

V&V Reference Report

L2 ASCDS Version : 8.4.5

Observation 1771 - L2 Version 5
Chandra X-Ray Center

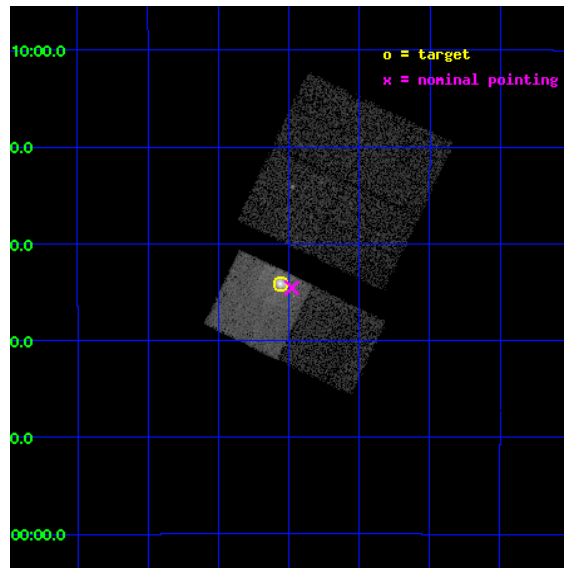
L2 Processing Date : Aug 30 2012

Contents

| | | |
|----------|-------------------------------|-----------|
| 1 | Front | 2 |
| 2 | OBI | 3 |
| 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 6 | 12 |
| 2.4.5 | Slot 7 | 13 |
| 2.5 | FID Slots | 14 |
| 2.5.1 | Slot 0 | 14 |
| 2.5.2 | Slot 1 | 15 |
| 2.5.3 | Slot 2 | 16 |
| A | Summary | 17 |
| A.1 | Status | 17 |
| A.2 | Comments | 17 |

1 Front

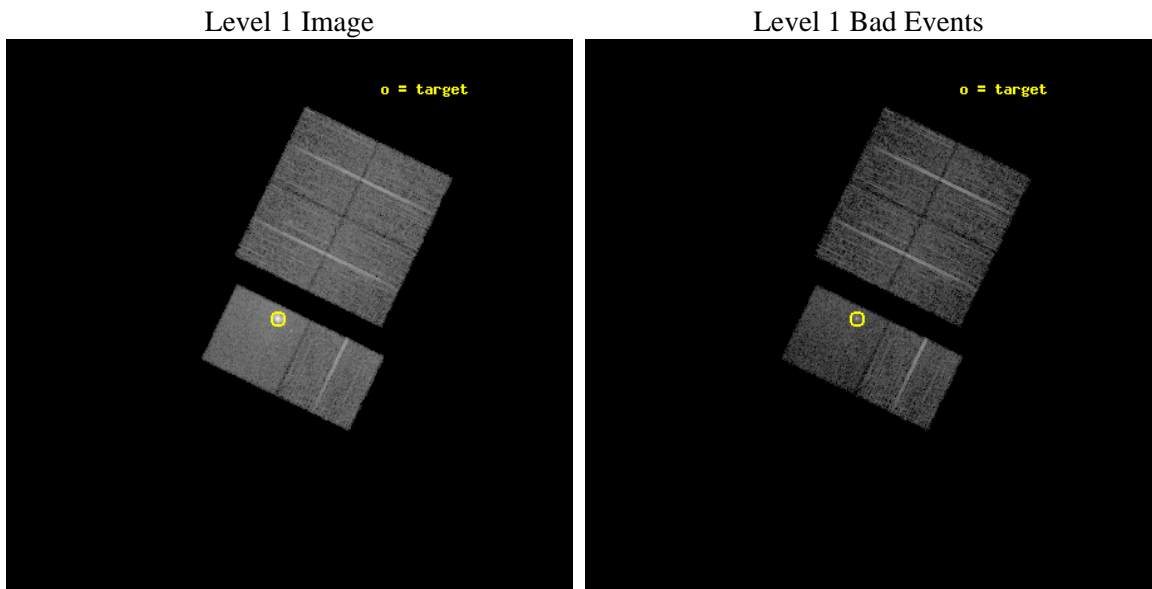
| | | |
|----------|---|---|
| seq_num | 590197 | Sequence number |
| obs_id | 1771 | Observation id |
| title | HRC RESPONSE TO CONTINUUM SOURCE. | Proposal title |
| observer | Dr. CXC Calibration | Principal investigator |
| object | G21.5-0.9 [Chip S3, T=110, Offsets=-1,0,-3] | Source name |
| dtcycle | 0 | |
| cycle | P | events from which exps? Prim/Second/Both |
| ra_targ | 278.389583 | Observer's specified target RA [deg] |
| dec_targ | -10.568528 | Observer's specified target Dec [deg] |
| ra_nom | 278.36960480332 | Nominal RA [deg] |
| dec_nom | -10.575939084291 | Nominal Dec [deg] |
| roll_nom | 205.69267609794 | Nominal Roll [deg] |
| revision | 5 | Processing version of data |
| ontime | 7318.4000068009 | Sum of GTIs [s] |
| livetime | 7225.7300193033 | Livetime [s] |
| ontime0 | 7318.4000068009 | Sum of GTIs [s] |
| ontime1 | 7318.4000068009 | Sum of GTIs [s] |
| ontime2 | 7318.4000068009 | Sum of GTIs [s] |
| ontime3 | 7318.4000068009 | Sum of GTIs [s] |
| ontime6 | 7318.4000068009 | Sum of GTIs [s] |
| ontime7 | 7318.4000068009 | Sum of GTIs [s] |
| l2events | 69770 | Number of level 2 events |



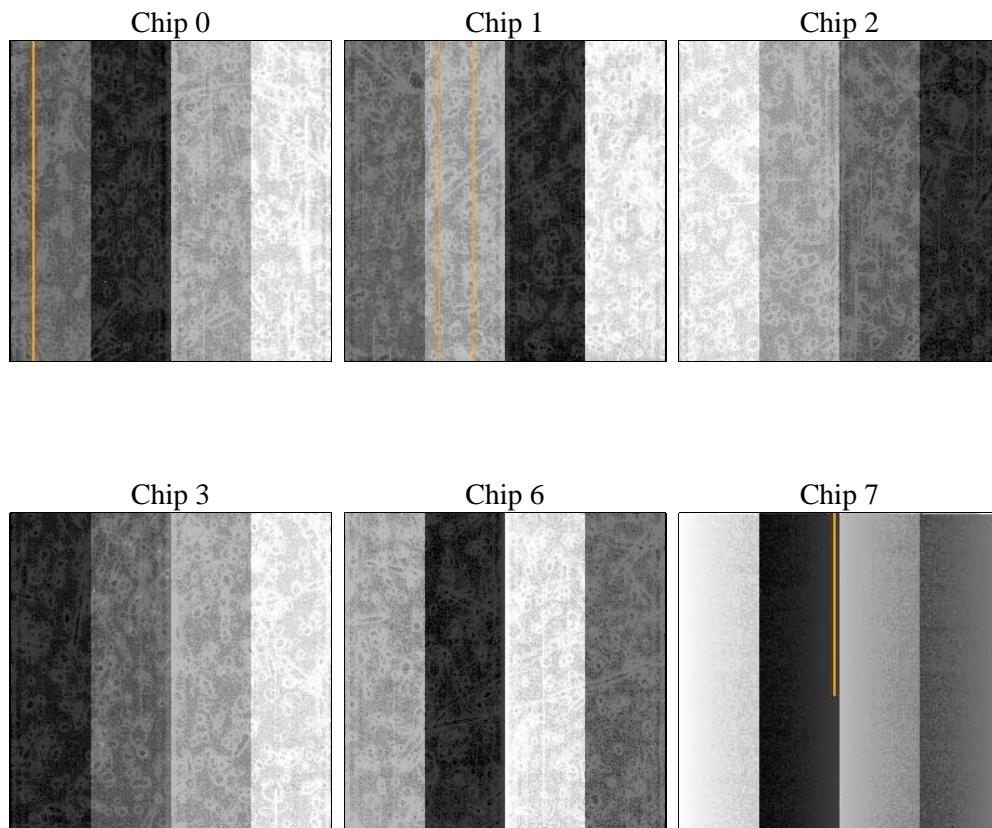
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

| | | | | | |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num | 0 | Obi number | sched_exp_time | 7560.000000 | [s] Scheduled observation exposure time |
| ascdsver | 8.4.5 | Processing system revision | ontime | 7318.4000068009 | Sum of GTIs [s] |
| caldsver | 4.5.1.1 | | ontime0 | 7318.4000068009 | Sum of GTIs [s] |
| date | 2012-08-30T03:40:06 | Date and time of file creation | ontime1 | 7318.4000068009 | Sum of GTIs [s] |
| revision | 5 | Processing version of data | ontime2 | 7318.4000068009 | Sum of GTIs [s] |
| | | | ontime3 | 7318.4000068009 | Sum of GTIs [s] |
| | | | ontime6 | 7318.4000068009 | Sum of GTIs [s] |
| | | | ontime7 | 7318.4000068009 | Sum of GTIs [s] |
| | | | l1events | 333738 | Number of level 1 events |

