

V&V Reference Report

L2 ASCDS Version : 10.2.1

Observation 16423 - L2 Version 2
Chandra X-Ray Center

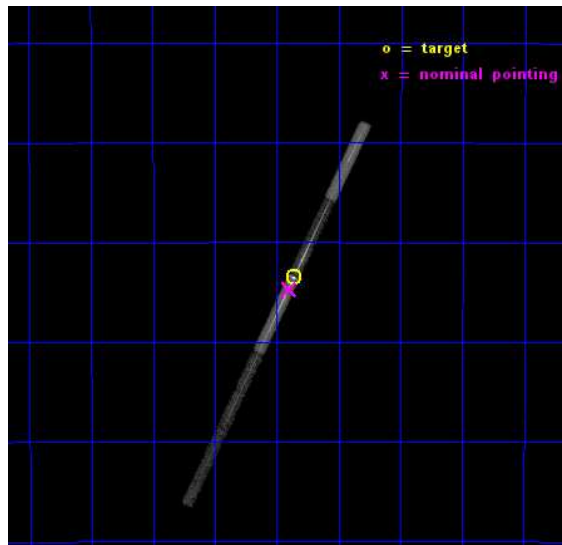
L2 Processing Date : Dec 11 2014

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1 Front

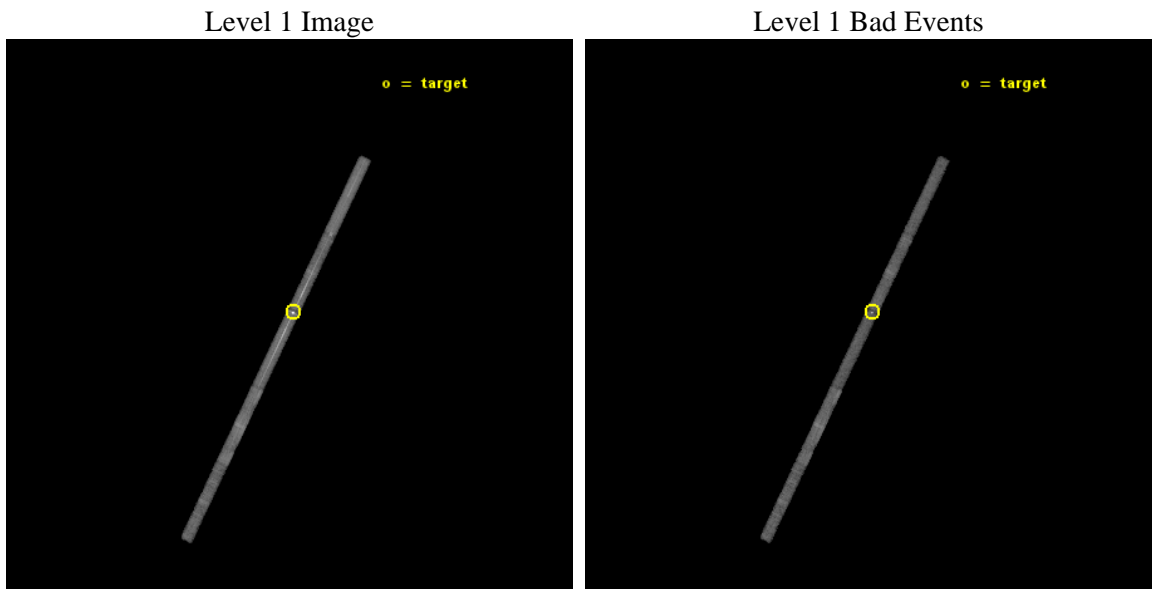
| | | |
|----------|---|---|
| seq_num | 790263 | Sequence number |
| obs_id | 16423 | Observation id |
| title | AO-15 LETG/ACIS-S Calibration Observations of PKS2155-304 | Proposal |
| observer | Dr. CXC Calibration | Principal investigator |
| object | PKS2155-304 | Source name |
| dtcycle | 0 | |
| cycle | P | events from which exps? Prim/Second/Both |
| ra_targ | 329.716667 | Observer's specified target RA [deg] |
| dec_targ | -30.225556 | Observer's specified target Dec [deg] |
| ra_nom | 329.72455175915 | Nominal RA [deg] |
| dec_nom | -30.245450520454 | Nominal Dec [deg] |
| roll_nom | 116.04369389001 | Nominal Roll [deg] |
| revision | 2 | Processing version of data |
| ontime | 30066.001194715 | Sum of GTIs [s] |
| livetime | 28141.146756566 | Livetime [s] |
| ontime5 | 30066.001194715 | Sum of GTIs [s] |
| ontime6 | 30066.001194715 | Sum of GTIs [s] |
| ontime7 | 30066.001194715 | Sum of GTIs [s] |
| ontime8 | 30066.001194715 | Sum of GTIs [s] |
| ontime9 | 30066.001194715 | Sum of GTIs [s] |
| l2events | 77451 | Number of level 2 events |



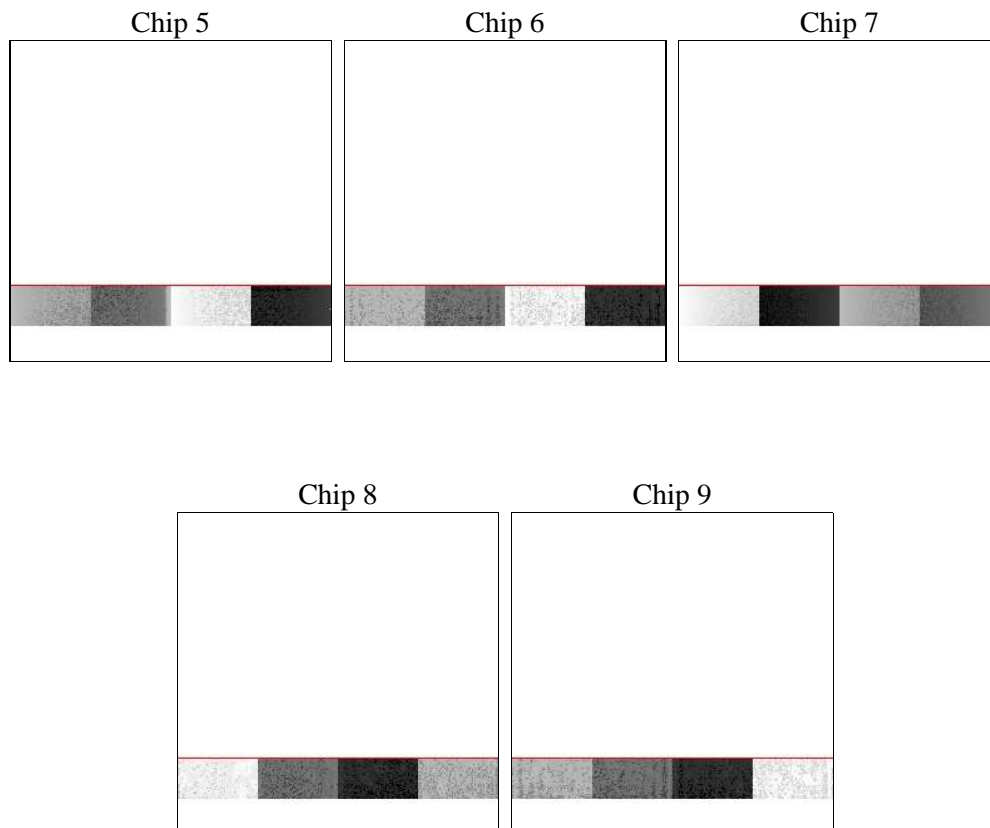
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

| | | | | | |
|----------|---------------------|--------------------------------|----------------|--------------------|---|
| obi_num | 0 | Obi number | sched_exp_time | 30000.000000 | [s] Scheduled observation exposure time |
| ascdsver | 10.3.1 | Processing system revision | ontime | 30066.001194715 | Sum of GTIs [s] |
| caldbver | 4.6.4 | | ontime5 | 30066.001194715 | Sum of GTIs [s] |
| date | 2014-12-11T09:24:30 | Date and time of file creation | ontime6 | 30066.001194715 | Sum of GTIs [s] |
| revision | 2 | Processing version of data | ontime7 | 30066.001194715 | Sum of GTIs [s] |
| | | | ontime8 | 30066.001194715 | Sum of GTIs [s] |
| | | | ontime9 | 30066.001194715 | Sum of GTIs [s] |
| | | | l1events | 179969 | Number of level 1 events |
| | | | tgmethod | TGDETECT | Method used to create src1a file |
| | | | zo_pos | (4144.05, 4241.95) | src1a sky pixel position |

2.1.4 Events

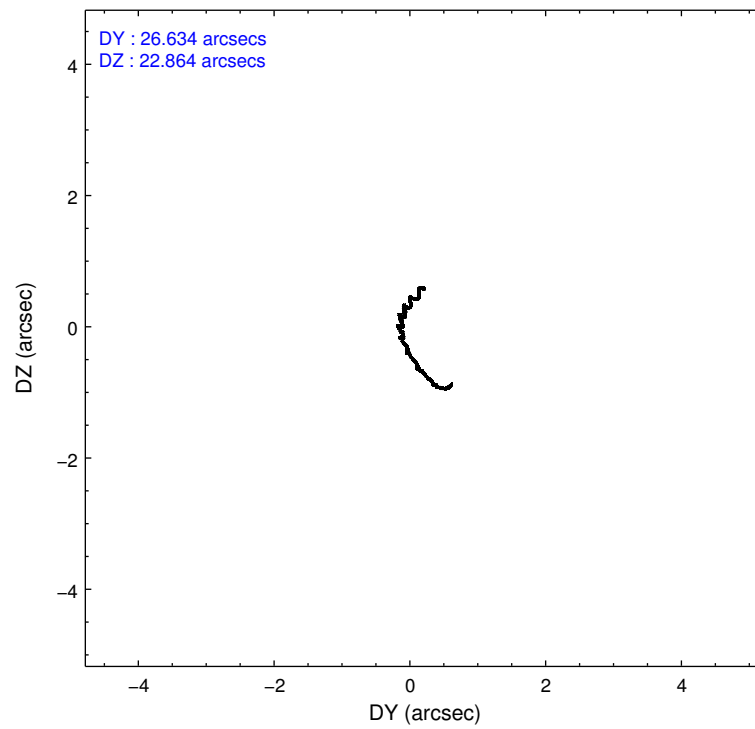
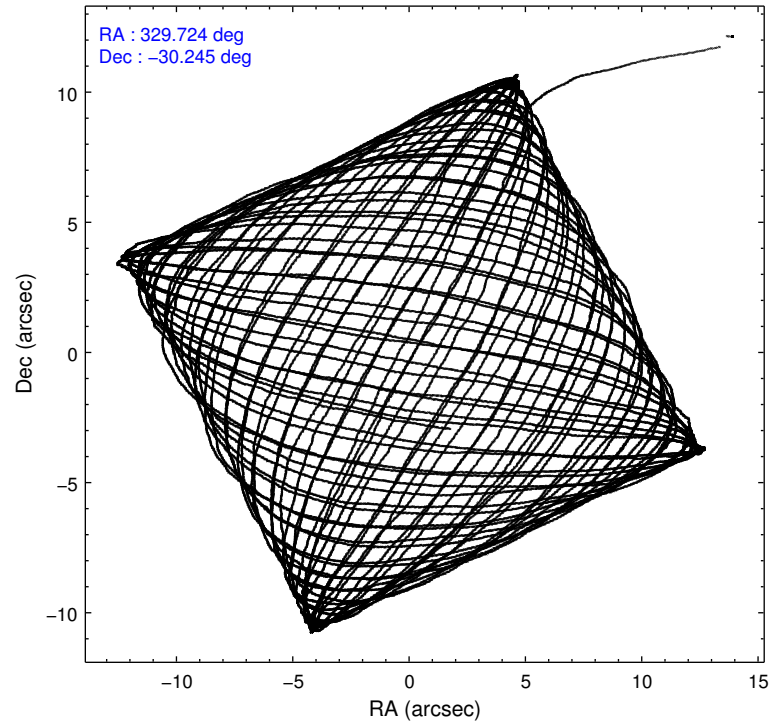
| | ccd 5 | ccd 6 | ccd 7 | ccd 8 | ccd 9 |
|-----------------|-------|-------|-------|-------|-------|
| level 1 events | 34860 | 32323 | 57162 | 34629 | 20995 |
| rejected events | 15754 | 19028 | 15458 | 25693 | 17823 |
| rejected % | 45% | 58% | 27% | 74% | 84% |

