

# V&V Reference Report

## L2 ASCDS Version : 10.4.1

Observation 17300 - L2 Version 2  
Chandra X-Ray Center

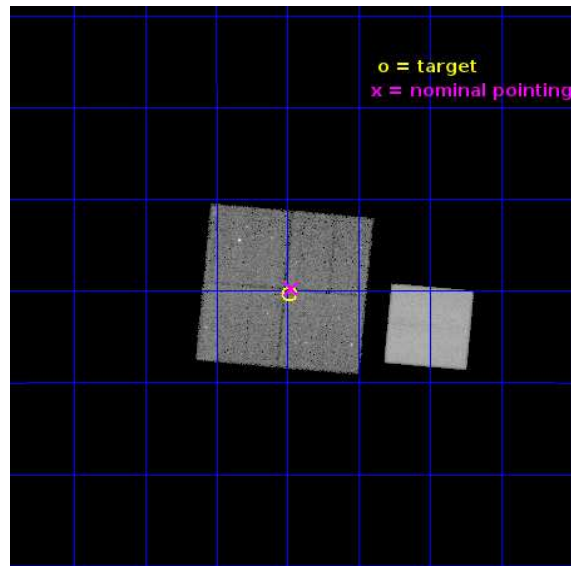
L2 Processing Date : Sep 16 2015

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# 1 Front

|          |                                                         |                                             |
|----------|---------------------------------------------------------|---------------------------------------------|
| seq_num  | 901158                                                  | Sequence number                             |
| obs_id   | 17300                                                   | Observation id                              |
| title    | Black Hole Fingerprints from Cosmic Dawn to Cosmic Noon | Proposal t                                  |
| observer | Prof. Guenther Hasinger                                 | Principal investigator                      |
| object   | UDS                                                     | Source name                                 |
| dtcycle  | 0                                                       | &#160                                       |
| cycle    | P                                                       | events from which exps?<br>Prim/Second/Both |
| ra_targ  | 34.497486                                               | Observer's specified target RA [deg]        |
| dec_targ | -5.172095                                               | Observer's specified target Dec [deg]       |
| ra_nom   | 34.493346166018                                         | Nominal RA [deg]                            |
| dec_nom  | -5.1629535252401                                        | Nominal Dec [deg]                           |
| roll_nom | 95.208314184091                                         | Nominal Roll [deg]                          |
| revision | 2                                                       | Processing version of data                  |
| ontime   | 50058.759294748                                         | Sum of GTIs [s]                             |
| livetime | 49404.70475184                                          | Livetime [s]                                |
| ontime0  | 50061.900385141                                         | Sum of GTIs [s]                             |
| ontime1  | 50061.900385141                                         | Sum of GTIs [s]                             |
| ontime2  | 50058.759304881                                         | Sum of GTIs [s]                             |
| ontime3  | 50058.759294748                                         | Sum of GTIs [s]                             |
| ontime7  | 50061.900385141                                         | Sum of GTIs [s]                             |
| l2events | 240065                                                  | Number of level 2 events                    |

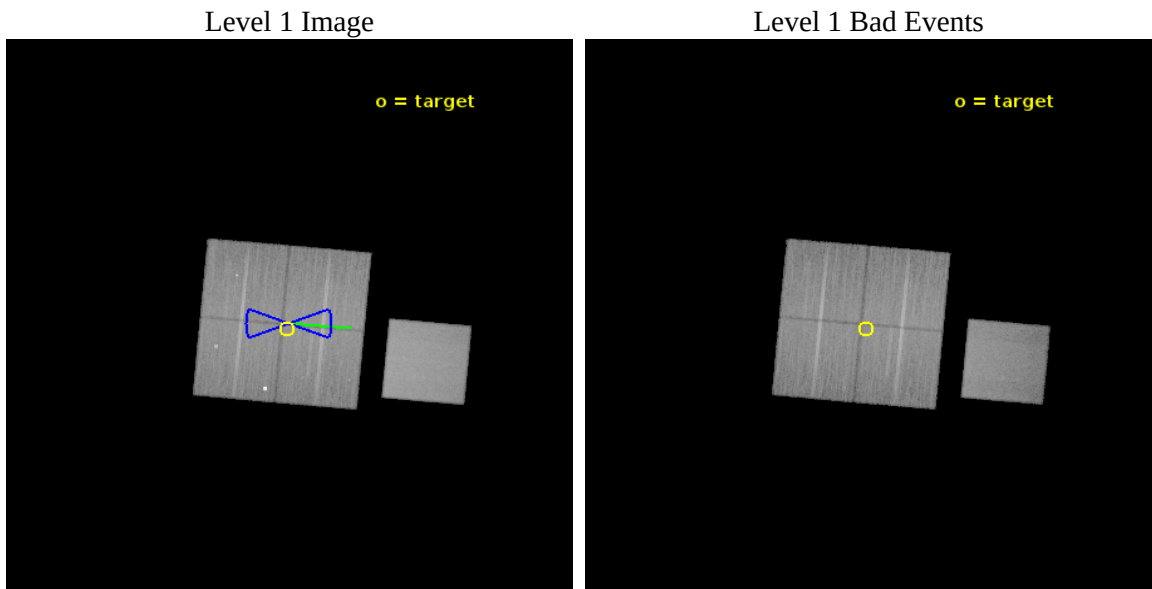




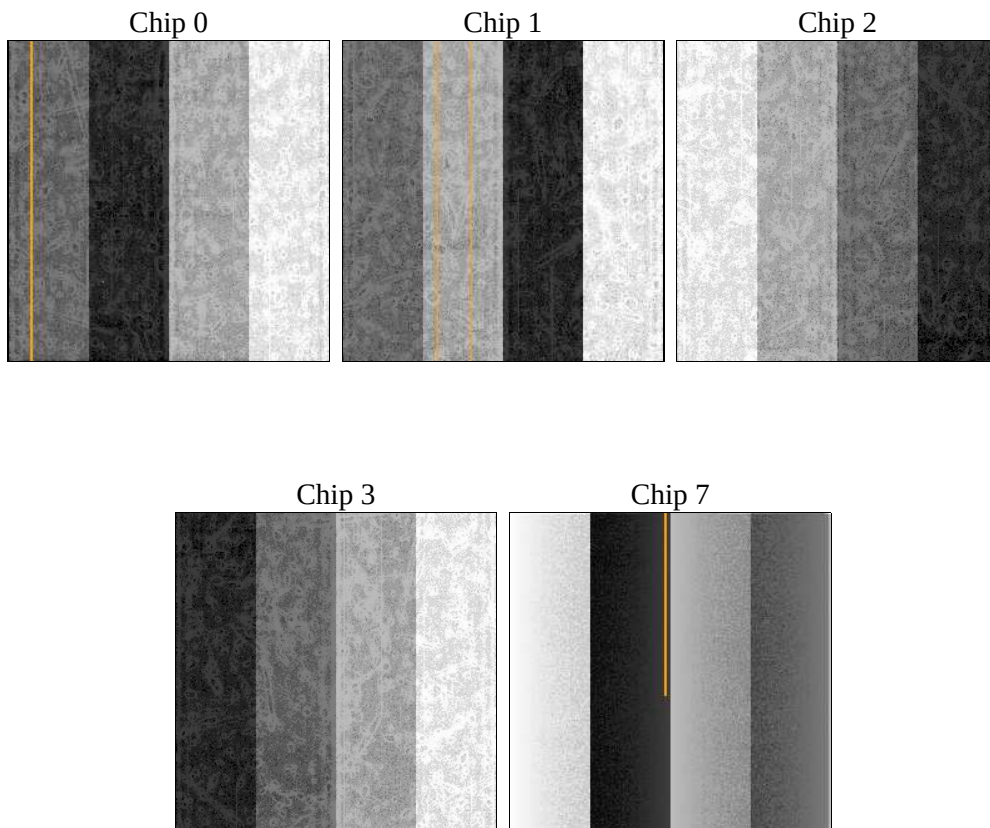
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