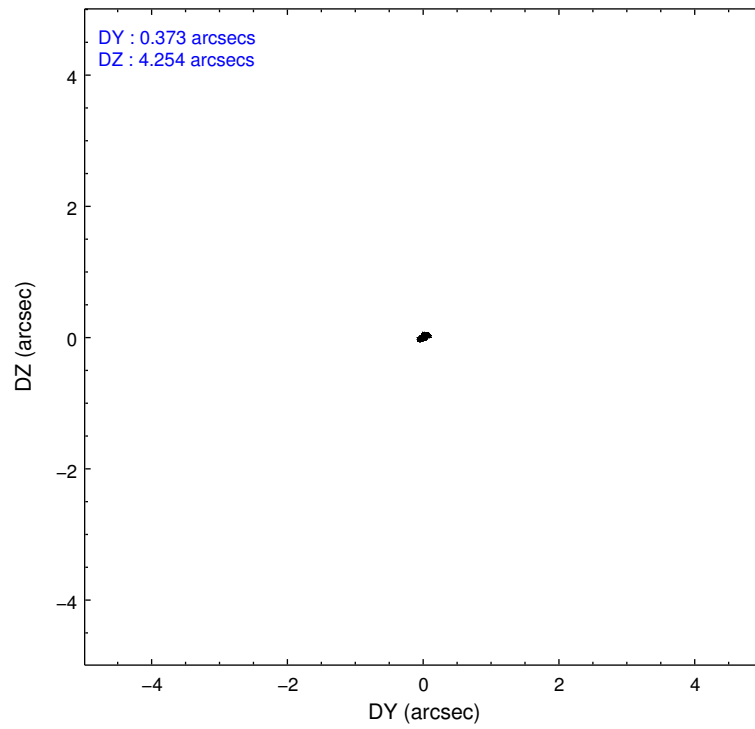
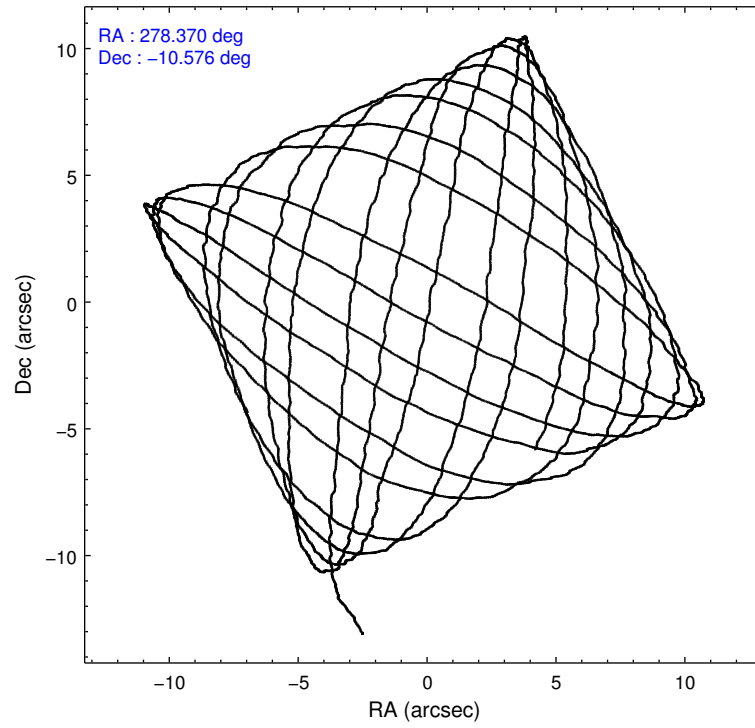
2.1.4 Events