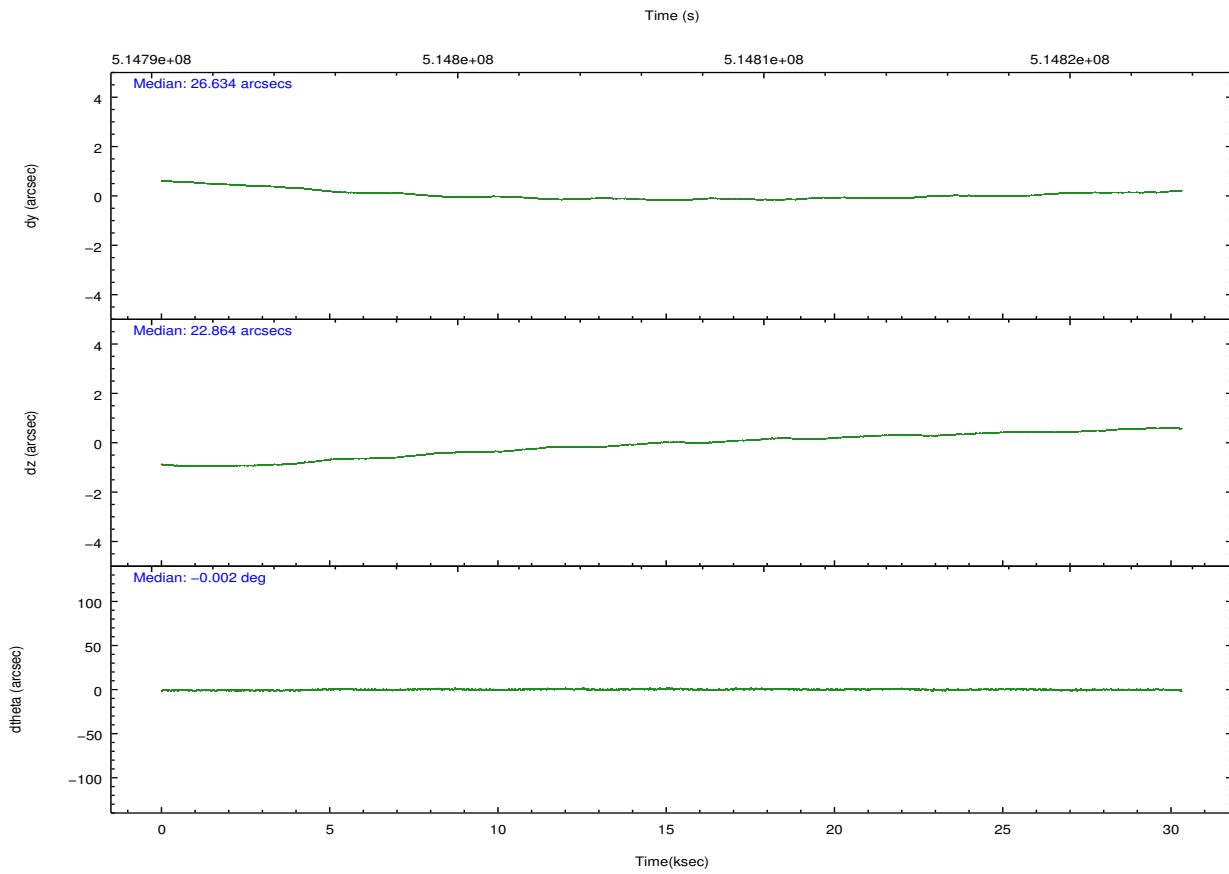
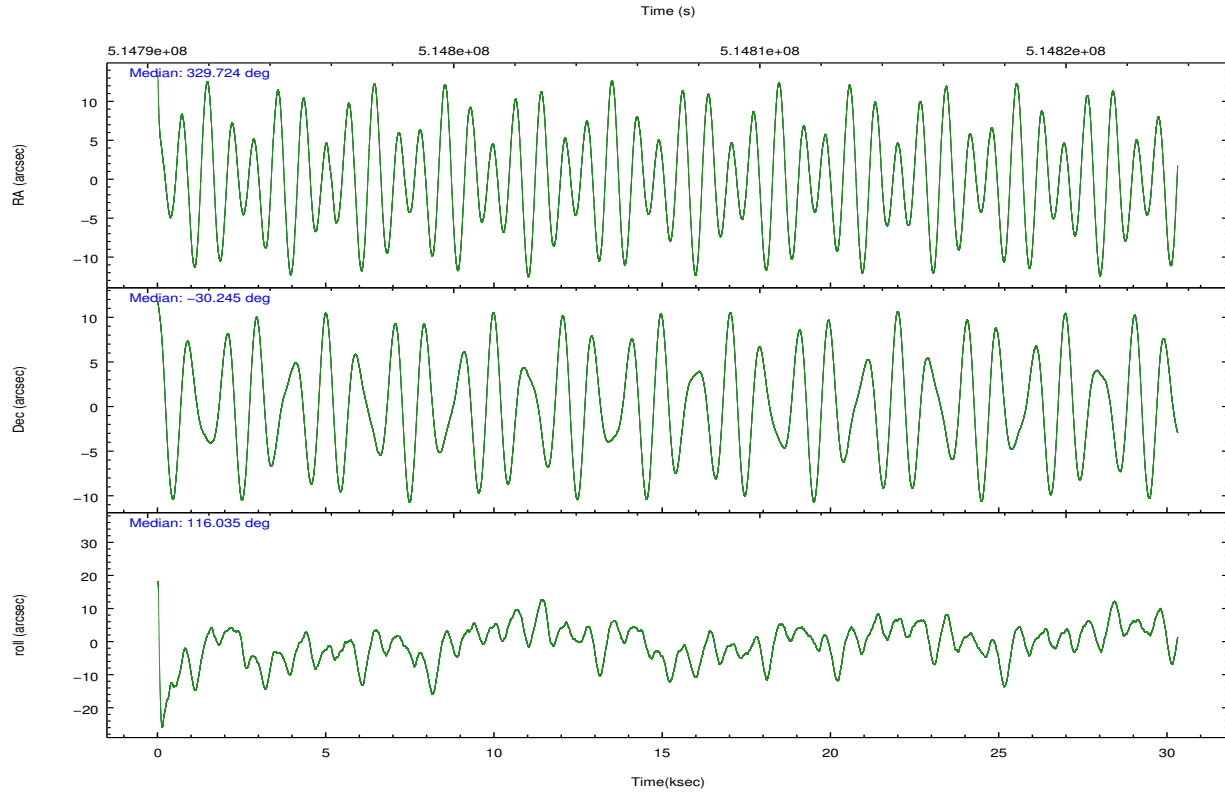
| | ccd 5 | ccd 6 | ccd 7 | ccd 8 | ccd 9 |
|----------------|-------|-------|-------|-------|-------|
| grade 0 events | 4185 | 9396 | 10224 | 2779 | 1085 |
| | 12% | 29% | 17% | 8% | 5% |
| grade 1 events | 62 | 17 | 189 | 13 | 12 |
| | 0% | 0% | 0% | 0% | 0% |
| grade 2 events | 4586 | 1547 | 10114 | 1776 | 543 |
| | 13% | 4% | 17% | 5% | 2% |
| grade 3 events | 1494 | 820 | 4751 | 981 | 485 |
| | 4% | 2% | 8% | 2% | 2% |
| grade 4 events | 1464 | 761 | 4620 | 942 | 494 |
| | 4% | 2% | 8% | 2% | 2% |
| grade 5 events | 2870 | 889 | 3187 | 1299 | 852 |
| | 8% | 2% | 5% | 3% | 4% |
| grade 6 events | 7377 | 771 | 11997 | 2458 | 565 |
| | 21% | 2% | 20% | 7% | 2% |
| grade 7 events | 12822 | 18122 | 12080 | 24381 | 16959 |
| | 36% | 56% | 21% | 70% | 80% |