|          |                     |                                |                |                 |                                         |
|----------|---------------------|--------------------------------|----------------|-----------------|-----------------------------------------|
| obi_num  | 0                   | Obi number                     | sched_exp_time | 50000.000000    | [s] Scheduled observation exposure time |
| ascdsver | 10.4.1              | Processing system revision     | ontime         | 50058.759294748 | Sum of GTIs [s]                         |
| caldsver | 4.6.8               | &#160                          | ontime0        | 50061.900385141 | Sum of GTIs [s]                         |
| date     | 2015-09-16T17:54:11 | Date and time of file creation | ontime1        | 50061.900385141 | Sum of GTIs [s]                         |
| revision | 2                   | Processing version of data     | ontime2        | 50058.759304881 | Sum of GTIs [s]                         |
|          |                     |                                | ontime3        | 50058.759294748 | Sum of GTIs [s]                         |
|          |                     |                                | ontime7        | 50061.900385141 | Sum of GTIs [s]                         |
|          |                     |                                | l1events       | 1357969         | Number of level 1 events                |

### 2.1.4 Events

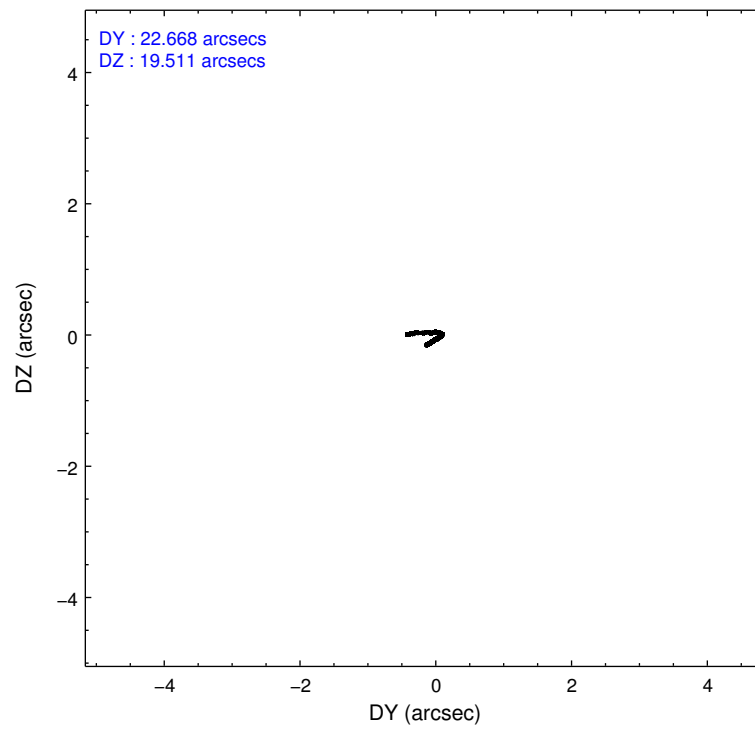
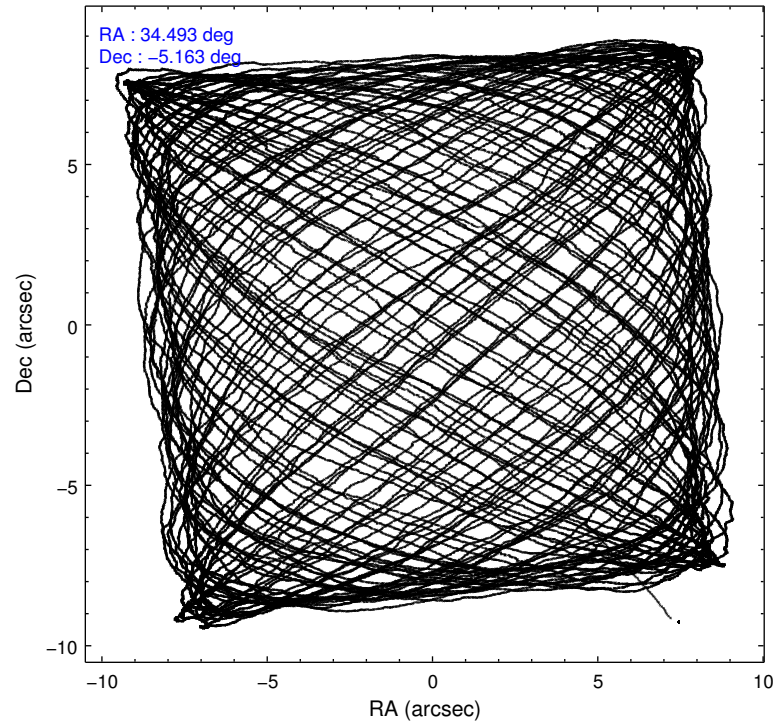
|                 | ccd 0  | ccd 1  | ccd 2  | ccd 3  | ccd 7  |
|-----------------|--------|--------|--------|--------|--------|
| level 1 events  | 240987 | 259269 | 262727 | 247556 | 347430 |
| rejected events | 210747 | 211278 | 235071 | 219926 | 201609 |
| rejected %      | 87%    | 81%    | 89%    | 88%    | 58%    |

