

V&V Reference Report

L2 ASCDS Version : 10.7

Observation 21970 - L2 Version 2
Chandra X-Ray Center

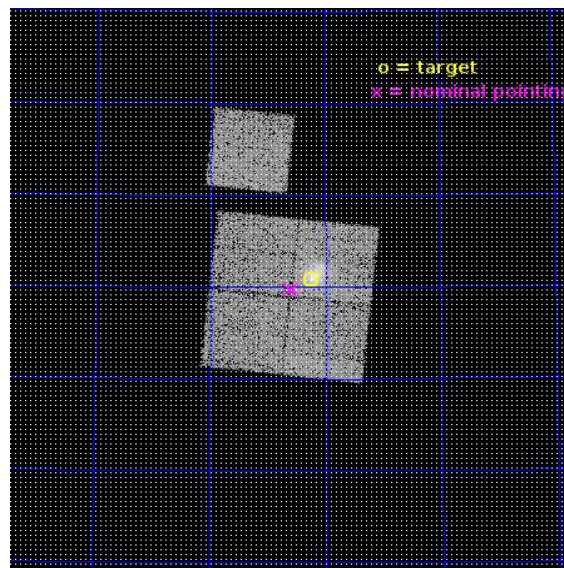
L2 Processing Date : Dec 7 2018

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1 Front

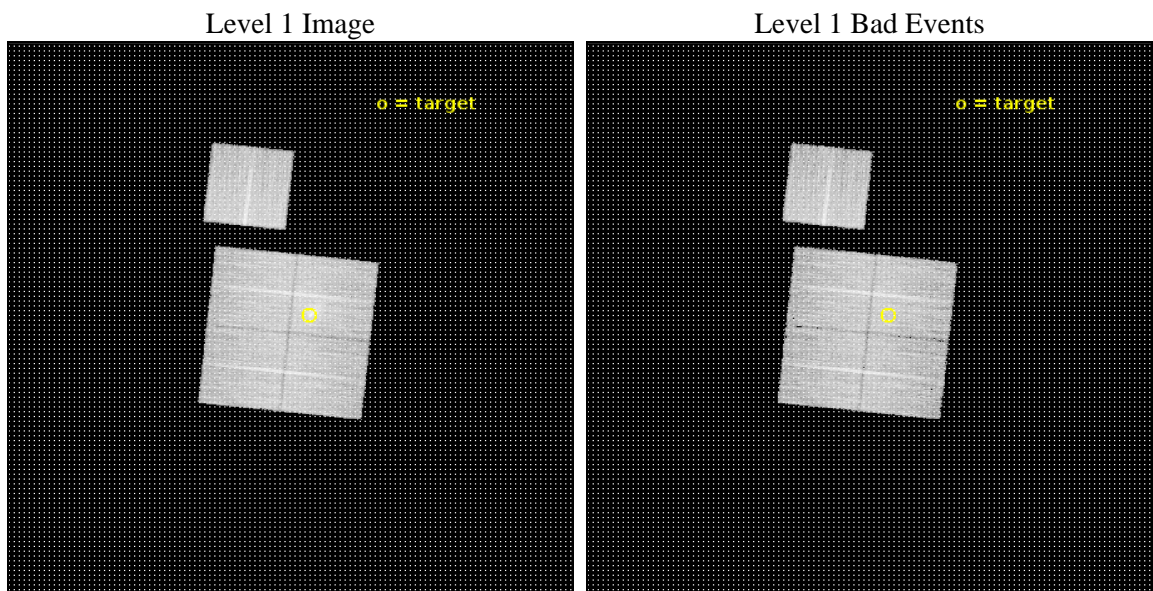
| | | |
|----------|---|---|
| seq_num | 801762 | Sequence number |
| obs_id | 21970 | Observation id |
| title | Shock structure, the electron-ion equilibration timescale and the disintegrating cool core in A2146 | Proposal title |
| observer | Helen Russell | Principal investigator |
| object | Abell 2146 | Source name |
| dtcycle | 0 | |
| cycle | P | events from which exps? Prim/Second/Both |
| ra_targ | 239.06125 | Observer's specified target RA [deg] |
| dec_targ | 66.346917 | Observer's specified target Dec [deg] |
| ra_nom | 239.14764249399 | Nominal RA [deg] |
| dec_nom | 66.32861213204 | Nominal Dec [deg] |
| roll_nom | 6.1295375292844 | Nominal Roll [deg] |
| revision | 2 | Processing version of data |
| ontime | 13134.700101137 | Sum of GTIs [s] |
| livetime | 12963.08557469 | Livetime [s] |
| ontime0 | 13131.559150815 | Sum of GTIs [s] |
| ontime1 | 13131.559111118 | Sum of GTIs [s] |
| ontime2 | 13134.700101137 | Sum of GTIs [s] |
| ontime3 | 13134.700101137 | Sum of GTIs [s] |
| ontime6 | 13134.700101137 | Sum of GTIs [s] |
| l2events | 54623 | Number of level 2 events |



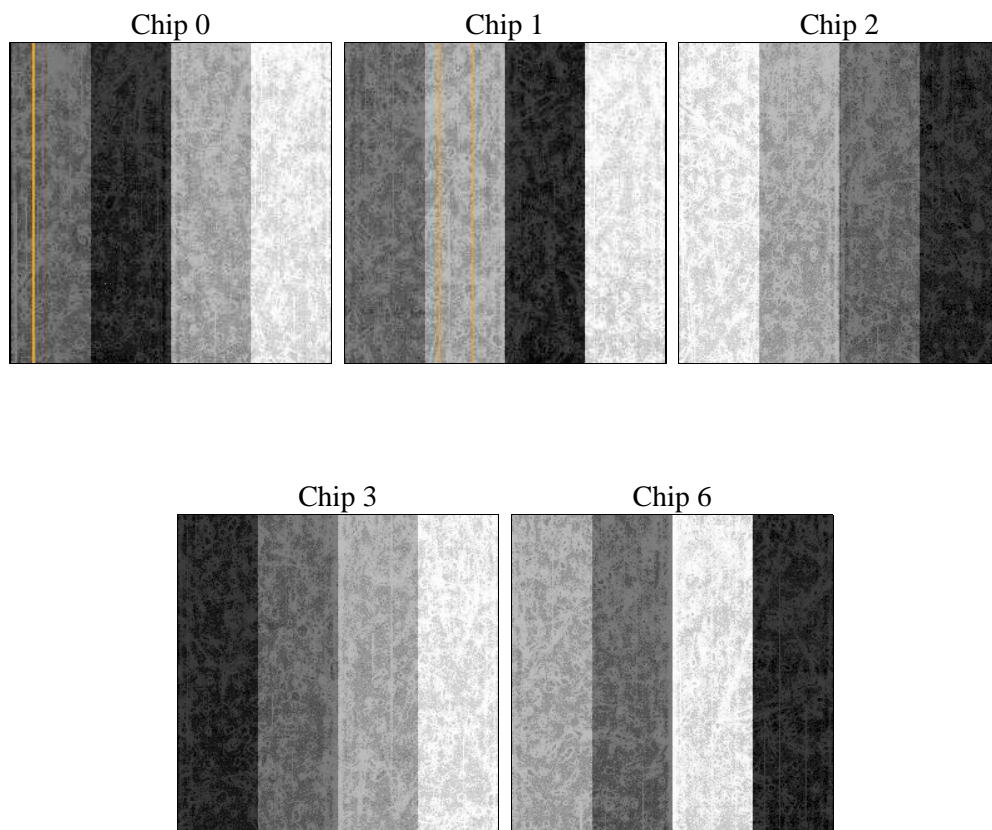
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

| | | | | | |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num | 0 | Obi number | sched_exp_time | 13066.482000 | [s] Scheduled observation exposure time |
| ascdsver | 10.7 | Processing system revision | ontime | 13134.700101137 | Sum of GTIs [s] |
| caldsver | 4.8.0.1 | | ontime0 | 13131.559150815 | Sum of GTIs [s] |
| date | 2018-12-08T00:34:53 | Date and time of file creation | ontime1 | 13131.559111118 | Sum of GTIs [s] |
| revision | 2 | Processing version of data | ontime2 | 13134.700101137 | Sum of GTIs [s] |
| | | | ontime3 | 13134.700101137 | Sum of GTIs [s] |
| | | | ontime6 | 13134.700101137 | Sum of GTIs [s] |
| | | | l1events | 495789 | Number of level 1 events |