2.2 Compared Parameters

| Parameter | Planned | Actual | Parameter | Planned | Actual |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument | ACIS | ACIS | Obspar format version number | 7 | 7 |
| Detector | ACIS-56789 | ACIS-56789 | Obspar file type | PREDICTED | ACTUAL |
| Grating | LETG | LETG | Obspar update status | NONE | UPDATED |
| Data mode | FAINT | FAINT | CCD I0 on | N | N |
| Observation mode | POINTING | POINTING | CCD I1 on | N | N |
| [deg] Pointing RA | 329.751053 | 329.7245517591548 | CCD I2 on | N | N |
| [deg] Pointing Dec | -30.260421 | -30.24545052045386 | CCD I3 on | N | N |
| [deg] Pointing Roll | 115.900399 | 116.0436938900117 | CCD S0 on | N | N |
| [s] Window start time (MET) | 512697667.184000 | 512697667.184000 | CCD S1 on | Y | Y |
| [s] Window stop time (MET) | 517881667.184000 | 517881667.184000 | CCD S2 on | Y | Y |
| [mm] SIM focus pos | -0.684267 | -0.6828225247311905 | CCD S3 on | Y | Y |
| [mm] SIM defocus | 0 | 0.001444936568705701 | CCD S4 on | Y | Y |
| [mm] SIM translation stage pos | -182.132523 | -182.1344861297048 | CCD S5 on | O1 | Y |
| [mm] SIM translation stage offset | -8 | -7.998036453302973 | Number of optional ACIS chips dropped | 0 | 0 |
| [s] Observation start time (MET) | 514792158.184000 | 514790853.41243 | On-chip summing requested | N | N |
| Observation start date | 2014-04-25T05:48:11 | 2014-04-25T05:27:33 | Subarray requested | CUSTOM | 1/8 |
| [s] Observation end time (MET) | 514822158.184000 | 514822845.7142 | Subarray start row | 113 | 113 |
| Observation end date | 2014-04-25T14:08:11 | 2014-04-25T14:20:45 | Subarray row count | 128 | 128 |
| Read mode | TIMED | TIMED | Alternating exposures requested | N | N |
| | | | [s] Primary exposure time | 0.000000 | 0.6 |

2.3 Aspect





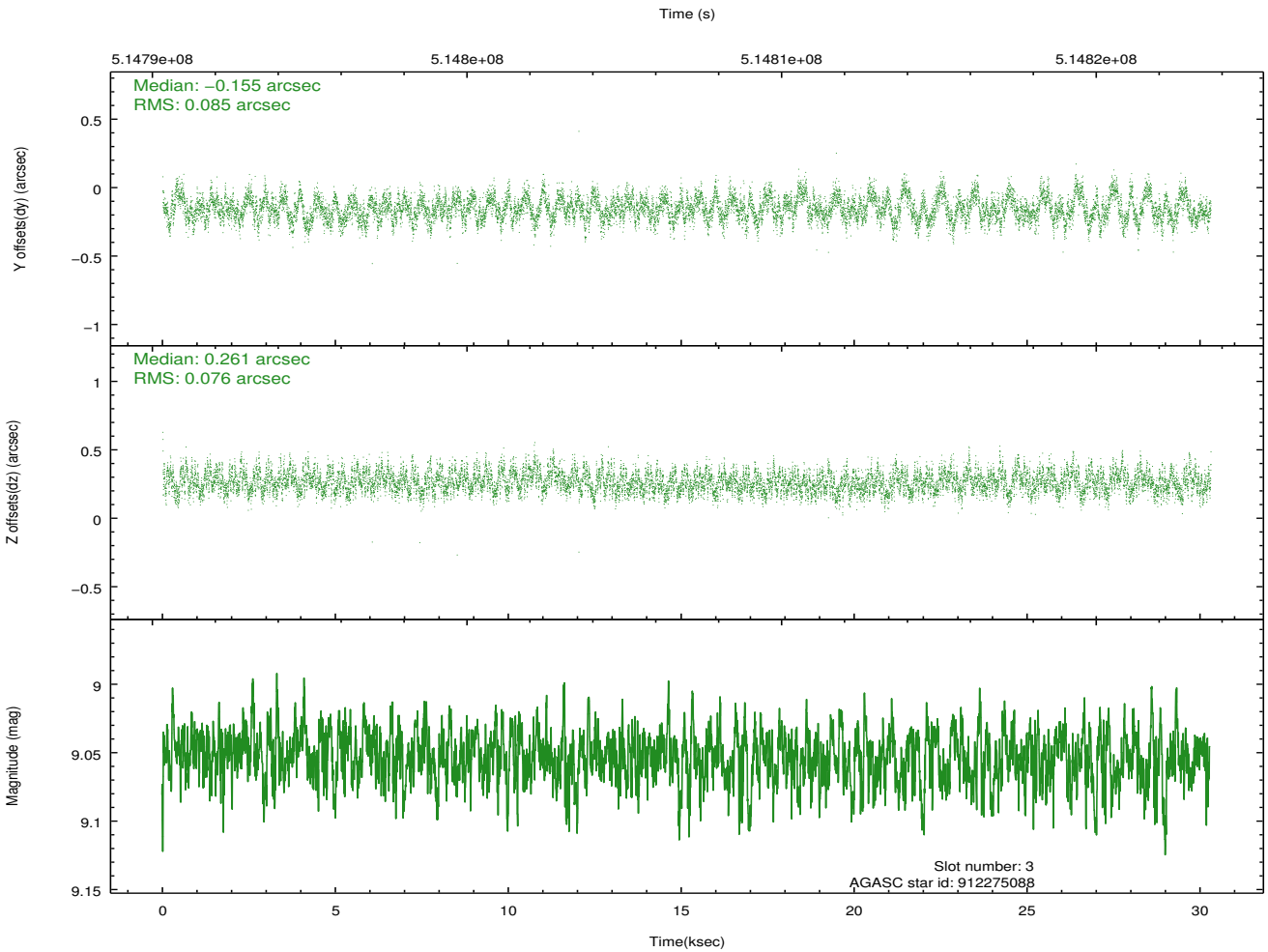
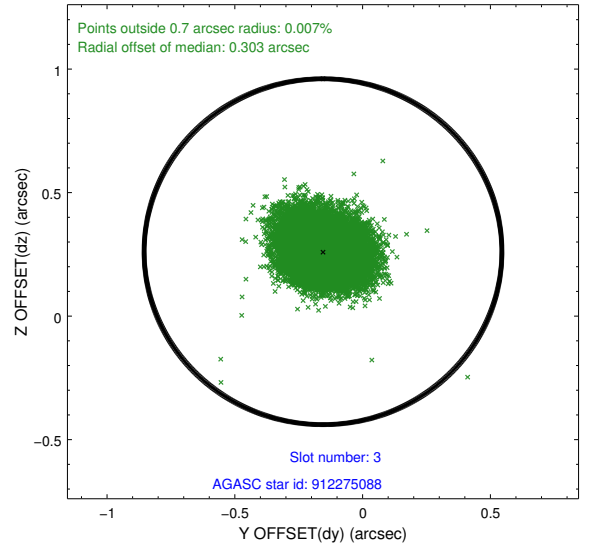
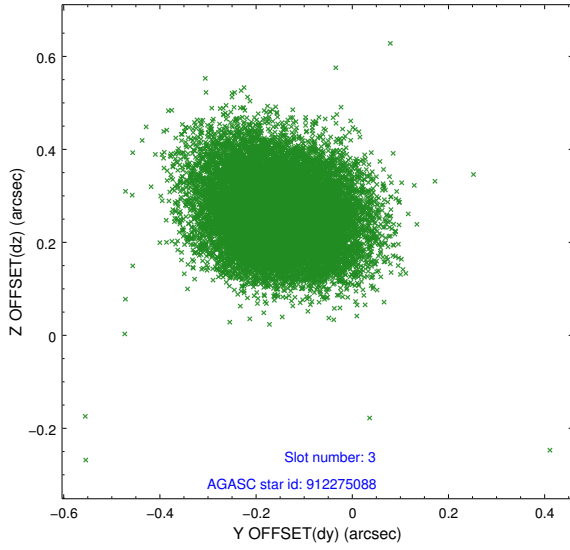
Slot Statistics

| slot | status | used | id | mag | n_pts | med_dy | med_dz | dr1 | dr2 | ra | dec | mean_y | mean_z |
|------|--------|------|-----------|------|-------|--------|--------|-------|-------|------------|------------|---------|----------|
| 0 | FID | | ACIS-S-2 | 6.92 | 7391 | -0.225 | -0.135 | 0.019 | 0.028 | 0.000000 | 0.000000 | -779.68 | -1909.22 |
| 1 | FID | | ACIS-S-4 | 7.00 | 7392 | 0.214 | 0.150 | 0.009 | 0.016 | 0.000000 | 0.000000 | 2134.06 | -0.65 |
| 2 | FID | | ACIS-S-6 | 7.22 | 7392 | -0.016 | -0.008 | 0.023 | 0.035 | 0.000000 | 0.000000 | 382.67 | 636.72 |
| 3 | GUIDE | used | 912275088 | 9.05 | 14769 | -0.155 | 0.261 | 0.122 | 0.194 | 329.619228 | -29.738698 | 1869.52 | -449.17 |
| 4 | GUIDE | used | 981468016 | 8.98 | 14777 | -0.196 | -0.300 | 0.110 | 0.178 | 328.842457 | -30.034984 | 1956.60 | 2197.57 |
| 5 | GUIDE | used | 981468128 | 9.34 | 14773 | 0.304 | 0.337 | 0.155 | 0.243 | 329.756350 | -30.158334 | 323.80 | -175.08 |
| 6 | GUIDE | used | 981478152 | 9.37 | 14772 | 0.086 | -0.198 | 0.129 | 0.206 | 329.415589 | -30.057192 | 1113.63 | 621.26 |
| 7 | GUIDE | used | 912131856 | 9.70 | 14719 | -0.038 | -0.100 | 0.145 | 0.239 | 328.758728 | -29.933690 | 2397.61 | 2276.85 |

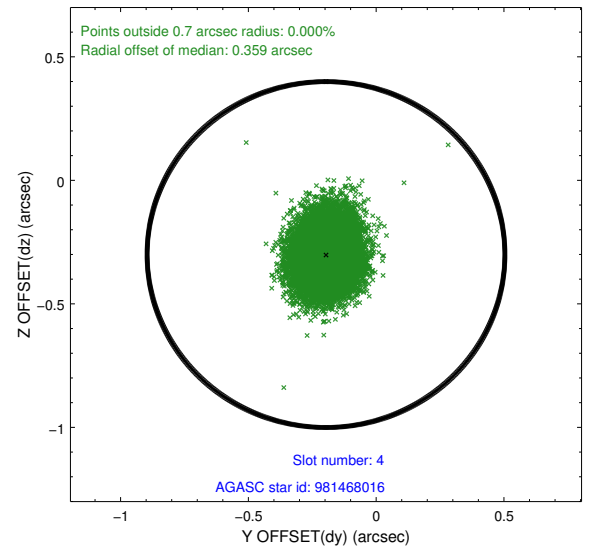
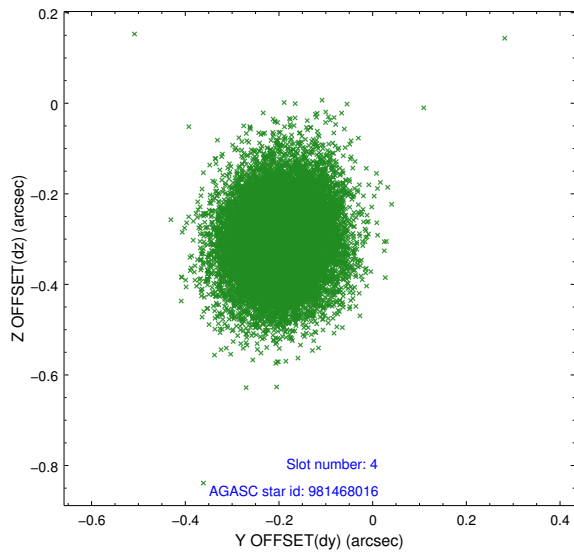
∞

