

V&V Reference Report

L2 ASCDS Version : 8.4.4

Observation 10830 - L2 Version 3
Chandra X-Ray Center

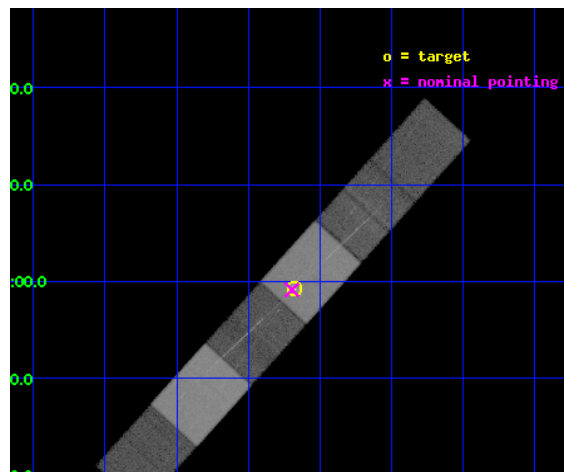
L2 Processing Date : Jun 5 2012

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1 Front

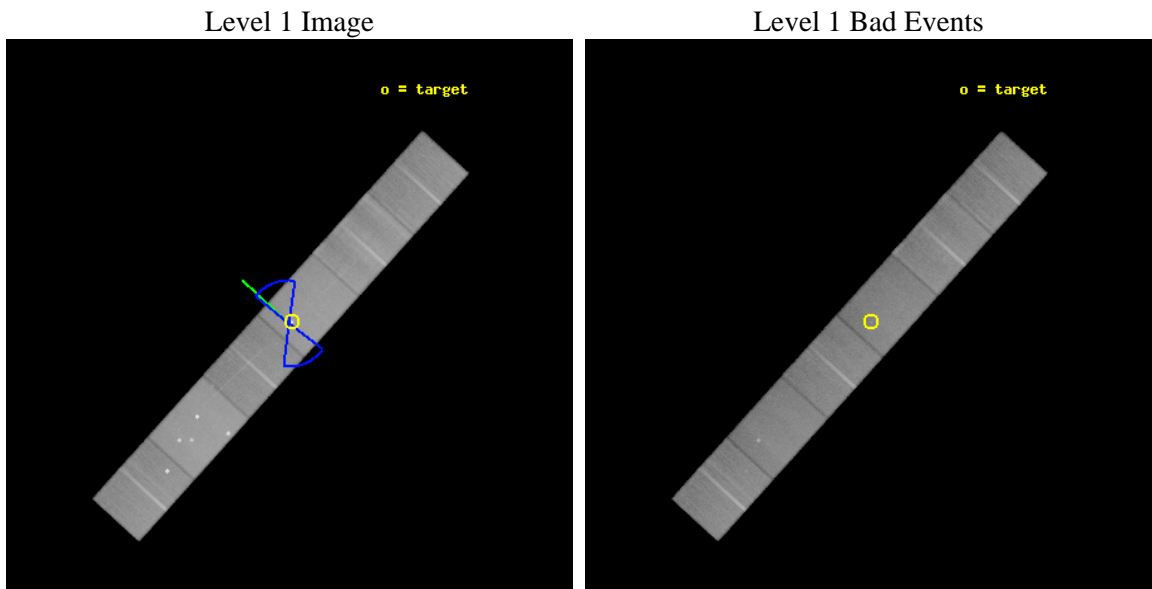
| | | |
|----------|---|--|
| seq_num | 701591 | Sequence number |
| obs_id | 10830 | Observation id |
| title | NGC 1068: Photo-ionized gas in the nucleus, and ionization cone | Pr |
| observer | Prof Claude Canizares | Principal investigator |
| object | NGC 1068 | Source name |
| dtcycle | 0 | |
| cycle | P | events from which exps? Prim/Second/Both |
| ra_targ | 40.669583 | Observer's specified target RA [deg] |
| dec_targ | -0.013333 | Observer's specified target Dec [deg] |
| ra_nom | 40.674235080817 | Nominal RA [deg] |
| dec_nom | -0.014676269822665 | Nominal Dec [deg] |
| roll_nom | 312.15662369246 | Nominal Roll [deg] |
| revision | 3 | Processing version of data |
| ontime | 43605.0 | Sum of GTIs [s] |
| livetime | 42900.741428706 | Livetime [s] |
| ontime4 | 43605.0 | Sum of GTIs [s] |
| ontime5 | 43605.0 | Sum of GTIs [s] |
| ontime6 | 43602.458969772 | Sum of GTIs [s] |
| ontime7 | 43605.0 | Sum of GTIs [s] |
| ontime8 | 43602.458969772 | Sum of GTIs [s] |
| ontime9 | 43605.0 | Sum of GTIs [s] |
| l2events | 587722 | Number of level 2 events |



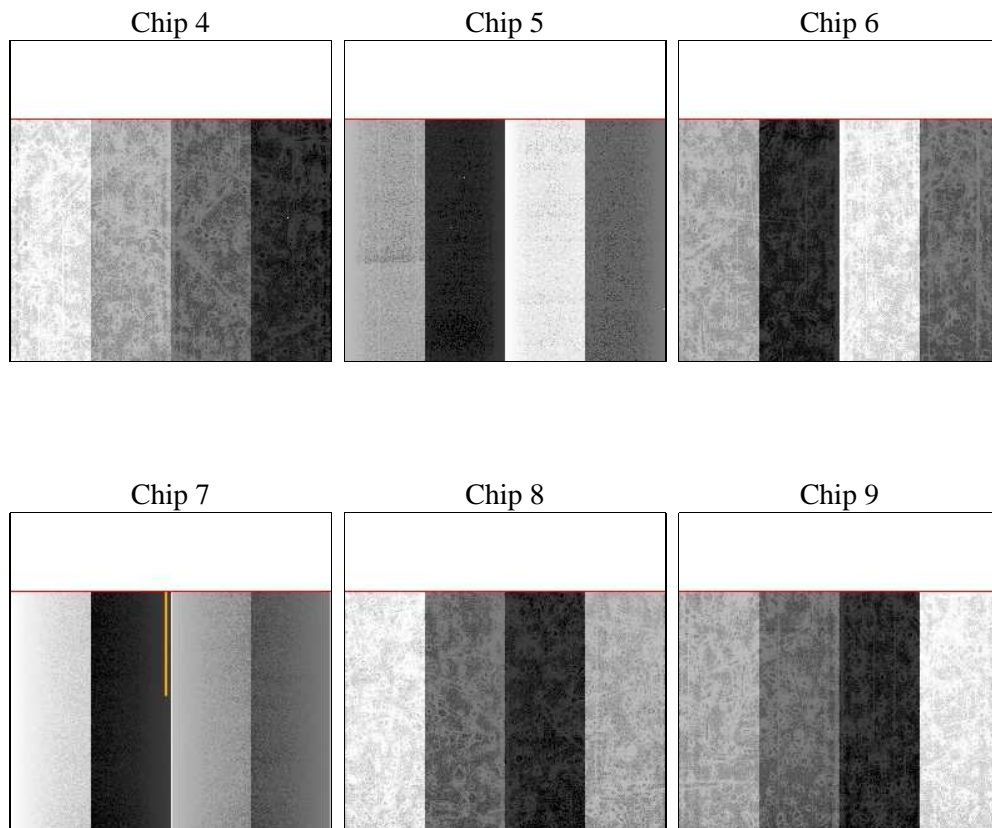
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

| | | | | | |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num | 0 | Obi number | sched_exp_time | 43427.533000 | [s] Scheduled observation exposure time |
| ascdsver | 8.4.4 | Processing system revision | ontime | 43605.0 | Sum of GTIs [s] |
| caldbver | 4.4.9 | | ontime4 | 43605.0 | Sum of GTIs [s] |
| date | 2012-05-25T19:57:42 | Date and time of file creation | ontime5 | 43605.0 | Sum of GTIs [s] |
| revision | 2 | Processing version of data | ontime6 | 43602.458969772 | Sum of GTIs [s] |
| | | | ontime7 | 43605.0 | Sum of GTIs [s] |
| | | | ontime8 | 43602.458969772 | Sum of GTIs [s] |
| | | | ontime9 | 43605.0 | Sum of GTIs [s] |
| | | | l1events | 2572482 | Number of level 1 events |

