

V&V Reference Report

L2 ASCDS Version : 8.4.5

Observation 1783 - L2 Version 6
Chandra X-Ray Center

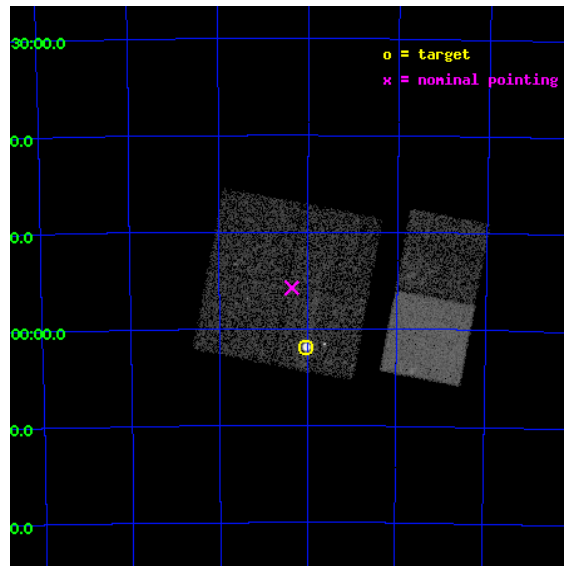
L2 Processing Date : Aug 30 2012

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1 Front

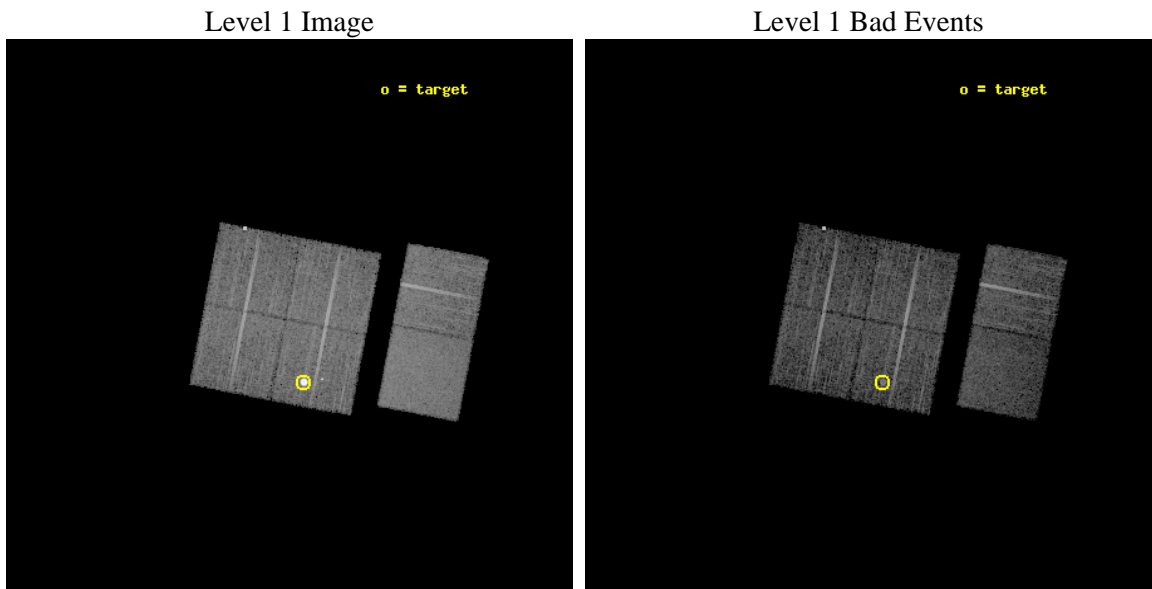
| | | |
|----------|---|---|
| seq_num | 590209 | Sequence number |
| obs_id | 1783 | Observation id |
| title | ACIS CHIP RESPONSE TO LINES WITH E=0.6-1.5 KEV | Proposal title |
| observer | Dr. CXC Calibration | Principal investigator |
| object | E0102-72.3 [Chip I3, T=110, Offsets=-5,2,0] | Source name |
| dtcycle | 0 | |
| cycle | P | events from which exps? Prim/Second/Both |
| ra_targ | 16.01 | Observer's specified target RA [deg] |
| dec_targ | -72.032028 | Observer's specified target Dec [deg] |
| ra_nom | 16.091037335626 | Nominal RA [deg] |
| dec_nom | -71.929369044456 | Nominal Dec [deg] |
| roll_nom | 100.88552813933 | Nominal Roll [deg] |
| revision | 6 | Processing version of data |
| ontime | 7868.6816902608 | Sum of GTIs [s] |
| livetime | 7769.0437047474 | Livetime [s] |
| ontime0 | 7868.5585702658 | Sum of GTIs [s] |
| ontime1 | 7868.5996102691 | Sum of GTIs [s] |
| ontime2 | 7868.6406502724 | Sum of GTIs [s] |
| ontime3 | 7868.6816902608 | Sum of GTIs [s] |
| ontime6 | 7868.7637702674 | Sum of GTIs [s] |
| ontime7 | 7868.7227302641 | Sum of GTIs [s] |
| l2events | 75528 | Number of level 2 events |



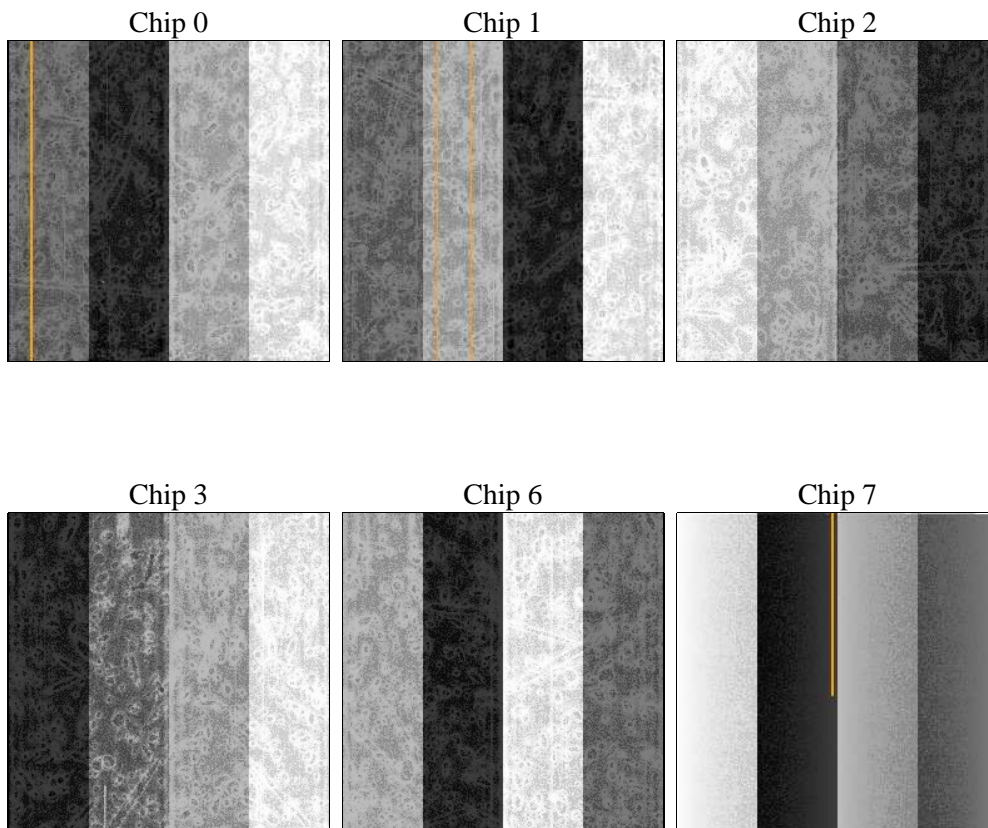
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

| | | | | | |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num | 0 | Obi number | sched_exp_time | 7920.000000 | [s] Scheduled observation exposure time |
| ascdsver | 8.4.5 | Processing system revision | ontime | 7868.6816902608 | Sum of GTIs [s] |
| caldbver | 4.5.1.1 | | ontime0 | 7868.5585702658 | Sum of GTIs [s] |
| date | 2012-08-30T15:02:04 | Date and time of file creation | ontime1 | 7868.5996102691 | Sum of GTIs [s] |
| revision | 6 | Processing version of data | ontime2 | 7868.6406502724 | Sum of GTIs [s] |
| | | | ontime3 | 7868.6816902608 | Sum of GTIs [s] |
| | | | ontime6 | 7868.7637702674 | Sum of GTIs [s] |
| | | | ontime7 | 7868.7227302641 | Sum of GTIs [s] |
| | | | l1events | 361895 | Number of level 1 events |