2.4 Star Slots

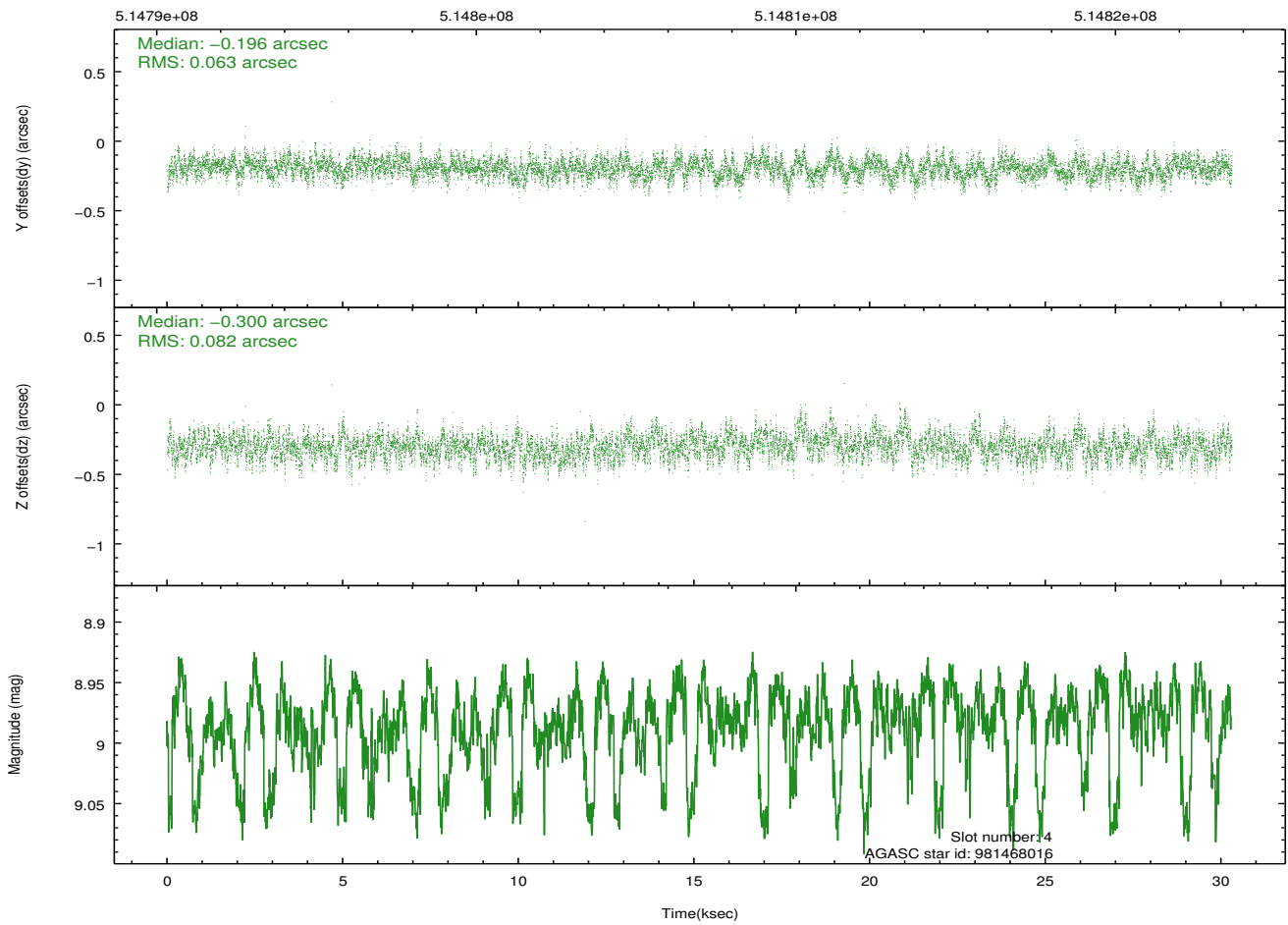
2.4.1 Slot 3



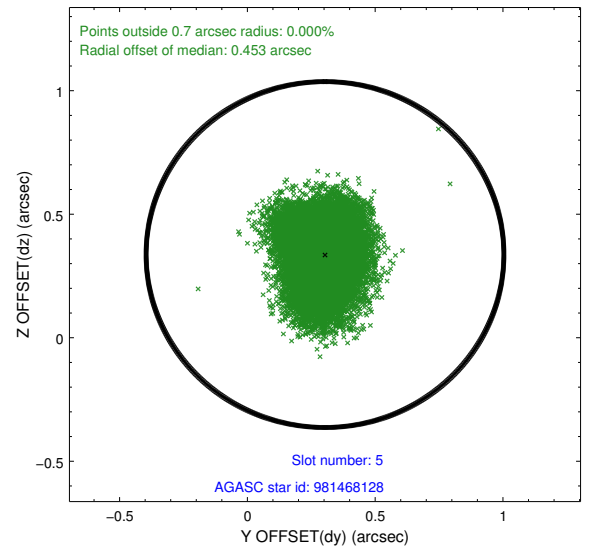
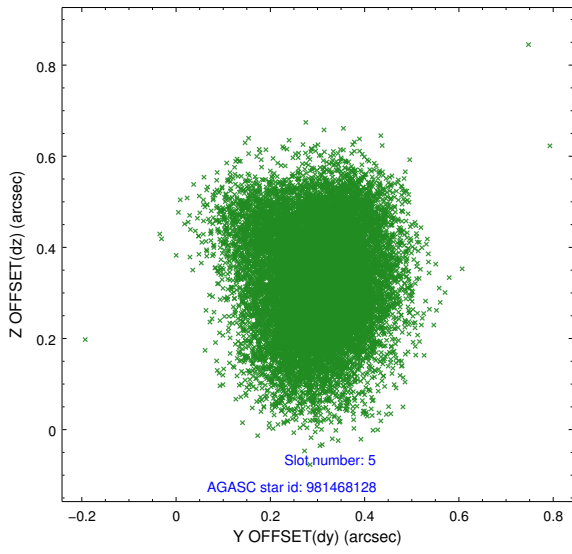
2.4.2 Slot 4



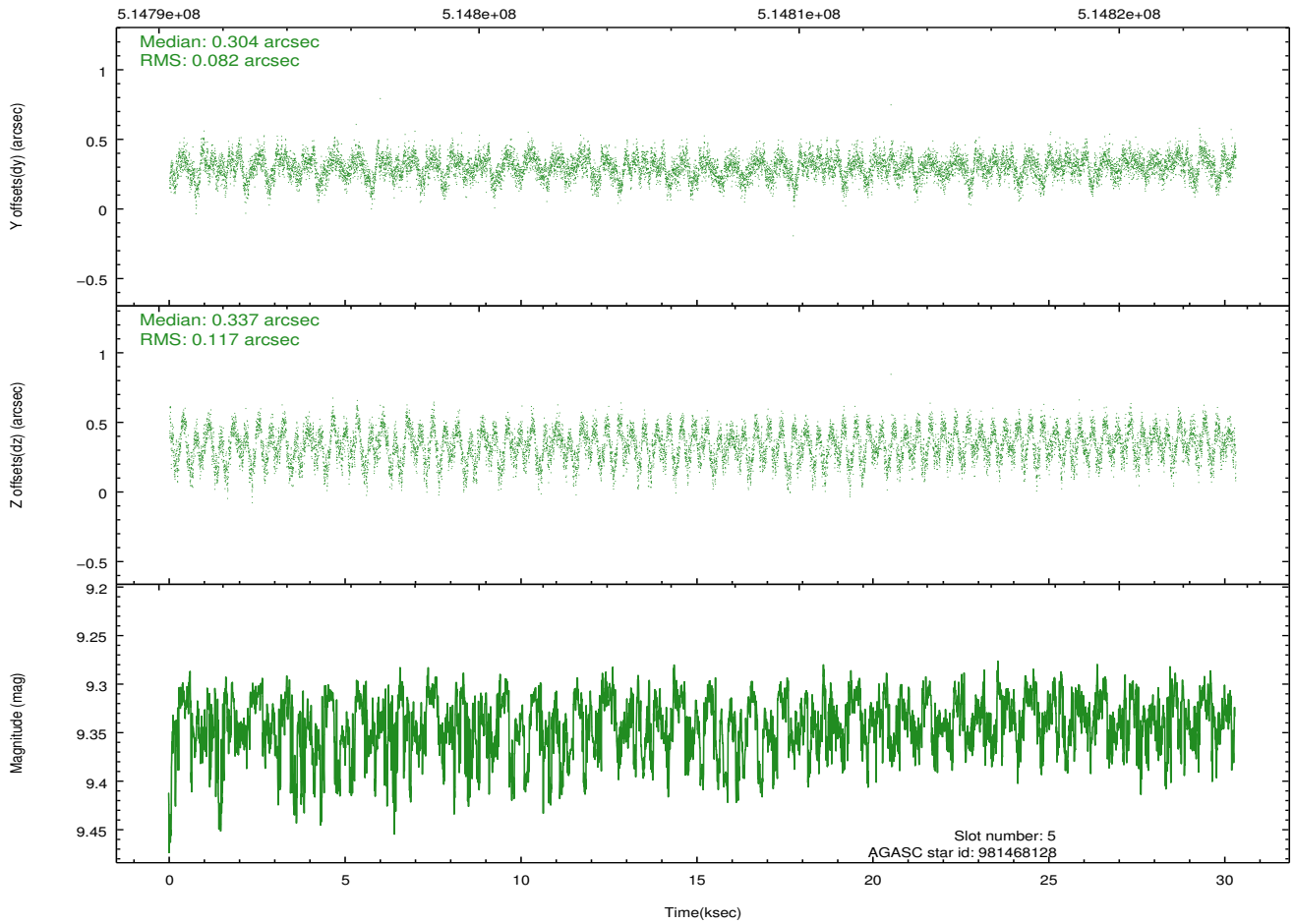
Time (s)