2.1.4 Events

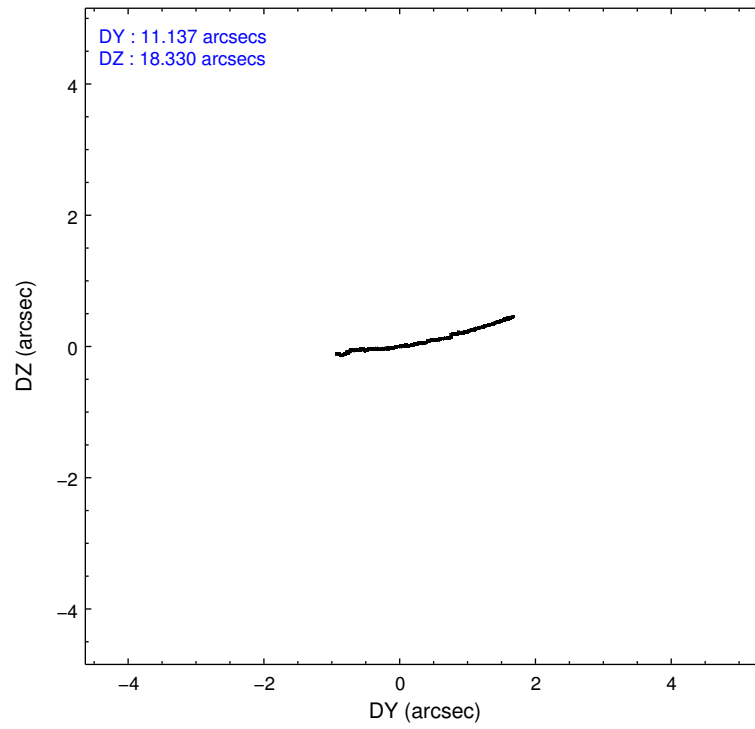
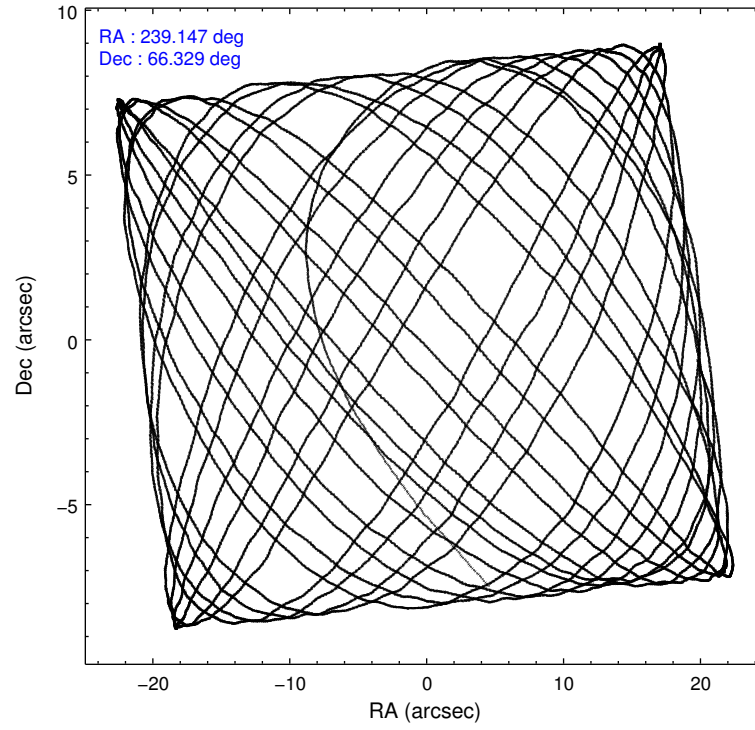
| | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 |
|-----------------|-------|-------|-------|--------|--------|
| level 1 events | 94346 | 92660 | 98910 | 106270 | 103603 |
| rejected events | 82869 | 80263 | 87759 | 88897 | 92286 |
| rejected % | 87% | 86% | 88% | 83% | 89% |

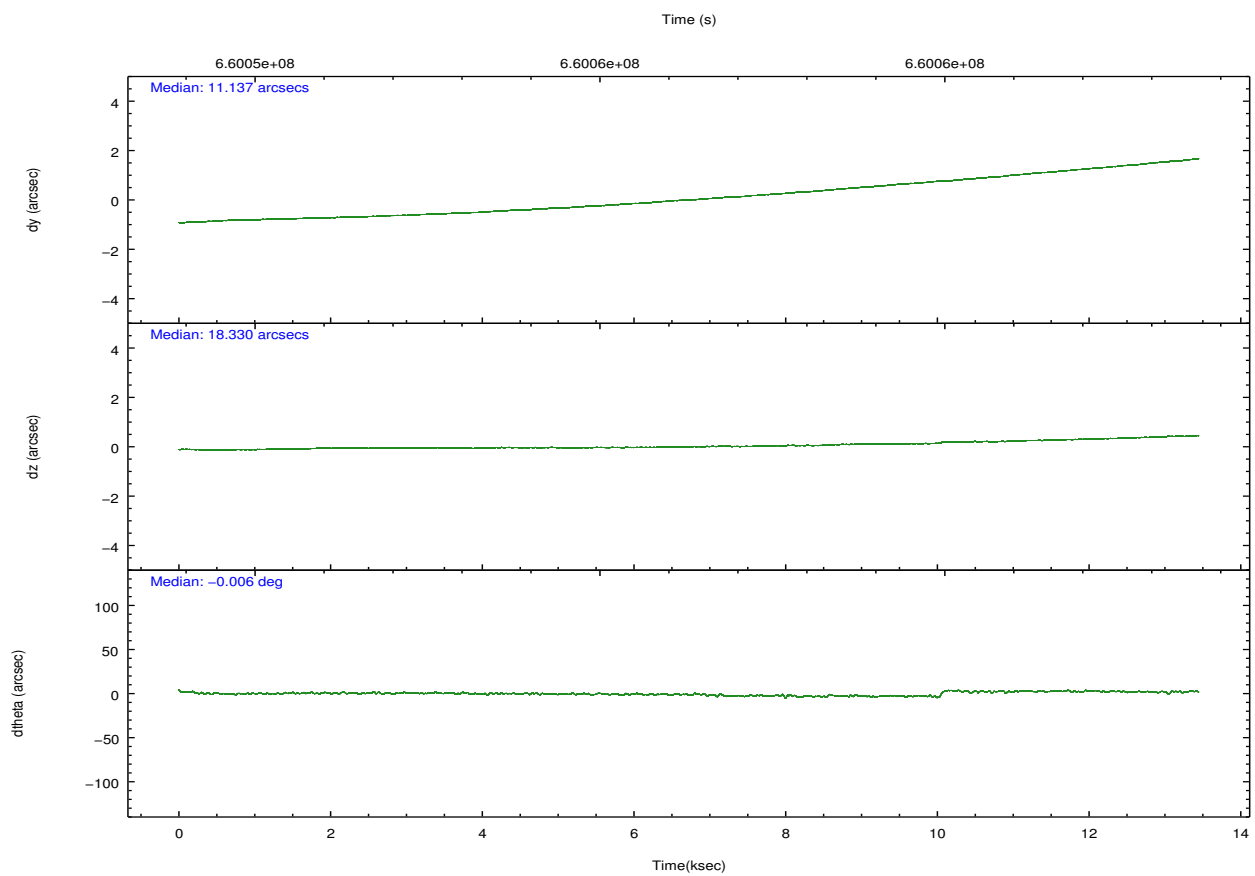
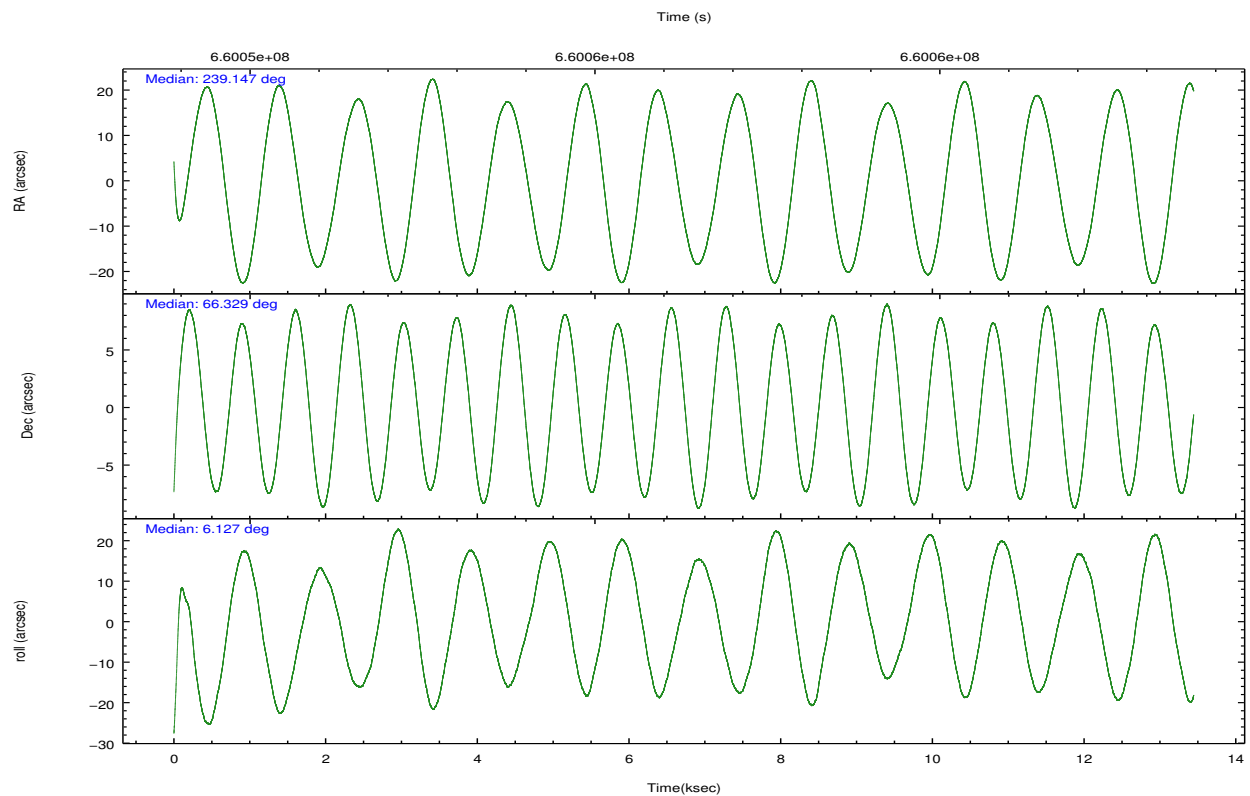
| | ccd 0 | ccd 1 | ccd 2 | ccd 3 | ccd 6 |
|----------------|-------|-------|-------|-------|-------|
| grade 0 events | 3826 | 4126 | 3913 | 9213 | 3718 |
| | 4% | 4% | 3% | 8% | 3% |
| grade 1 events | 52 | 63 | 55 | 101 | 50 |
| | 0% | 0% | 0% | 0% | 0% |
| grade 2 events | 3017 | 3199 | 2860 | 3115 | 2693 |
| | 3% | 3% | 2% | 2% | 2% |
| grade 3 events | 1160 | 1126 | 1096 | 1309 | 1148 |
| | 1% | 1% | 1% | 1% | 1% |
| grade 4 events | 1120 | 1201 | 1127 | 1291 | 1148 |
| | 1% | 1% | 1% | 1% | 1% |
| grade 5 events | 4431 | 4460 | 4103 | 4686 | 4574 |
| | 4% | 4% | 4% | 4% | 4% |
| grade 6 events | 2357 | 2749 | 2157 | 2451 | 2612 |
| | 2% | 2% | 2% | 2% | 2% |
| grade 7 events | 78383 | 75736 | 83599 | 84104 | 87660 |
| | 83% | 81% | 84% | 79% | 84% |