2.1.4 Events

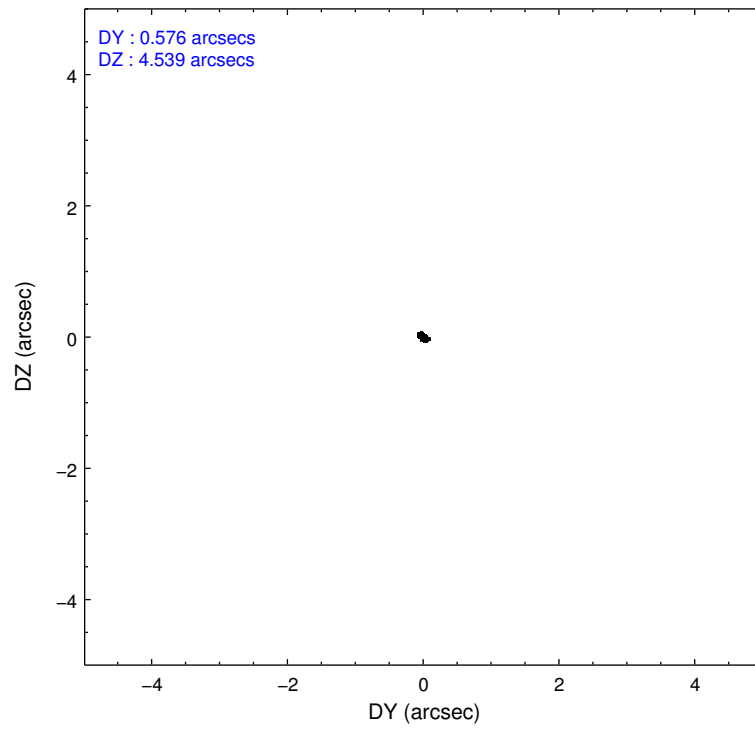
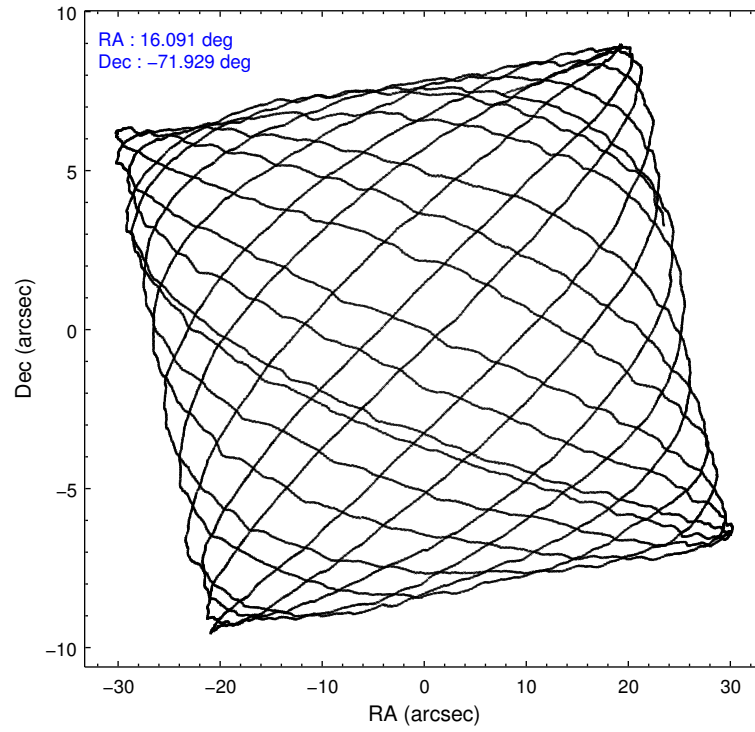
| | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 | ccd 7 |
|-----------------|-------|-------|-------|-------|-------|-------|
| level 1 events | 51216 | 52070 | 56497 | 83118 | 56940 | 62054 |
| rejected events | 45786 | 46163 | 51336 | 49094 | 51049 | 38154 |
| rejected % | 89% | 88% | 90% | 59% | 89% | 61% |