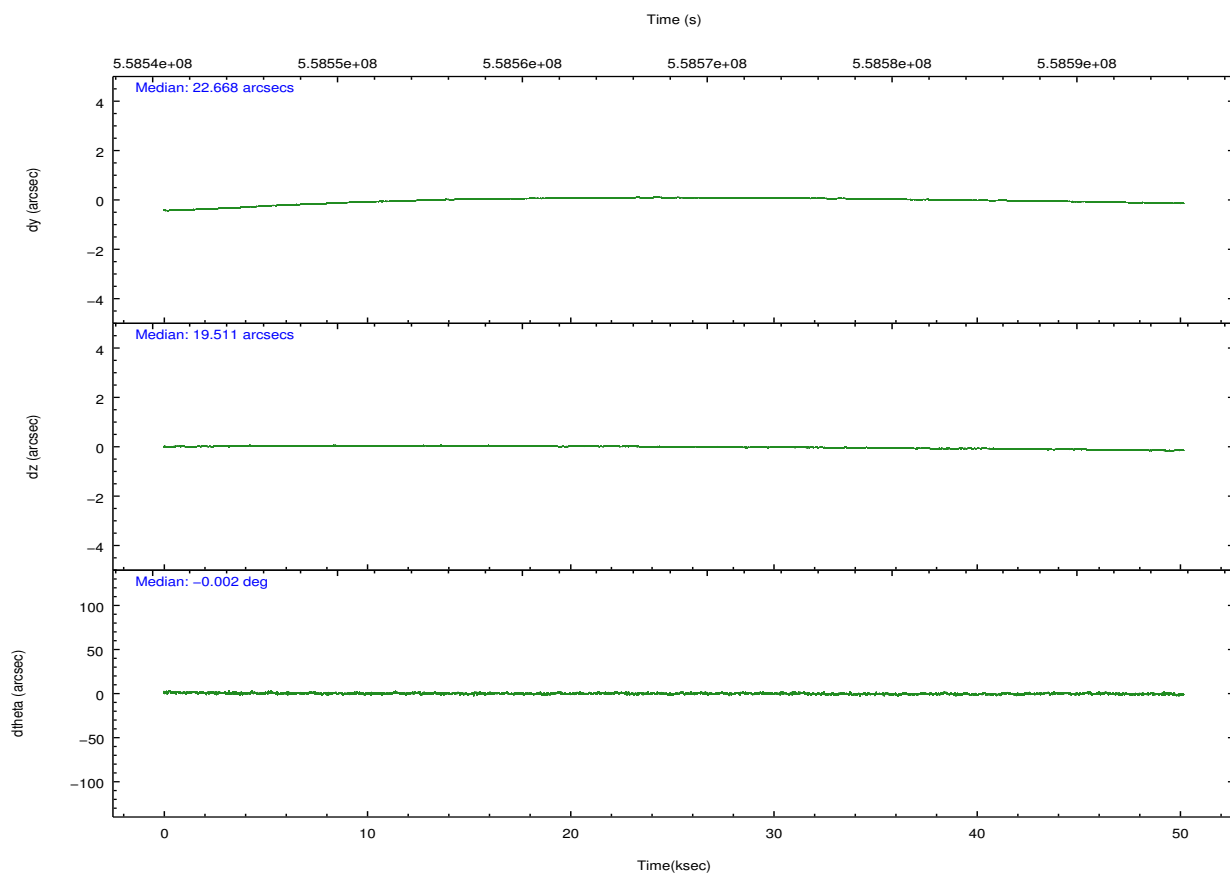
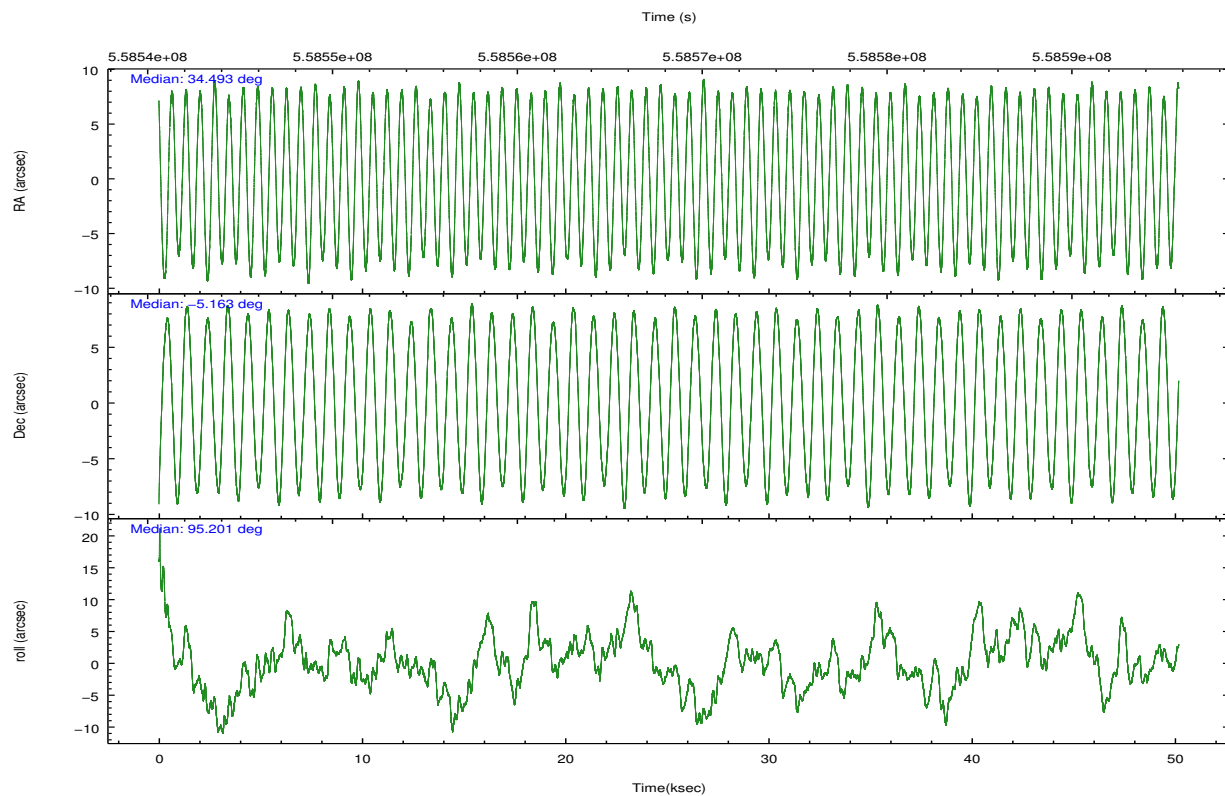
|                | ccd 0  | ccd 1  | ccd 2  | ccd 3  | ccd 7  |
|----------------|--------|--------|--------|--------|--------|
| grade 0 events | 10772  | 27236  | 9773   | 9598   | 11613  |
|                | 4%     | 10%    | 3%     | 3%     | 3%     |
| grade 1 events | 135    | 164    | 121    | 141    | 389    |
|                | 0%     | 0%     | 0%     | 0%     | 0%     |
| grade 2 events | 7128   | 7378   | 6515   | 6007   | 30344  |
|                | 2%     | 2%     | 2%     | 2%     | 8%     |
| grade 3 events | 3162   | 2959   | 2812   | 2930   | 11178  |
|                | 1%     | 1%     | 1%     | 1%     | 3%     |
| grade 4 events | 2861   | 2933   | 2864   | 3009   | 11057  |
|                | 1%     | 1%     | 1%     | 1%     | 3%     |
| grade 5 events | 11354  | 11741  | 10718  | 12969  | 33679  |
|                | 4%     | 4%     | 4%     | 5%     | 9%     |
| grade 6 events | 6323   | 7495   | 5697   | 6089   | 81643  |
|                | 2%     | 2%     | 2%     | 2%     | 23%    |
| grade 7 events | 199252 | 199363 | 224227 | 206813 | 167527 |
|                | 82%    | 76%    | 85%    | 83%    | 48%    |

## 2.2 Compared Parameters

| Parameter                            | Planned             | Actual                | Parameter                             | Planned   | Actual  |
|--------------------------------------|---------------------|-----------------------|---------------------------------------|-----------|---------|
| Instrument                           | ACIS                | ACIS                  | Obspar format version number          | 7         | 7       |
| Detector                             | ACIS-01237          | ACIS-01237            | Obspar file type                      | PREDICTED | ACTUAL  |
| Grating                              | NONE                | NONE                  | Obspar update status                  | NONE      | UPDATED |
| Data mode                            | FAINT               | FAINT                 | CCD I0 on                             | Y         | Y       |
| Observation mode                     | POINTING            | POINTING              | CCD I1 on                             | Y         | Y       |
| [deg] Pointing RA                    | 34.509409           | 34.49334616601819     | CCD I2 on                             | Y         | Y       |
| [deg] Pointing Dec                   | -5.185445           | -5.162953525240094    | CCD I3 on                             | Y         | Y       |
| [deg] Pointing Roll                  | 95.001081           | 95.20831418409134     | CCD S0 on                             | N         | N       |
| [deg] Roll angle                     | 0.000000            | 0.000000              | CCD S1 on                             | N         | N       |
| [deg] Roll tolerance                 | 20.000000           | 20.000000             | CCD S2 on                             | O1        | N       |
| Roll constraint allows 180D rotation | Y                   | Y                     | CCD S3 on                             | O2        | Y       |
| [mm] SIM focus pos                   | -0.782348           | -0.7809083437167272   | CCD S4 on                             | N         | N       |
| [mm] SIM defocus                     | 0                   | 0.001439871863259334  | CCD S5 on                             | N         | N       |
| [mm] SIM translation stage pos       | -233.592463         | -233.5874344608287    | Number of optional ACIS chips dropped | 1         | 1       |
| [mm] SIM translation stage offset    | 0                   | -0.005018542100998502 | On-chip summing requested             | N         | N       |
| [s] Observation start time (MET)     | 558543264.184000    | 558541761.10326       | Subarray requested                    | NONE      | NONE    |
| Observation start date               | 2015-09-13T14:53:16 | 2015-09-13T14:29:21   | Alternating exposures requested       | N         | N       |
| [s] Observation end time (MET)       | 558593264.184000    | 558594525.03124       | [s] Primary exposure time             | 0.000000  | 3.1     |
| Observation end date                 | 2015-09-14T04:46:36 | 2015-09-14T05:08:45   |                                       |           |         |
| Read mode                            | TIMED               | TIMED                 |                                       |           |         |