2.2 Compared Parameters

| Parameter | Planned | Actual | Parameter | Planned | Actual |
|-----------------------------------|---------------------|-----------------------|---------------------------------------|-----------|---------|
| Instrument | ACIS | ACIS | Obspar format version number | 7 | 7 |
| Detector | ACIS-01236 | ACIS-01236 | Obspar file type | PREDICTED | ACTUAL |
| Grating | NONE | NONE | Obspar update status | NONE | UPDATED |
| Data mode | VFAINT | VFAINT | CCD I0 on | Y | Y |
| Observation mode | POINTING | POINTING | CCD I1 on | Y | Y |
| [deg] Pointing RA | 239.092238 | 239.147642493986 | CCD I2 on | Y | Y |
| [deg] Pointing Dec | 66.312251 | 66.32861213204026 | CCD I3 on | Y | Y |
| [deg] Pointing Roll | 5.971616 | 6.129537529284399 | CCD S0 on | N | N |
| [mm] SIM focus pos | -0.782348 | -0.7809083437167272 | CCD S1 on | N | N |
| [mm] SIM defocus | 0 | 0.001439871863259334 | CCD S2 on | O1 | Y |
| [mm] SIM translation stage pos | -233.592463 | -233.5874344608287 | CCD S3 on | N | N |
| [mm] SIM translation stage offset | 0 | -0.005018542100998502 | CCD S4 on | N | N |
| [s] Observation start time (MET) | 660049927.184000 | 660048828.26728 | CCD S5 on | N | N |
| Observation start date | 2018-12-01T11:10:58 | 2018-12-01T10:53:48 | Number of optional ACIS chips dropped | 0 | 0 |
| [s] Observation end time (MET) | 660062994.184000 | 660063916.26818 | On-chip summing requested | N | N |
| Observation end date | 2018-12-01T14:48:45 | 2018-12-01T15:05:16 | Subarray requested | NONE | NONE |
| Read mode | TIMED | TIMED | Alternating exposures requested | N | N |
| | | | [s] Primary exposure time | 0.000000 | 3.1 |

2.3 Aspect



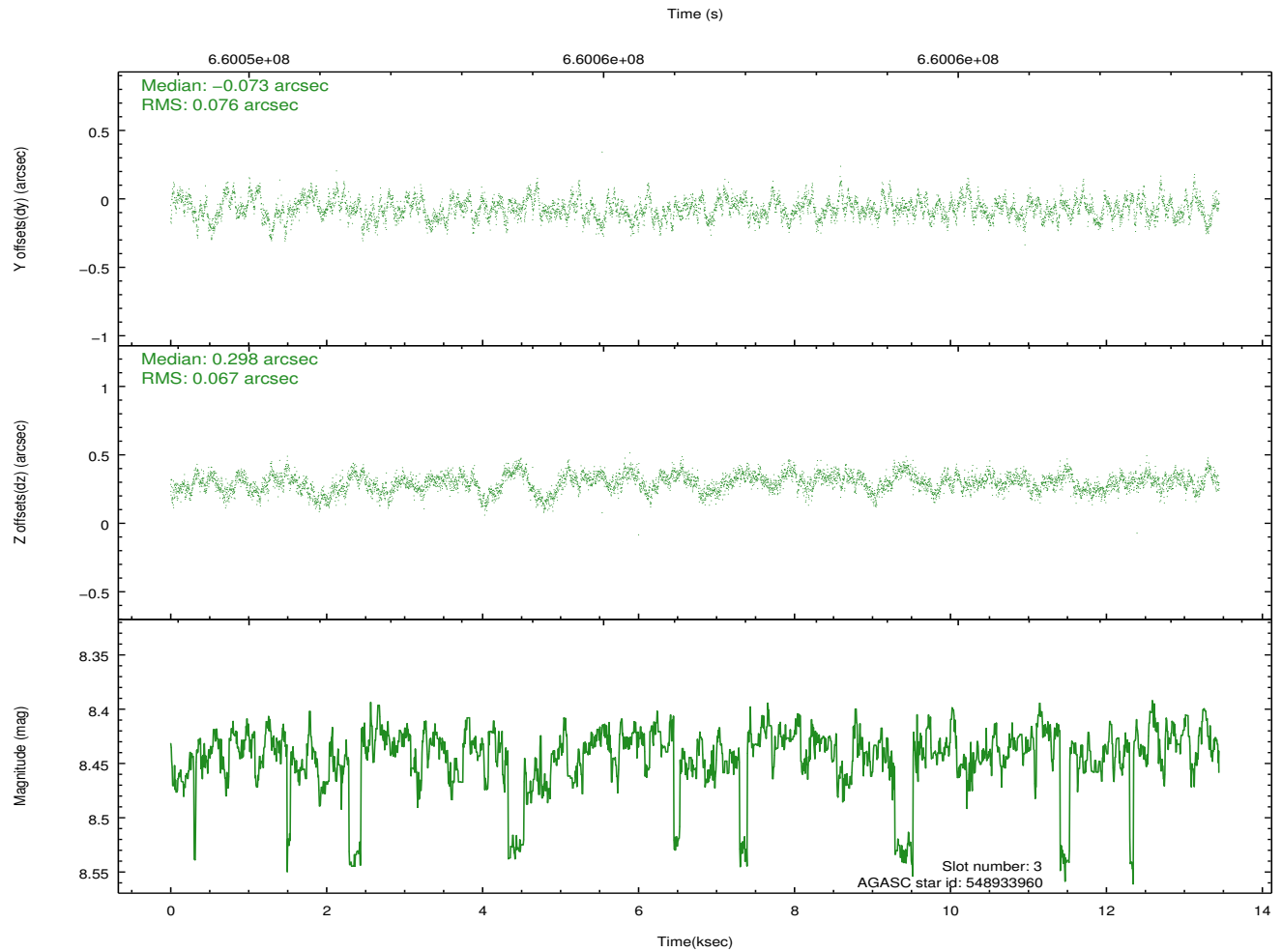
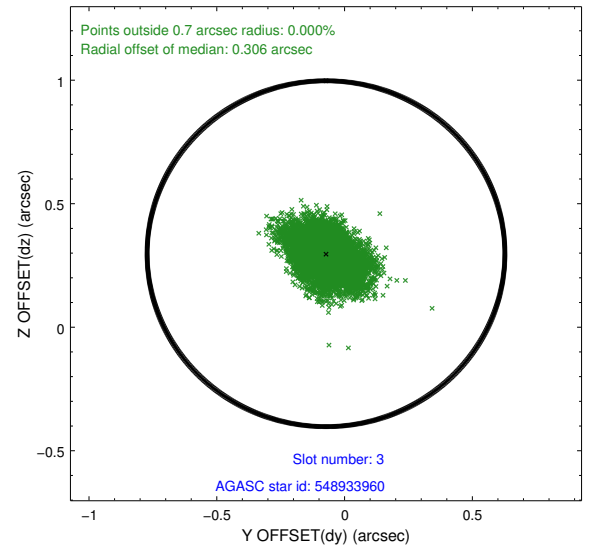
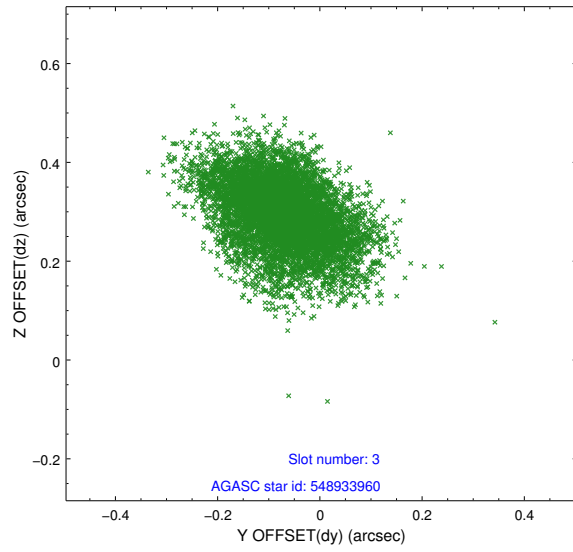