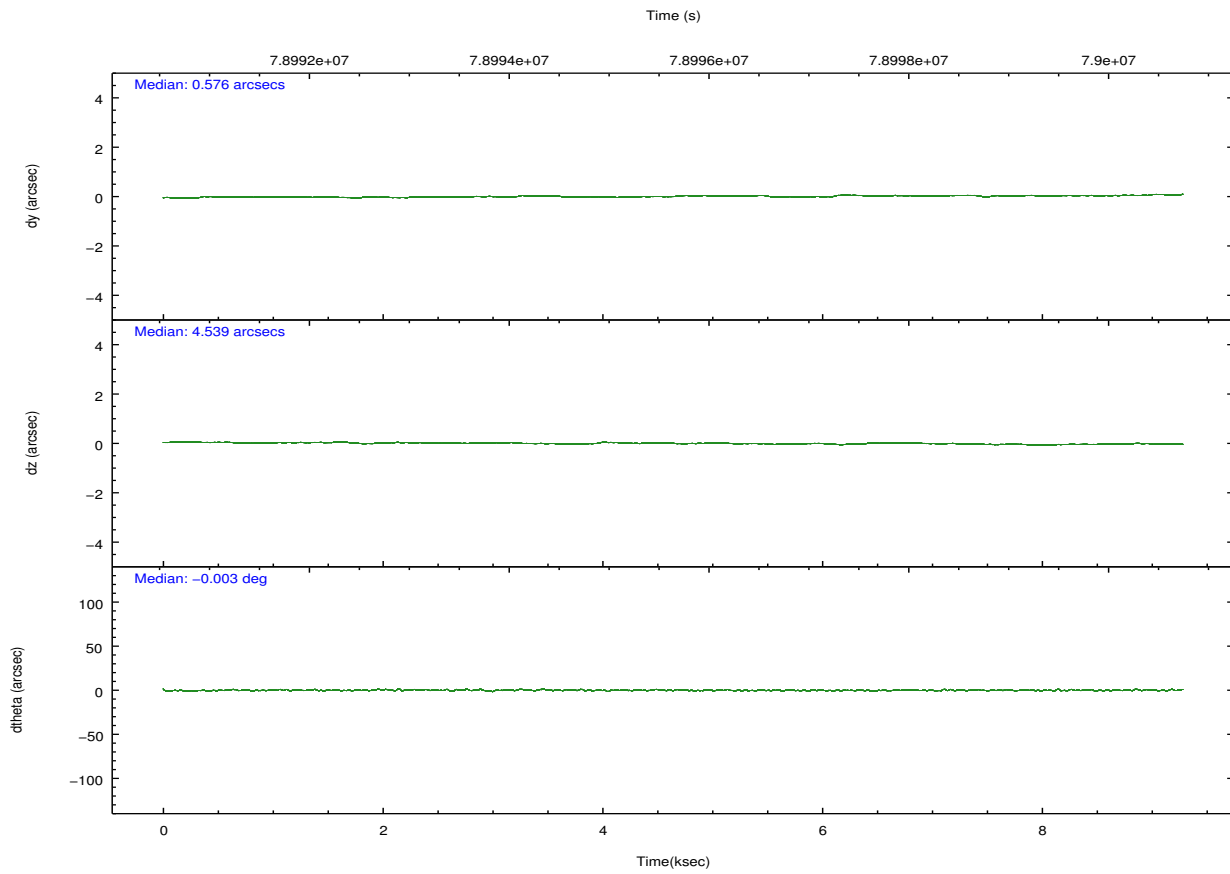
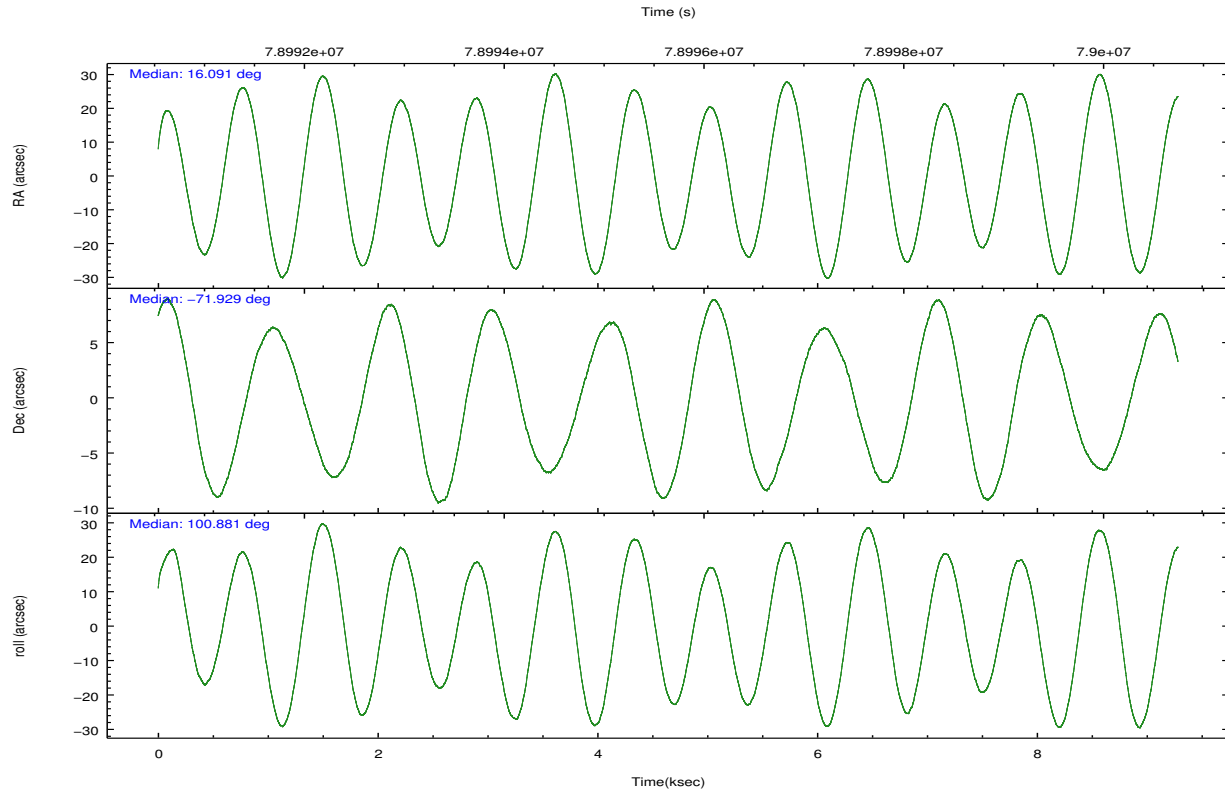
| | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 | ccd 7 |
|----------------|-------|-------|-------|-------|-------|-------|
| grade 0 events | 1210 | 1465 | 1141 | 26094 | 1278 | 1710 |
| | 2% | 2% | 2% | 31% | 2% | 2% |
| grade 1 events | 2349 | 18 | 13 | 202 | 8 | 32 |
| | 4% | 0% | 0% | 0% | 0% | 0% |
| grade 2 events | 2071 | 2200 | 2041 | 4528 | 2269 | 5077 |
| | 4% | 4% | 3% | 5% | 3% | 8% |
| grade 3 events | 400 | 427 | 327 | 894 | 372 | 1392 |
| | 0% | 0% | 0% | 1% | 0% | 2% |
| grade 4 events | 376 | 407 | 366 | 834 | 339 | 1288 |
| | 0% | 0% | 0% | 1% | 0% | 2% |
| grade 5 events | 1121 | 1229 | 950 | 1271 | 1287 | 3698 |
| | 2% | 2% | 1% | 1% | 2% | 5% |
| grade 6 events | 1374 | 1409 | 1287 | 1684 | 1641 | 14447 |
| | 2% | 2% | 2% | 2% | 2% | 23% |
| grade 7 events | 42315 | 44915 | 50372 | 47611 | 49746 | 34410 |
| | 82% | 86% | 89% | 57% | 87% | 55% |

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 | 16.148946 | 16.0910373356261 | Subarray requested | NONE | NONE |
| [deg] Pointing Dec | -71.950323 | -71.929369044456 | Alternating exposures requested | N | N |
| [deg] Pointing Roll | 100.731893 | 100.8855281393334 | [s] Primary exposure time | 0.000000 | 3.2 |
| [mm] SIM focus pos | -0.782348 | -0.7809083437167272 | | | |
| [mm] SIM defocus | 0 | 0.001439871863259334 | | | |
| [mm] SIM translation stage pos | -233.592463 | -233.5874344608287 | | | |
| [mm] SIM translation stage offset | 0 | -0.005018542100998502 | | | |
| [s] Observation start time (MET) | 78992359.184000 | 78990812.809404 | | | |
| Observation start date | 2000-07-03T06:18:15 | 2000-07-03T05:53:32 | | | |
| [s] Observation end time (MET) | 79000279.184000 | 79000412.959758 | | | |
| Observation end date | 2000-07-03T08:30:15 | 2000-07-03T08:33:32 | | | |
| Read mode | TIMED | TIMED | | | |