## 2.3 Aspect



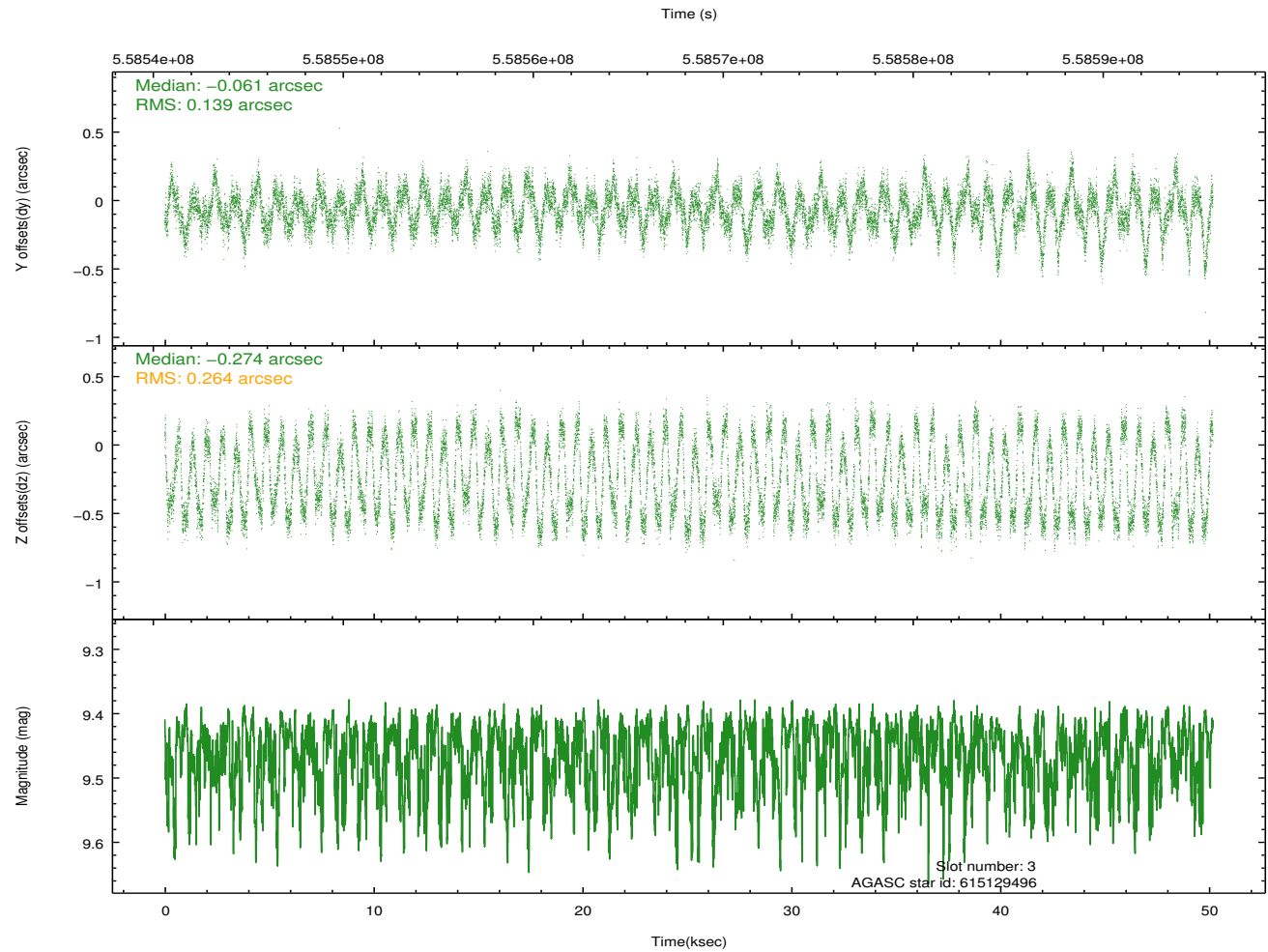
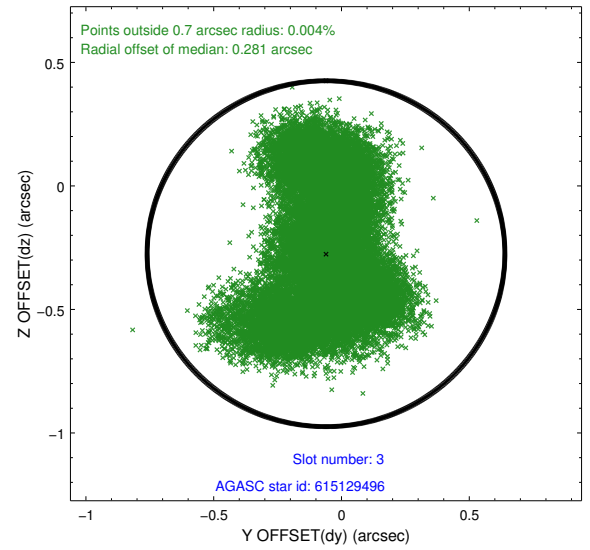
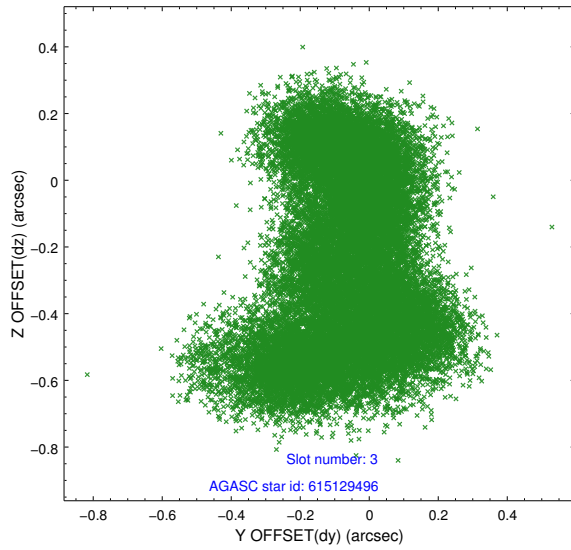


