       | 113     |
| Pointing Dec                      | 14.100534           | 14.07358232337819    | Subarray row count              | 128       | 128     |
| Pointing Roll                     | 246.940049          | 247.095737093641     | Alternating exposures requested | N         | N       |
| SIM focus pos (mm)                | -0.684267           | -0.6828225247311905  | Primary exposure time           | 0.000000  | 0.7     |
| SIM defocus (mm)                  | 0                   | 0.001444936568705701 |                                 |           |         |
| SIM translation stage pos (mm)    | -182.132523         | -182.1370004450064   |                                 |           |         |
| SIM translation stage offset (mm) | -8                  | -7.995522138001405   |                                 |           |         |
| Observation start time            | 204351162.184000    | 204350263.38395      |                                 |           |         |
| Observation start date            | 2004-06-23T04:11:38 | 2004-06-23T03:57:43  |                                 |           |         |
| Observation end time              | 204402162.184000    | 204402395.39876      |                                 |           |         |
| Observation end date              | 2004-06-23T18:21:38 | 2004-06-23T18:26:35  |                                 |           |         |
| Read mode                         | TIMED               | TIMED                |                                 |           |         |

## 2.3 Aspect



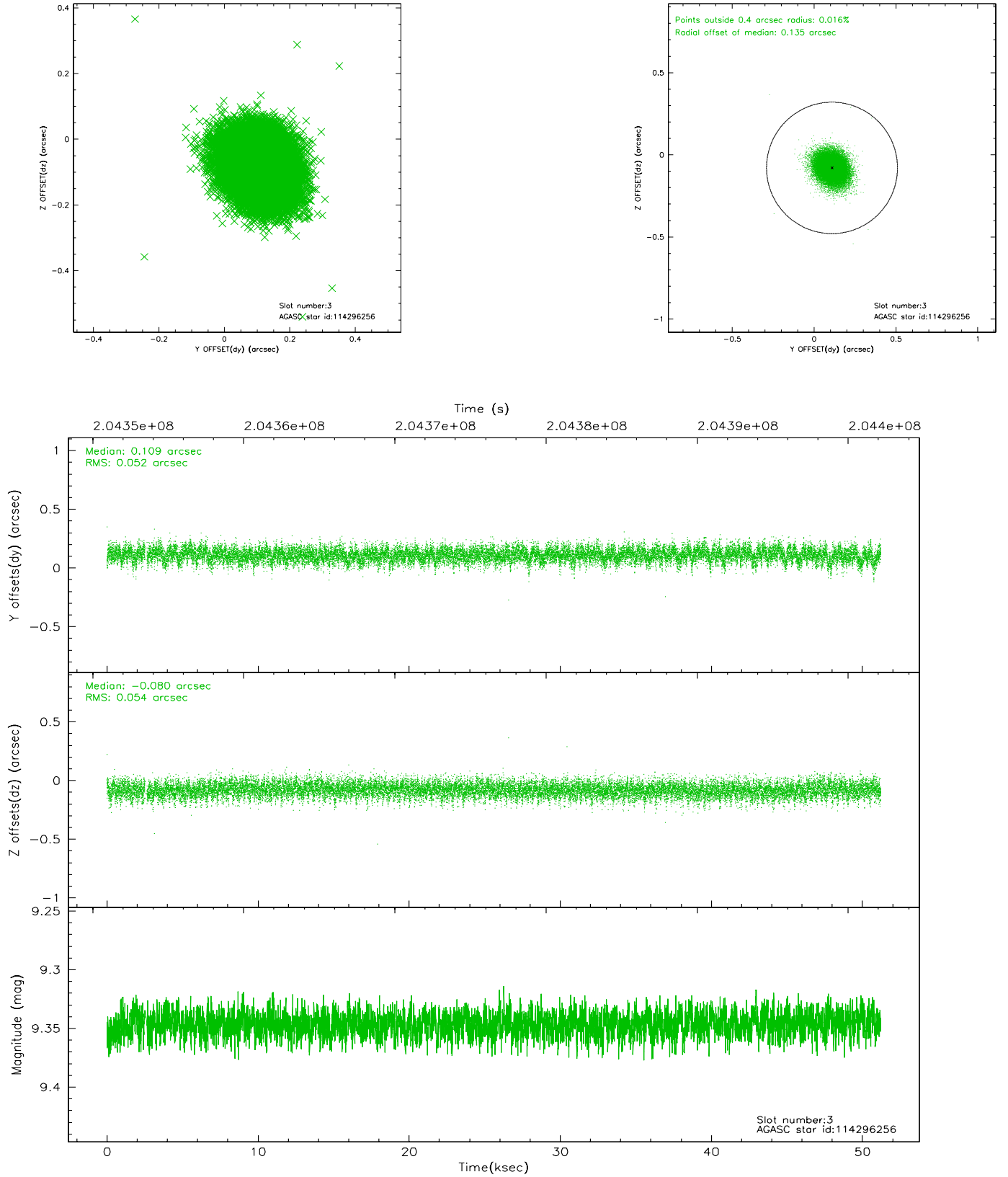


### Slot Statistics

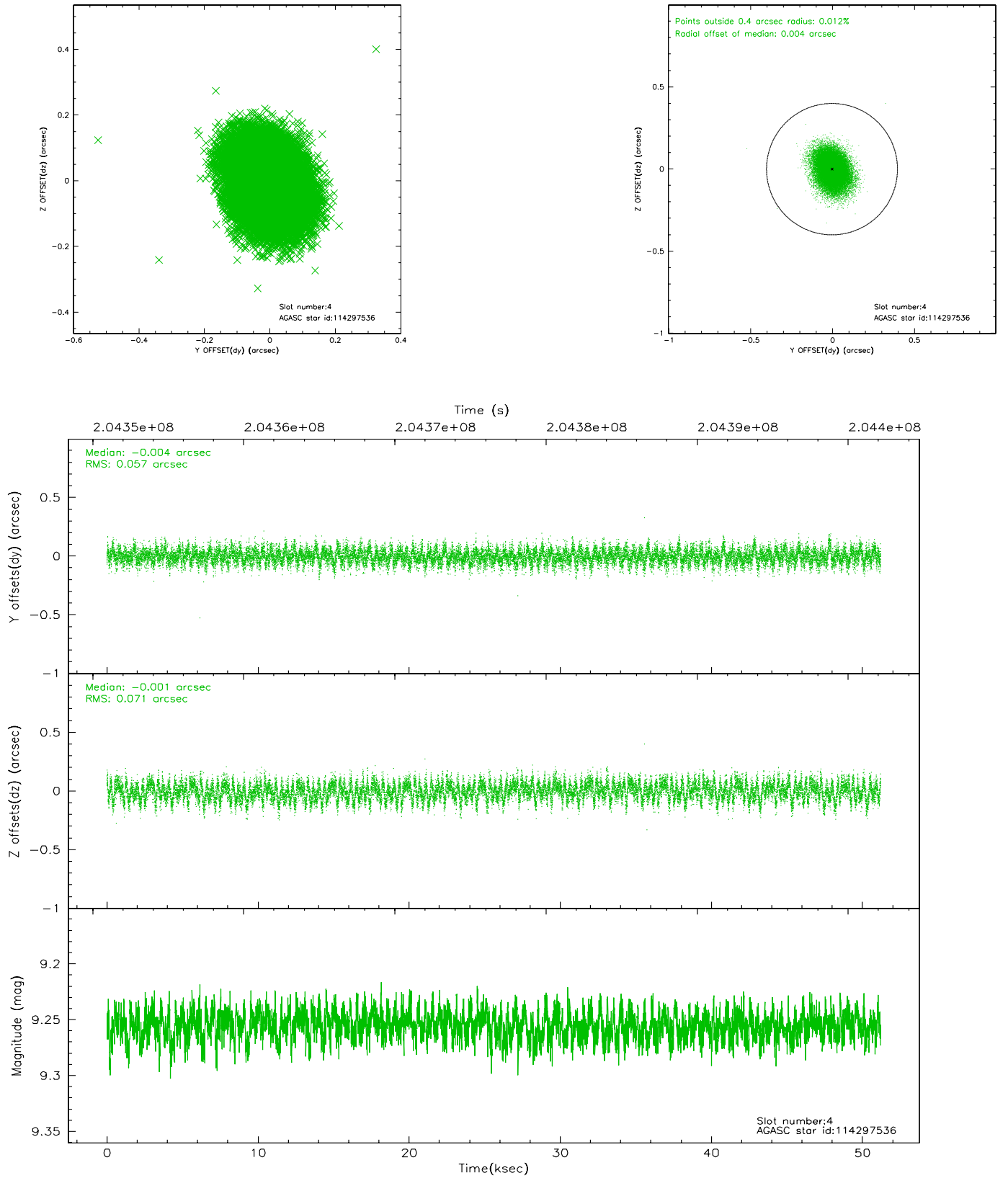
| slot | status | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra         | dec       | mean_y   | mean_z   |
|------|--------|-----------|------|-------|--------|--------|-------|-------|------------|-----------|----------|----------|
| 0    | FID    | ACIS-S-4  | 7.17 | 12493 | 0.064  | 0.042  | 0.013 | 0.036 | 0.000000   | 0.000000  | 2155.24  | 12.46    |
| 1    | FID    | ACIS-S-5  | 7.23 | 12493 | -0.098 | 0.031  | 0.014 | 0.043 | 0.000000   | 0.000000  | -1811.14 | 5.91     |
| 2    | FID    | ACIS-S-6  | 7.40 | 12493 | 0.005  | -0.058 | 0.008 | 0.014 | 0.000000   | 0.000000  | 403.46   | 649.56   |
| 3    | GUIDE  | 114296256 | 9.35 | 24913 | 0.109  | -0.080 | 0.079 | 0.130 | 182.985406 | 14.017213 | 1083.32  | -1783.55 |
| 4    | GUIDE  | 114297536 | 9.26 | 24969 | -0.004 | -0.001 | 0.097 | 0.155 | 183.757120 | 14.264956 | -791.05  | 347.20   |
| 5    | GUIDE  | 114301168 | 9.22 | 24961 | 0.068  | -0.109 | 0.089 | 0.145 | 182.996668 | 14.071189 | 888.93   | -1823.10 |
| 6    | GUIDE  | 114303096 | 9.31 | 24956 | -0.001 | -0.052 | 0.107 | 0.178 | 183.214020 | 14.515722 | -880.37  | -1749.13 |
| 7    | GUIDE  | 115218912 | 8.30 | 24979 | -0.174 | 0.245  | 0.082 | 0.130 | 184.400783 | 14.442830 | -2263.68 | 2158.48  |