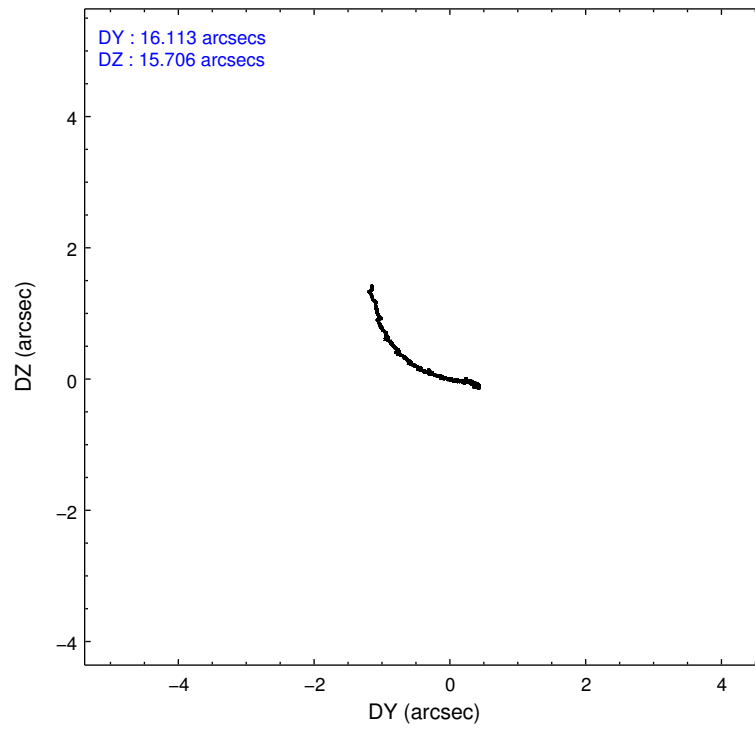
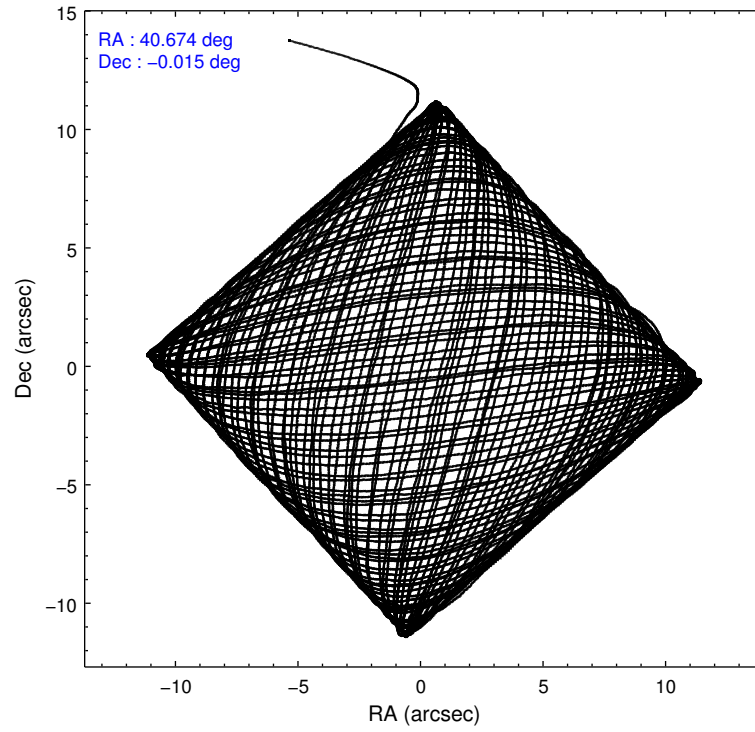
2.1.4 Events

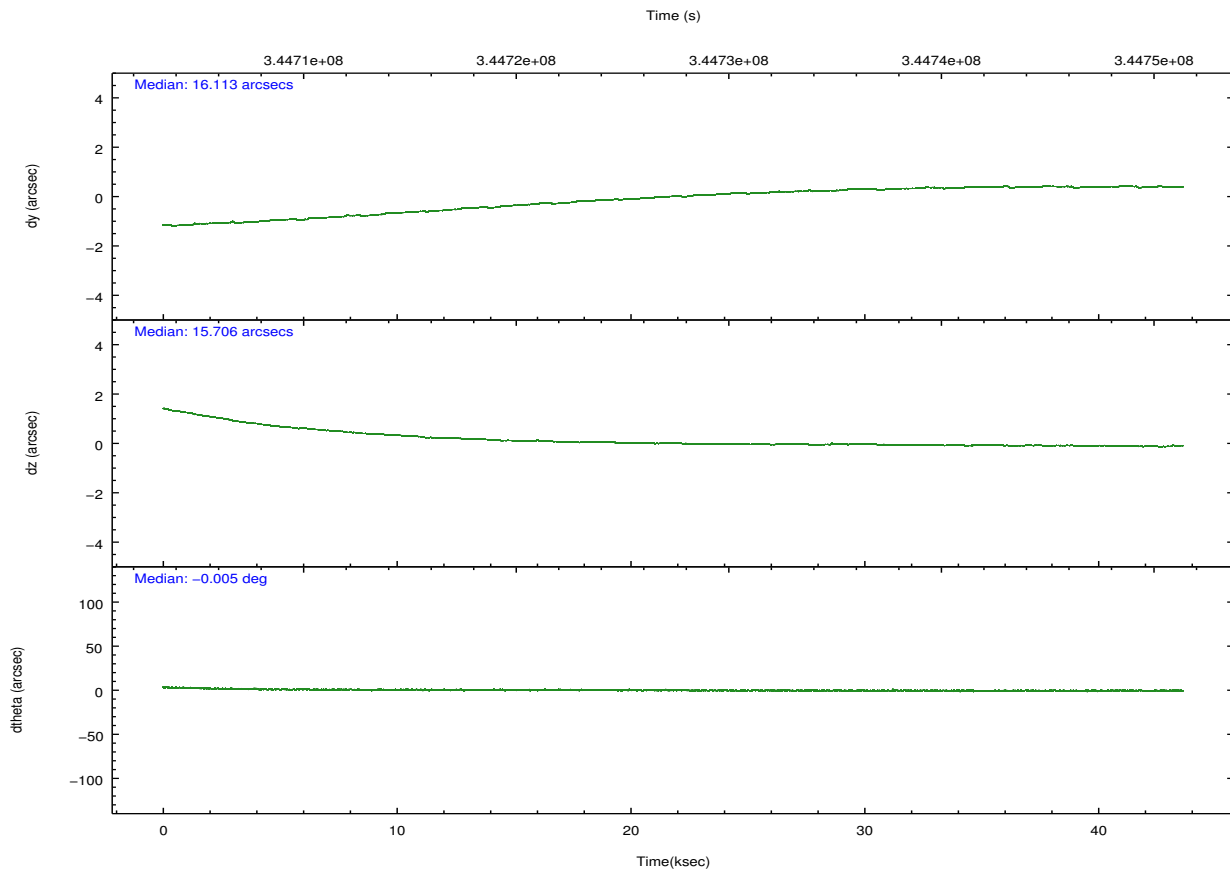
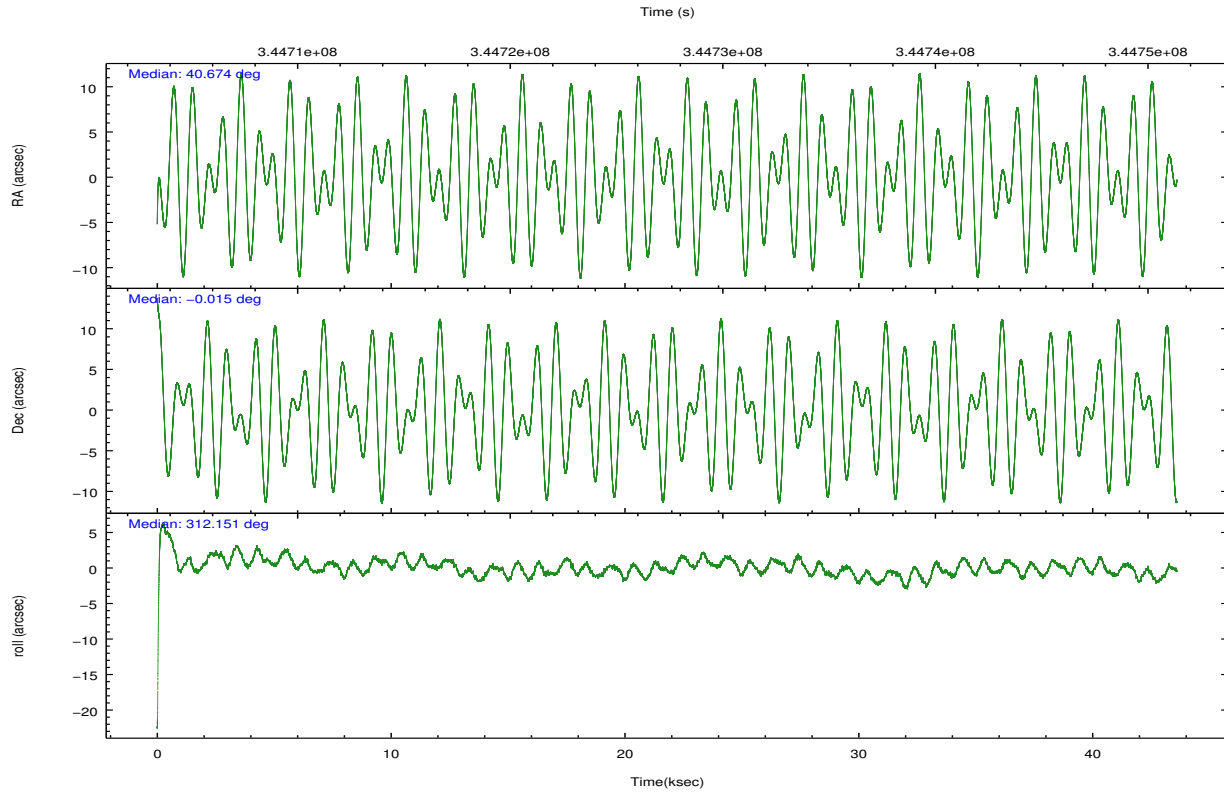
| | ccd 4 | ccd 5 | ccd 6 | ccd 7 | ccd 8 | ccd 9 | | ccd 4 | ccd 5 | ccd 6 | ccd 7 | ccd 8 | ccd 9 |
|-----------------|--------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|
| level 1 events | 388923 | 555237 | 347021 | 487968 | 449479 | 343854 | grade 0 events | 31534 | 41670 | 19445 | 20490 | 34534 | 18103 |
| rejected events | 332682 | 294238 | 301955 | 281493 | 344505 | 300603 | | 8% | 7% | 5% | 4% | 7% | 5% |
| rejected % | 85% | 52% | 87% | 57% | 76% | 87% | grade 1 events | 381 | 736 | 177 | 554 | 309 | 205 |
| | | | | | | | | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | | | | | grade 2 events | 9695 | 77445 | 9639 | 43876 | 24194 | 9006 |
| | | | | | | | | 2% | 13% | 2% | 8% | 5% | 2% |
| | | | | | | | grade 3 events | 4579 | 10334 | 4243 | 18746 | 10805 | 4408 |
| | | | | | | | | 1% | 1% | 1% | 3% | 2% | 1% |
| | | | | | | | grade 4 events | 4368 | 9716 | 4168 | 18499 | 10135 | 4292 |
| | | | | | | | | 1% | 1% | 1% | 3% | 2% | 1% |
| | | | | | | | grade 5 events | 15669 | 39994 | 16155 | 44573 | 21907 | 17519 |
| | | | | | | | | 4% | 7% | 4% | 9% | 4% | 5% |
| | | | | | | | grade 6 events | 7244 | 128169 | 8566 | 109615 | 27983 | 8539 |
| | | | | | | | | 1% | 23% | 2% | 22% | 6% | 2% |
| | | | | | | | grade 7 events | 315453 | 247173 | 284628 | 231615 | 319612 | 281782 |
| | | | | | | | | 81% | 44% | 82% | 47% | 71% | 81% |