2.3 Aspect



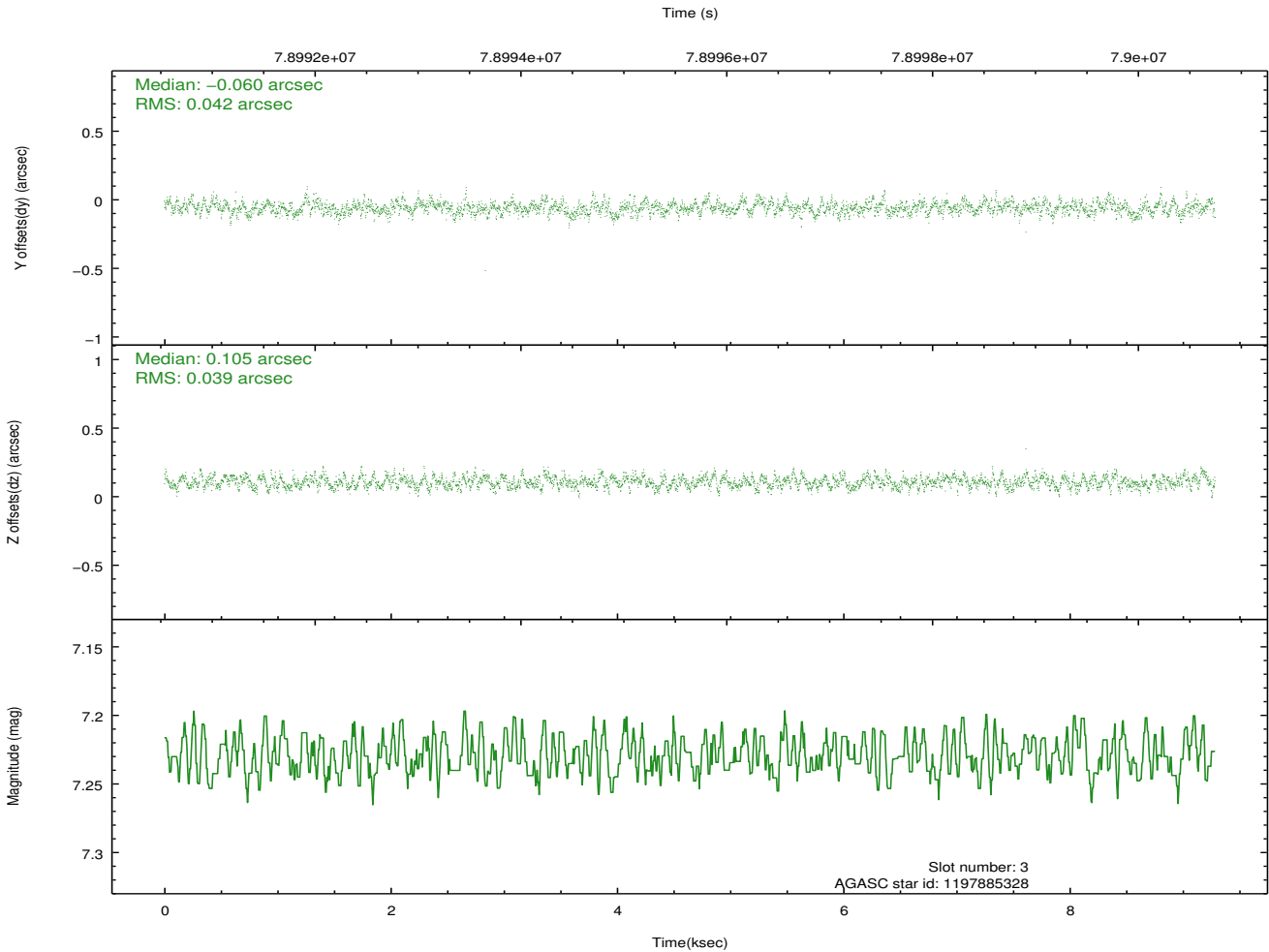
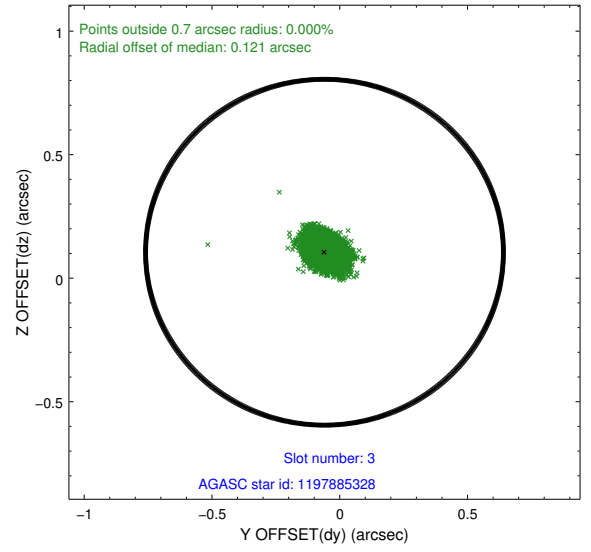
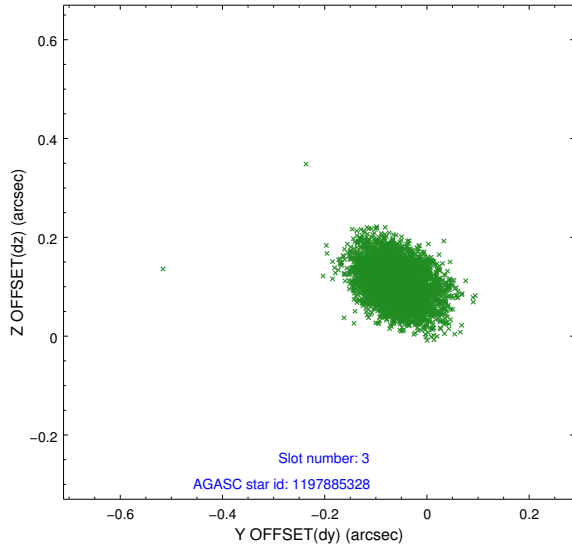


Slot Statistics

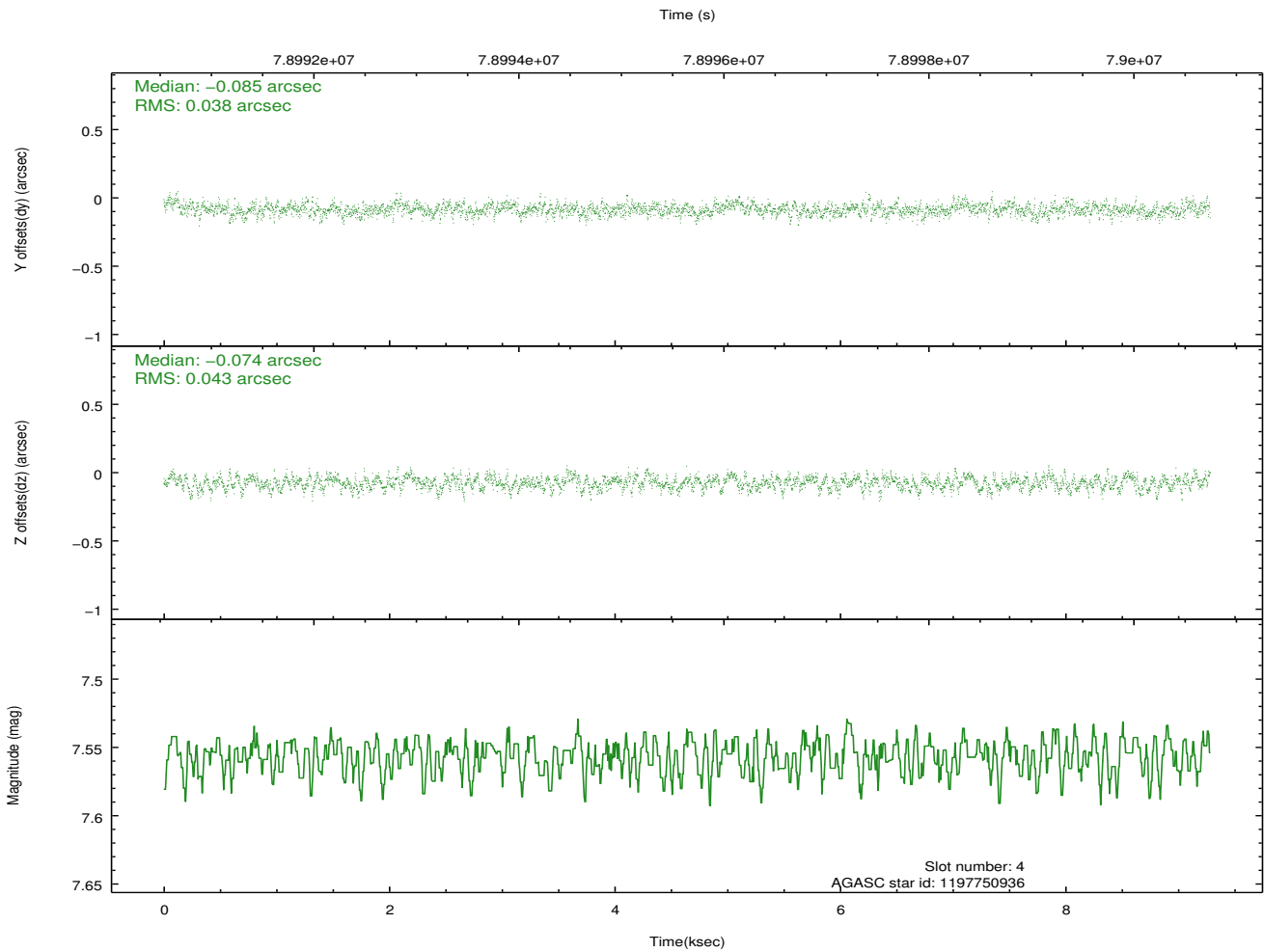
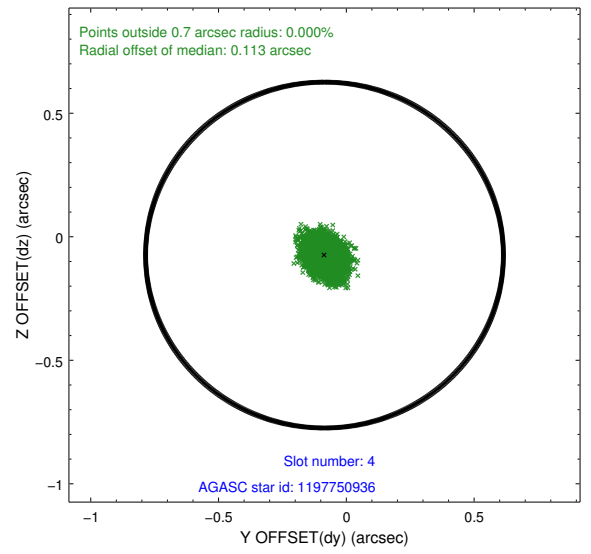
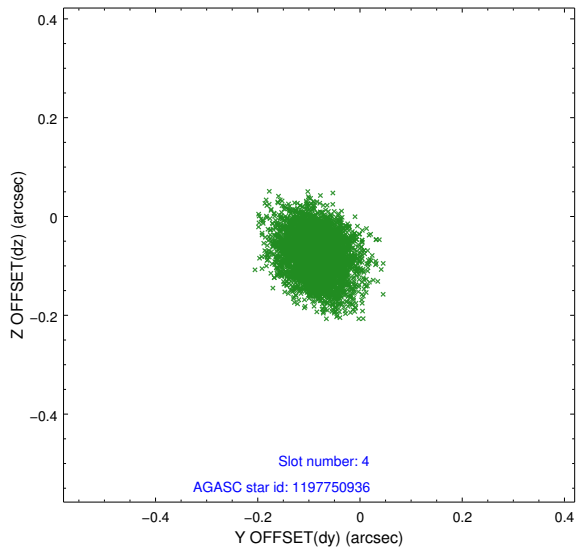
| slot | status | id | mag | n_pts | med_dy | med_dz | dr1 | dr2 | ra | dec | mean_y | mean_z |
|------|---------|------------|------|-------|--------|--------|-------|-------|-----------|------------|----------|----------|
| 0 | FID | ACIS-I-1 | 7.25 | 2264 | -0.031 | 0.025 | 0.004 | 0.008 | 0.000000 | 0.000000 | 939.26 | -827.82 |
| 1 | FID | ACIS-I-5 | 7.23 | 2264 | -0.030 | 0.025 | 0.004 | 0.008 | 0.000000 | 0.000000 | -1808.55 | 1069.32 |
| 2 | OMITTED | | 0.00 | 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000000 | 0.000000 | 0.00 | 0.00 |
| 3 | GUIDE | 1197885328 | 7.23 | 4529 | -0.060 | 0.105 | 0.060 | 0.098 | 16.283090 | -71.733943 | 737.14 | -294.02 |
| 4 | GUIDE | 1197750936 | 7.56 | 4529 | -0.085 | -0.074 | 0.061 | 0.099 | 15.387940 | -71.549550 | 1573.81 | 583.82 |
| 5 | GUIDE | 1197884536 | 8.49 | 4528 | 0.011 | 0.037 | 0.063 | 0.108 | 17.160729 | -71.835289 | 186.70 | -1191.16 |
| 6 | GUIDE | 1197884712 | 8.30 | 4528 | 0.009 | -0.049 | 0.066 | 0.111 | 16.087398 | -72.252690 | -1056.74 | 268.28 |
| 7 | GUIDE | 1197750640 | 9.74 | 4524 | 0.126 | -0.017 | 0.097 | 0.160 | 15.758835 | -72.088048 | -408.05 | 516.59 |