Slot Statistics

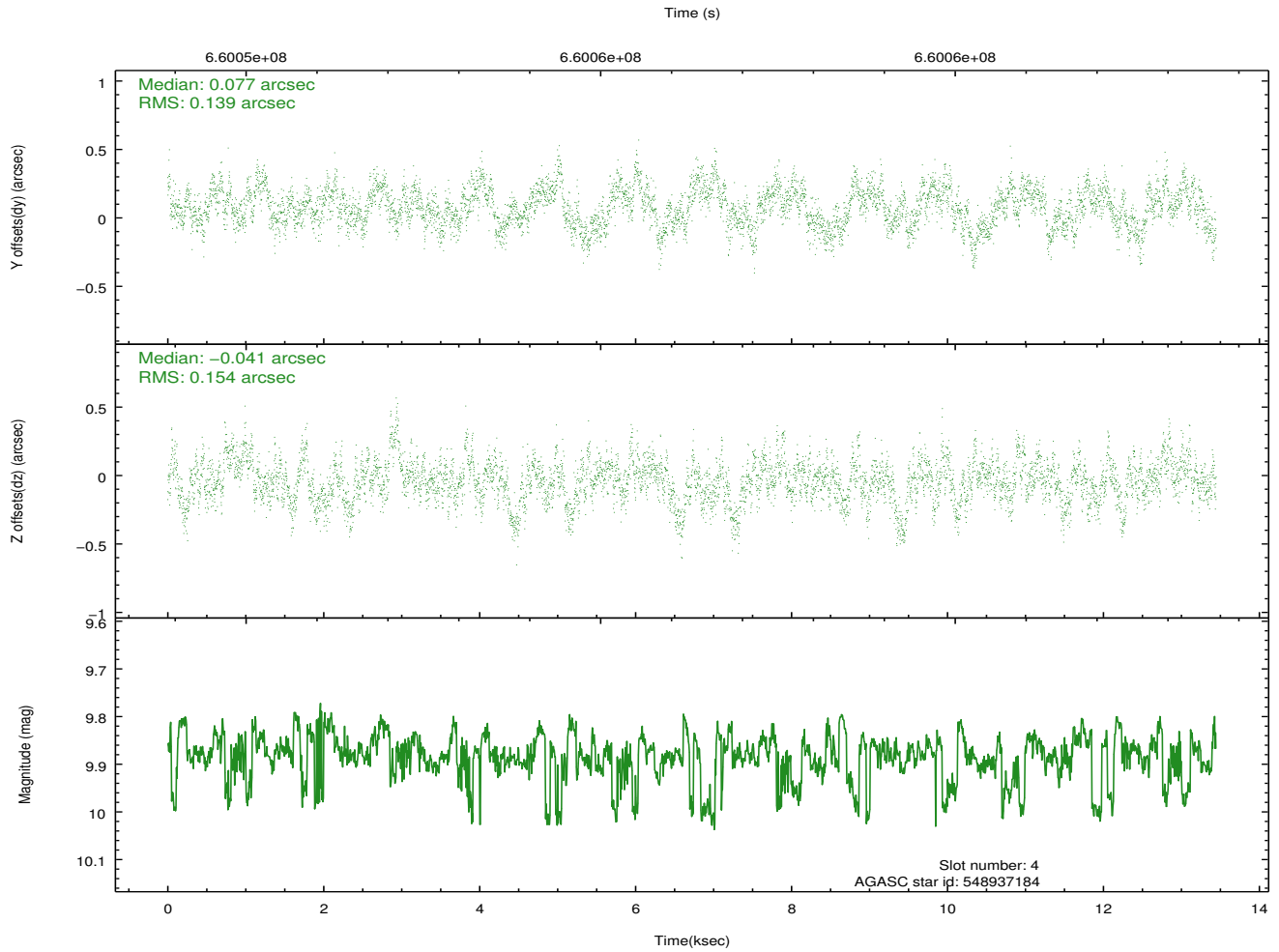
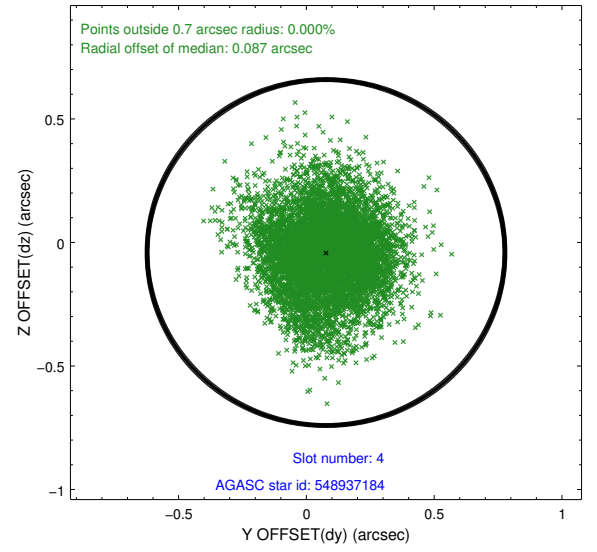
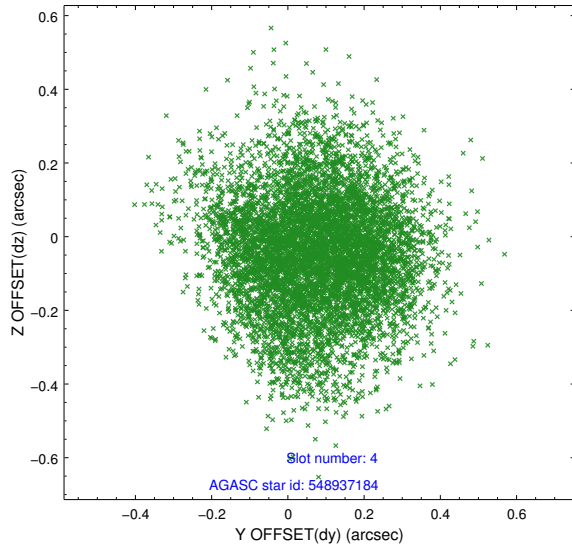
| pt | status | used | id | mag | n_pts | frac_pts | med_dy | med_dz | dr1 | dr2 | ra | dec | mean_y | mea |
|----|--------|------|-----------|------|-------|----------|--------|--------|-------|-------|------------|-----------|----------|-------|
| 0 | FID | | ACIS-I-2 | 7.00 | 3280 | 1.000 | -0.357 | -0.130 | 0.016 | 0.053 | 0.000000 | 0.000000 | -766.17 | -848 |
| 1 | FID | | ACIS-I-4 | 7.03 | 3280 | 1.000 | 0.672 | 0.218 | 0.016 | 0.042 | 0.000000 | 0.000000 | 2148.62 | 1057 |
| 2 | FID | | ACIS-I-5 | 7.09 | 3280 | 1.000 | -0.413 | -0.020 | 0.017 | 0.056 | 0.000000 | 0.000000 | -1819.75 | 1055 |
| 3 | GUIDE | used | 548933960 | 8.44 | 6550 | 1.000 | -0.073 | 0.298 | 0.107 | 0.176 | 237.671184 | 66.428675 | -1988.39 | 651 |
| 4 | GUIDE | used | 548937184 | 9.88 | 6545 | 1.000 | 0.077 | -0.041 | 0.223 | 0.357 | 238.771821 | 66.565432 | -360.97 | 955 |
| 5 | GUIDE | used | 549849072 | 9.21 | 6545 | 1.000 | -0.334 | -0.351 | 0.140 | 0.221 | 240.420863 | 66.802816 | 2059.38 | 1580 |
| 6 | GUIDE | used | 549849656 | 9.18 | 6549 | 1.000 | 0.321 | -0.042 | 0.191 | 0.376 | 240.650889 | 65.694358 | 2069.33 | -2423 |
| 7 | GUIDE | used | 548932512 | 8.58 | 6549 | 1.000 | 0.008 | 0.138 | 0.129 | 0.201 | 239.727627 | 66.054972 | 828.47 | -1012 |