2.2 Compared Parameters

| Parameter | Planned | Actual | Parameter | Planned | Actual |
|--------------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument | ACIS | ACIS | Obspar format version number | 7 | 7 |
| Detector | ACIS-456789 | ACIS-456789 | Obspar file type | PREDICTED | ACTUAL |
| Grating | HETG | HETG | 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 | 40.648106 | 40.67423508081697 | Subarray requested | CUSTOM | CUSTOM |
| [deg] Pointing Dec | -0.006660 | -0.01467626982266511 | Subarray start row | 1 | 1 |
| [deg] Pointing Roll | 311.999994 | 312.1566236924563 | Subarray row count | 774 | 774 |
| [deg] Roll angle | 338.000000 | 338.000000 | Alternating exposures requested | N | N |
| [deg] Roll tolerance | 30.000000 | 30.000000 | [s] Primary exposure time | 0.000000 | 2.5 |
| Roll constraint allows 180D rotation | Y | Y | | | |
| [mm] SIM focus pos | -0.684267 | -0.6828225247311905 | | | |
| [mm] SIM defocus | 0 | 0.001444936568705701 | | | |
| [mm] SIM translation stage pos | -186.772523 | -186.7834551222893 | | | |
| [mm] SIM translation stage offset | -3.36 | -3.349067460718516 | | | |
| [s] Observation start time (MET) | 344705743.184000 | 344704181.38899 | | | |
| Observation start date | 2008-12-03T15:34:38 | 2008-12-03T15:09:41 | | | |
| [s] Observation end time (MET) | 344749171.184000 | 344749394.14122 | | | |
| Observation end date | 2008-12-04T03:38:26 | 2008-12-04T03:43:14 | | | |
| Read mode | TIMED | TIMED | | | |

2.3 Aspect



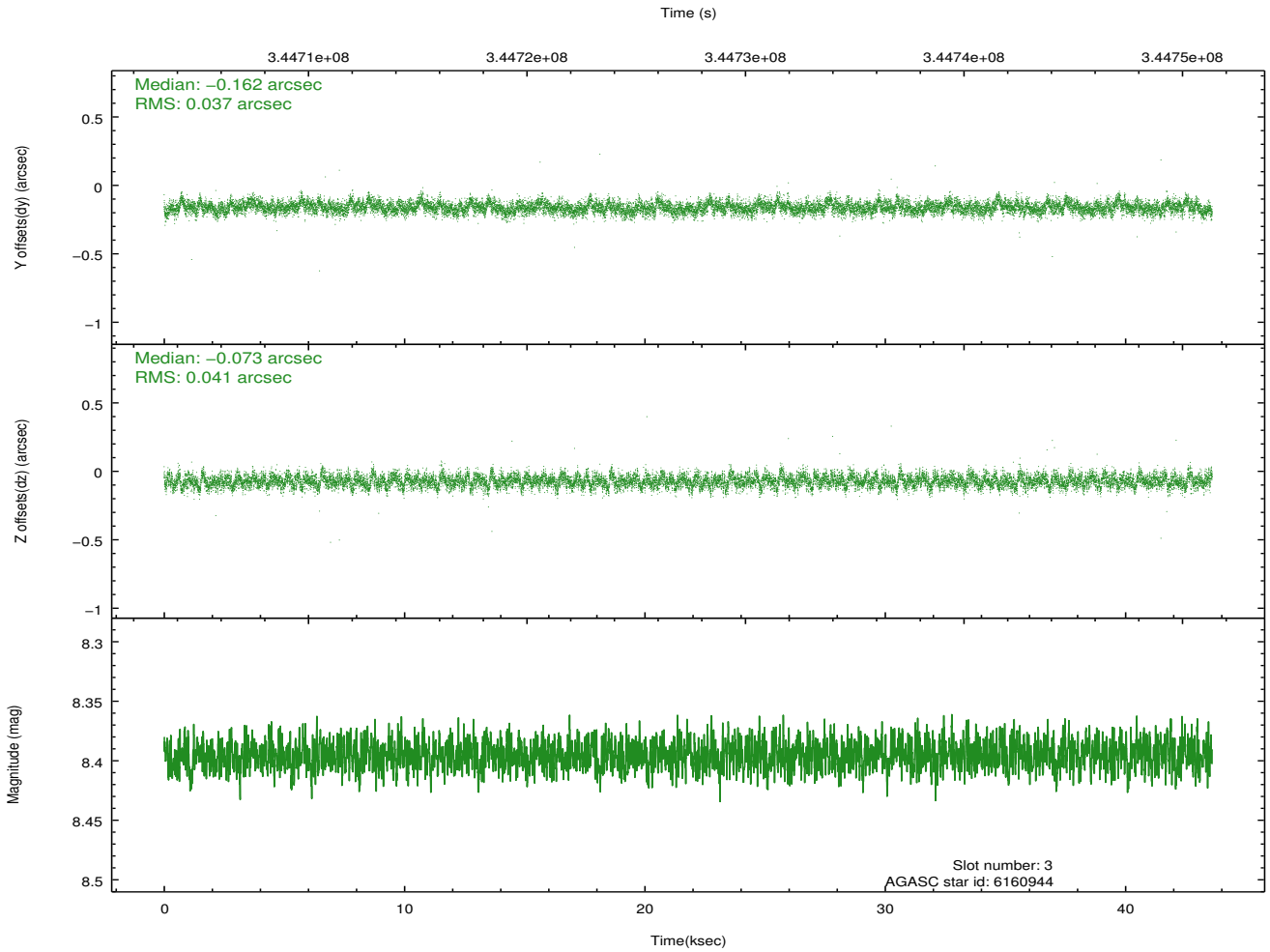
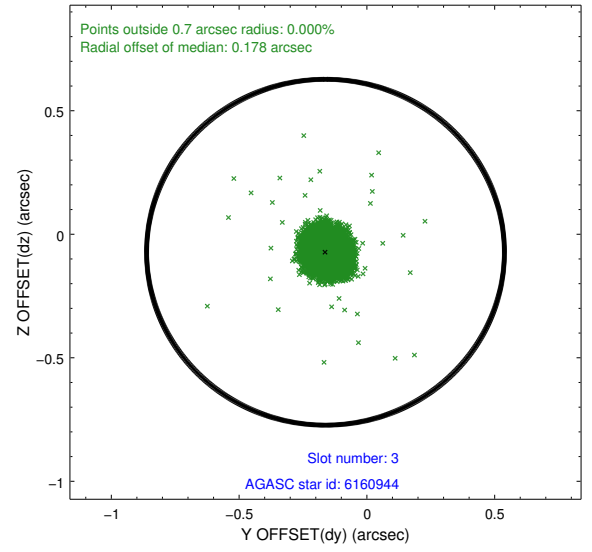
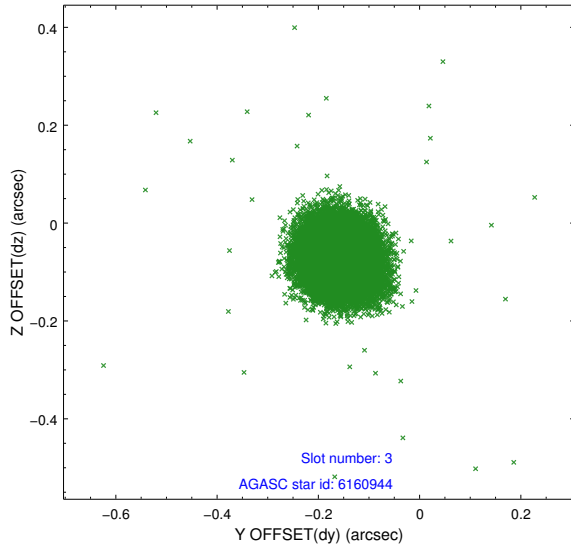