2.4 Star Slots

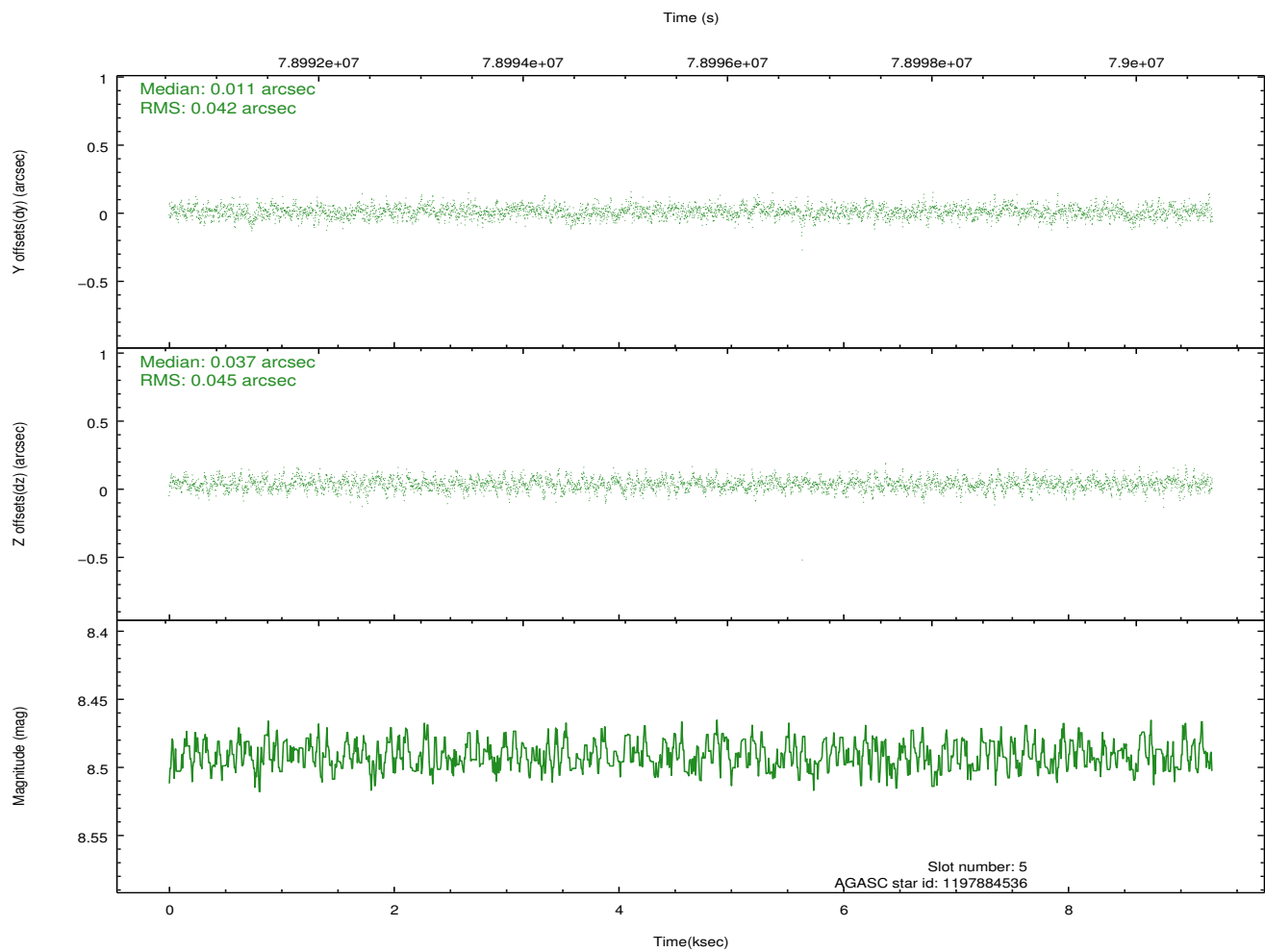
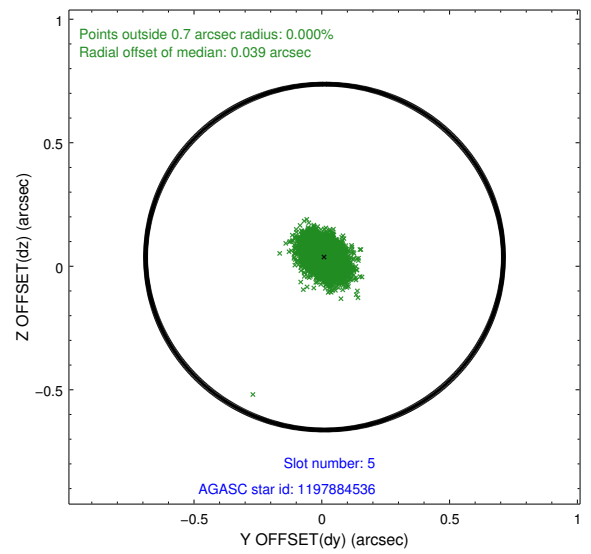
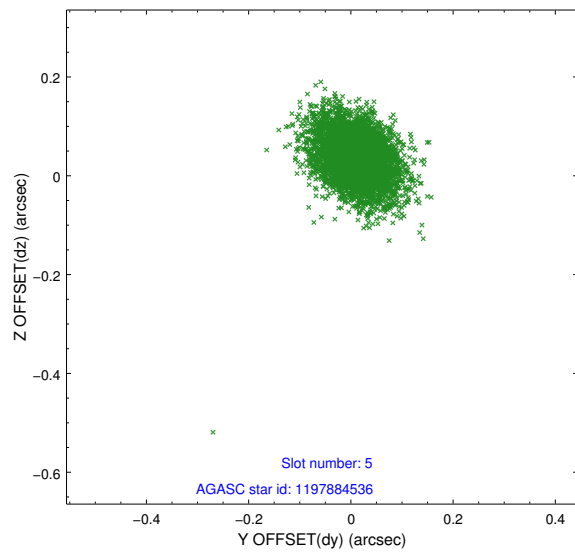
2.4.1 Slot 3