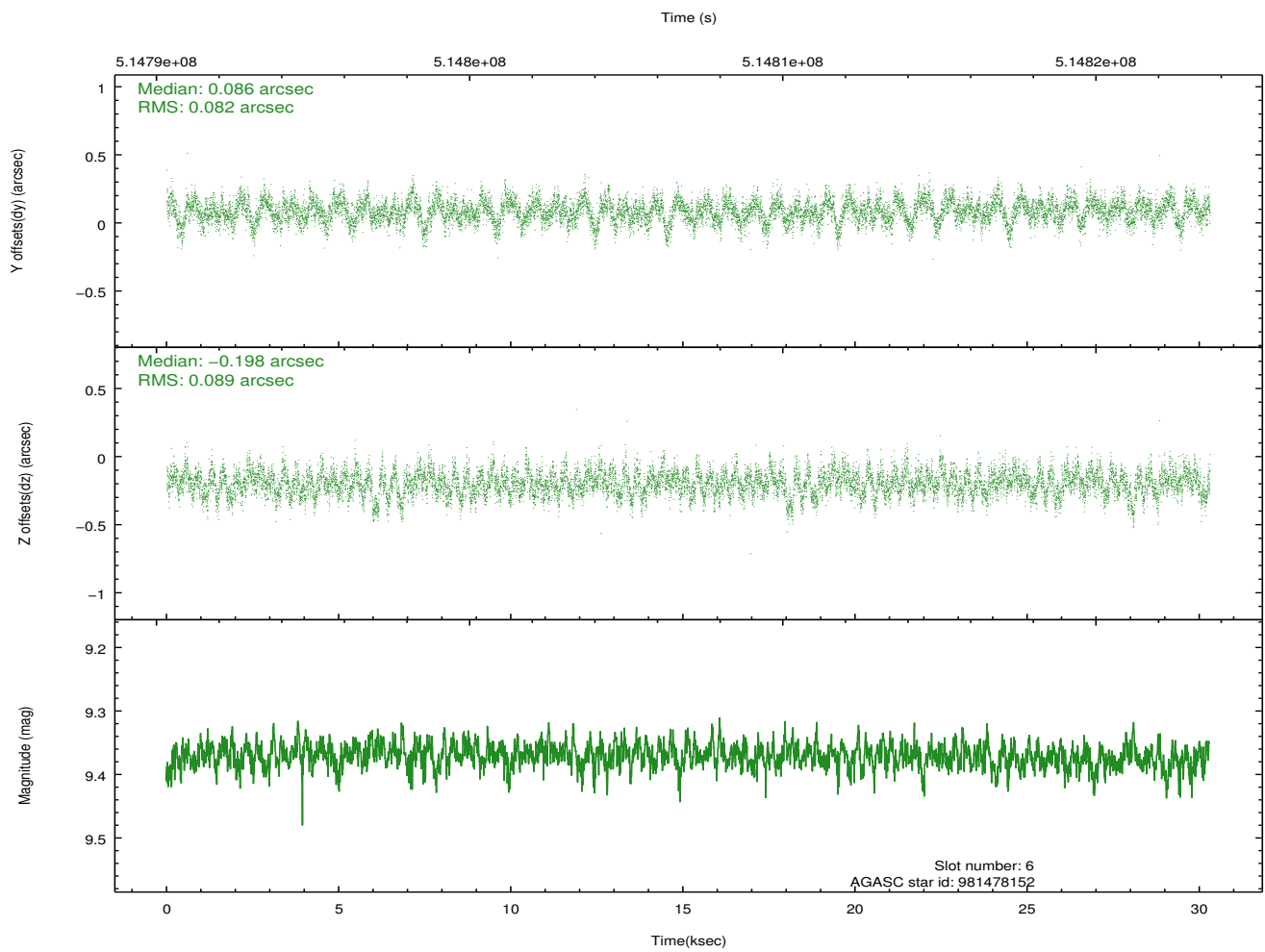
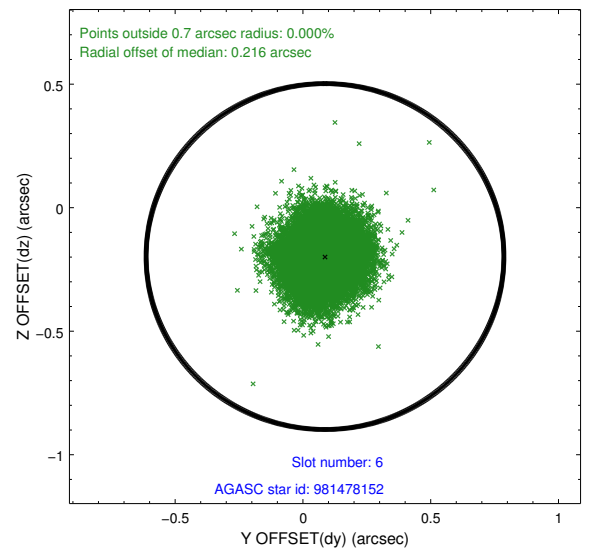
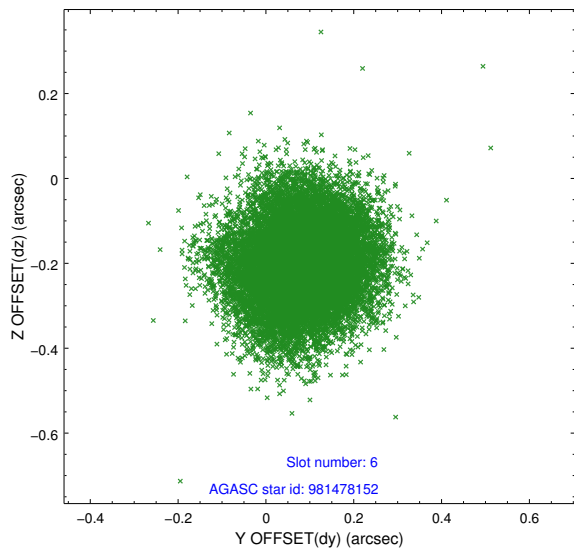
2.4.3 Slot 5



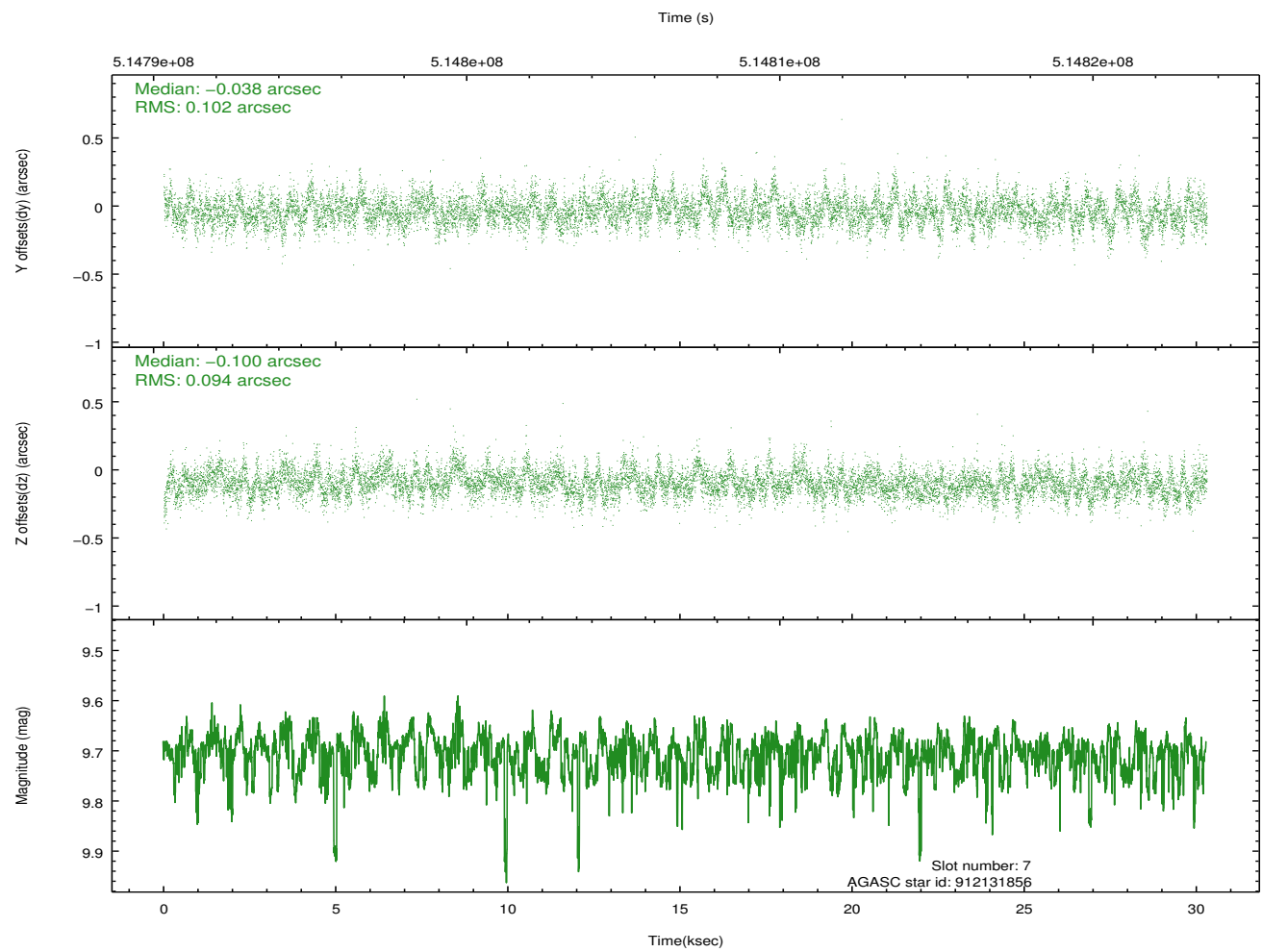
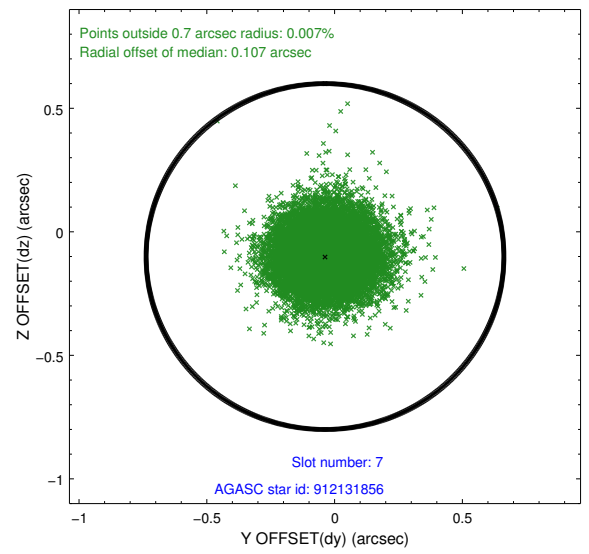
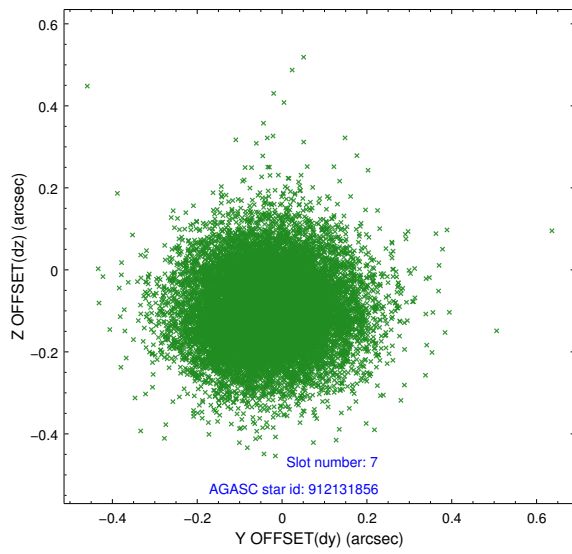
Time (s)