# Slot Statistics

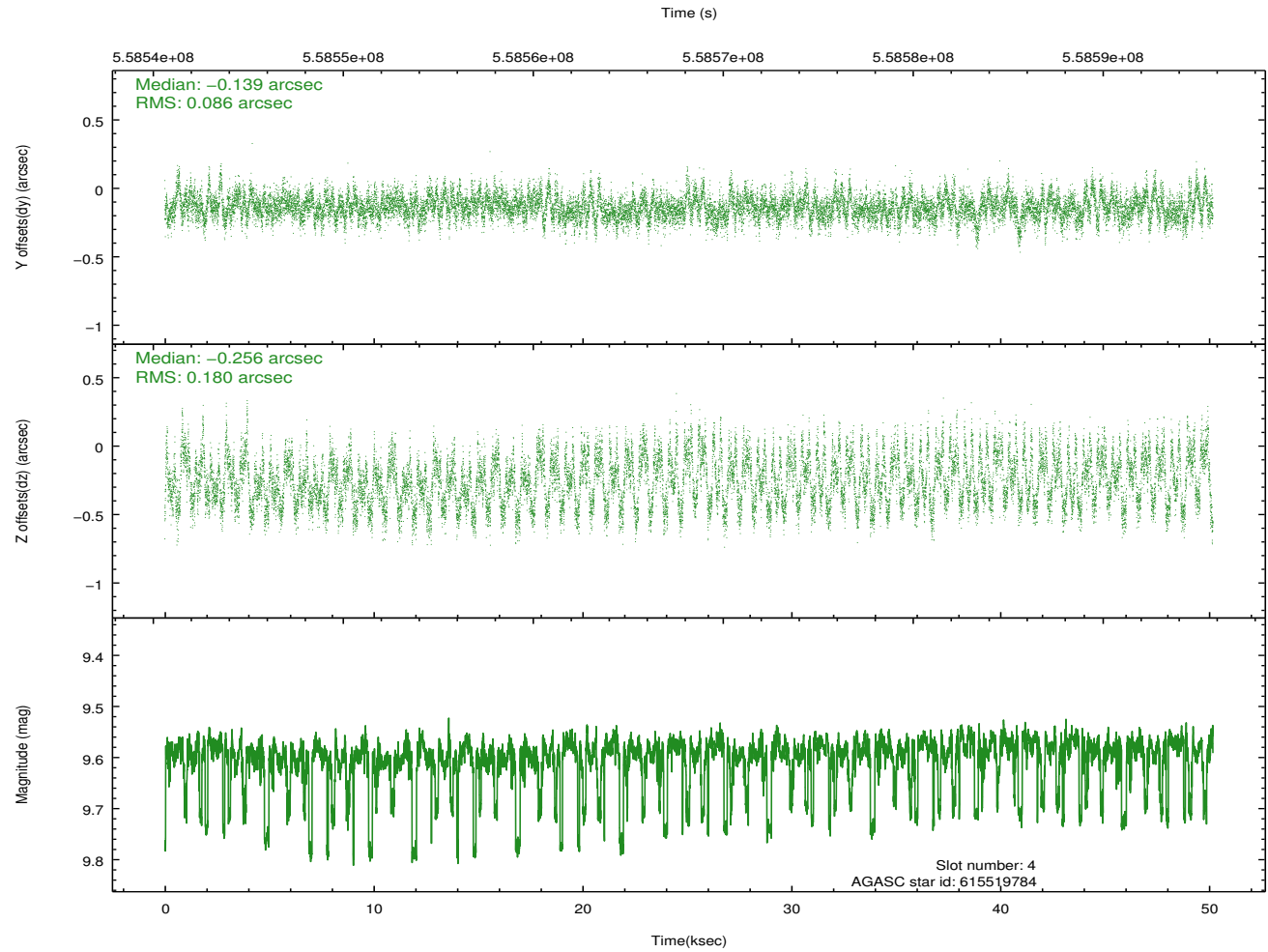
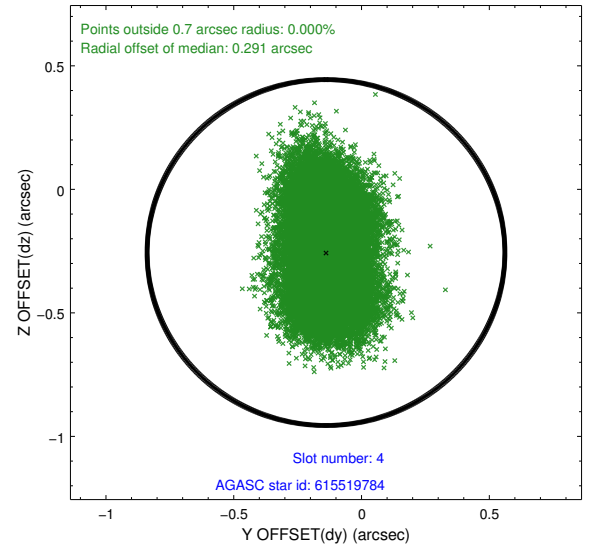
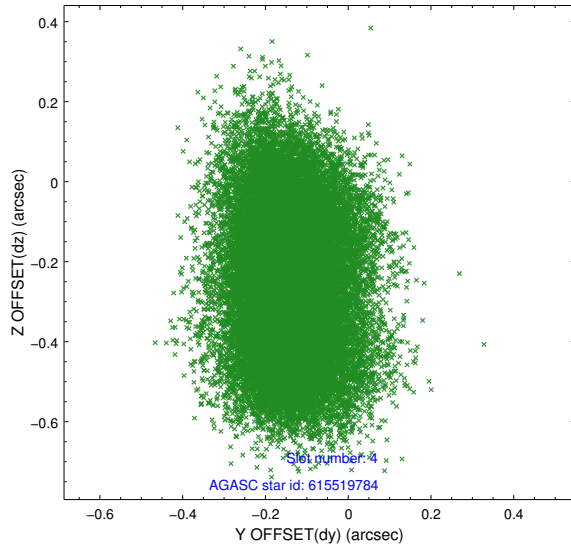
| slot | status  | used | id        | mag  | n_pts | med_dy | med_dz | dr1   | dr2   | ra        | dec       | mean_y   | mean_z   |
|------|---------|------|-----------|------|-------|--------|--------|-------|-------|-----------|-----------|----------|----------|
| 0    | FID     |      | ACIS-I-1  | 7.26 | 12239 | 0.044  | 0.052  | 0.010 | 0.017 | 0.000000  | 0.000000  | 916.67   | -843.14  |
| 1    | FID     |      | ACIS-I-2  | 7.15 | 12239 | -0.159 | -0.084 | 0.009 | 0.015 | 0.000000  | 0.000000  | -777.63  | -849.72  |
| 2    | FID     |      | ACIS-I-6  | 7.26 | 12237 | 0.023  | 0.098  | 0.009 | 0.016 | 0.000000  | 0.000000  | 382.28   | 1698.72  |
| 3    | GUIDE   | used | 615129496 | 9.46 | 24392 | -0.061 | -0.274 | 0.337 | 0.469 | 34.177462 | -4.840209 | 1340.44  | 1075.42  |
| 4    | GUIDE   | used | 615519784 | 9.59 | 24299 | -0.139 | -0.256 | 0.217 | 0.340 | 33.905889 | -5.455828 | -782.28  | 2239.51  |
| 5    | GUIDE   | used | 615521424 | 9.94 | 24224 | 0.205  | 0.094  | 0.194 | 0.322 | 34.185589 | -5.674448 | -1653.14 | 1308.88  |
| 6    | GUIDE   | used | 615520664 | 9.50 | 24460 | 0.002  | 0.405  | 0.219 | 0.321 | 34.931323 | -5.027518 | 434.43   | -1556.06 |
| 7    | OMITTED |      |           | 0.00 | 0     | 0.000  | 0.000  | 0.000 | 0.000 | 0.000000  | 0.000000  | 0.00     | 0.00     |