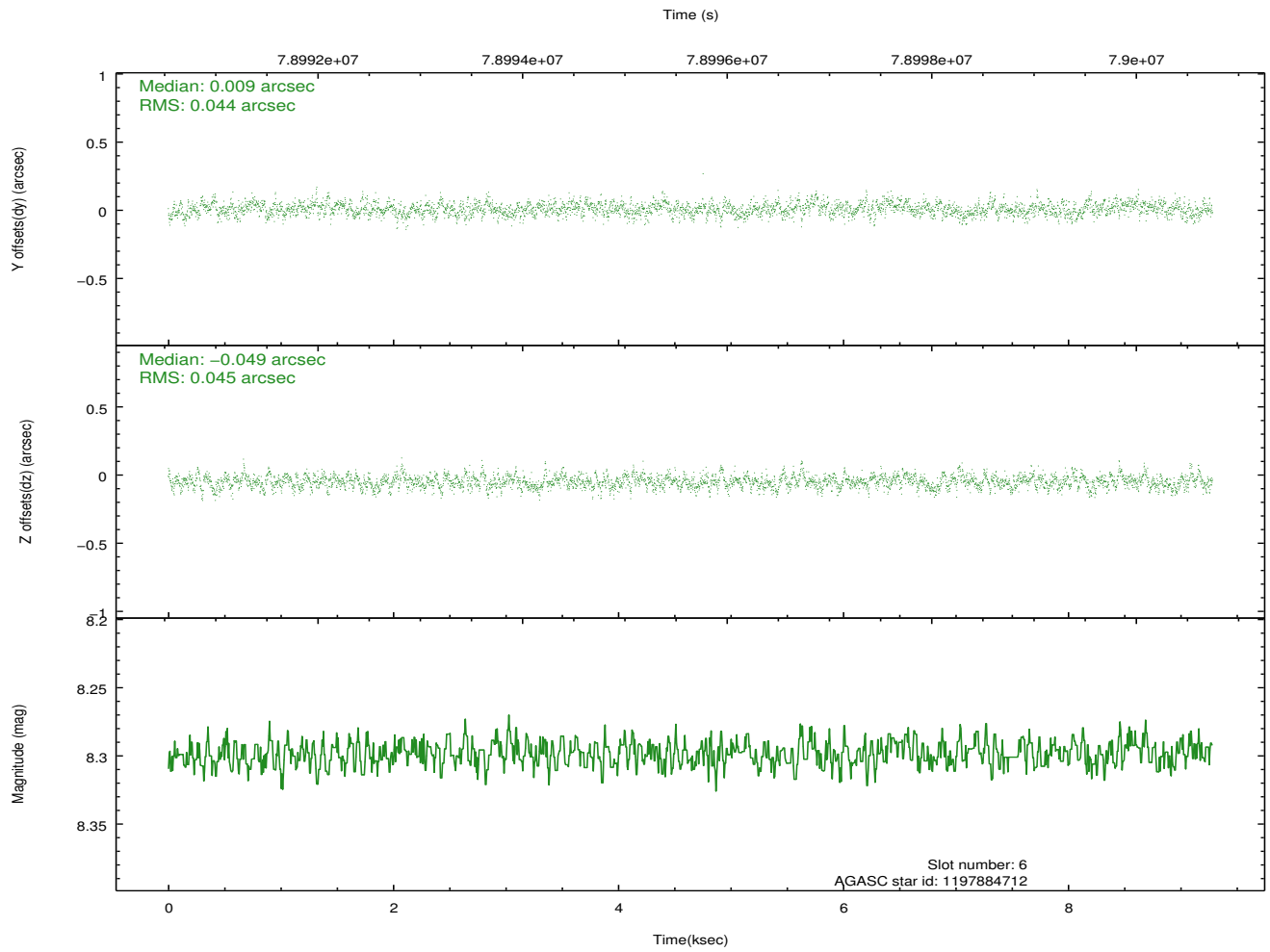
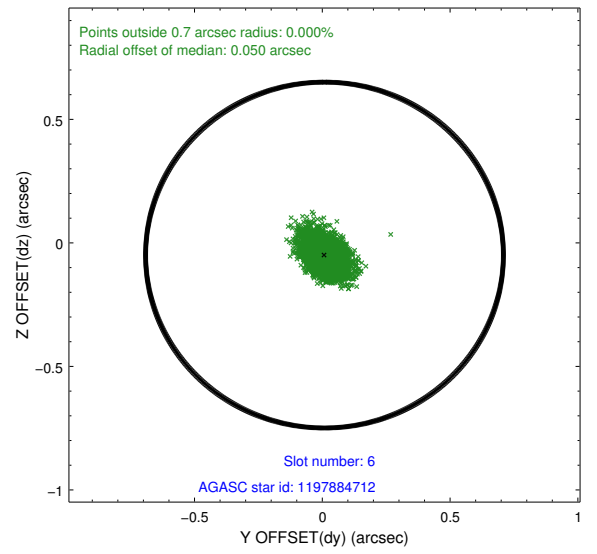
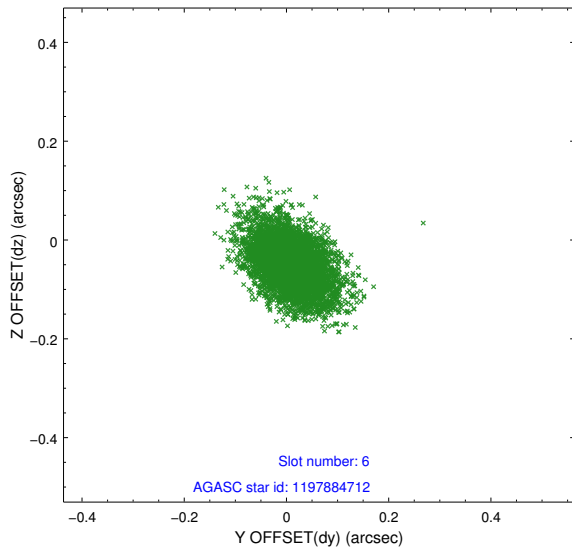
2.4.2 Slot 4