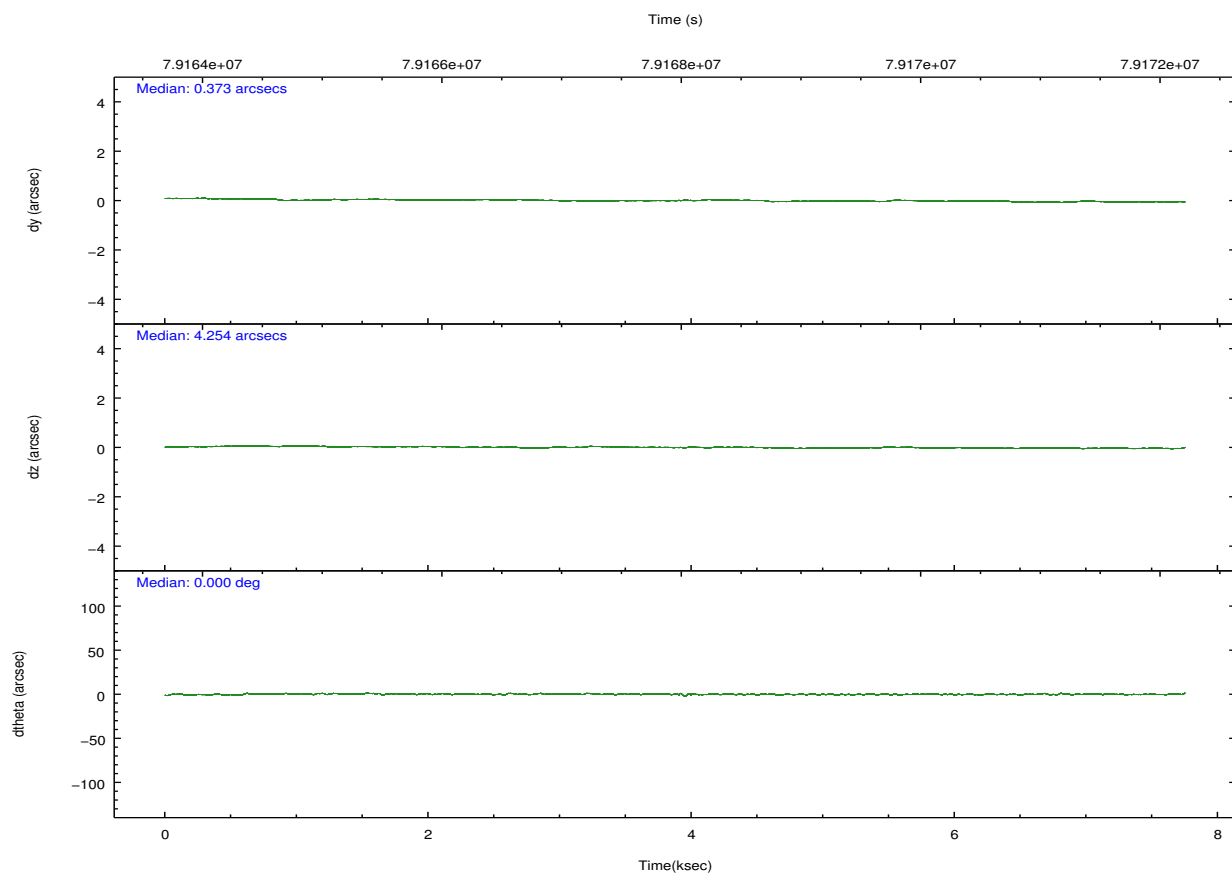
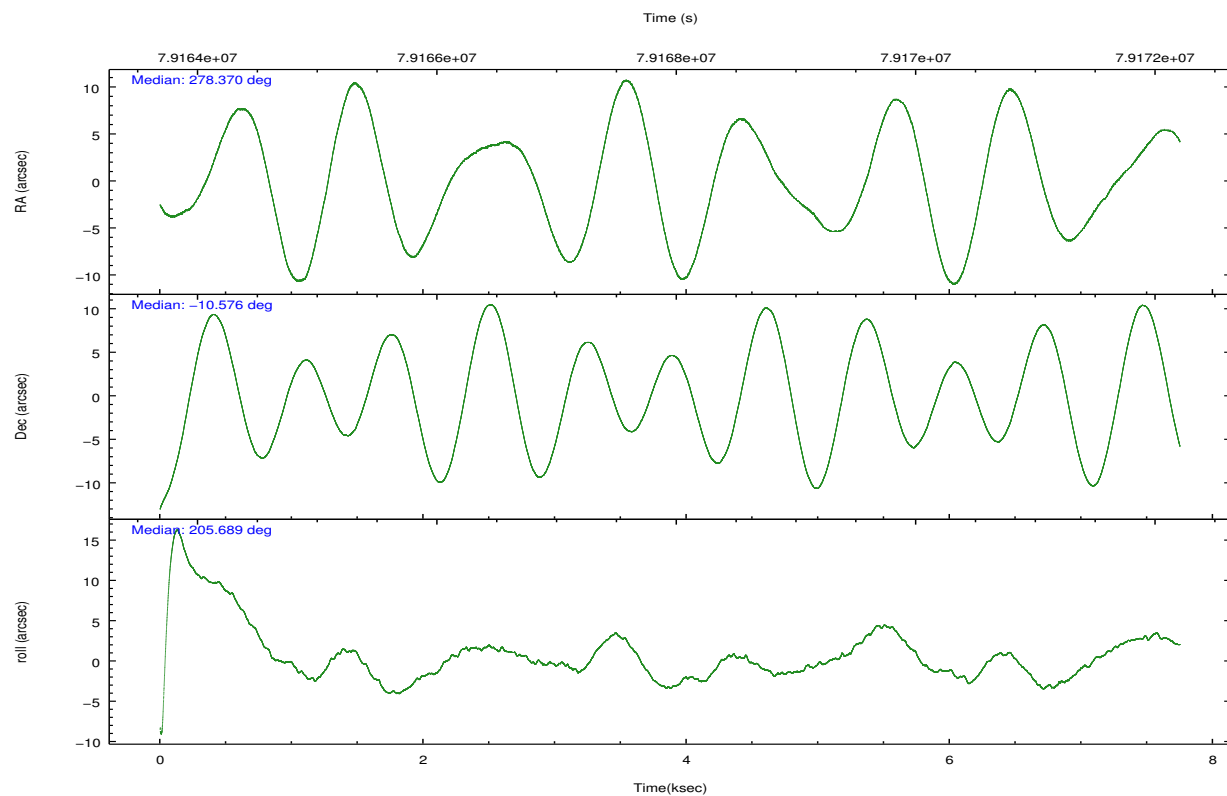
| | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 | ccd 7 | | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 | ccd 7 |
|-----------------|-------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|
| level 1 events | 49766 | 45317 | 50763 | 51334 | 53084 | 83474 | grade 0 events | 1361 | 1319 | 1136 | 1529 | 1184 | 5268 |
| rejected events | 44390 | 39869 | 45758 | 45493 | 47419 | 36661 | | 2% | 2% | 2% | 2% | 2% | 6% |
| rejected % | 89% | 87% | 90% | 88% | 89% | 43% | grade 1 events | 18 | 10 | 9 | 8 | 10 | 70 |
| | | | | | | | | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | | | | | grade 2 events | 2026 | 1977 | 2038 | 2303 | 2242 | 11681 |
| | | | | | | | | 4% | 4% | 4% | 4% | 4% | 13% |
| | | | | | | | grade 3 events | 375 | 403 | 301 | 351 | 318 | 3862 |
| | | | | | | | | 0% | 0% | 0% | 0% | 0% | 4% |
| | | | | | | | grade 4 events | 392 | 379 | 310 | 353 | 337 | 3231 |
| | | | | | | | | 0% | 0% | 0% | 0% | 0% | 3% |
| | | | | | | | grade 5 events | 1043 | 1010 | 930 | 1042 | 1127 | 3965 |
| | | | | | | | | 2% | 2% | 1% | 2% | 2% | 4% |
| | | | | | | | grade 6 events | 1228 | 1374 | 1227 | 1313 | 1585 | 22805 |
| | | | | | | | | 2% | 3% | 2% | 2% | 2% | 27% |
| | | | | | | | grade 7 events | 43323 | 38845 | 44812 | 44435 | 46281 | 32592 |
| | | | | | | | | 87% | 85% | 88% | 86% | 87% | 39% |

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 | FAINT | FAINT | Number of optional ACIS chips dropped | 0 | 0 |
| Observation mode | POINTING | POINTING | On-chip summing requested | N | N |
| [deg] Pointing RA | 278.385154 | 278.3696048033225 | Subarray requested | NONE | NONE |
| [deg] Pointing Dec | -10.553246 | -10.57593908429128 | Alternating exposures requested | N | N |
| [deg] Pointing Roll | 205.538935 | 205.6926760979435 | [s] Primary exposure time | 0.000000 | 3.2 |
| [mm] SIM focus pos | -0.684267 | -0.6828225247311905 | | | |
| [mm] SIM defocus | 0 | 0.001444936568705701 | | | |
| [mm] SIM translation stage pos | -198.916523 | -198.9099978217132 | | | |
| [mm] SIM translation stage offset | 8.784000000000001 | 8.777475238705364 | | | |
| [s] Observation start time (MET) | 79164266.184000 | 79163890.215784 | | | |
| Observation start date | 2000-07-05T06:03:22 | 2000-07-05T05:58:10 | | | |
| [s] Observation end time (MET) | 79171826.184000 | 79171960.041081 | | | |
| Observation end date | 2000-07-05T08:09:22 | 2000-07-05T08:12:40 | | | |
| Read mode | TIMED | TIMED | | | |