## 2.4 Star Slots

### 2.4.1 Slot 3

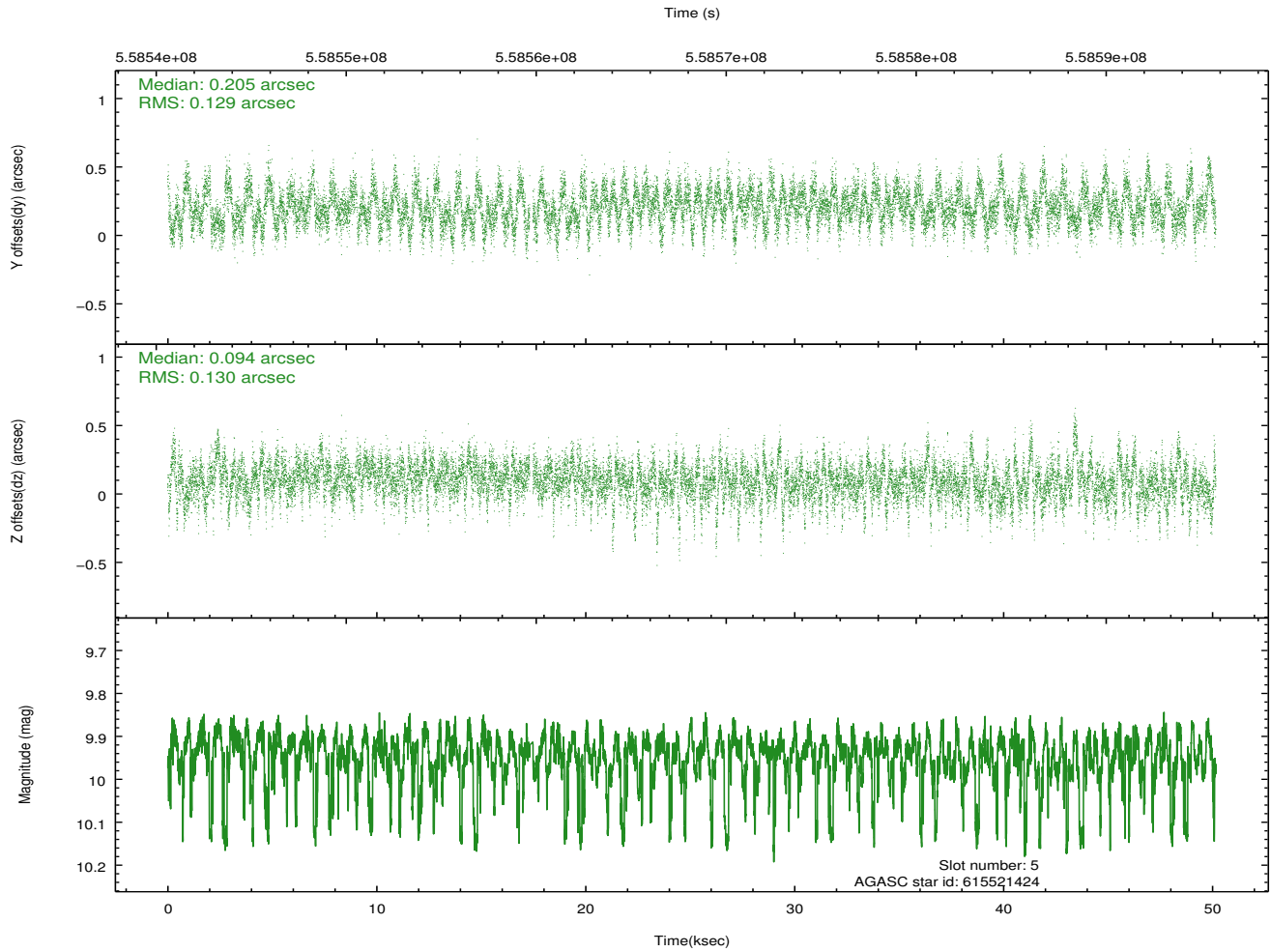
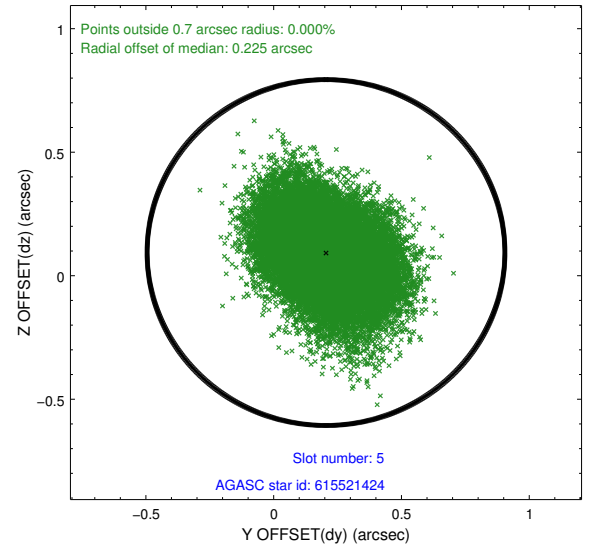
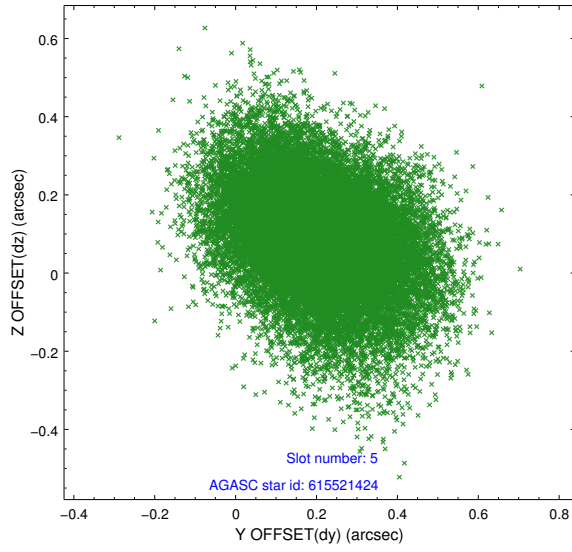