## 2.4 Star Slots

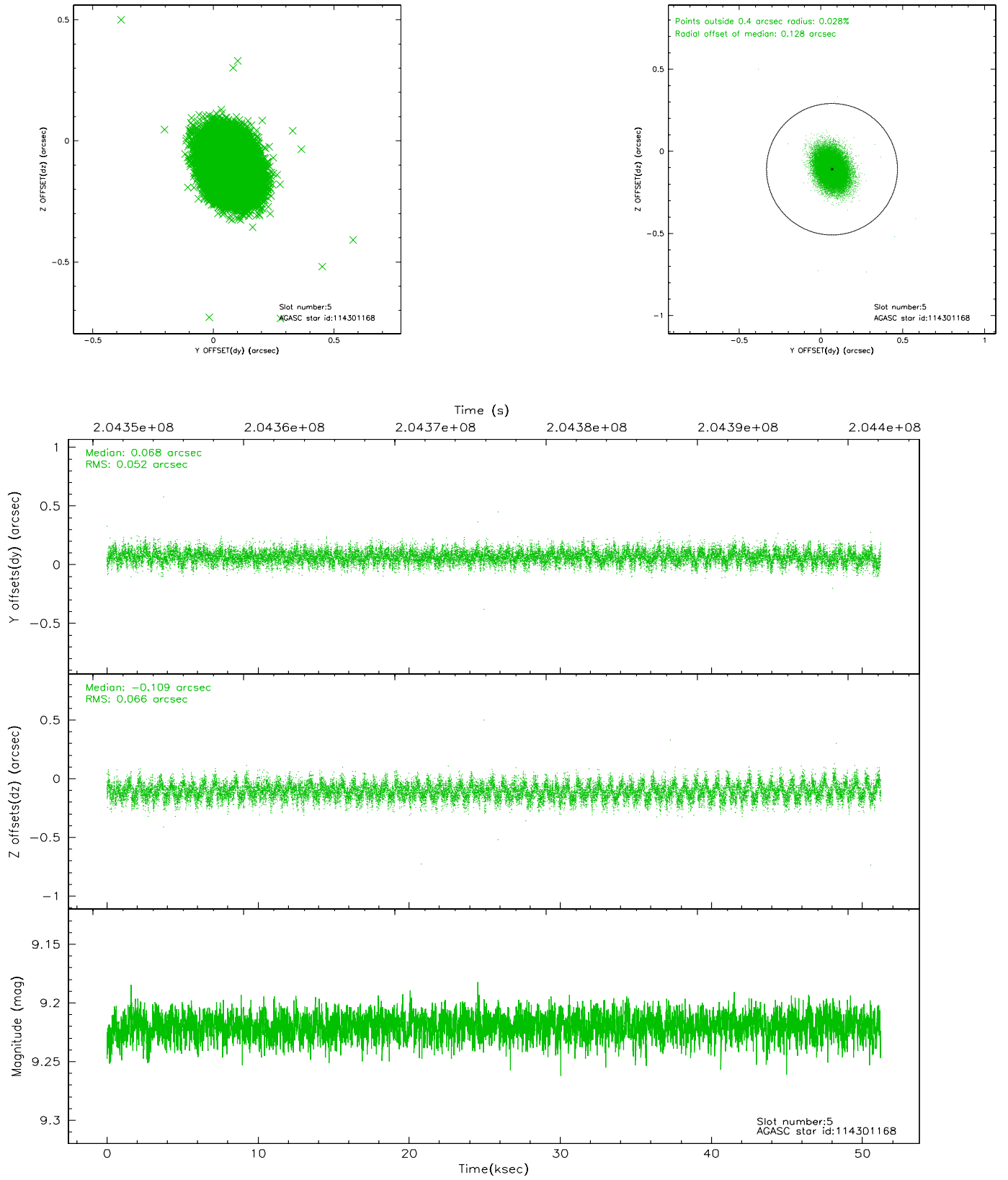
### 2.4.1 Slot 3



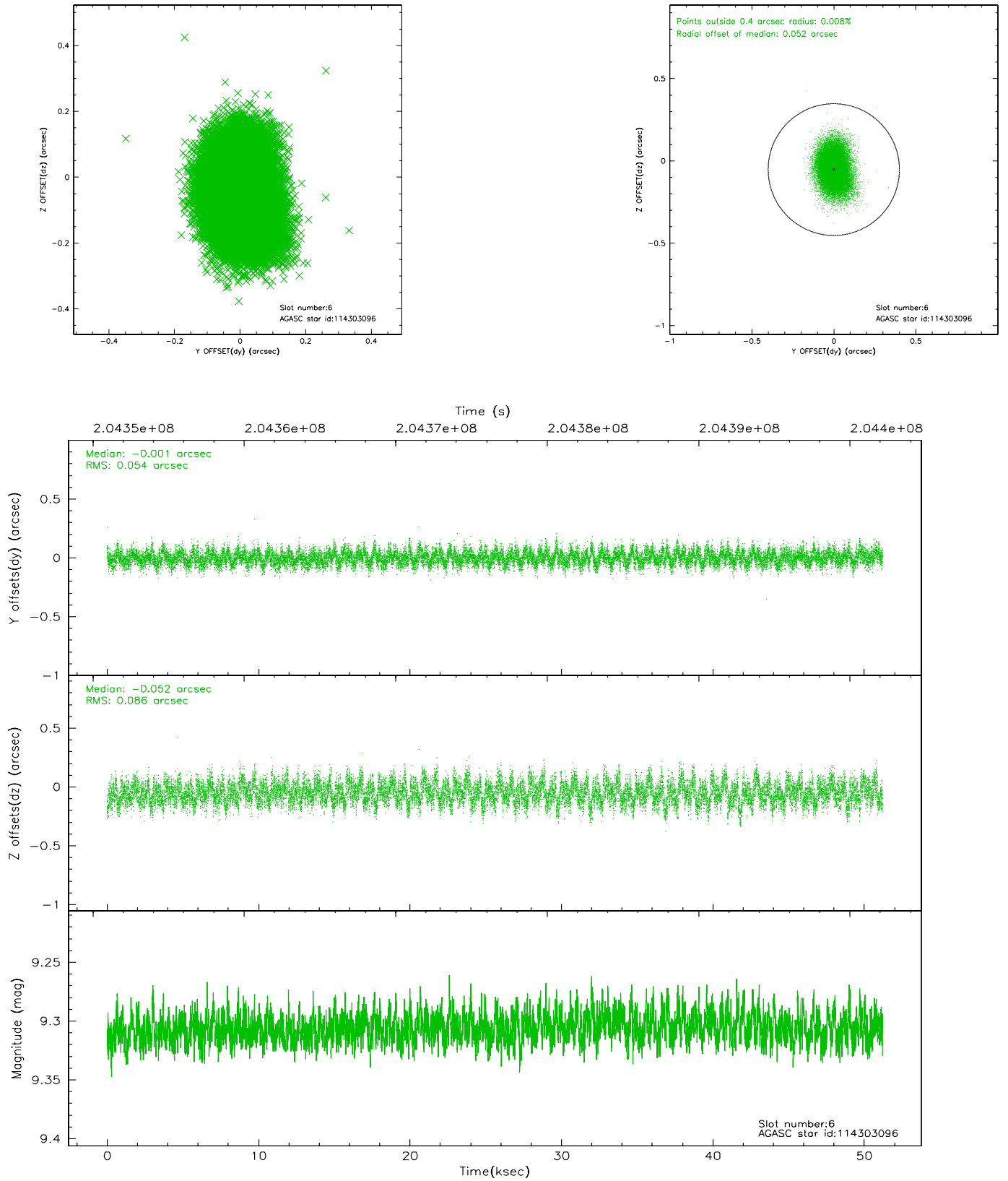