2.3 Aspect



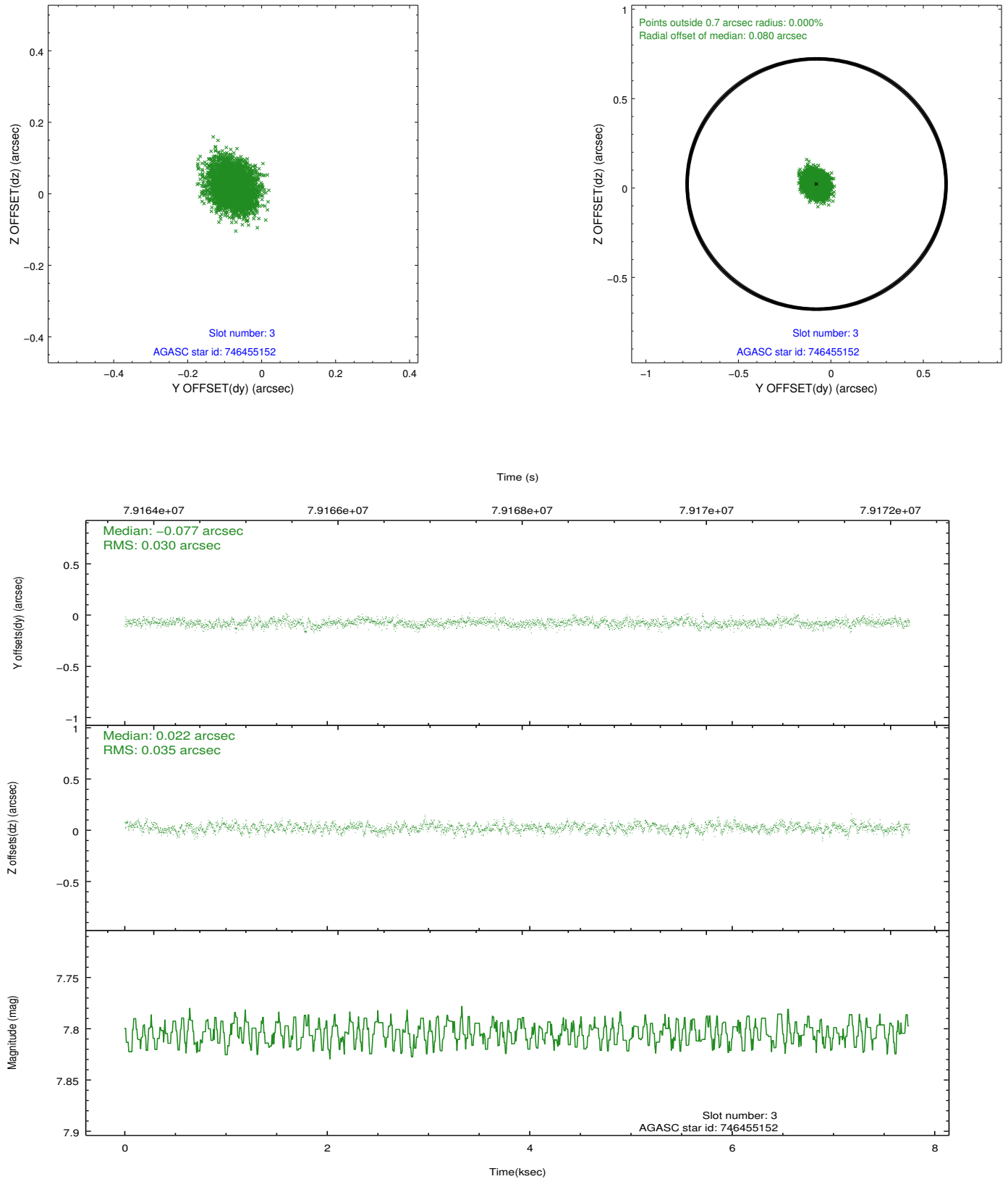


Slot Statistics

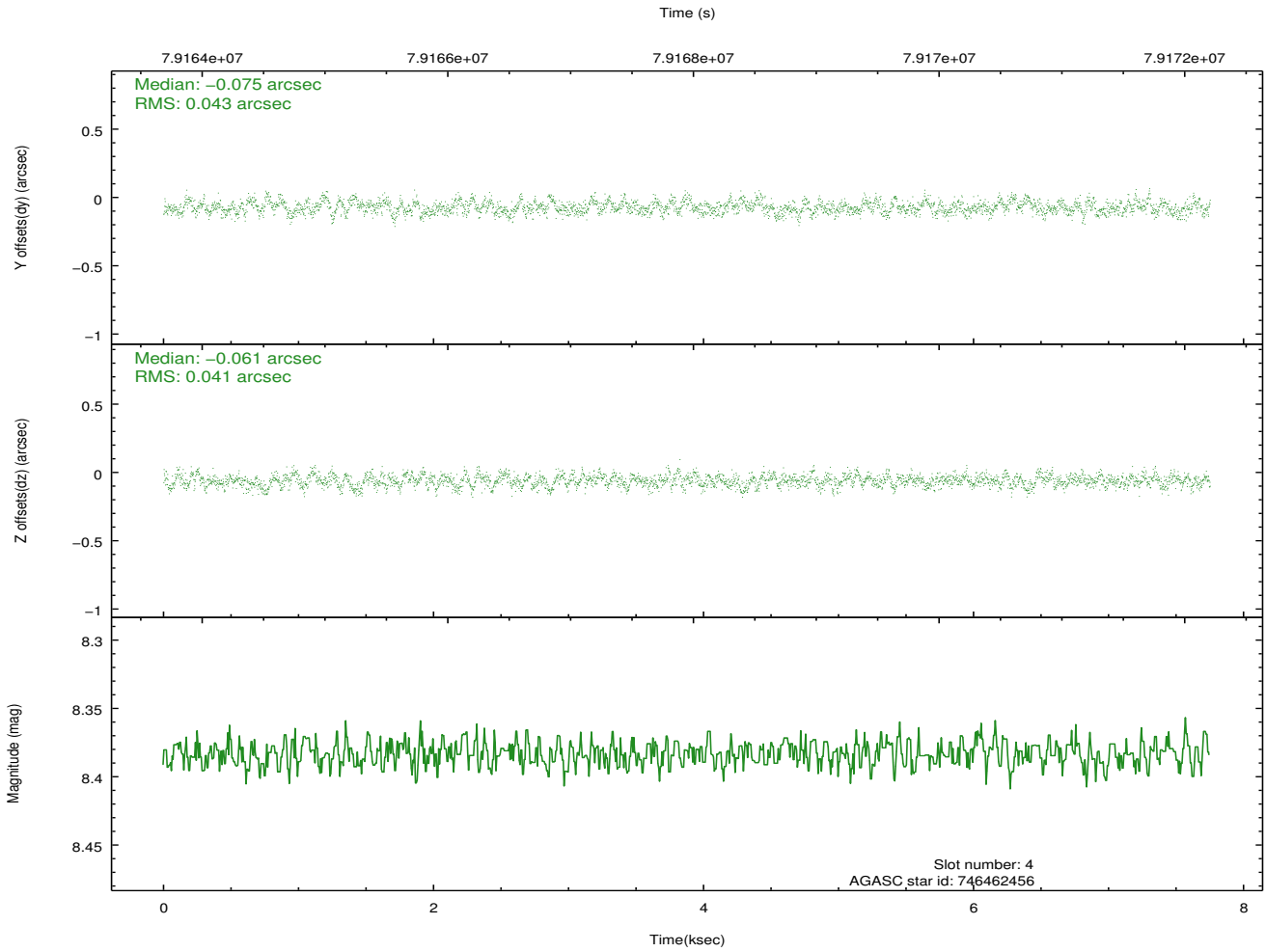
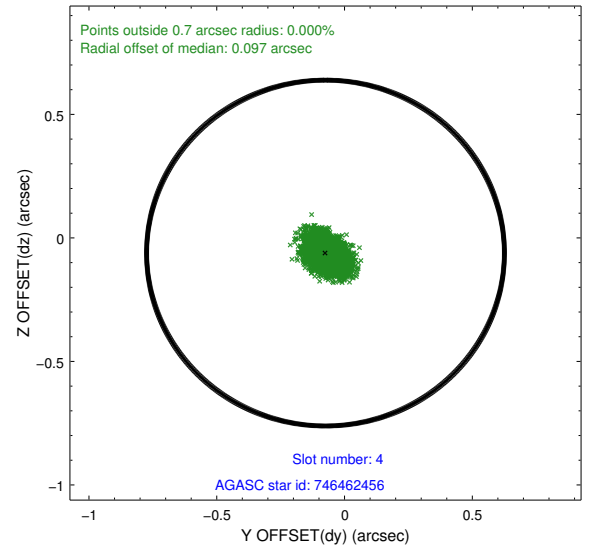
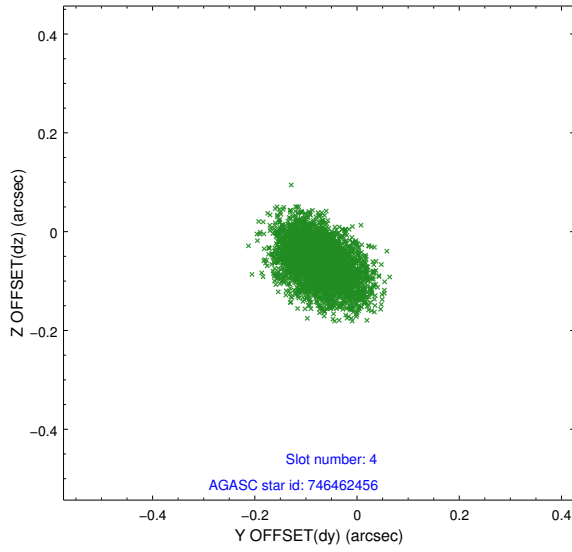
| slot | status | id | mag | n_pts | med_dy | med_dz | dr1 | dr2 | ra | dec | mean_y | mean_z |
|------|--------|-----------|------|-------|--------|--------|-------|-------|------------|------------|----------|----------|
| 0 | FID | ACIS-S-2 | 7.15 | 1891 | 0.078 | 0.095 | 0.008 | 0.012 | 0.000000 | 0.000000 | -753.52 | -1544.31 |
| 1 | FID | ACIS-S-4 | 7.24 | 1891 | -0.032 | -0.063 | 0.008 | 0.013 | 0.000000 | 0.000000 | 2159.46 | 363.16 |
| 2 | FID | ACIS-S-5 | 7.23 | 1891 | -0.076 | -0.023 | 0.007 | 0.011 | 0.000000 | 0.000000 | -1805.43 | 357.99 |
| 3 | GUIDE | 746455152 | 7.80 | 3781 | -0.077 | 0.022 | 0.049 | 0.081 | 278.447893 | -9.976732 | -1095.46 | -1776.49 |
| 4 | GUIDE | 746462456 | 8.38 | 3781 | -0.075 | -0.061 | 0.062 | 0.104 | 278.652171 | -10.530173 | -888.72 | 332.66 |
| 5 | GUIDE | 746455112 | 8.93 | 3780 | 0.217 | -0.091 | 0.067 | 0.111 | 278.266531 | -10.703234 | 611.38 | 306.72 |
| 6 | GUIDE | 746460328 | 9.80 | 3779 | -0.013 | 0.040 | 0.102 | 0.161 | 278.603974 | -9.898096 | -1716.68 | -1792.96 |
| 7 | GUIDE | 746995400 | 9.70 | 3776 | -0.052 | 0.089 | 0.100 | 0.162 | 278.078957 | -11.289885 | 2118.36 | 1927.36 |