2.4.4 Slot 6

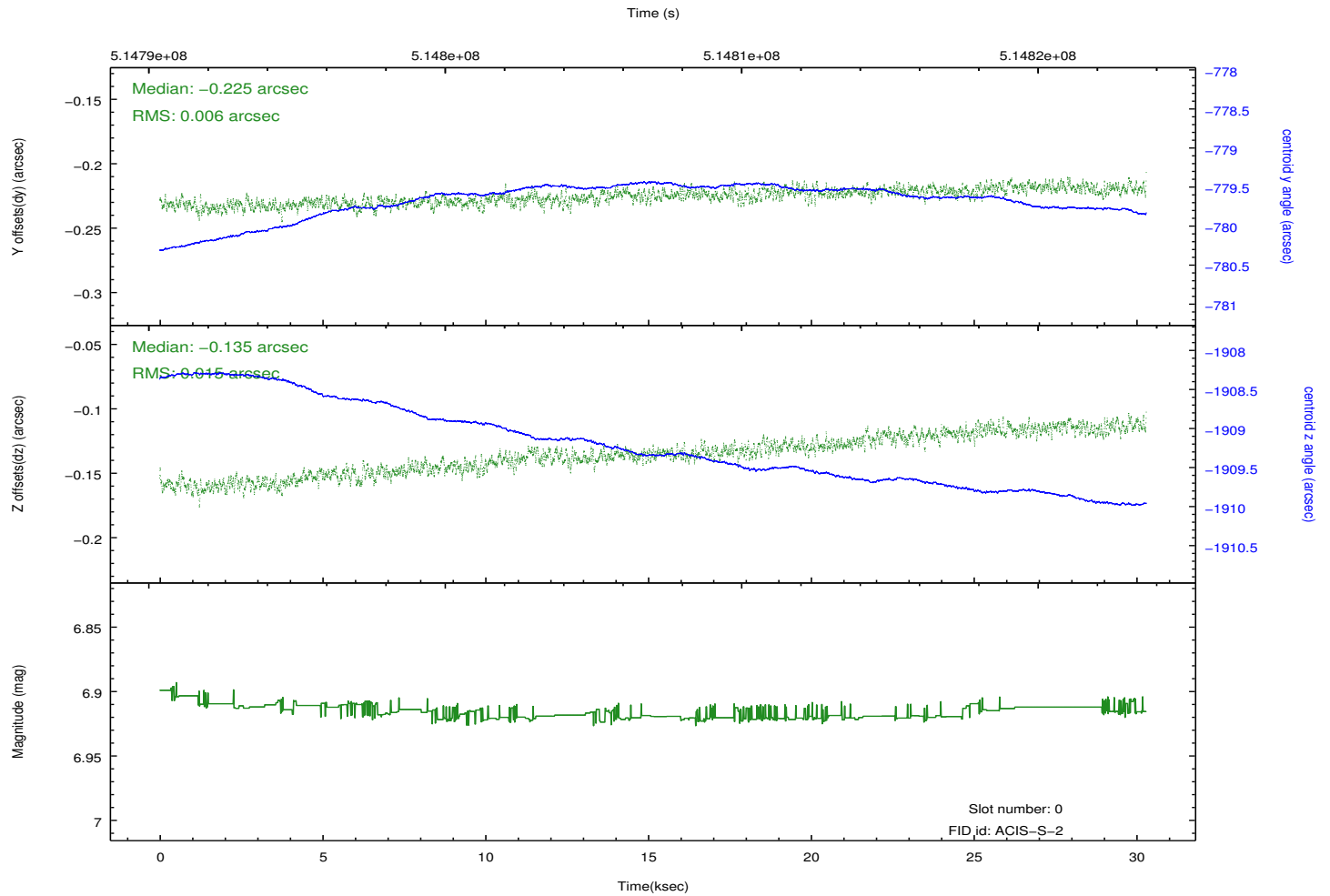
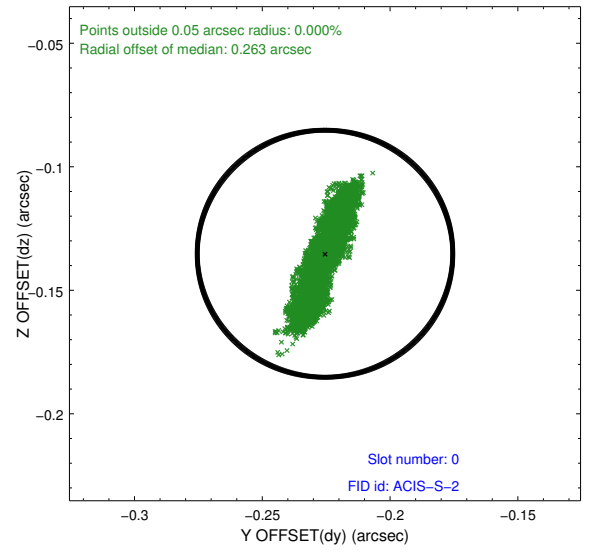
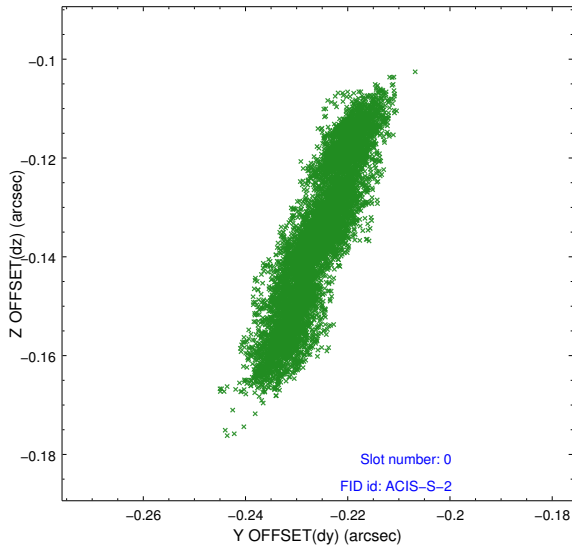


2.4.5 Slot 7

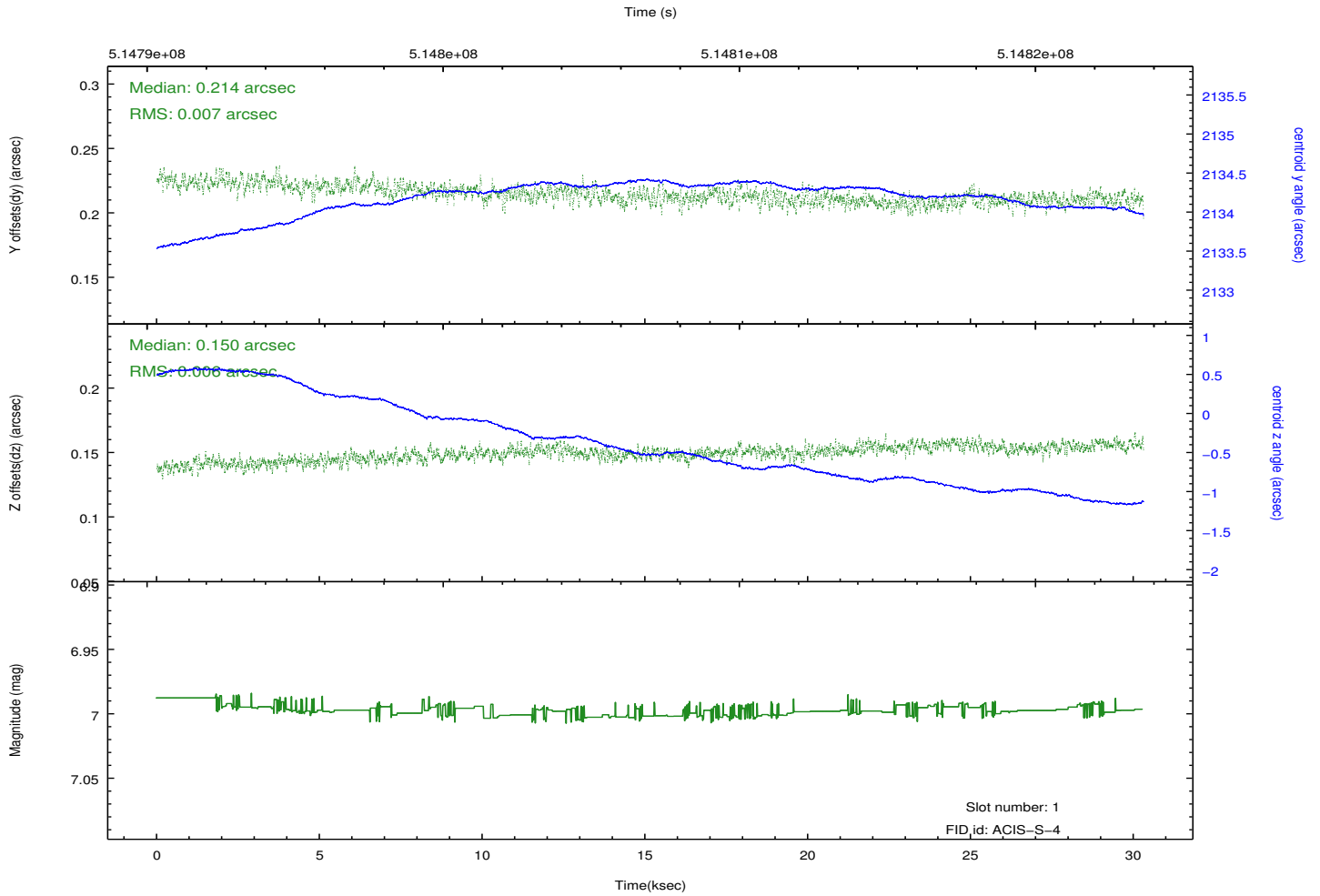
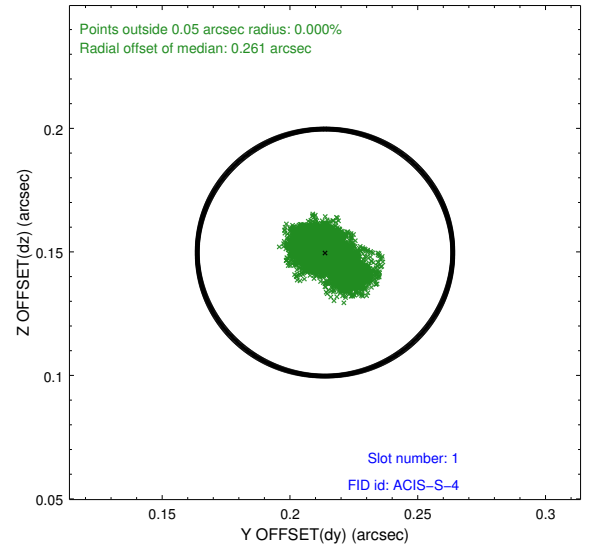
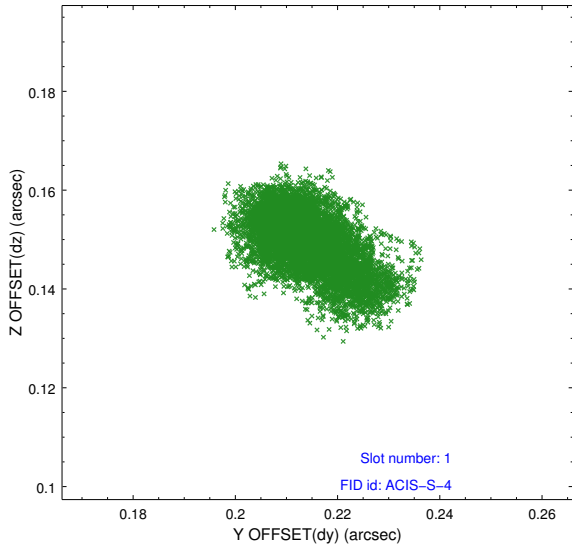