## 2.4.2 Slot 4



### 2.4.3 Slot 5

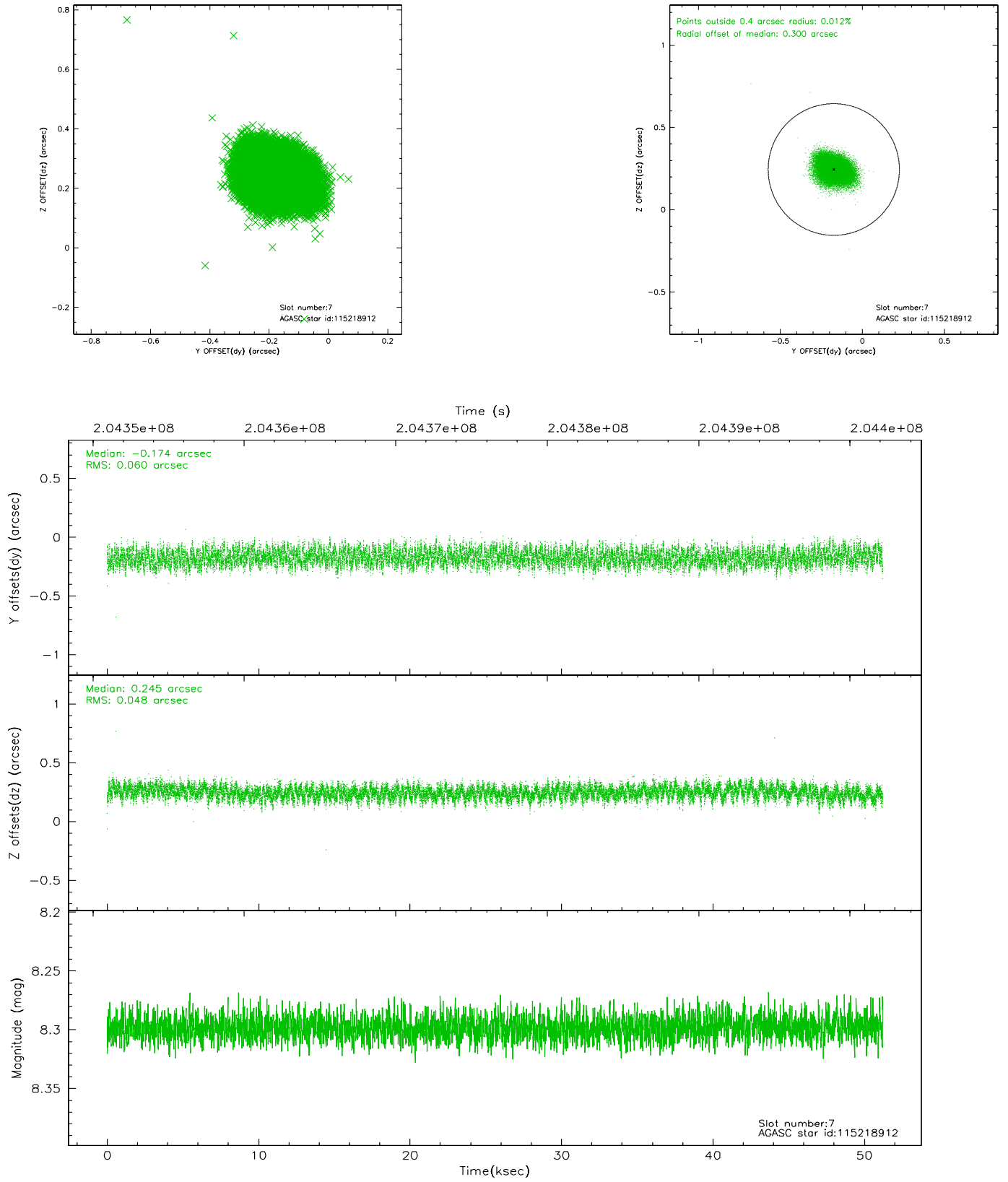


## 2.4.4 Slot 6



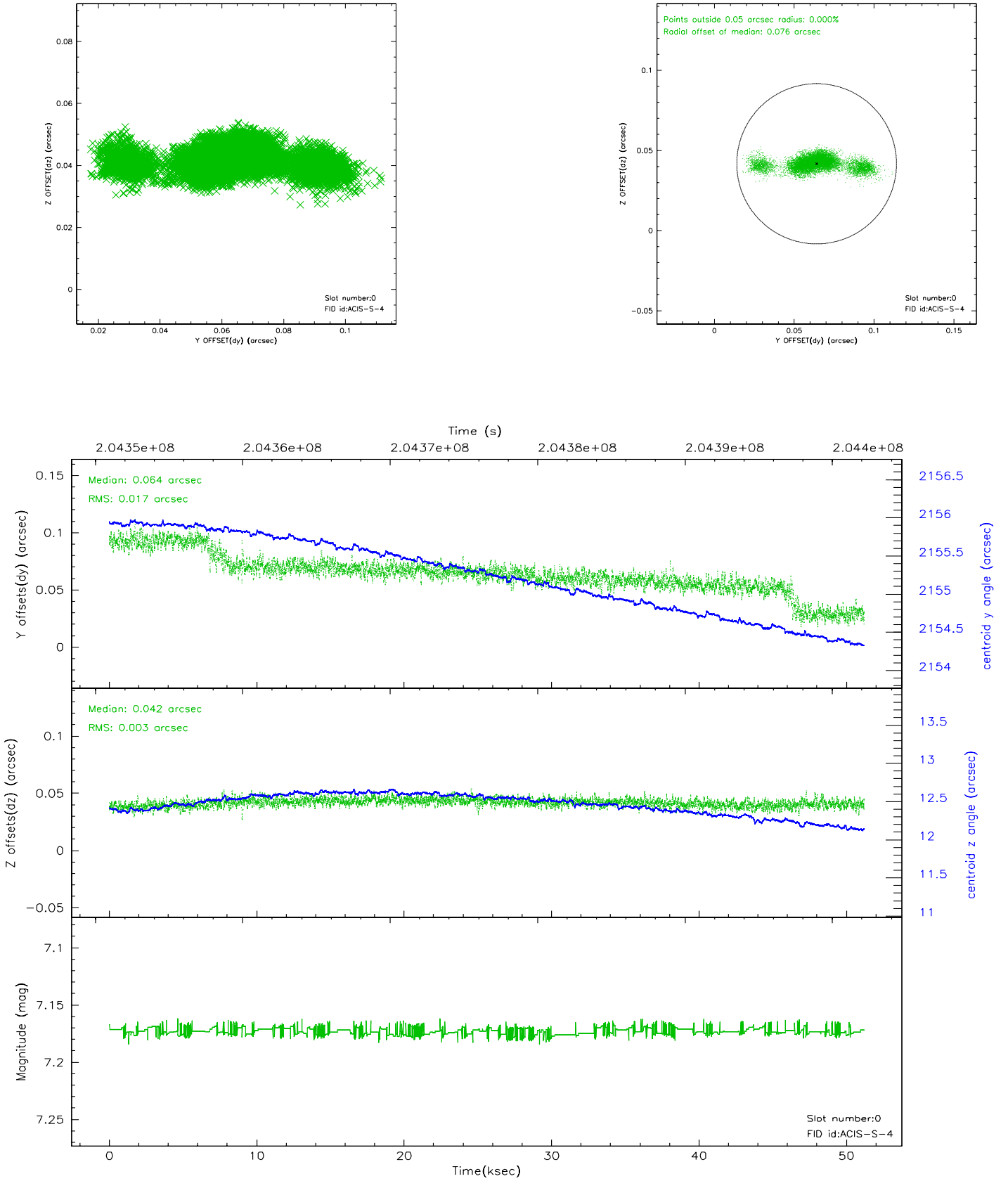