2.4 Star Slots

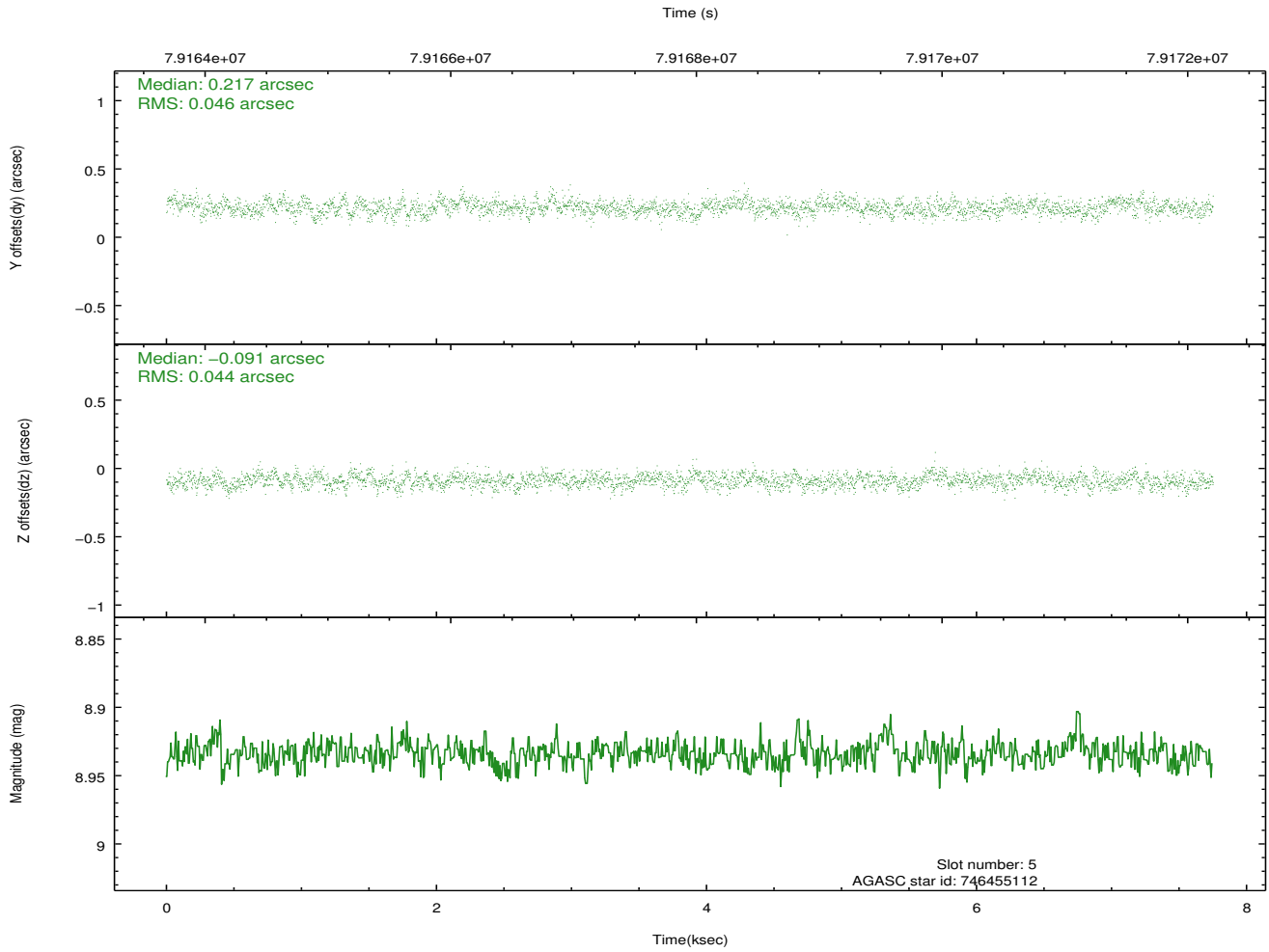
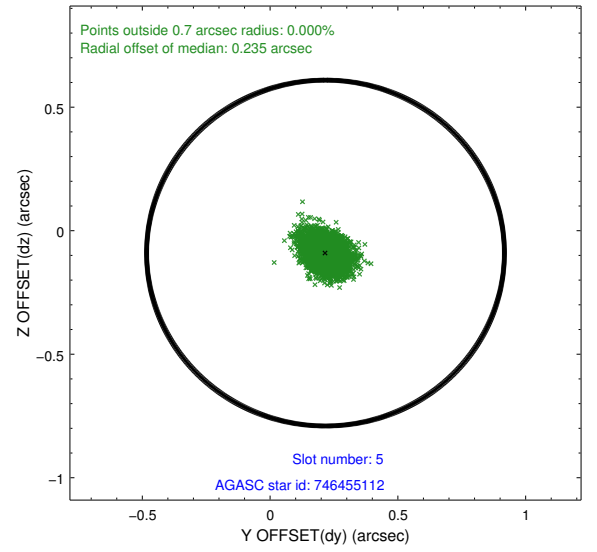
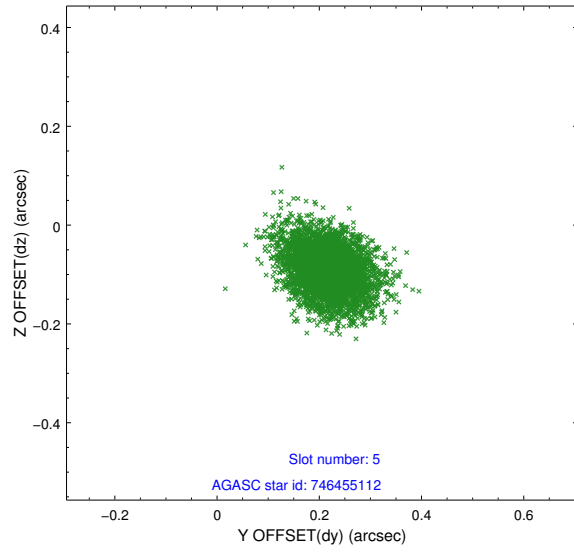
2.4.1 Slot 3