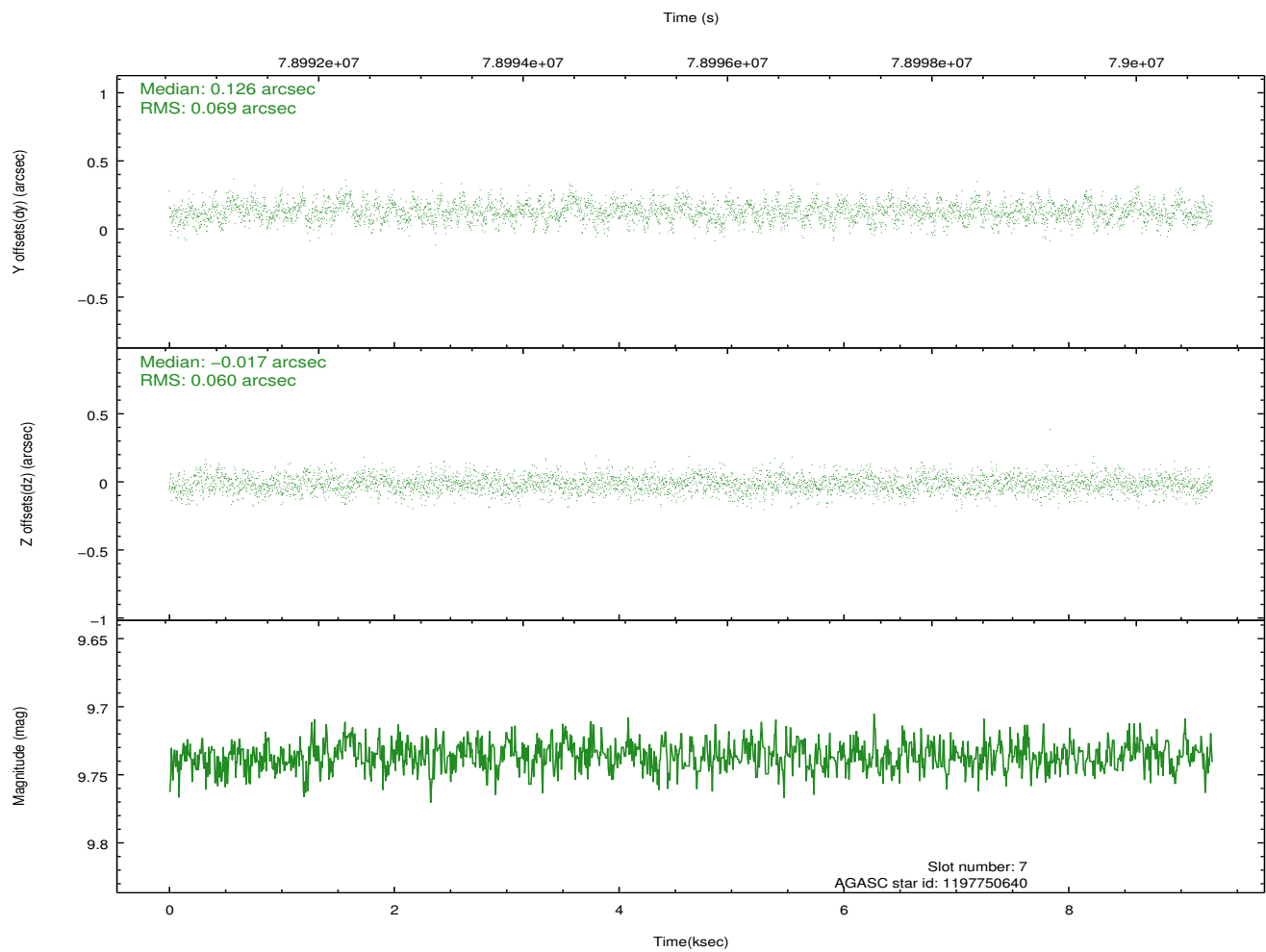
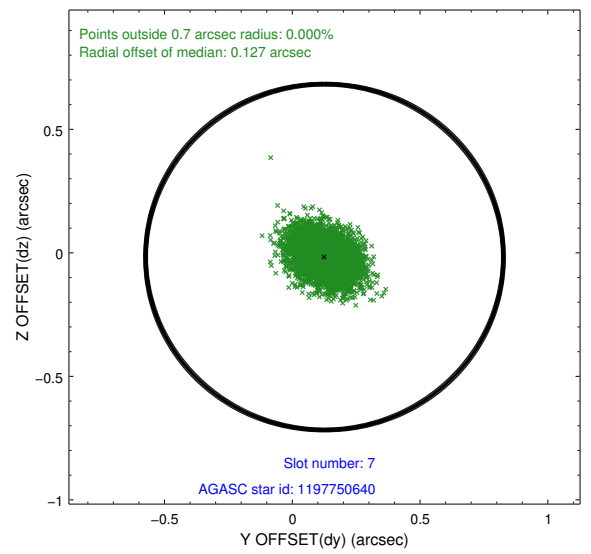
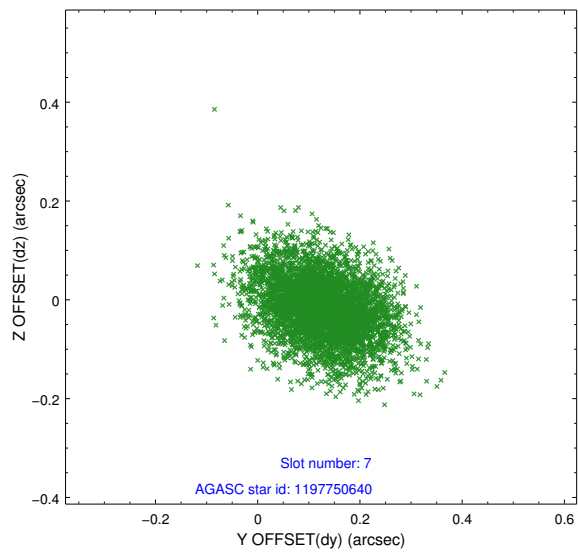
2.4.3 Slot 5



2.4.4 Slot 6

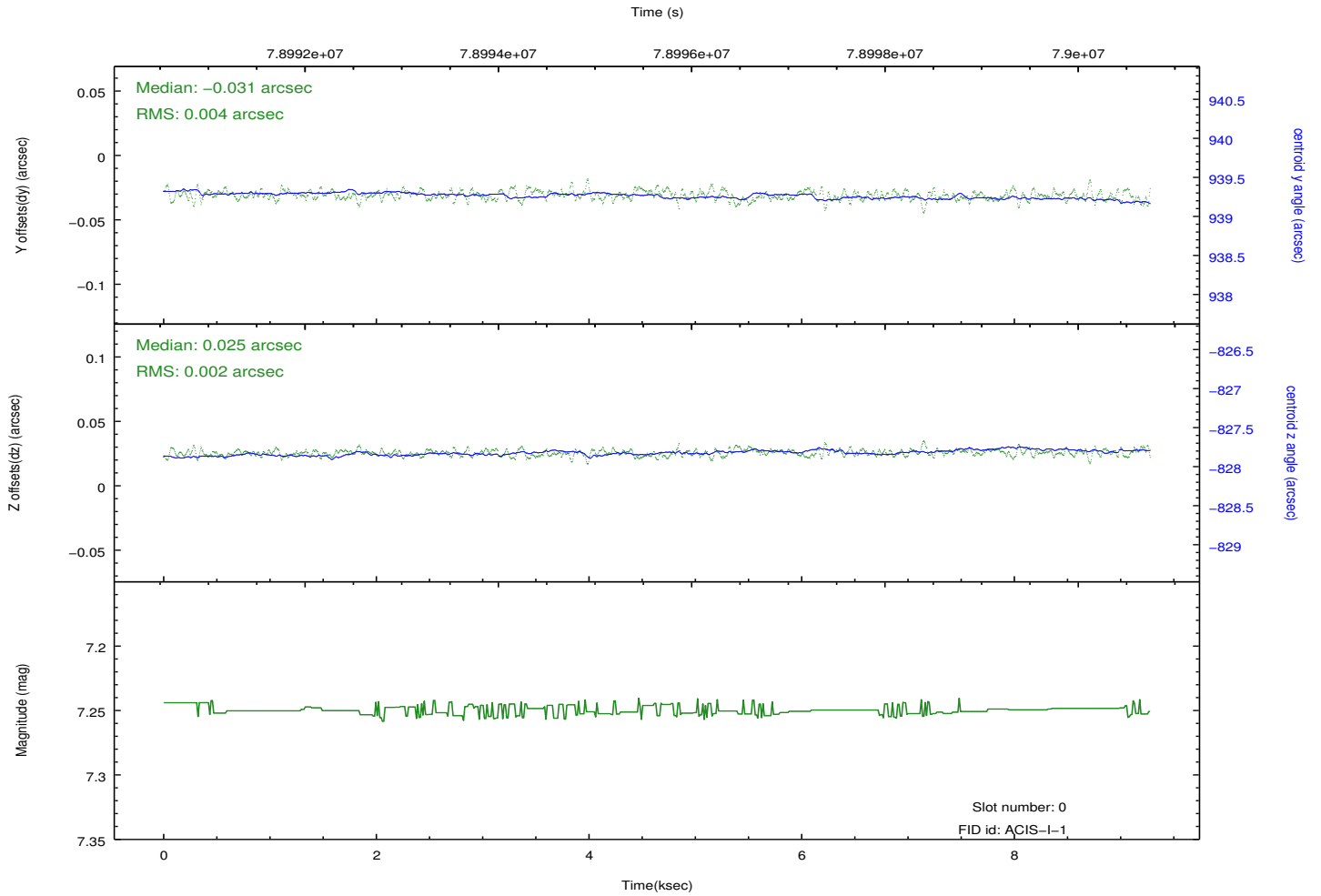
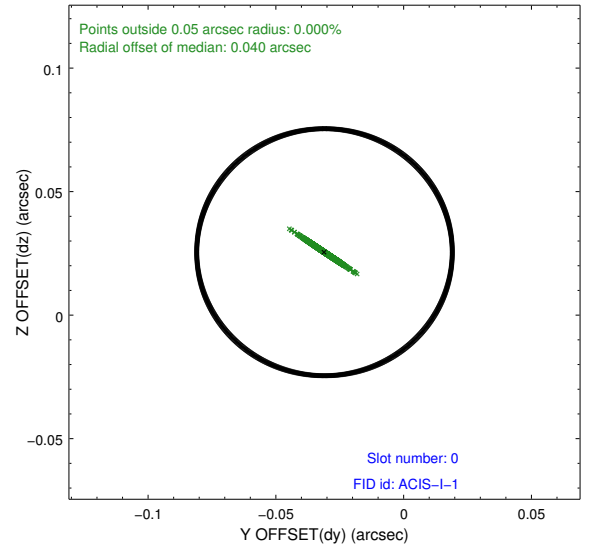
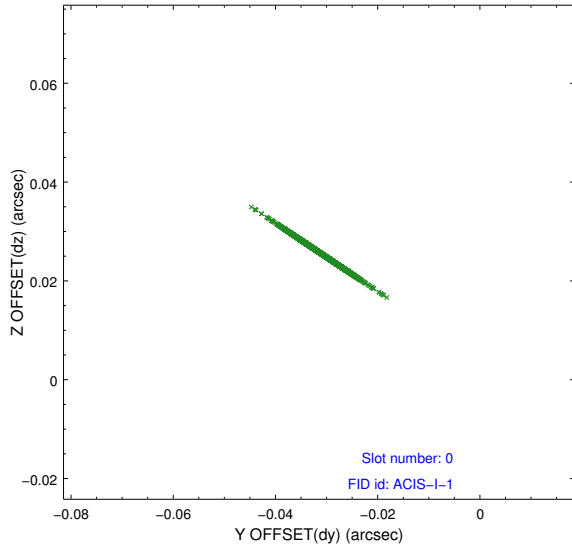