## 2.4.5 Slot 7

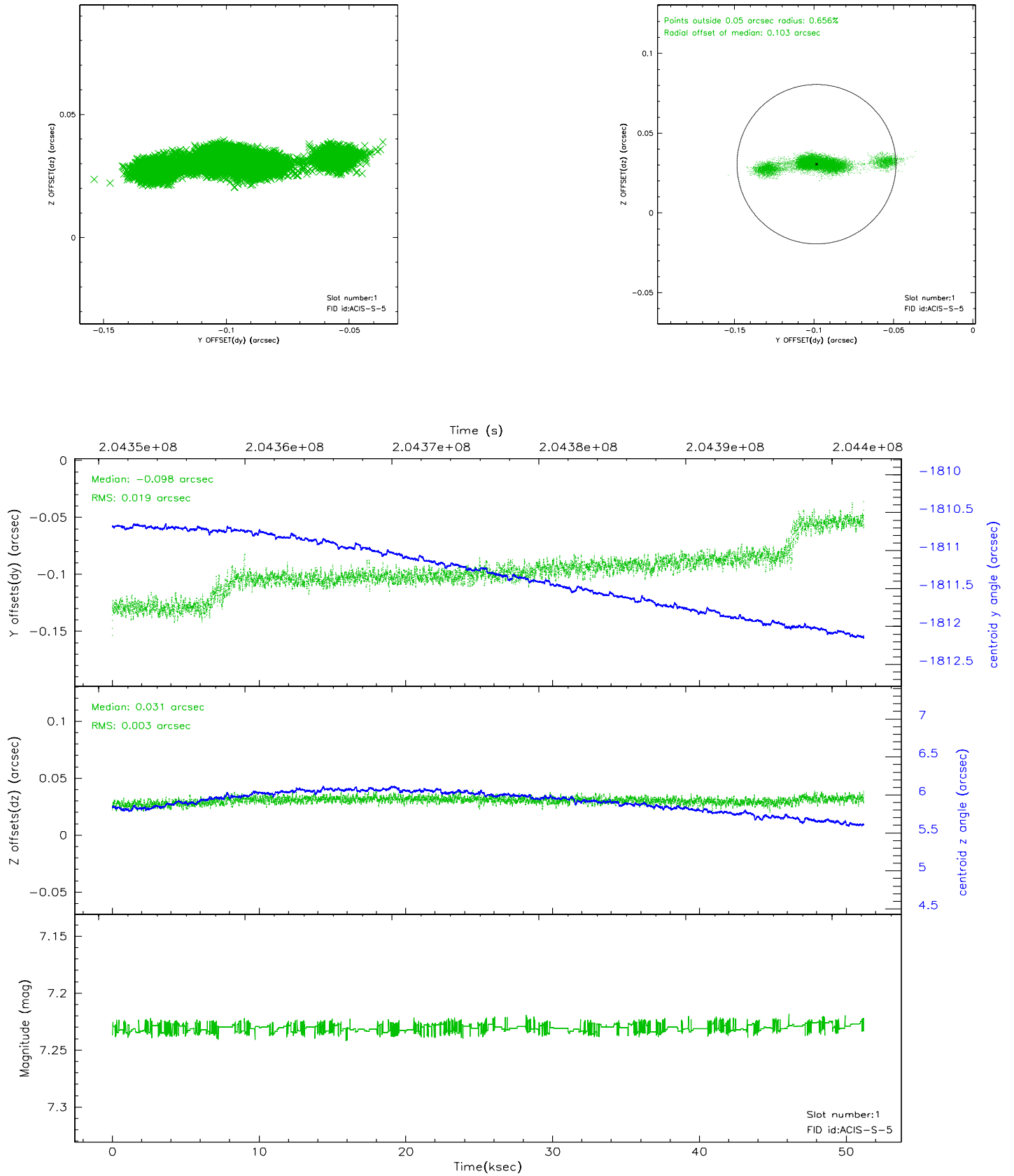


## 2.5 FID Slots

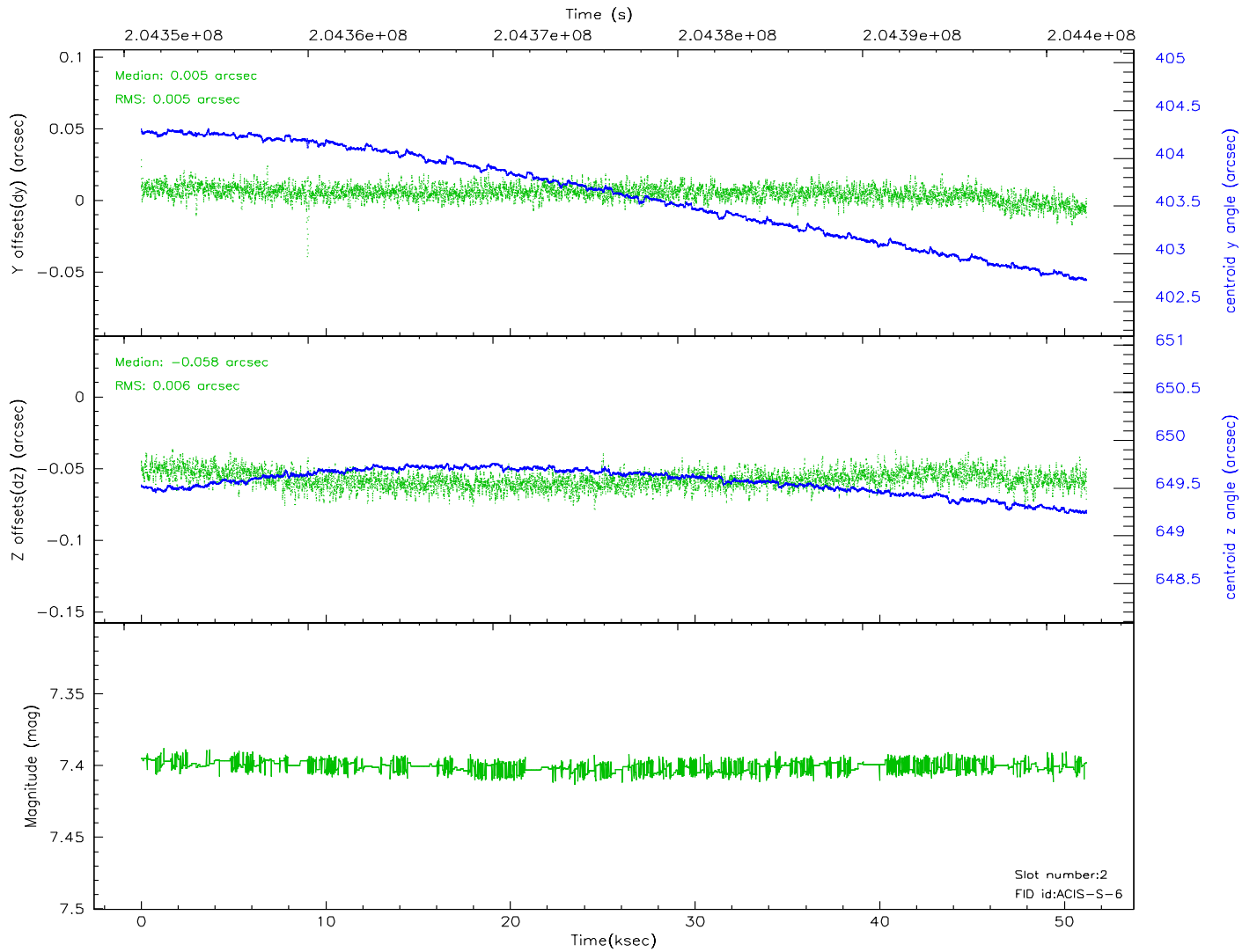