2.4 Star Slots

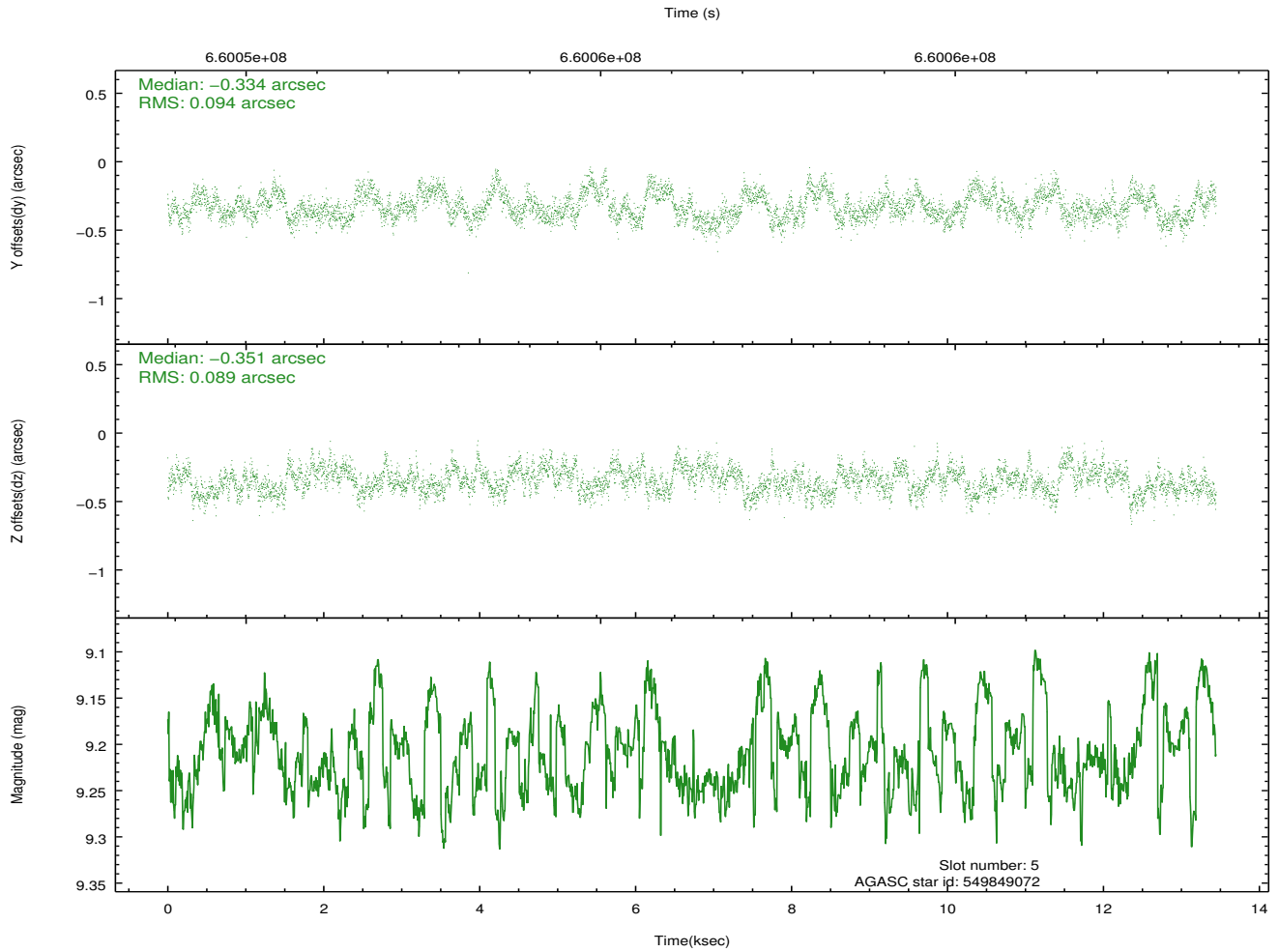
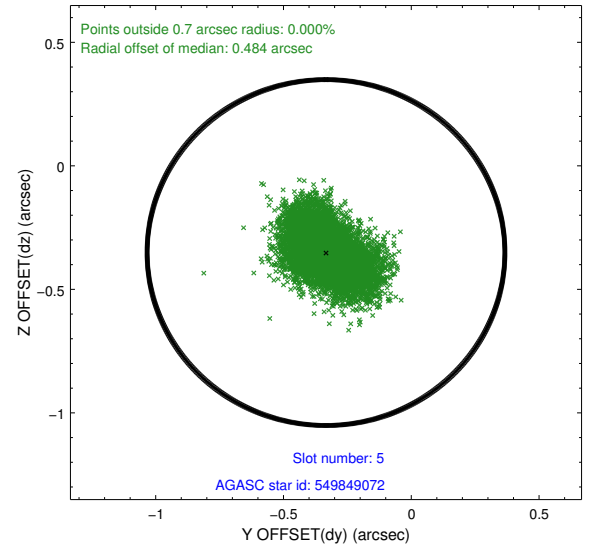
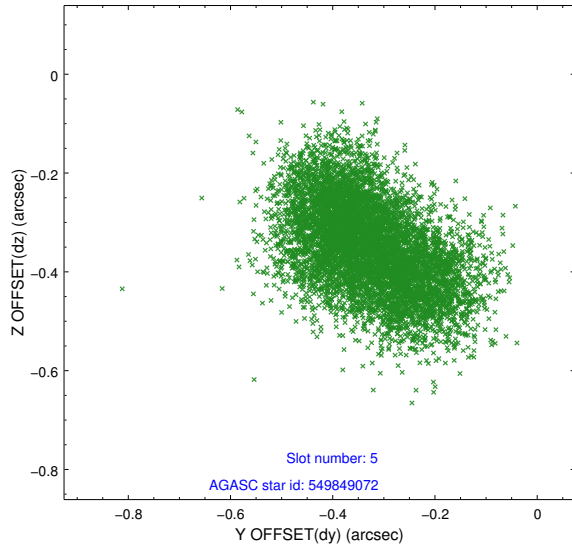
2.4.1 Slot 3