Slot Statistics

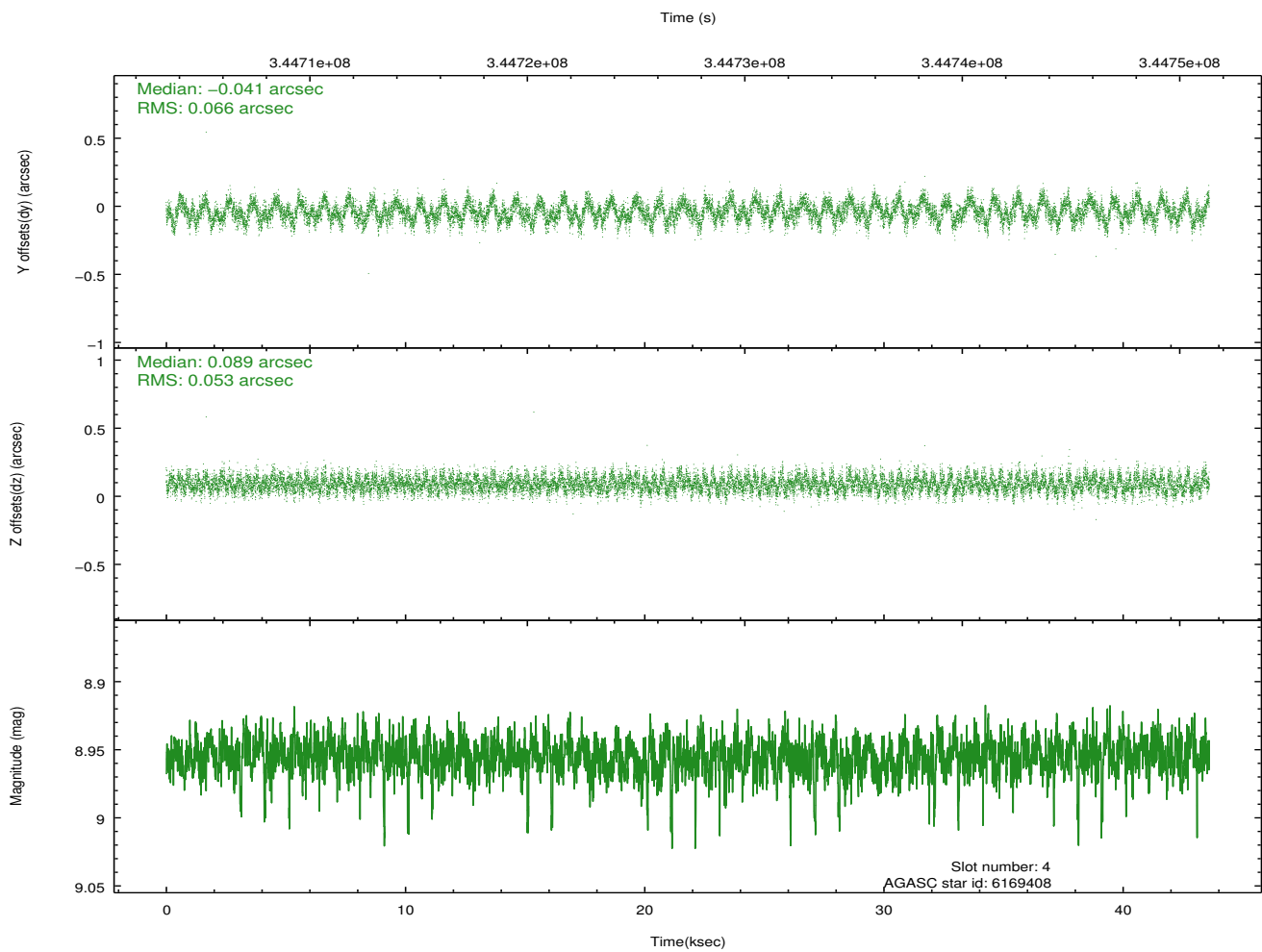
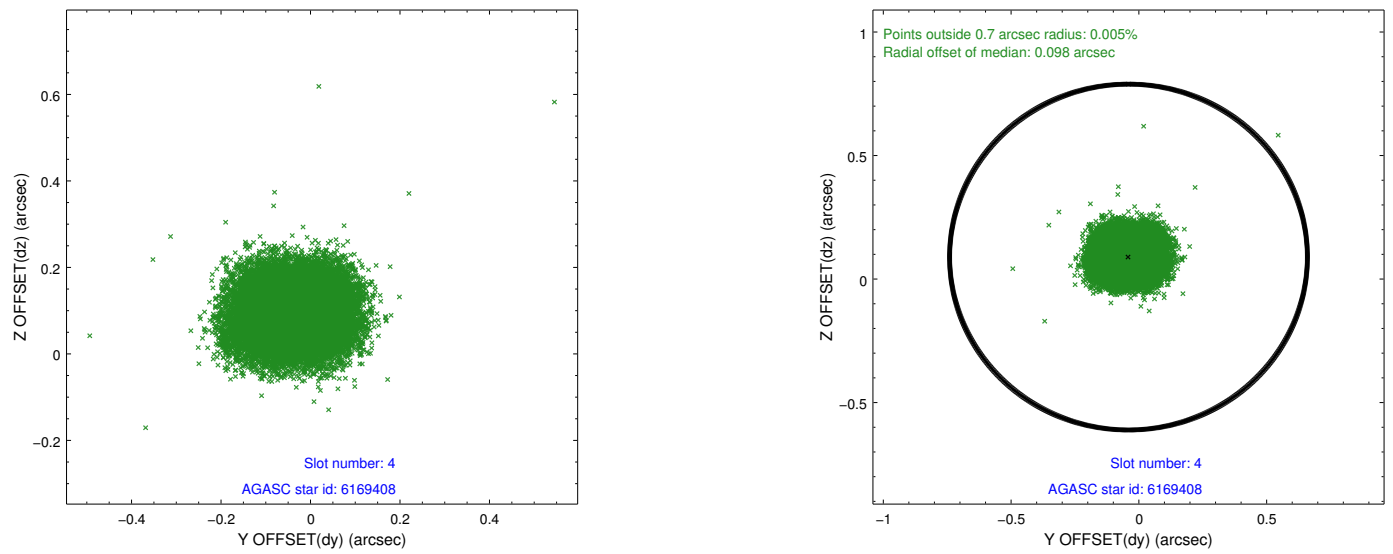
| slot | status | id | mag | n_pts | med_dy | med_dz | dr1 | dr2 | ra | dec | mean_y | mean_z |
|------|--------|-----------|------|-------|--------|--------|-------|-------|-----------|-----------|----------|----------|
| 0 | FID | ACIS-S-2 | 6.94 | 10637 | -0.114 | -0.030 | 0.011 | 0.022 | 0.000000 | 0.000000 | -768.82 | -1806.44 |
| 1 | FID | ACIS-S-4 | 7.02 | 10636 | 0.174 | 0.063 | 0.021 | 0.031 | 0.000000 | 0.000000 | 2144.73 | 102.14 |
| 2 | FID | ACIS-S-5 | 7.06 | 10636 | -0.087 | -0.025 | 0.018 | 0.049 | 0.000000 | 0.000000 | -1821.65 | 95.70 |
| 3 | GUIDE | 6160944 | 8.40 | 21266 | -0.162 | -0.073 | 0.057 | 0.093 | 40.821496 | 0.087247 | 166.65 | 690.08 |
| 4 | GUIDE | 6169408 | 8.95 | 21254 | -0.041 | 0.089 | 0.091 | 0.144 | 40.937839 | 0.210390 | 117.37 | 1297.83 |
| 5 | GUIDE | 615907528 | 7.75 | 21267 | -0.028 | -0.063 | 0.061 | 0.097 | 41.252710 | -0.191636 | 1951.48 | 1172.14 |
| 6 | GUIDE | 615909768 | 9.06 | 21253 | 0.132 | 0.083 | 0.095 | 0.152 | 40.904100 | -0.344520 | 1521.08 | -129.06 |
| 7 | GUIDE | 615913552 | 8.69 | 21264 | 0.101 | -0.031 | 0.070 | 0.116 | 41.235237 | -0.003650 | 1406.74 | 1578.12 |