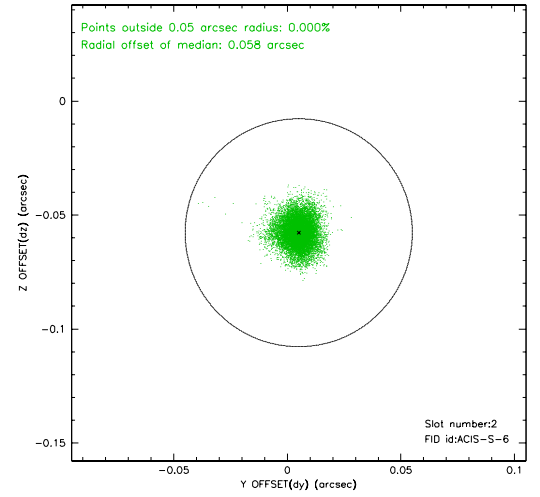
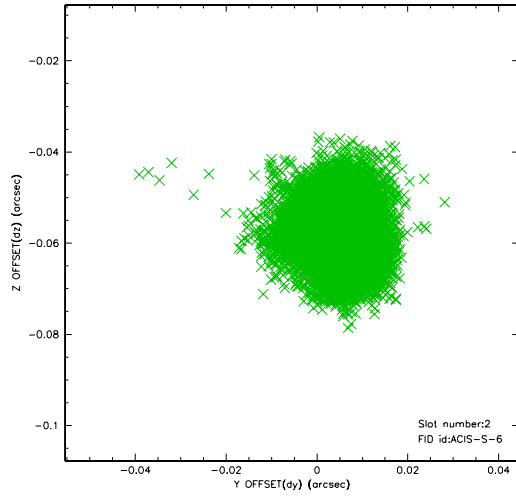
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2