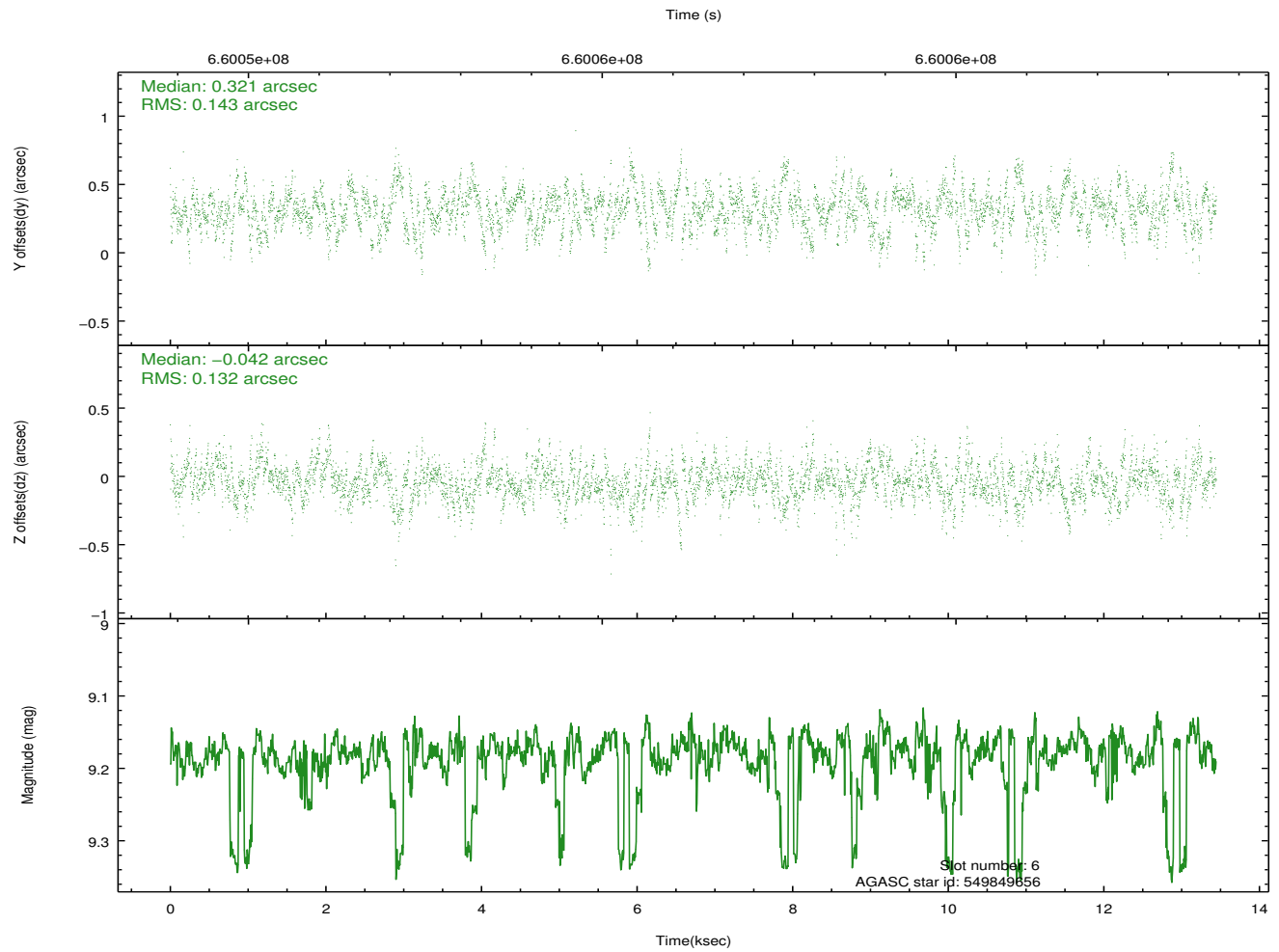
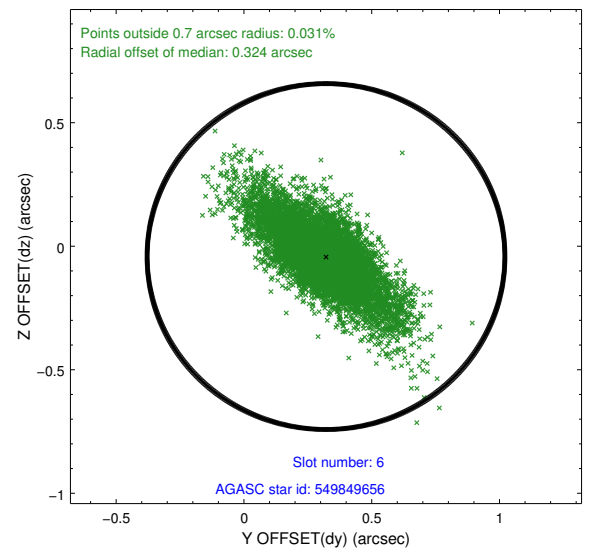
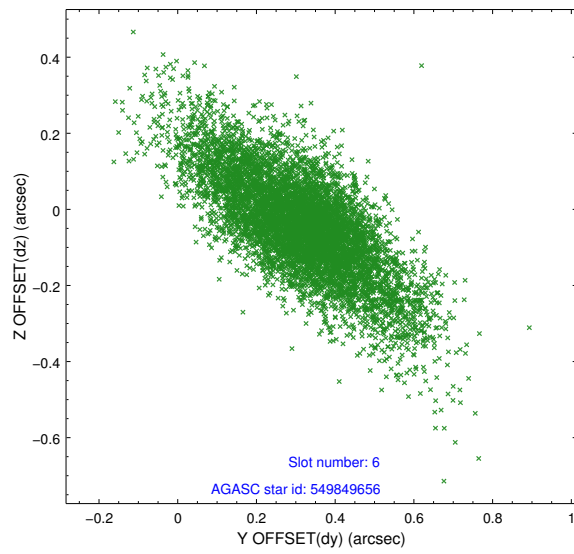
2.4.2 Slot 4



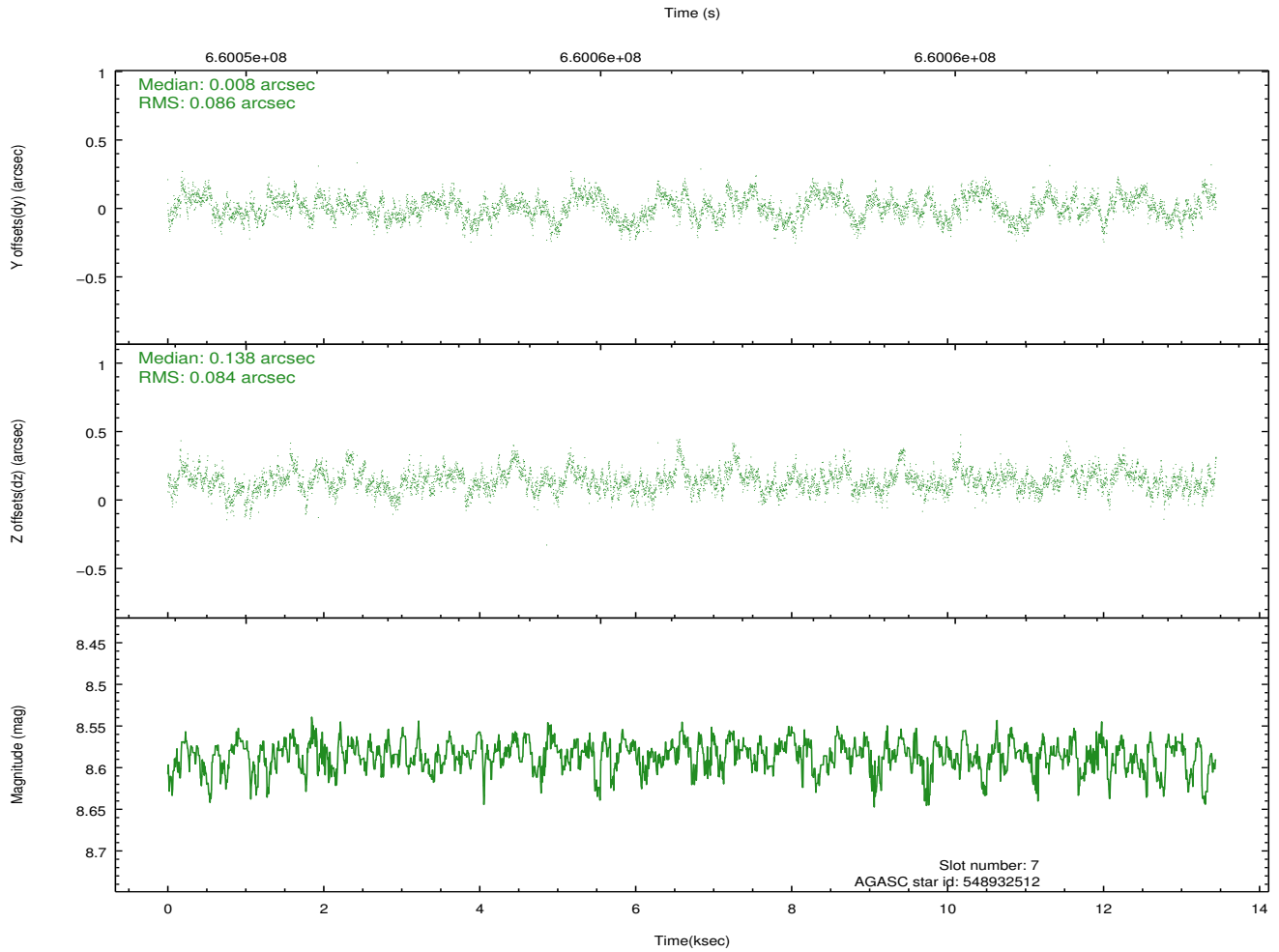
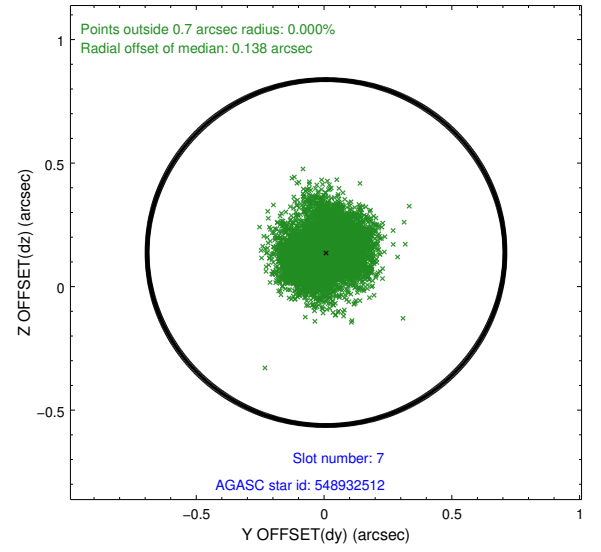
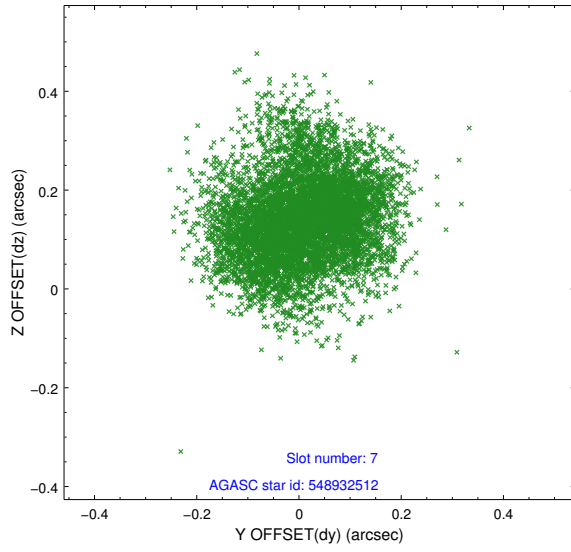
2.4.3 Slot 5