2.4 Star Slots

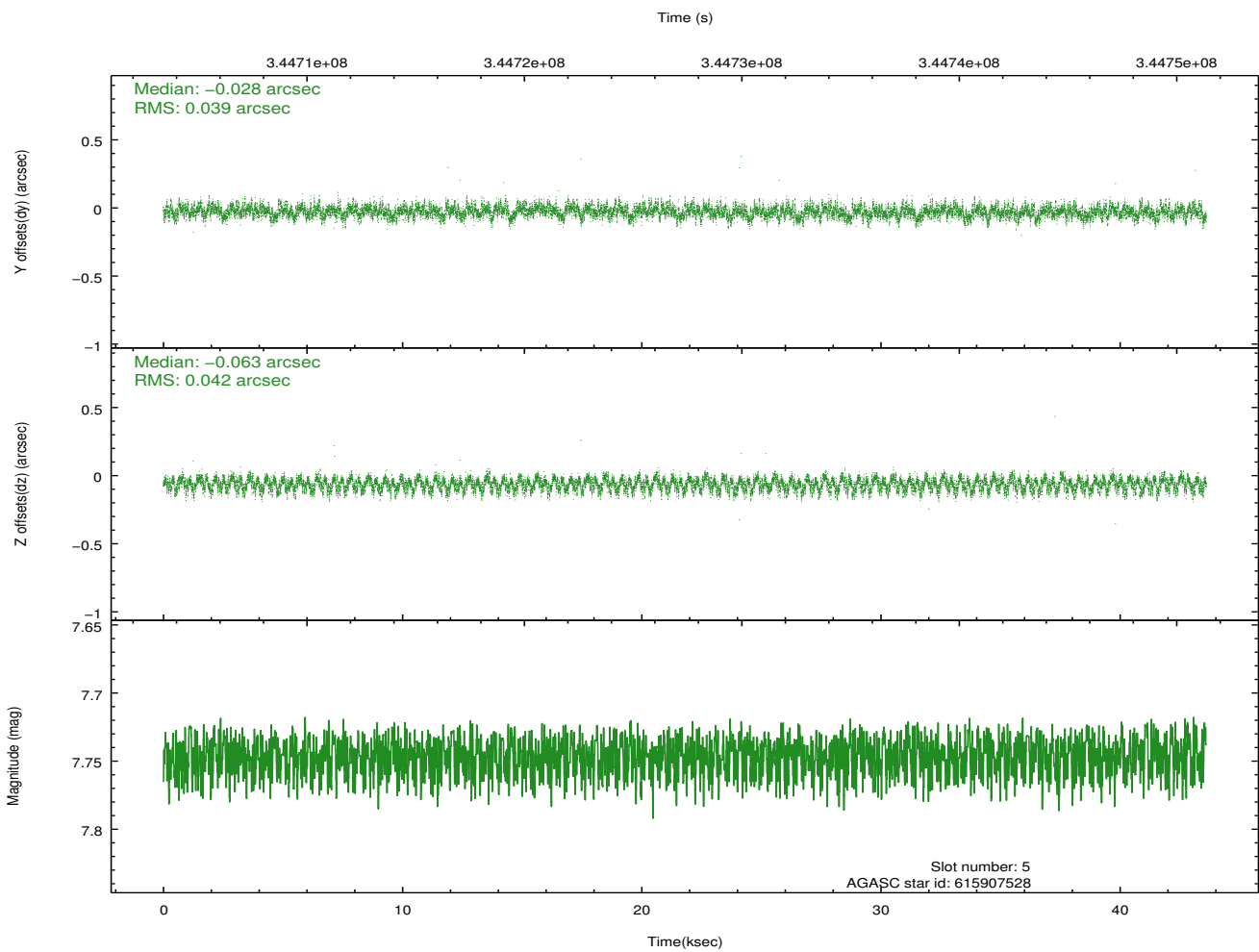
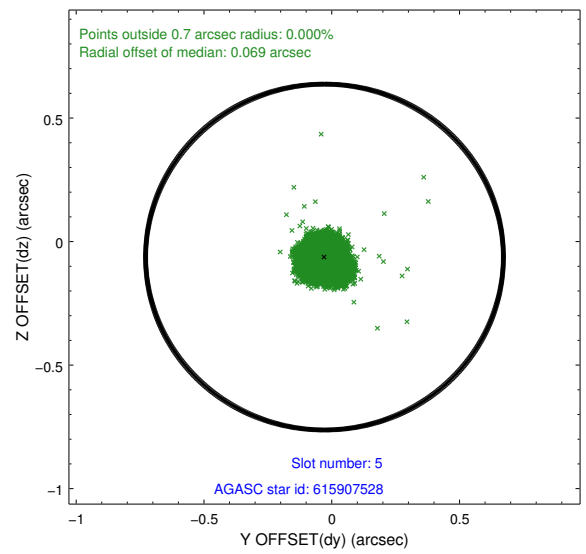
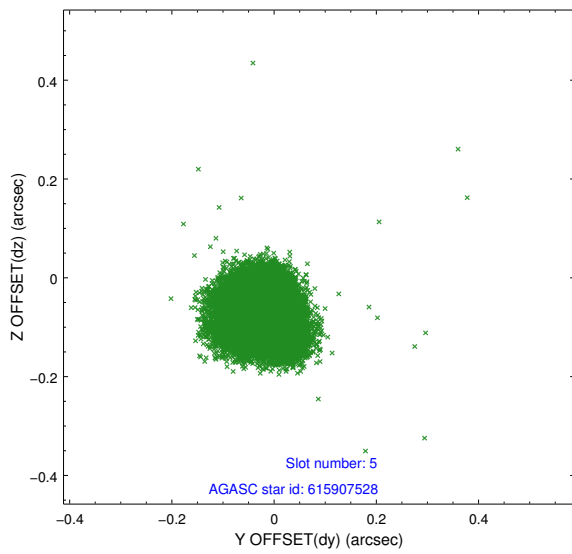
2.4.1 Slot 3



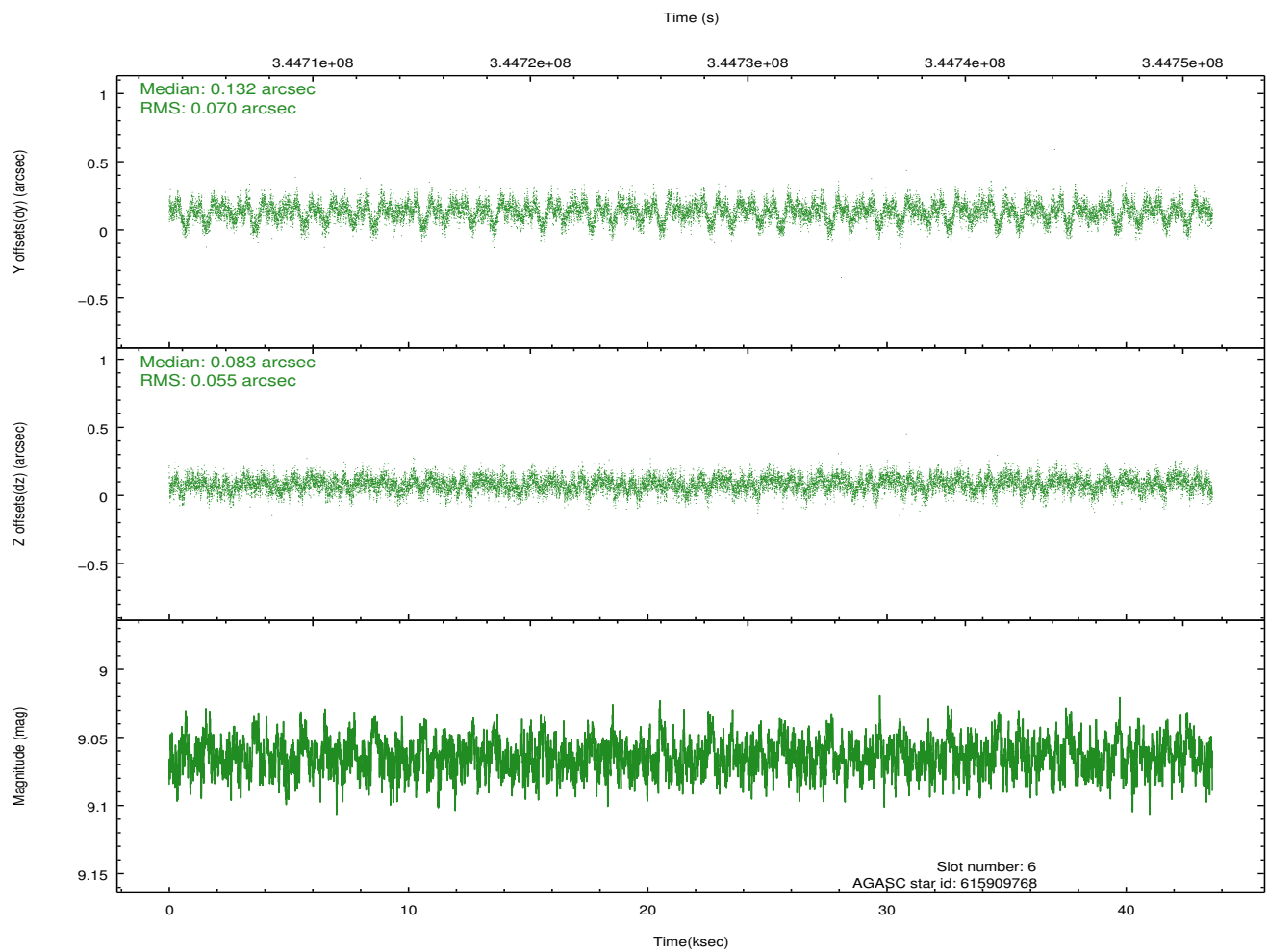
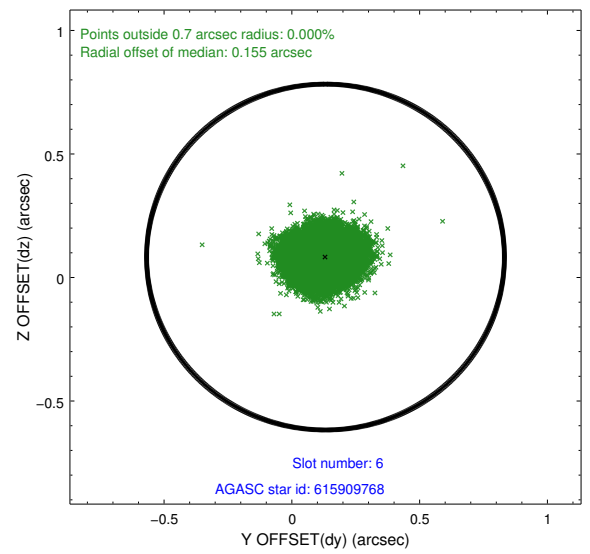
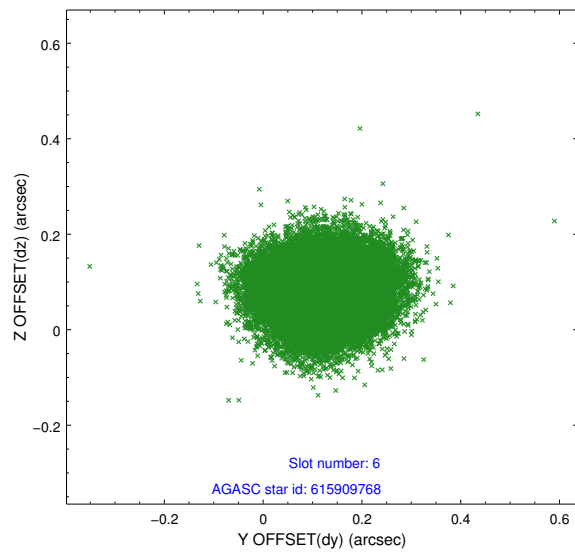
2.4.2 Slot 4