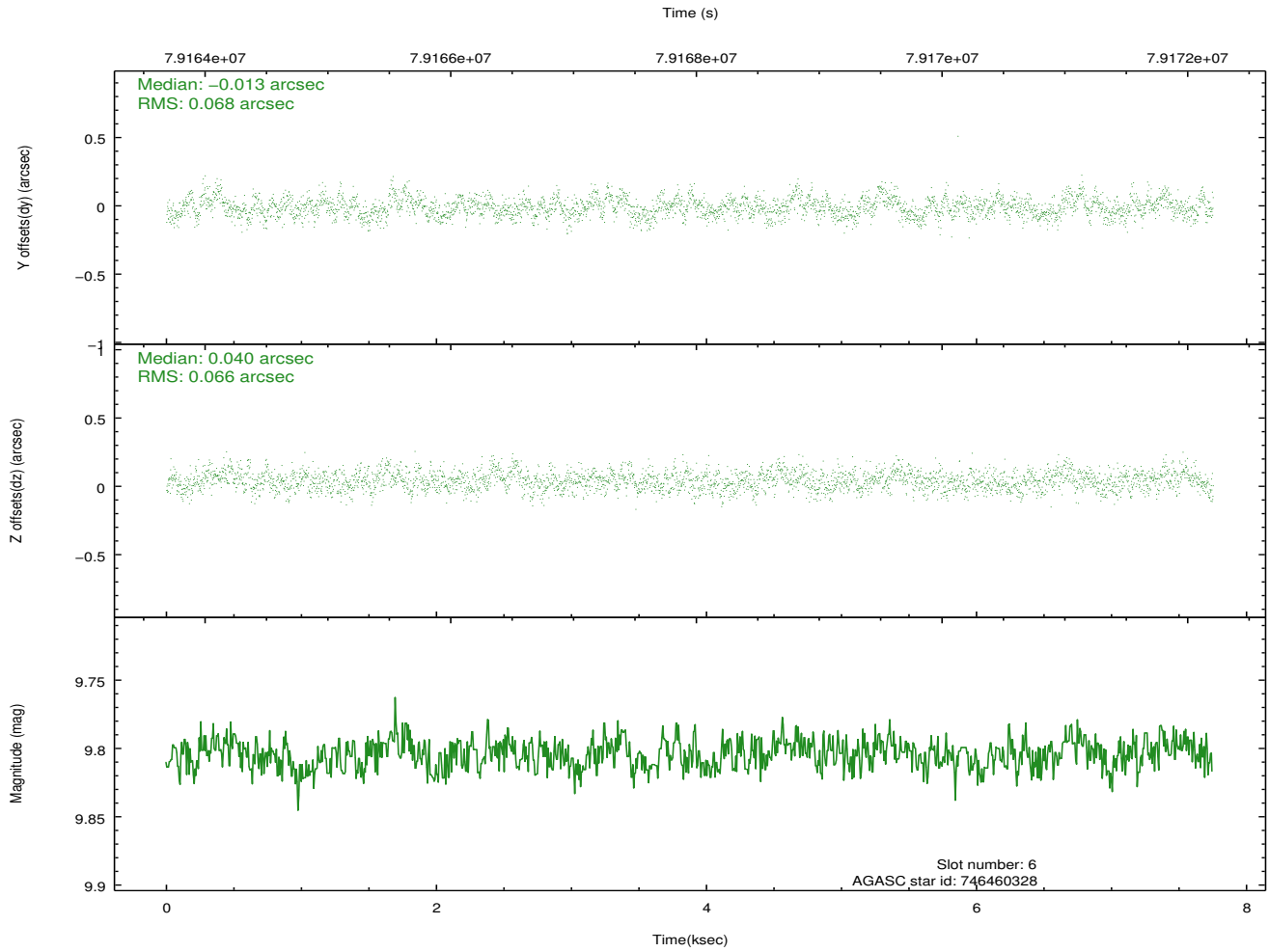
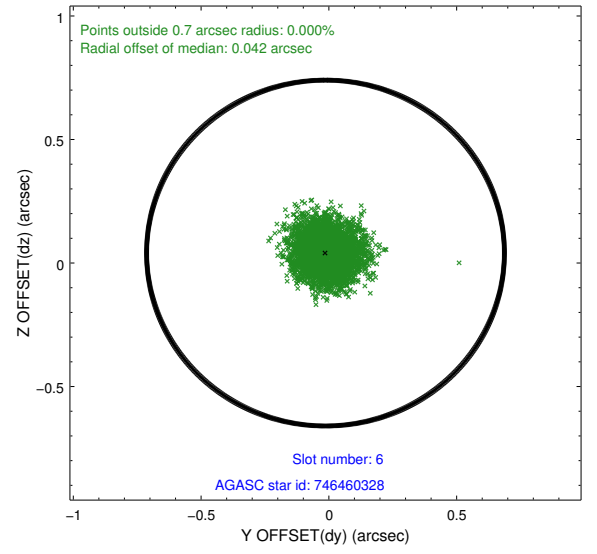
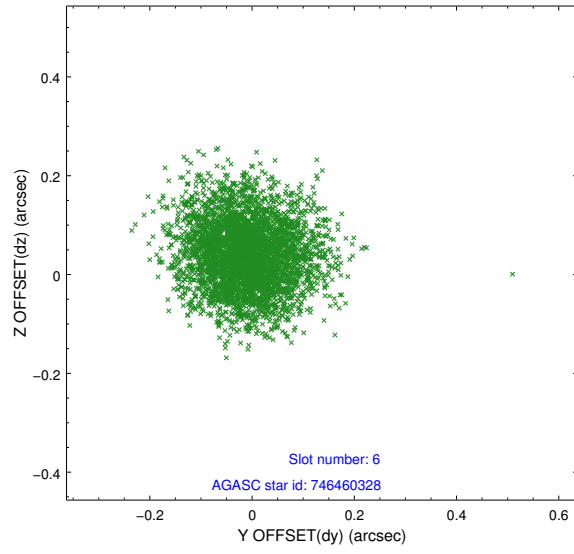
2.4.2 Slot 4