## 2.4.2 Slot 4

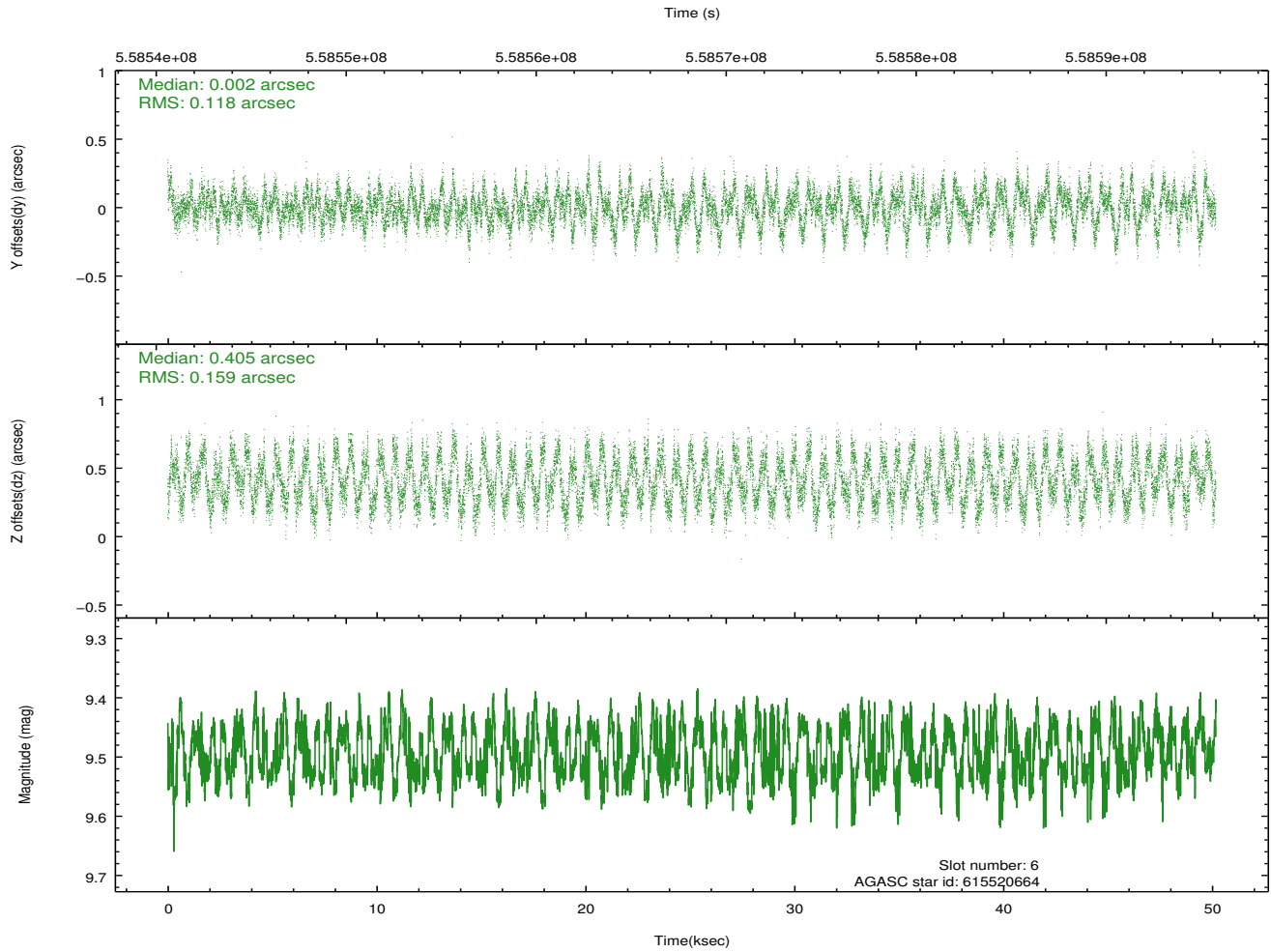
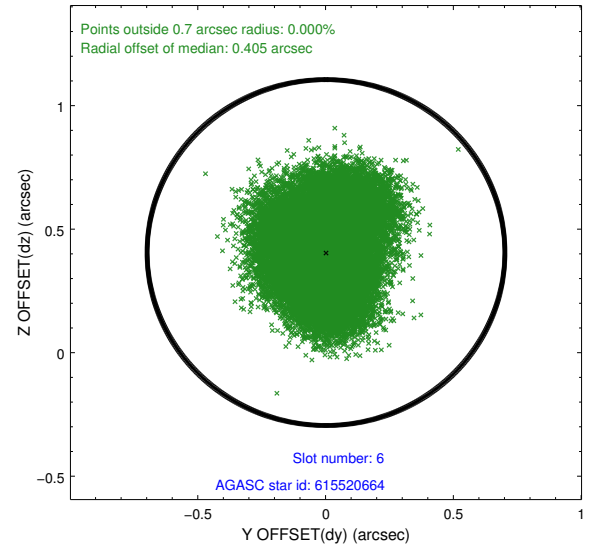
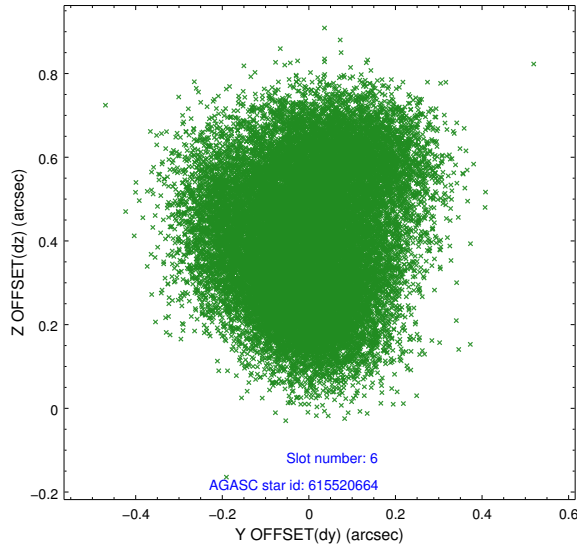