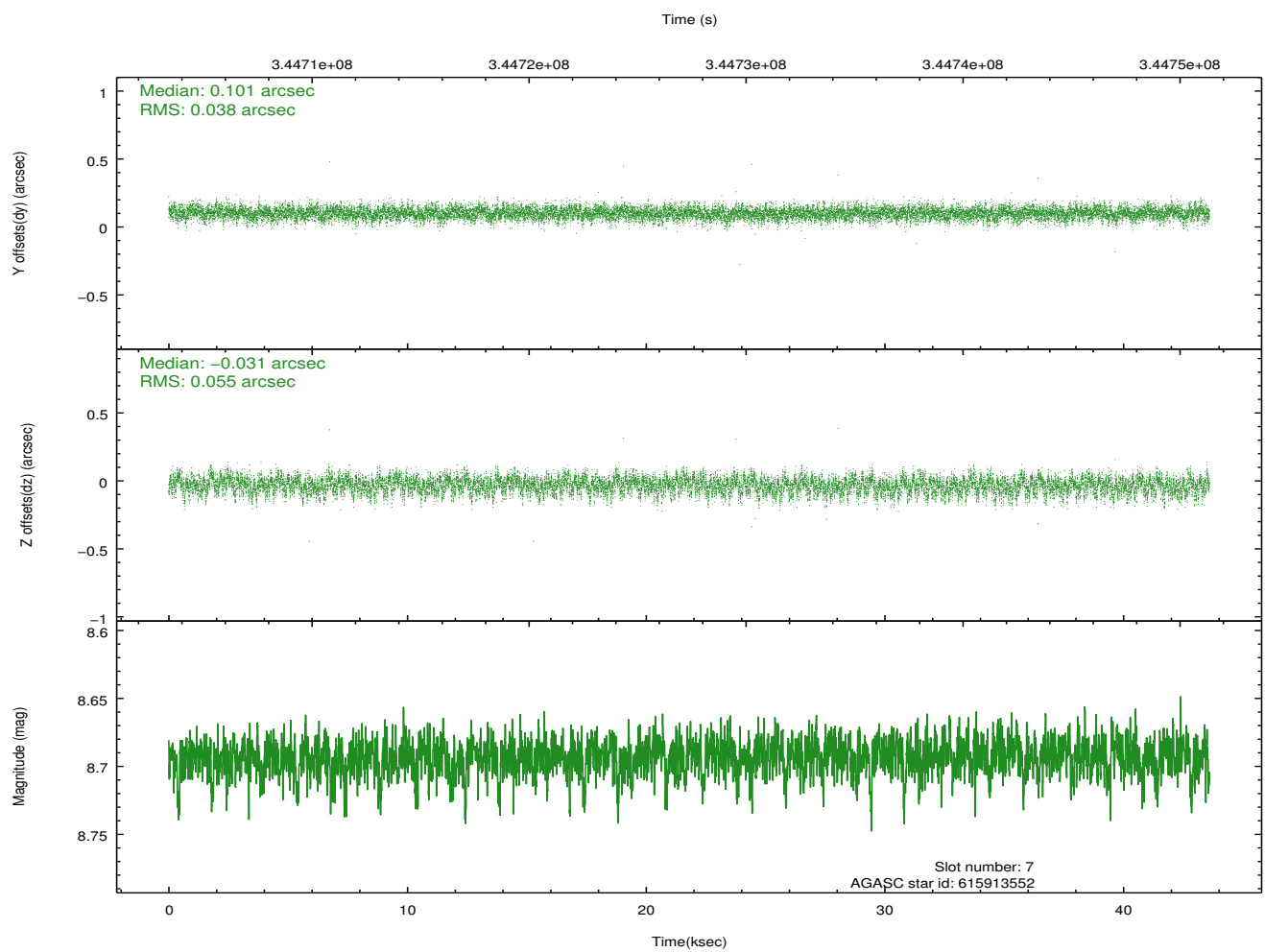
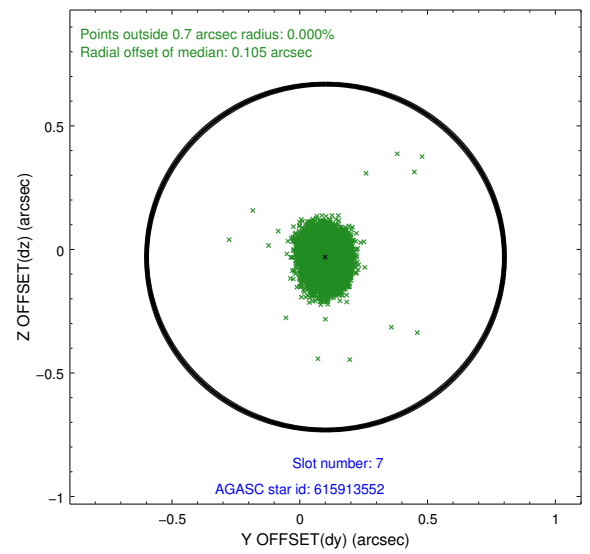
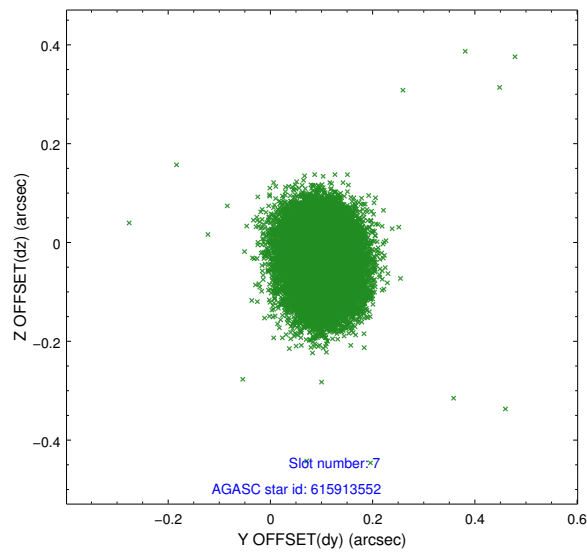
2.4.3 Slot 5