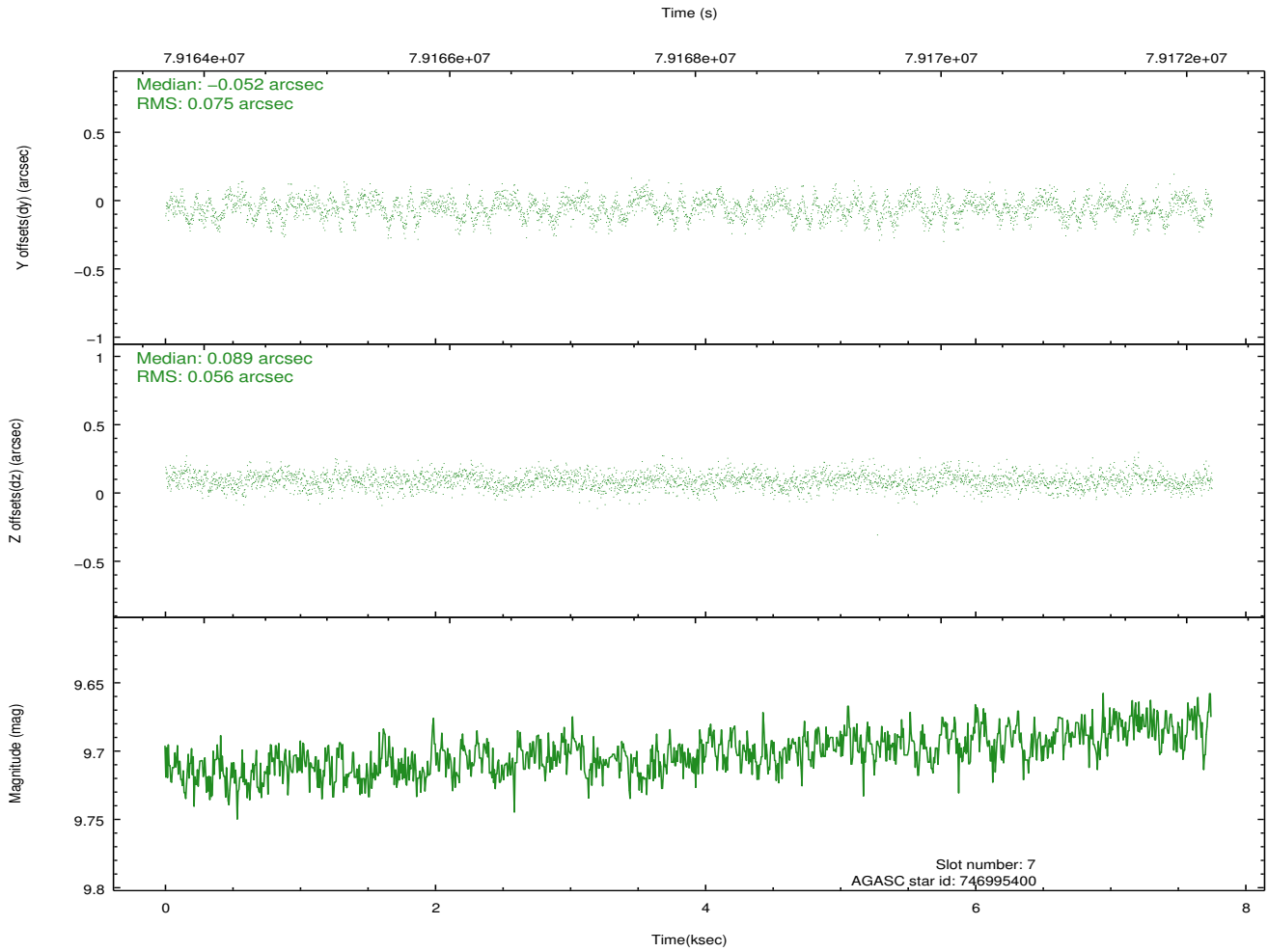
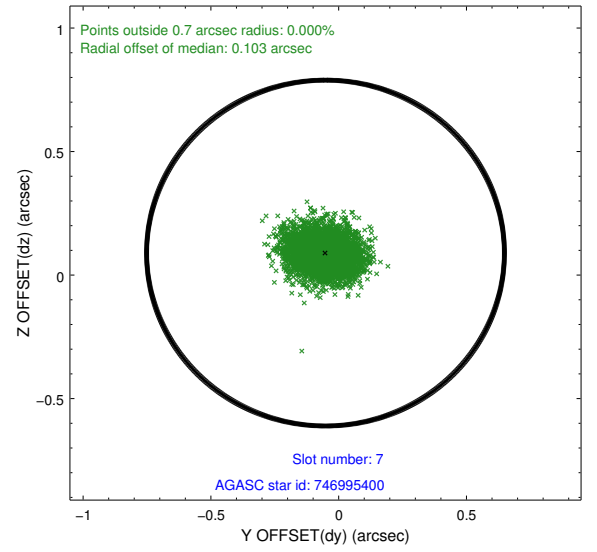
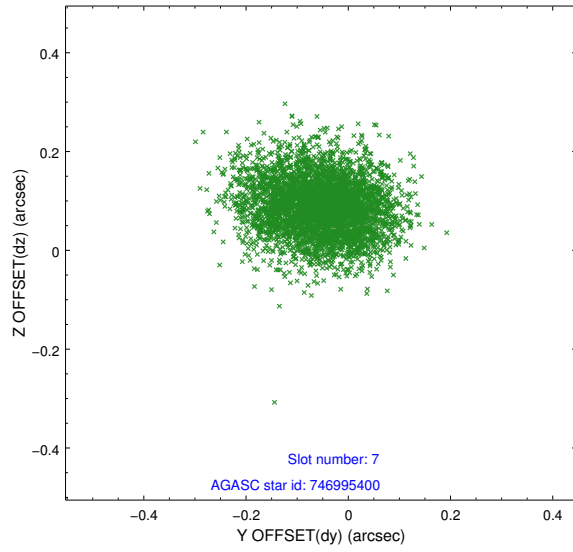
2.4.3 Slot 5