2.5 FID Slots

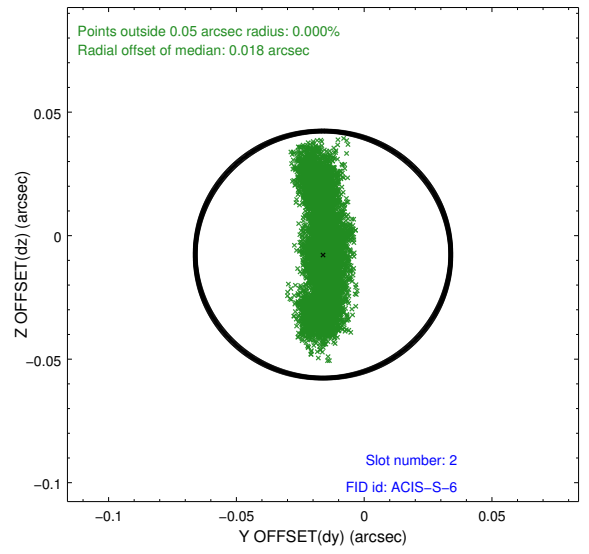
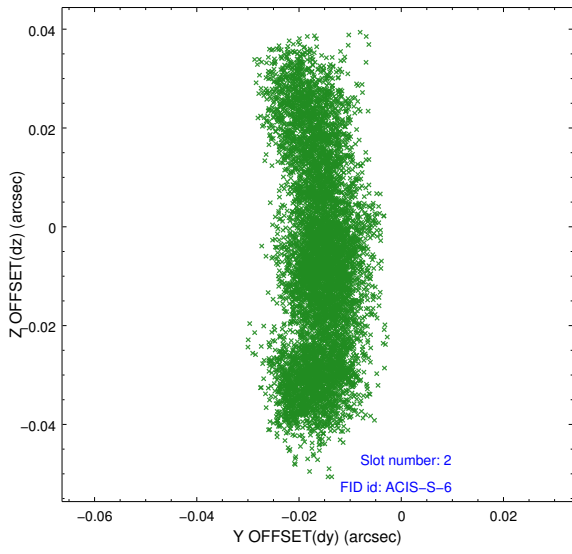
2.5.1 Slot 0



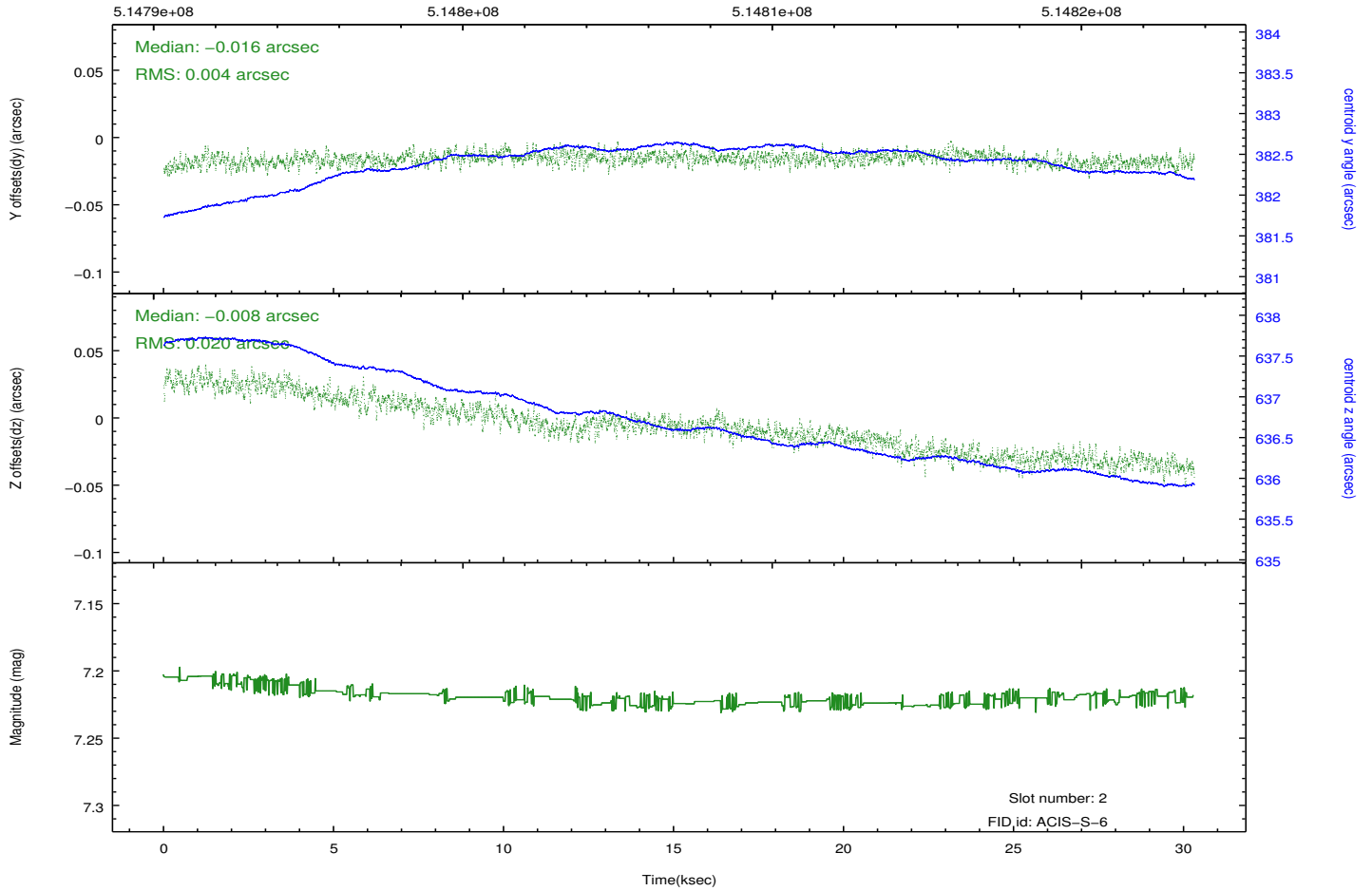
2.5.2 Slot 1



2.5.3 Slot 2

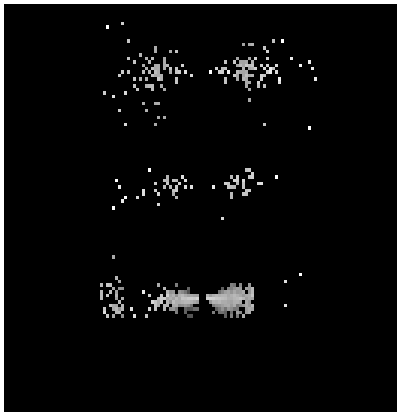


Time (s)