2.4.4 Slot 6

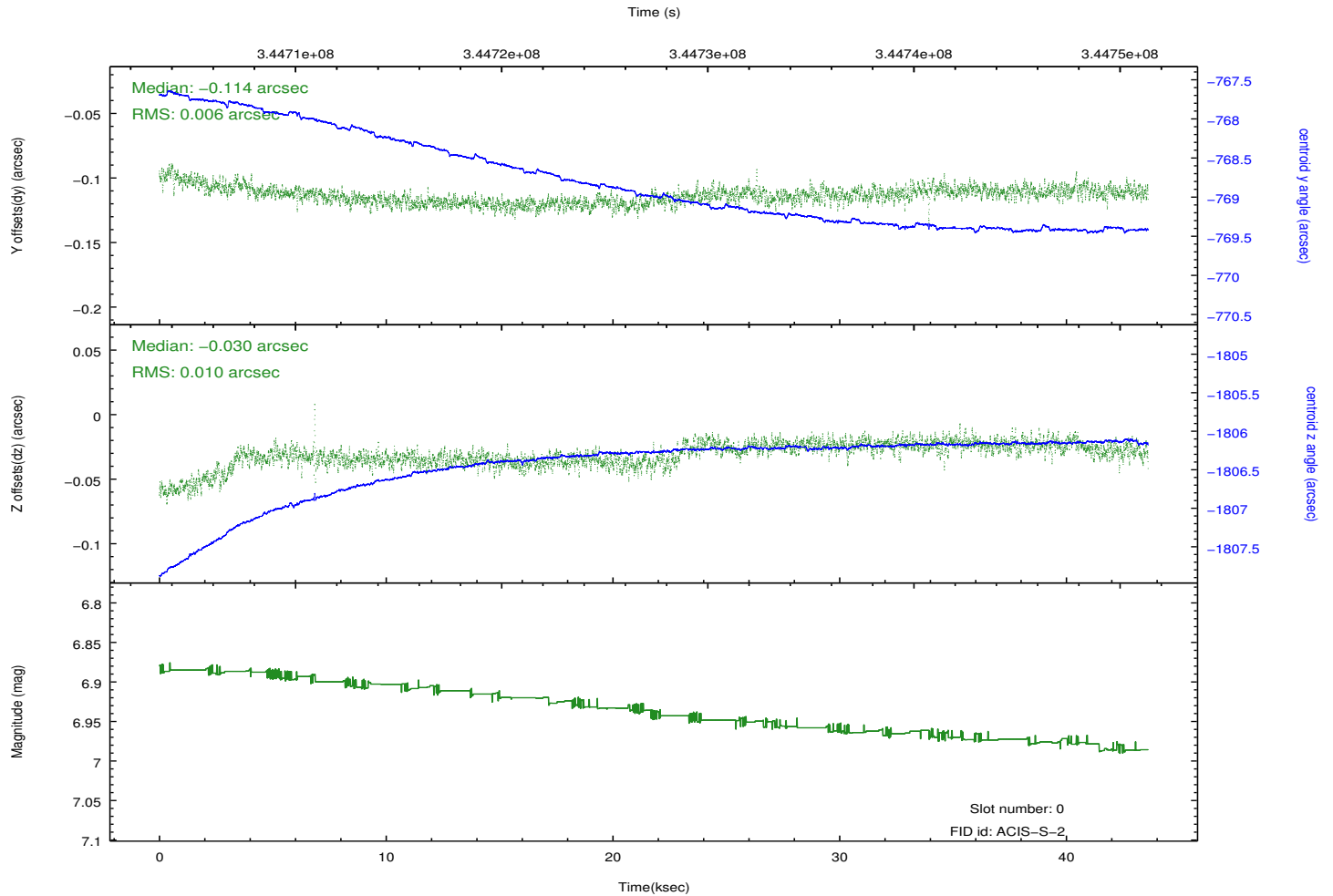
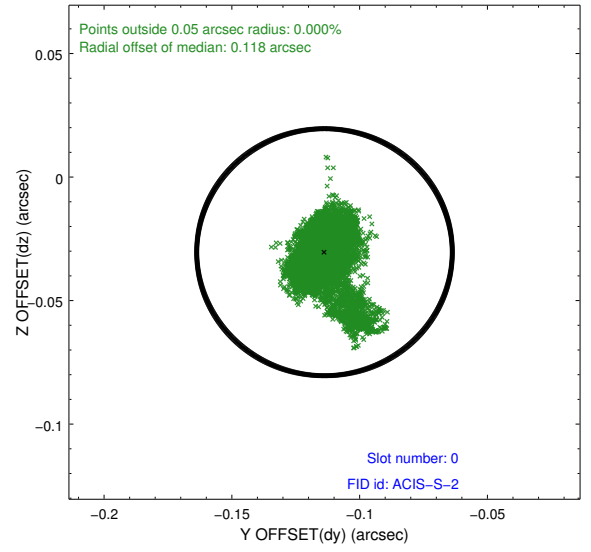
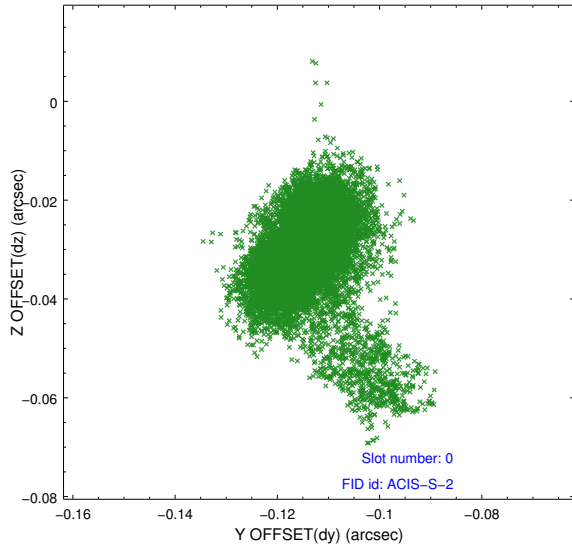


2.4.5 Slot 7

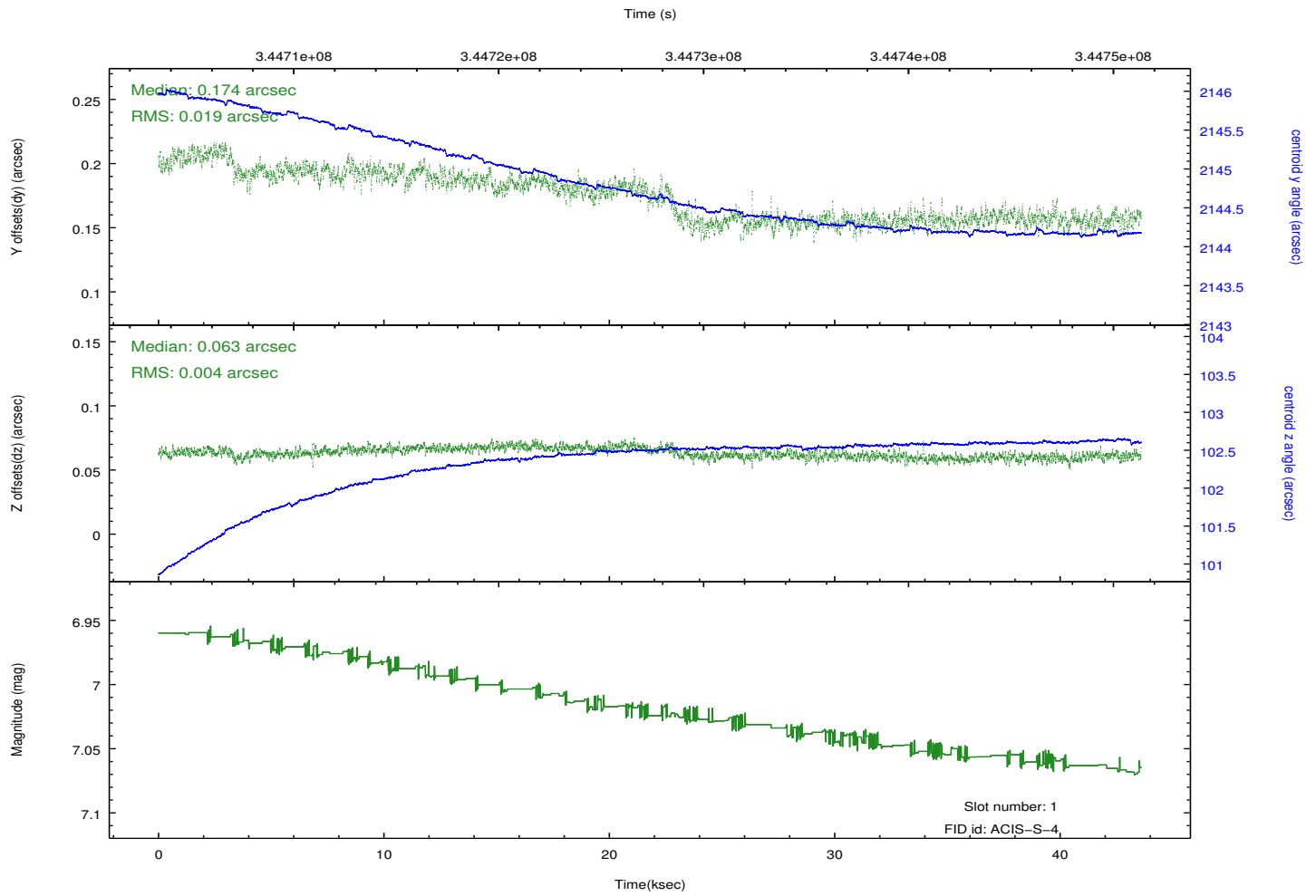
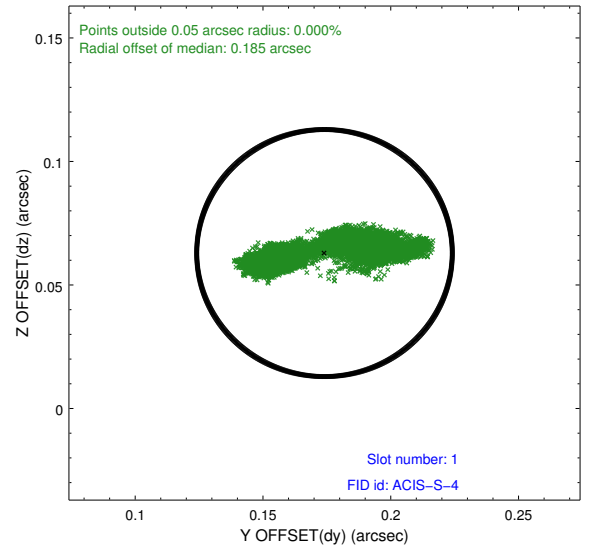
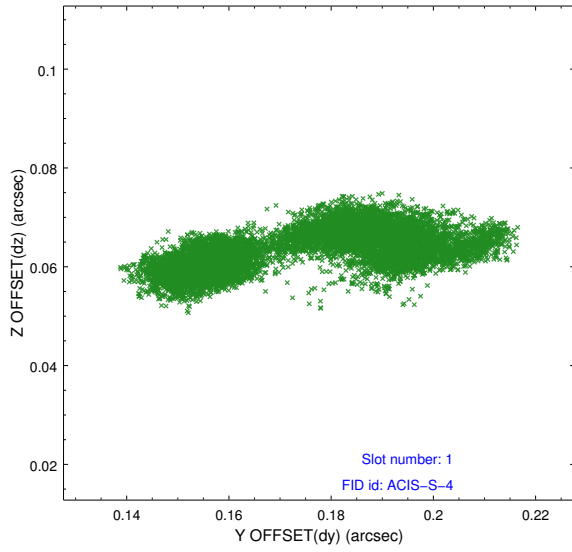