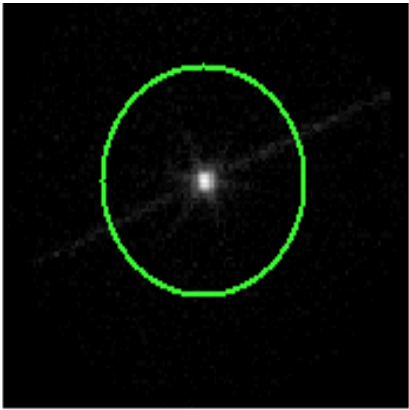


# 3 Gratings

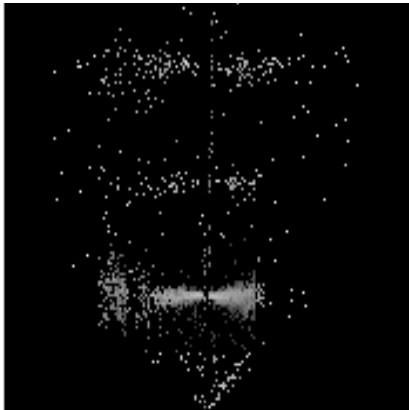
## 3.1 LETG Arm



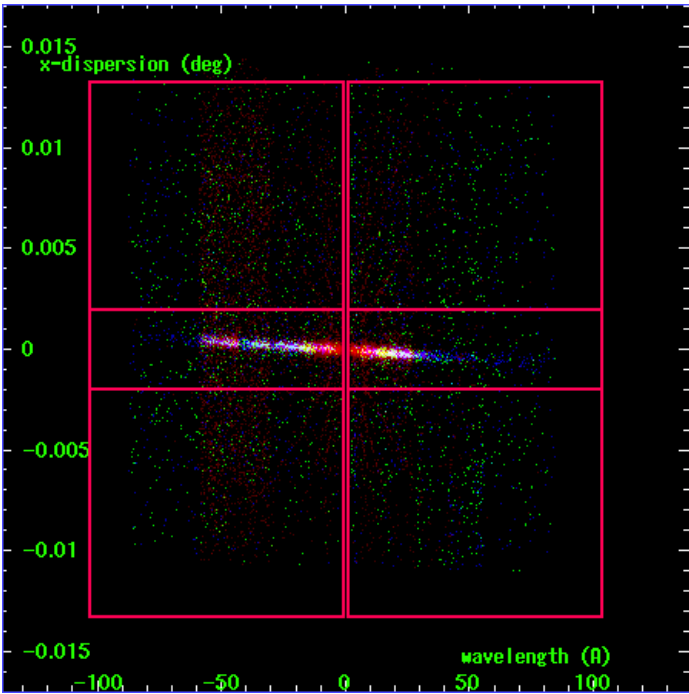
LETG Order Sort 123



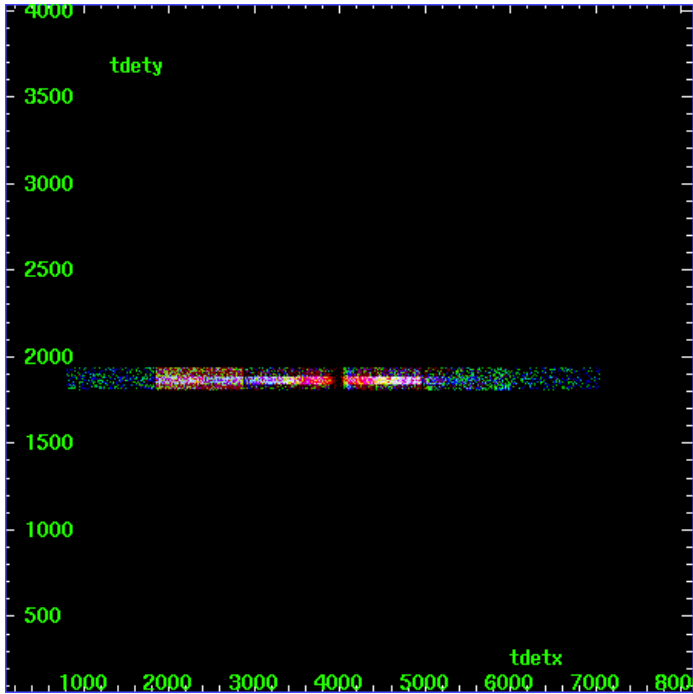
LETG Zero Order



LETG Order Sort ALL

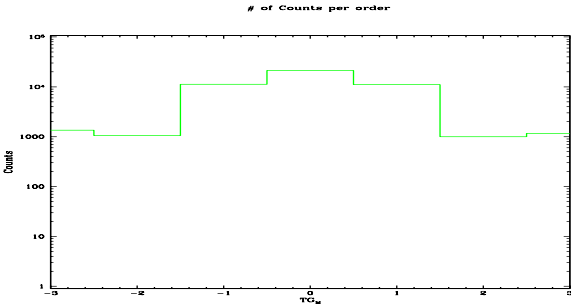


Spot Image LETG

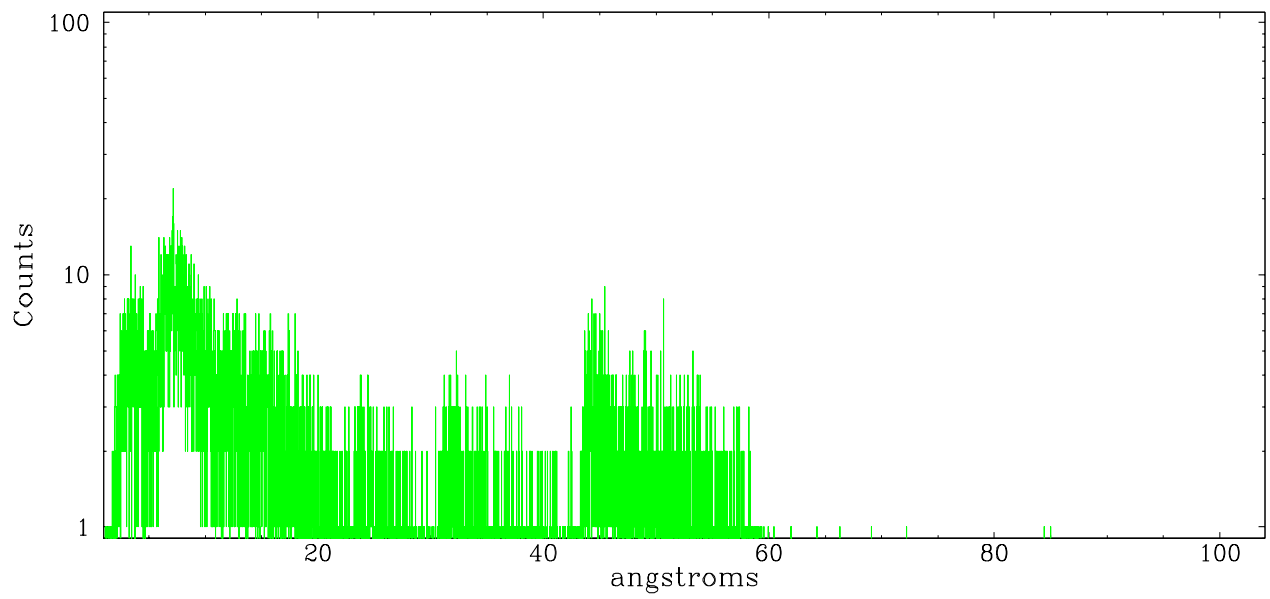


Full Detector LETG

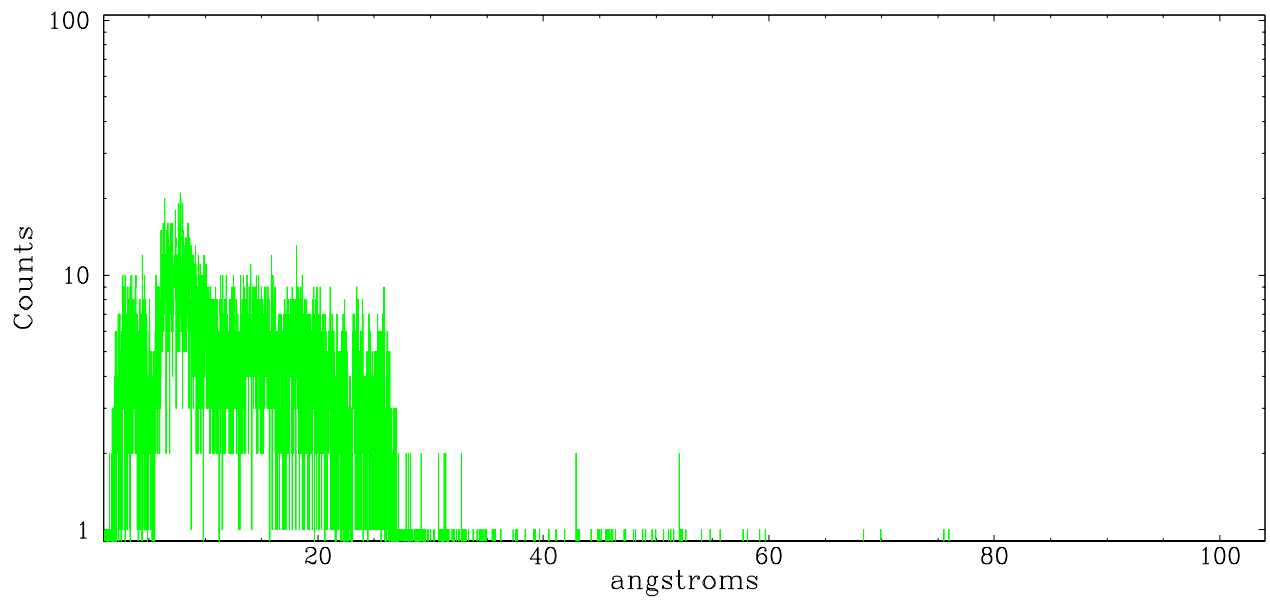
|        | order<br>-3 | order<br>-2 | order<br>-1 | order<br>0 | order<br>1 | order<br>2 | order<br>3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 1348        | 1049        | 11240       | 21212      | 11059      | 997        | 1162       |



leg order -1



leg order +1



## A Summary

### A.1 Status

|                            |               |
|----------------------------|---------------|
| V&V Scientist              | Beth Sundheim |
| V&V Date (YYYY-MM-DD)      | 2006.05.24    |
| V&V Edition                | 1             |
| V&V Disposition and Status | OK            |
| V&V Charge Time            | 51.064        |

### A.2 Comments