2.4.4 Slot 6

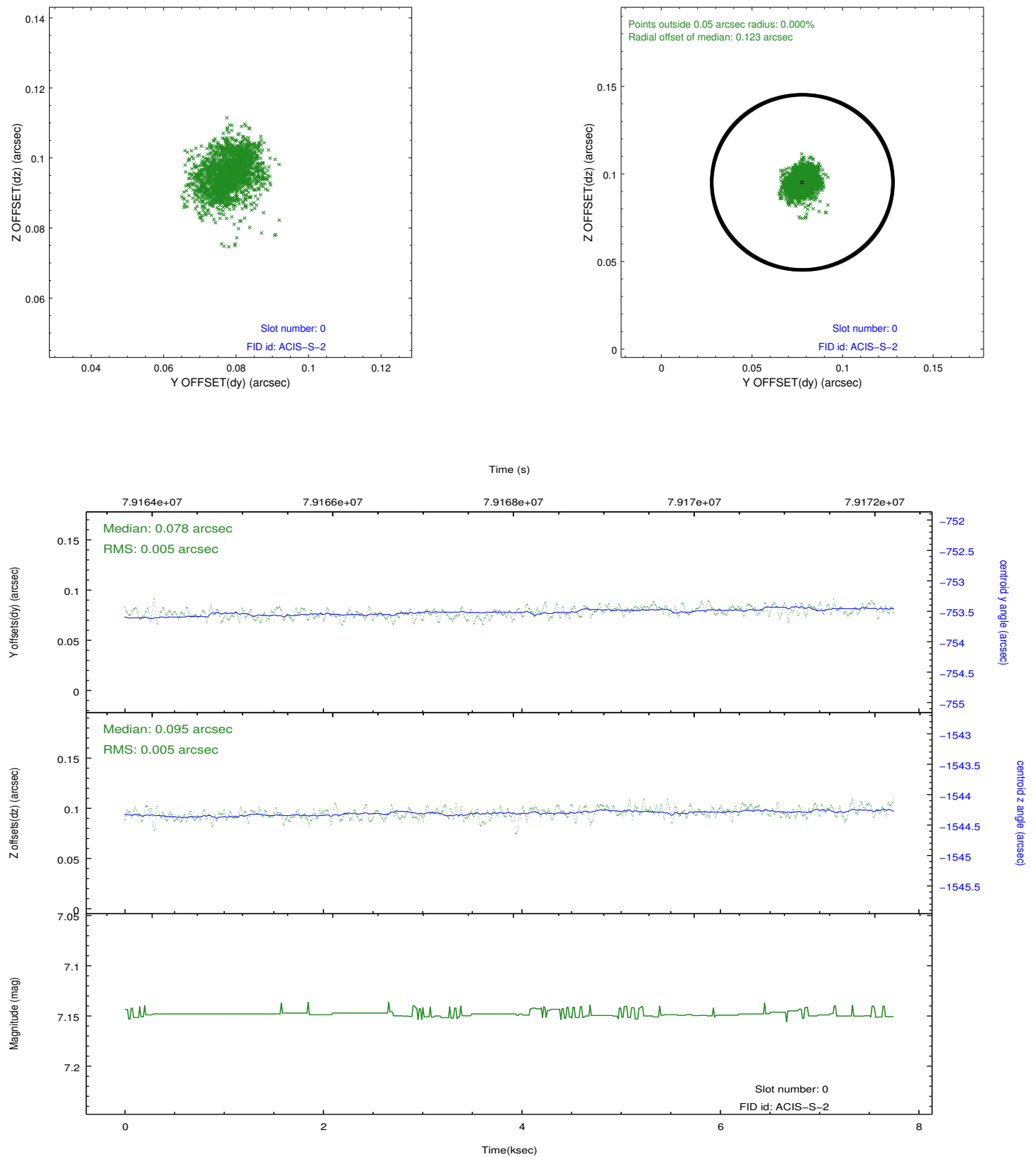


2.4.5 Slot 7

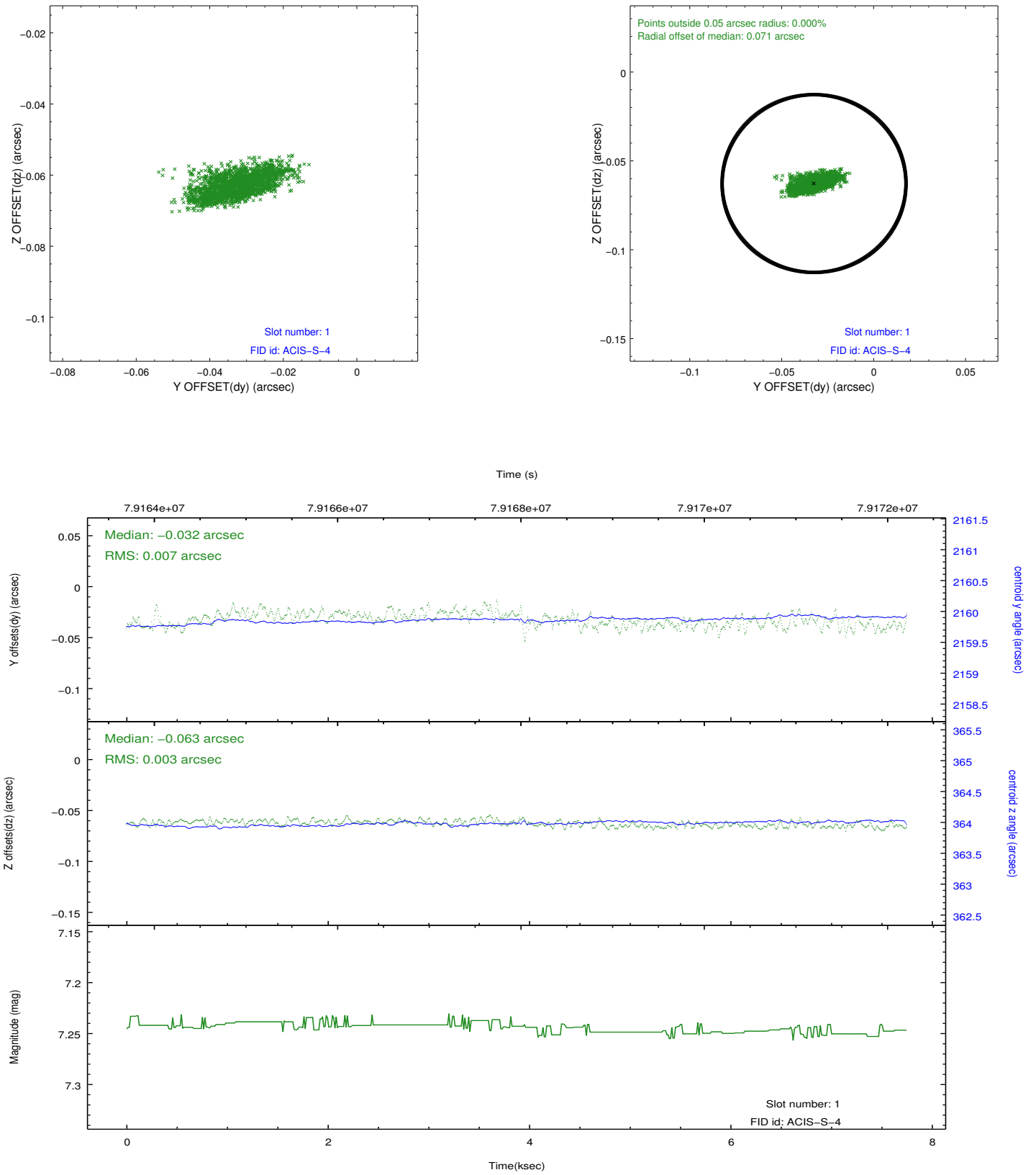


2.5 FID Slots

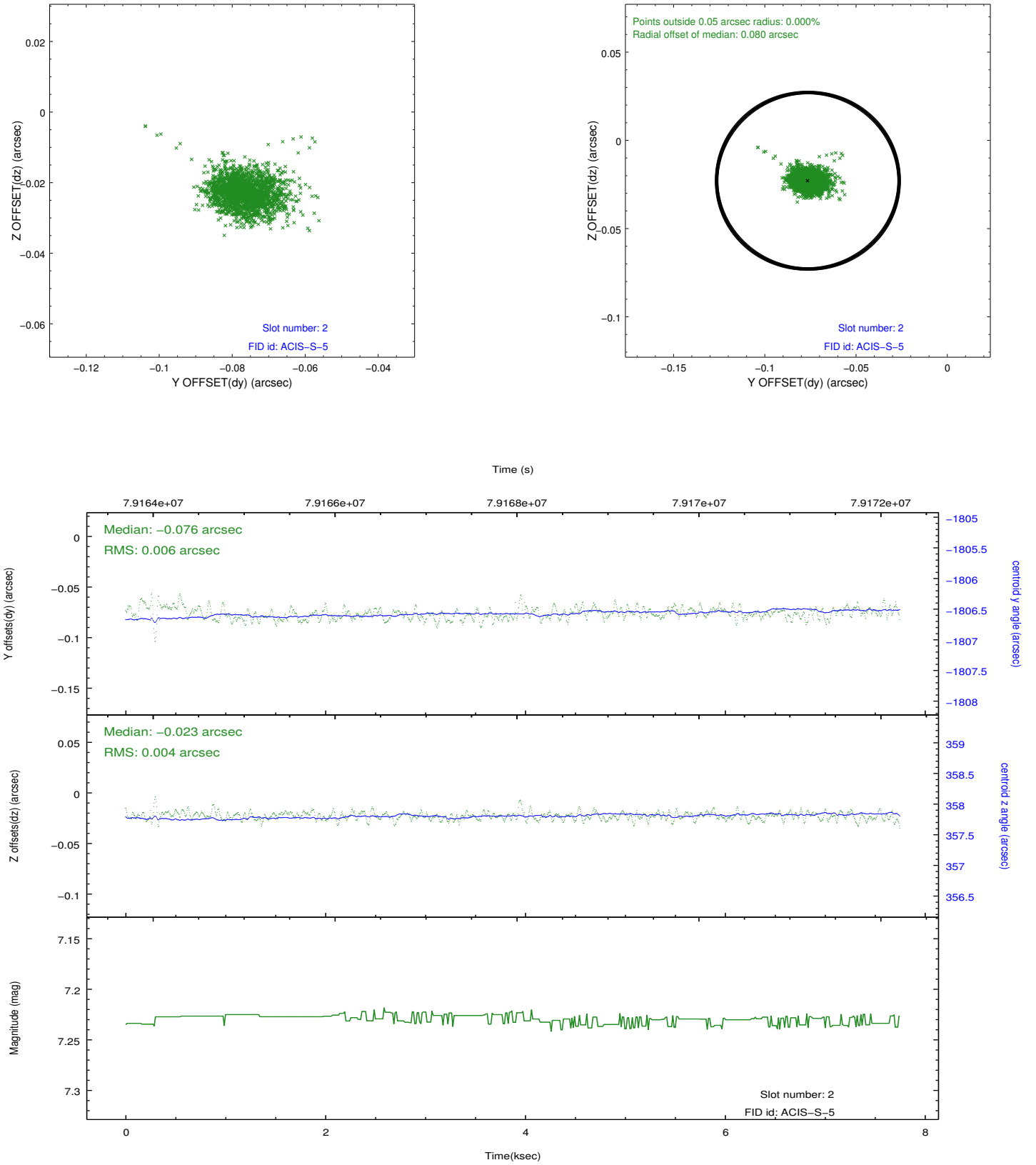
2.5.1 Slot 0



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) | 2018.03.05 |
| V&V Edition | 2 |
| V&V Disposition and Status | OK |
| V&V Charge Time | 7.324 |

A.2 Comments

The focal plane temperature during part of this observation was warmer than the upper limit for optimum calibration of the ACIS gain and spectral resolution (i.e., -114.0 C for ACIS-I and -112.0 C for ACIS-S).

The Chandra calibration team calibrates the ACIS gain and spectral resolution using data from the external calibration source (ECS). ECS data show that the frontside-illuminated (FI) CCDs are more temperature sensitive than the backside-illuminated (BI) CCDs.

A summary of the current calibration status of the ACIS gain and spectral resolution can be found at:

http://asc.harvard.edu/cal/Acis/Cal_prods/Gain_and_Spectral_Resolution/ACIS_response_summary.html

The main points are:

- 1) The gain on BI chips remains within 0.3% (i.e., the systematic uncertainty in the ACIS gain quoted on the Chandra Calibration Status Summary web page) at all measured temperatures.
 - 2) The gain on FI chips remains within 0.3% below row 600 at all measured temperatures.
 - 3) The gain on FI chips above row 600 can be underestimated by as much as 1% for focal plane temperatures exceeding -116 C.
 - 4) The spectral resolution (i.e., FWHM) on BI chips is insensitive to the focal plane temperature.
 - 5) Warmer focal plane temperatures increase the FWHM on FI chips by up to 30 eV near row 512 and by up to 70 eV near the top of the chips.
- In summary, the user should be cautious in the spectral analysis of high S/N emission lines detected on the top half of FI chips in this observation. Default processing with the current version of the CALDB will underestimate photon energies by up to 1% and broaden emission lines by up to 70 eV.