2.4.4 Slot 6

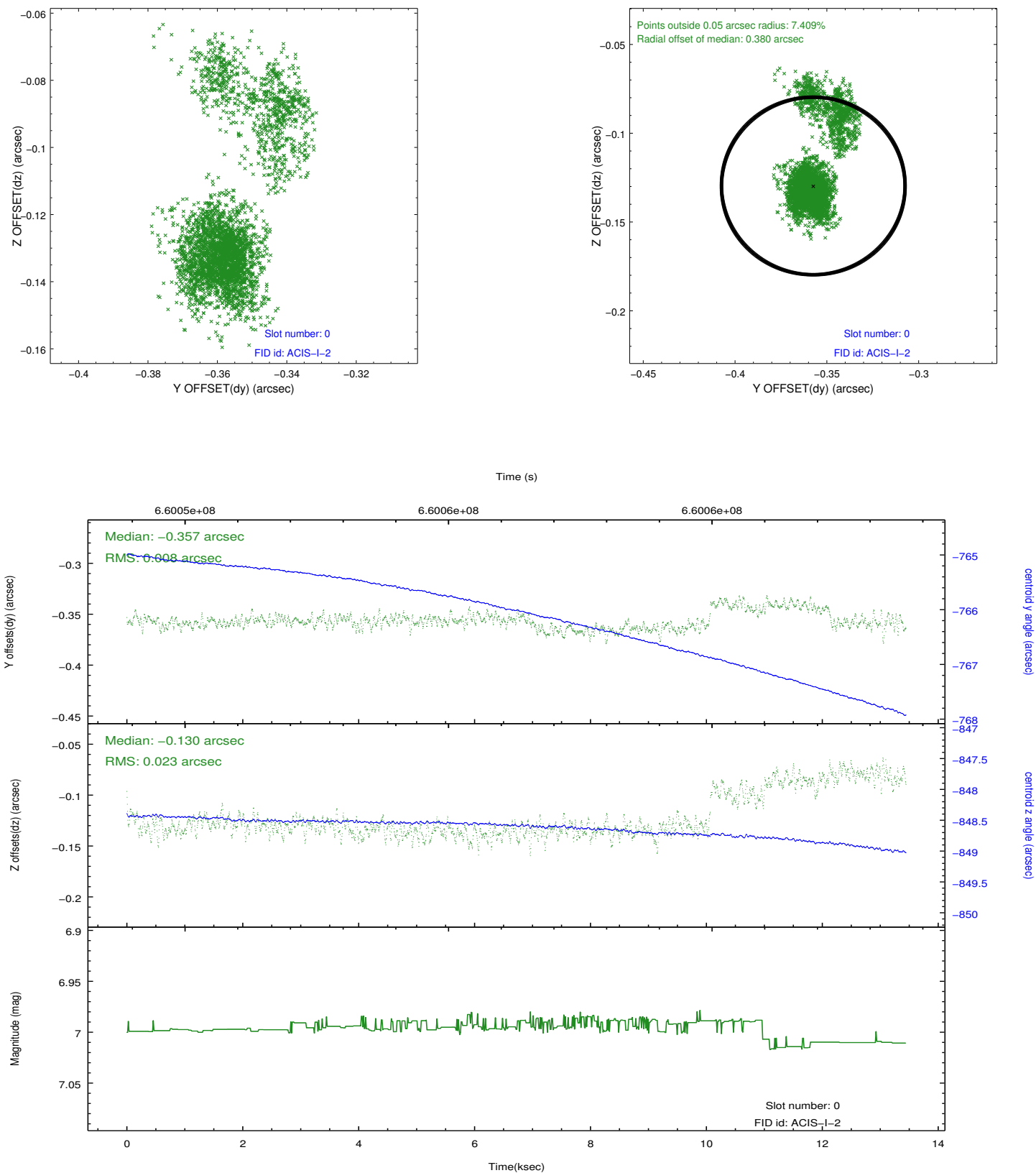


2.4.5 Slot 7

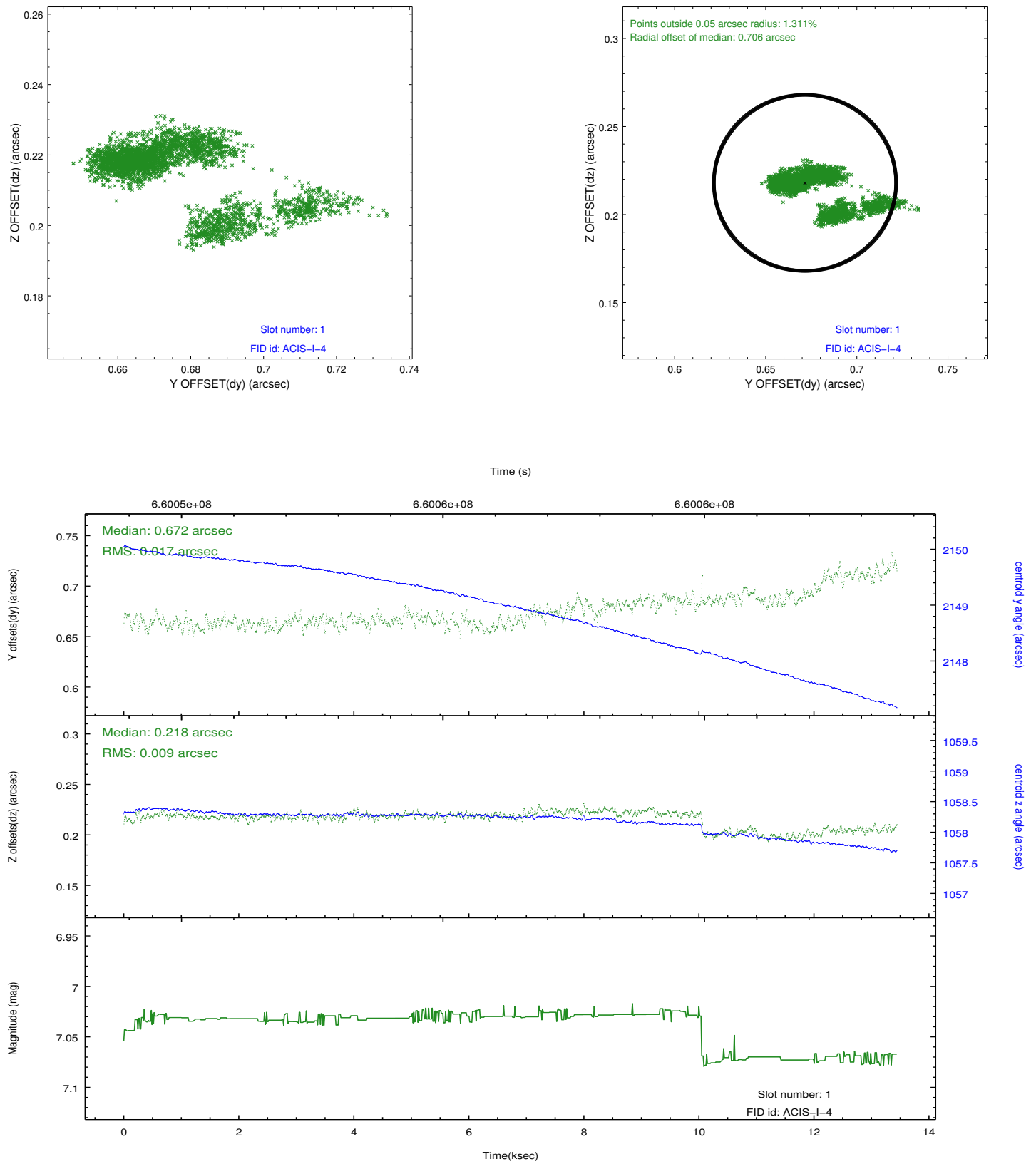


2.5 FID Slots

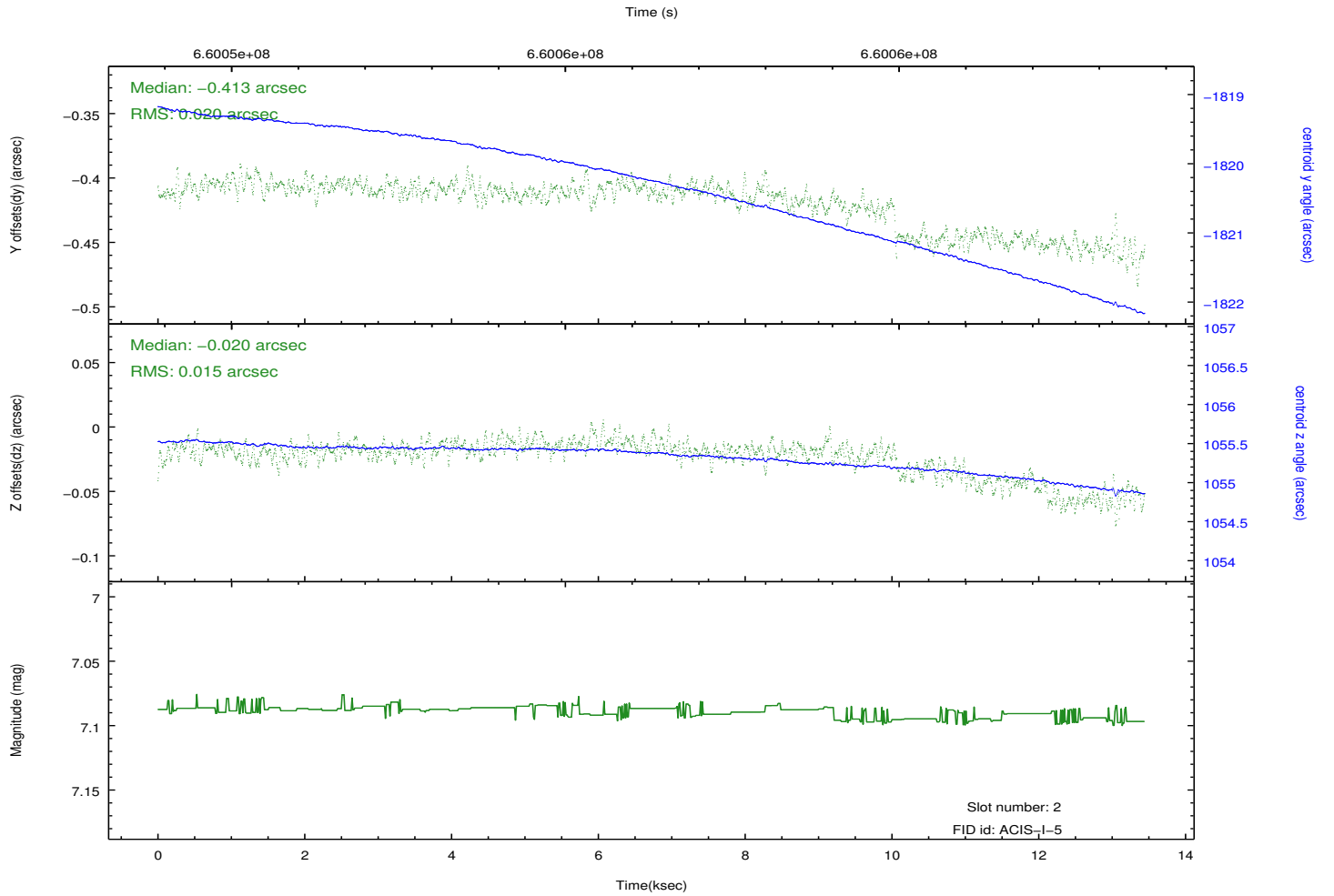
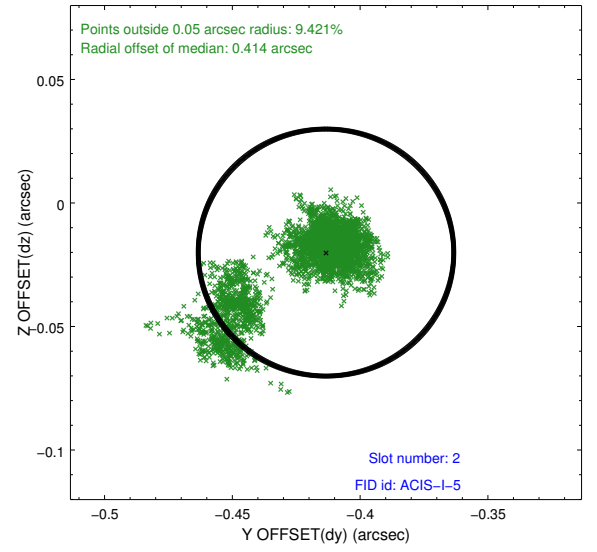
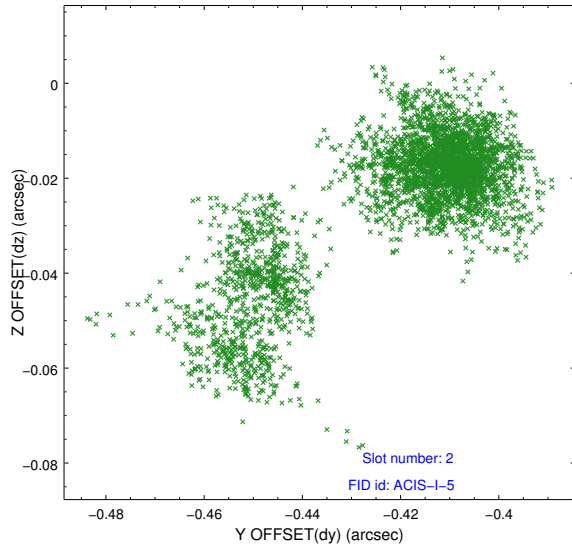
2.5.1 Slot 0



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) | 2018.12.10 |
| V&V Edition | 1 |
| V&V Disposition and Status | OK |
| V&V Charge Time | 13.134700101137 |

A.2 Comments

A spatial region of the original bias map for CCD = 1 suffered from anomalously high data values. Pixels in the event data that were bias-corrected by one of the original affected bias pixels may have an apparent energy shift. While the change in energy is expected to be small (~ 20 eV), it depends on many parameters that have not yet been fully explored for this bias anomaly. The bias map for CCD = 1 has been reconstructed for this processing to remove this anomaly using scaled data from a comparable bias map from another observation. The pixels affected by the anomaly are bounded by sky coords: (239.09486,66.18464), (239.09828,66.17217), (239.19089,66.17620), (239.18751,66.18867).