2.4.5 Slot 7

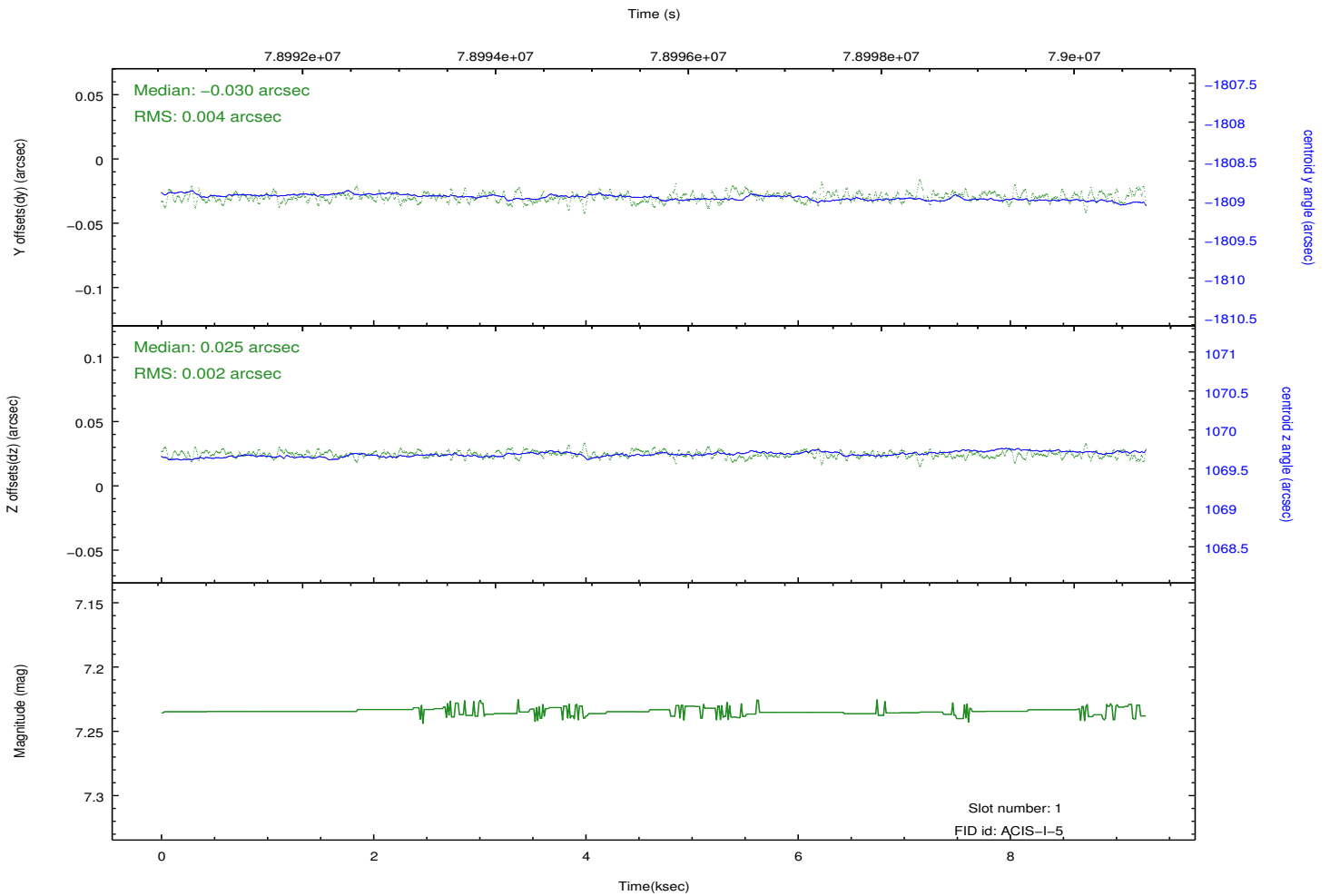
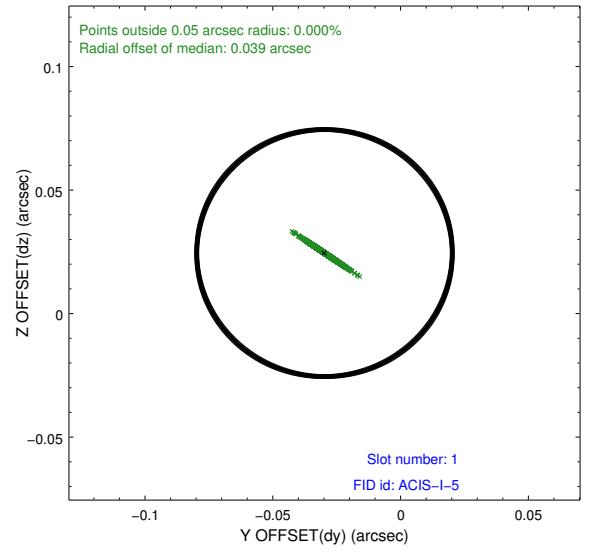
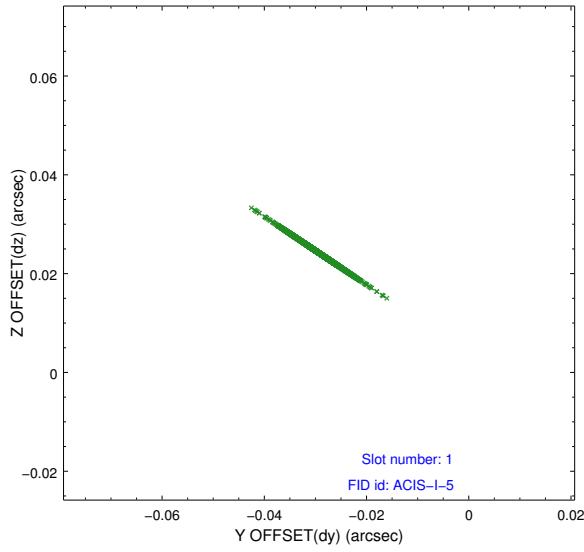


2.5 FID Slots

2.5.1 Slot 0



2.5.2 Slot 1



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 | 7.868 |

A.2 Comments

The fid light in slot 2 was removed from the aspect solution due to poor data quality. The aspect solution is improved by the removal of this slot from the solution.

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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/A_CIS_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.