### 2.4.3 Slot 5

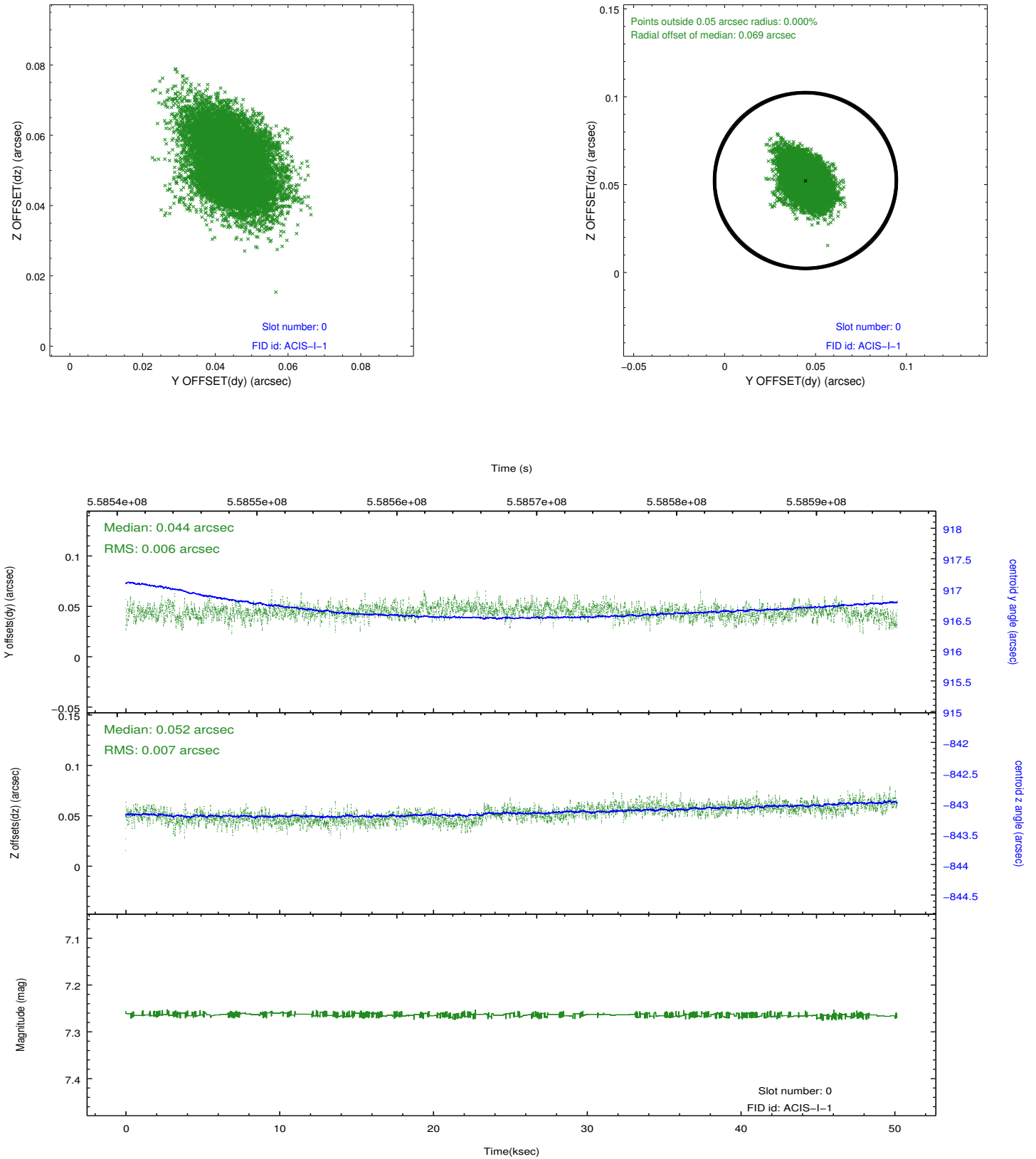


## 2.4.4 Slot 6

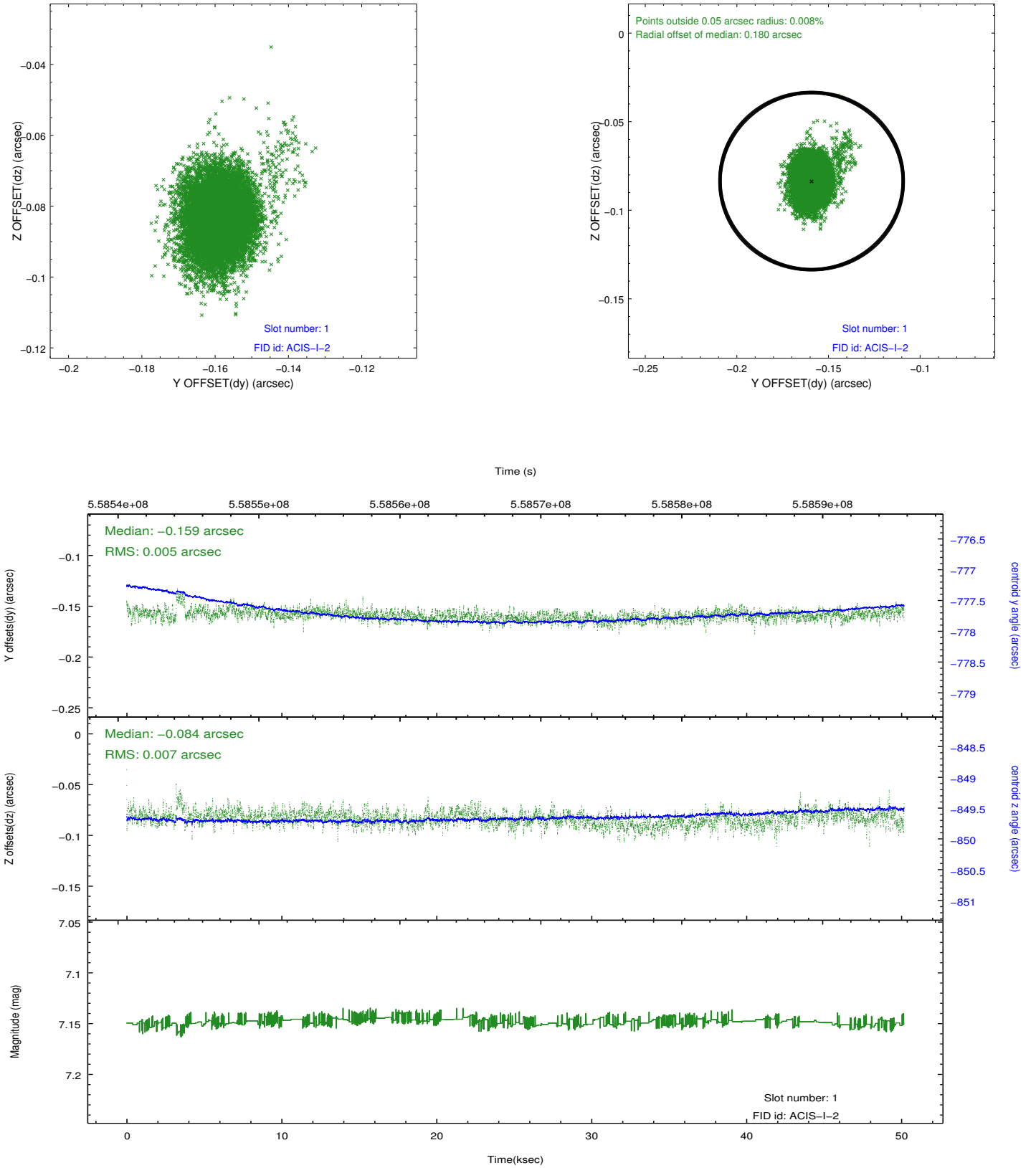


## 2.5 FID Slots

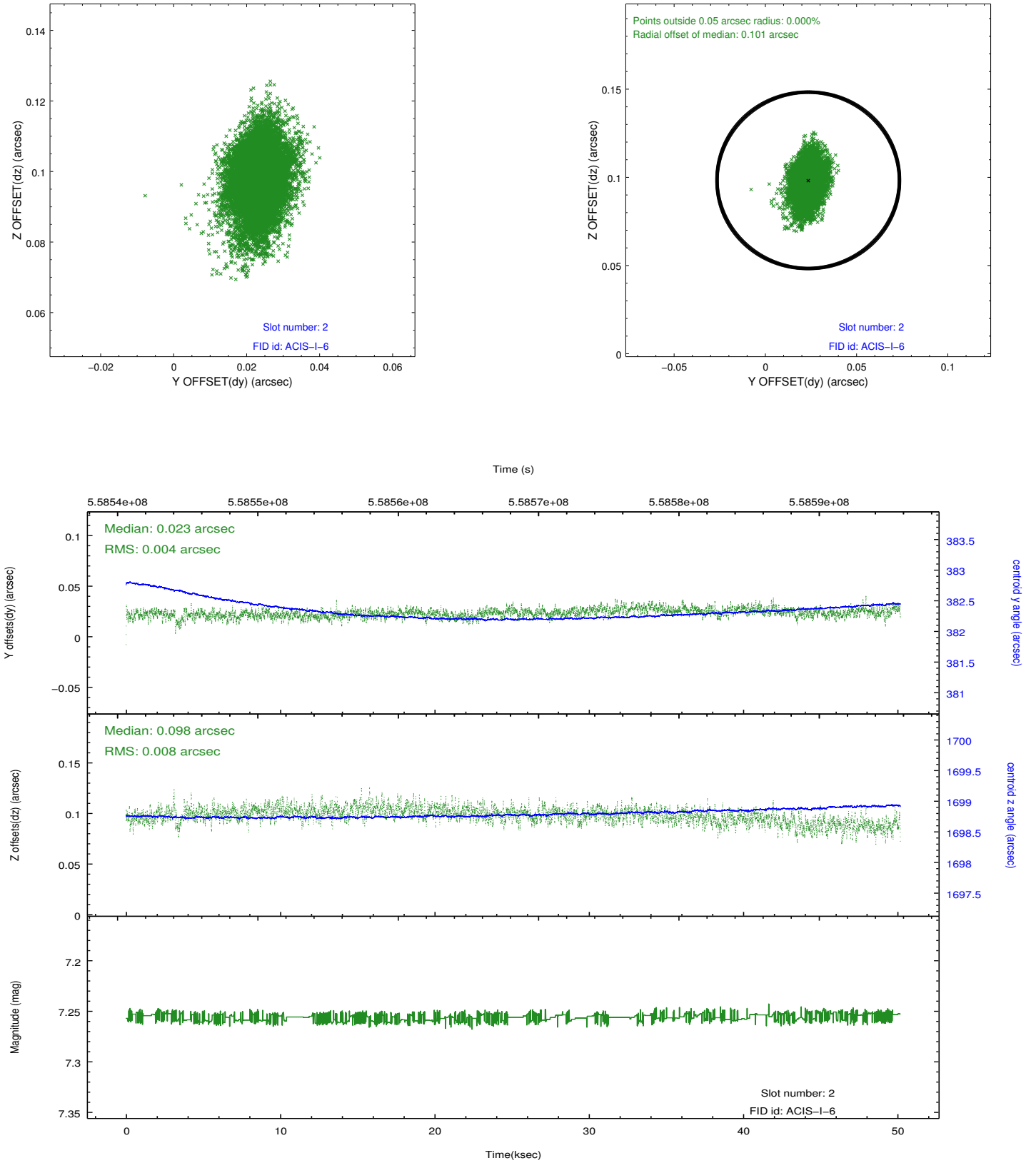
### 2.5.1 Slot 0



## 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)      | 2015.09.16      |
| V&V Edition                | 1               |
| V&V Disposition and Status | OK              |
| V&V Charge Time            | 50.058759294748 |

## A.2 Comments

Roll preference met.

Optional chip S2 was dropped.

The guide star in slot 7 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.