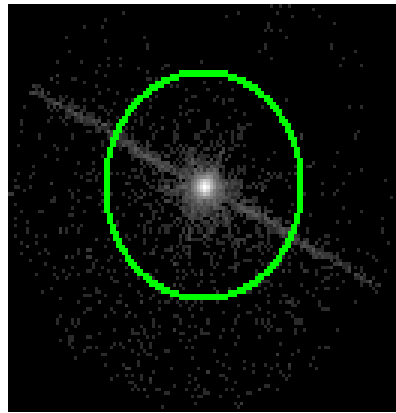


3 Gratings

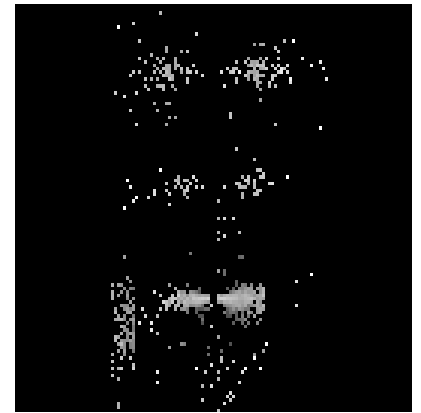
3.1 LETG Arm



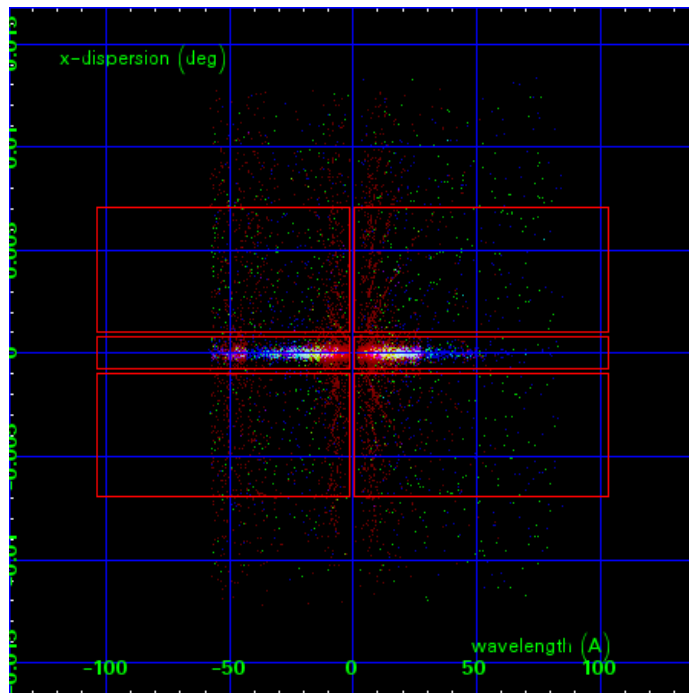
LETG Order Sort 123



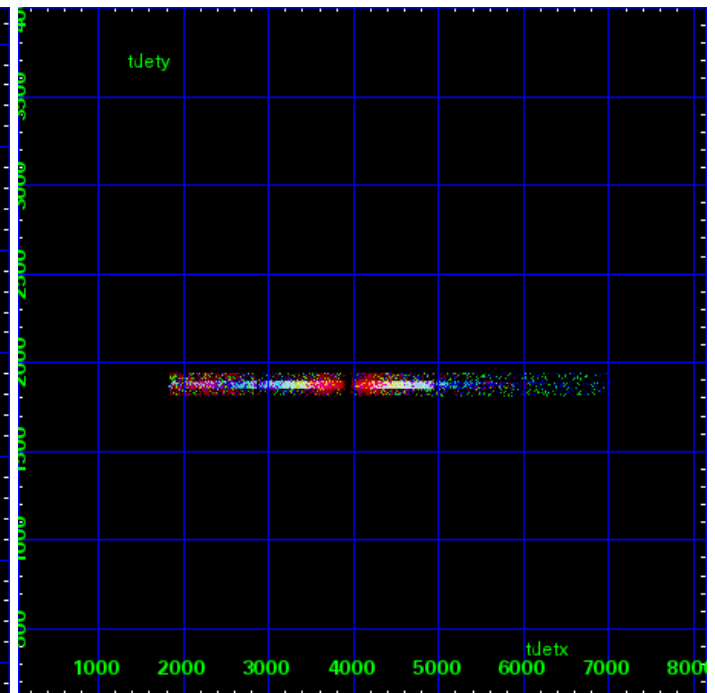
LETG Zero Order



LETG Order Sort ALL

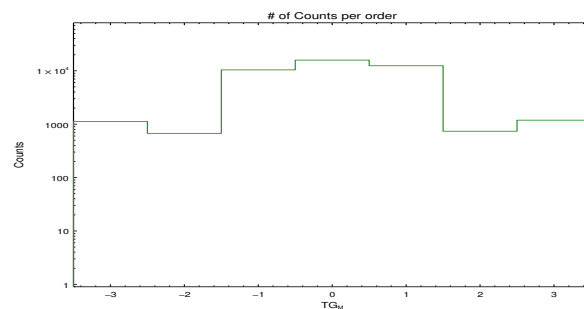


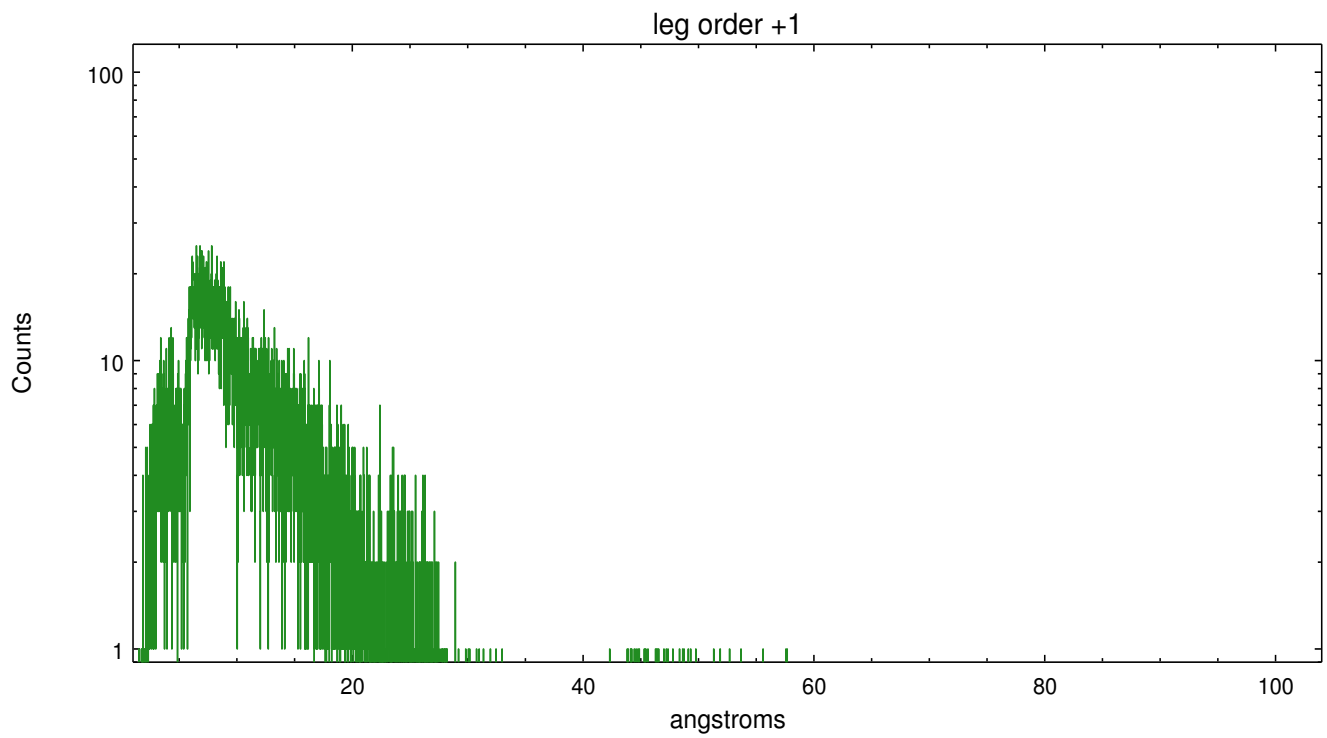
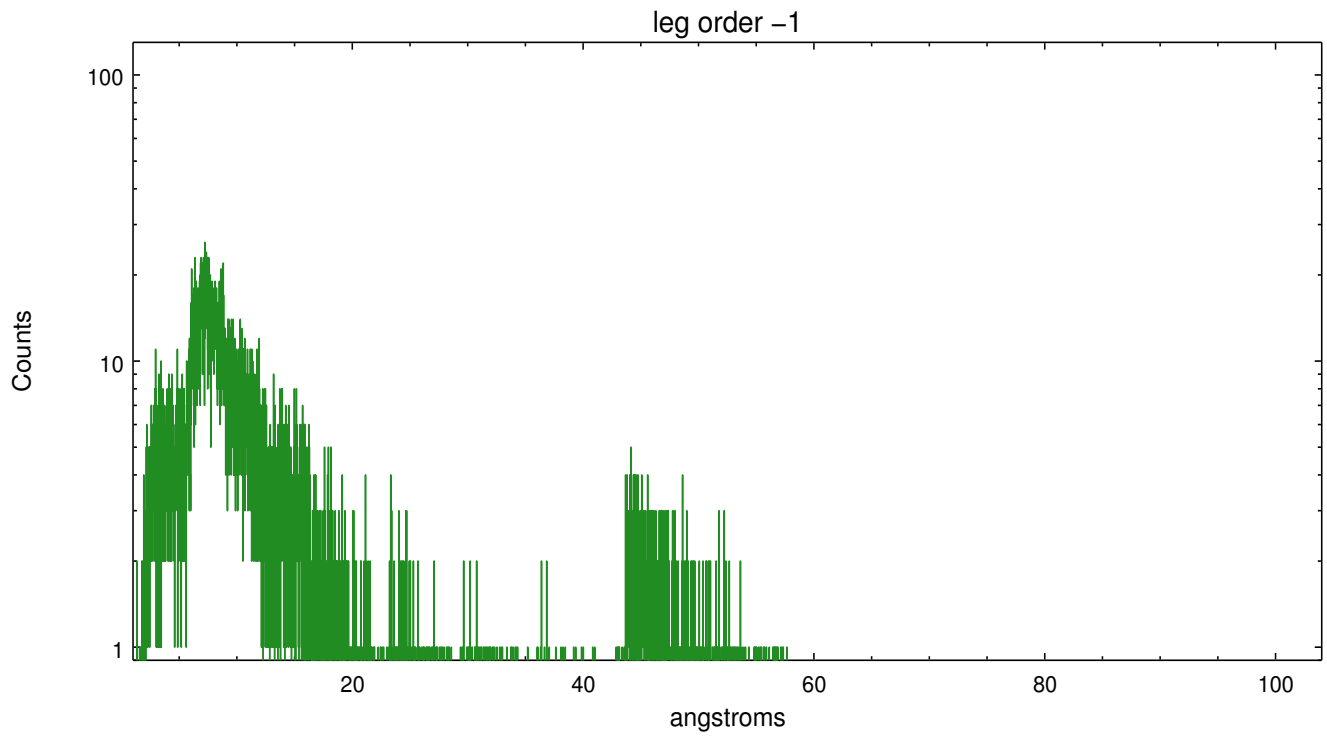
Spot Image LETG



Full Detector LETG

| | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 1118 | 673 | 10404 | 15863 | 12442 | 738 | 1189 |





A Summary

A.1 Status

| | |
|----------------------------|-----------------|
| V&V Scientist | Jen Lauer |
| V&V Date (YYYY-MM-DD) | 2015.11.05 |
| V&V Edition | 1 |
| V&V Disposition and Status | OK |
| V&V Charge Time | 30.066001194715 |

A.2 Comments

These data have been reprocessed with new aspect alignment calibration files that correct small mean offsets (up to 0.4 arcsecs) and improve overall astrometric accuracy. The new calibration was determined using data from the time period being reprocessed and was performed using cross-correlation of X-ray sources with radio and optical counterparts.

=====

Window constraint met.

=====

Gain and CTI correction are not well calibrated on CCD_ID 5 (ACIS-S1). Default order sorting can clip some regions, particularly longward of 30A (first order). User-specified custom processing parameters may be required in `tg_resolve_events` (`osipfile=None`, `osort_lo`, `osort_hi ~0.5`) though this can allow more zeroth order background at short wavelengths.

=====

The source's zeroth order falls very close to the gap between the CCD chips. Any suggestion of source variability should consider this possibility. Dithering over the chip boundary can give a false indication of variability.