2.5 FID Slots

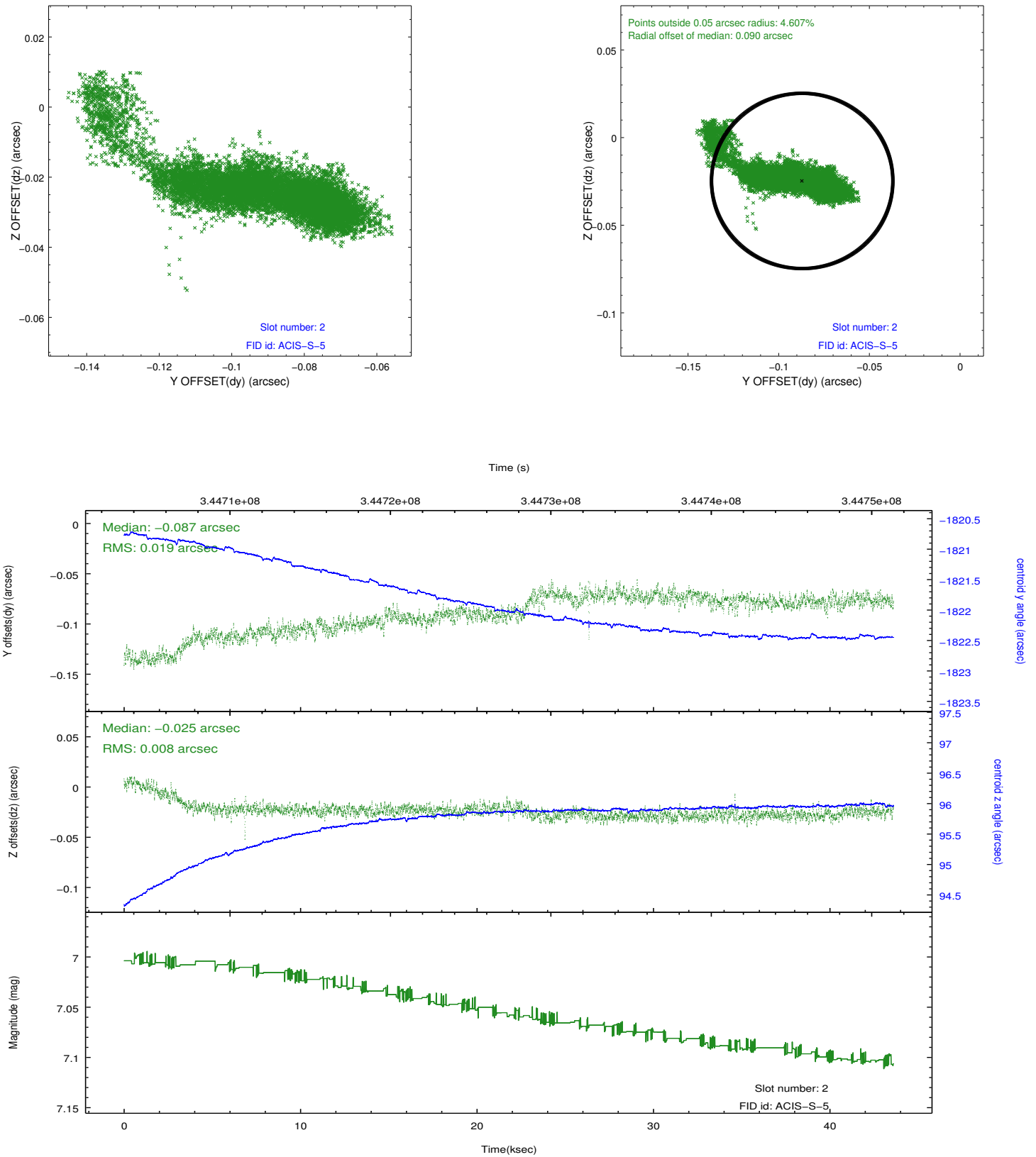
2.5.1 Slot 0



2.5.2 Slot 1

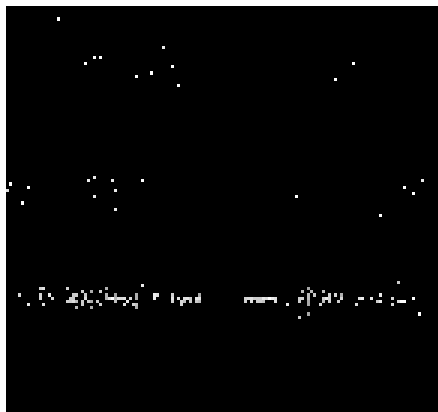


2.5.3 Slot 2

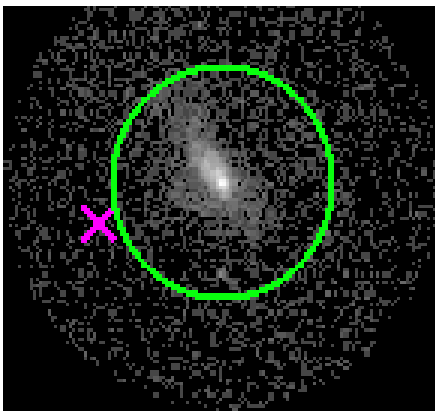


3 Gratings

3.1 HEG Arm



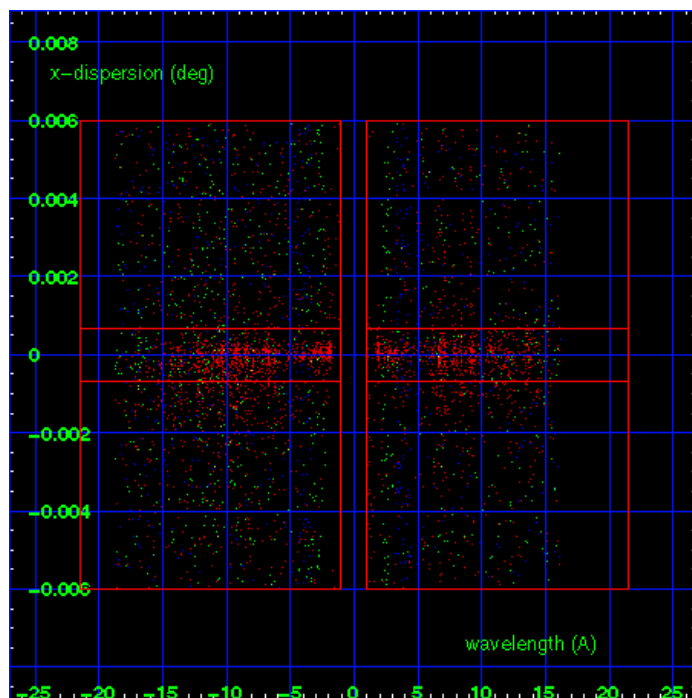
HEG Order Sort 123



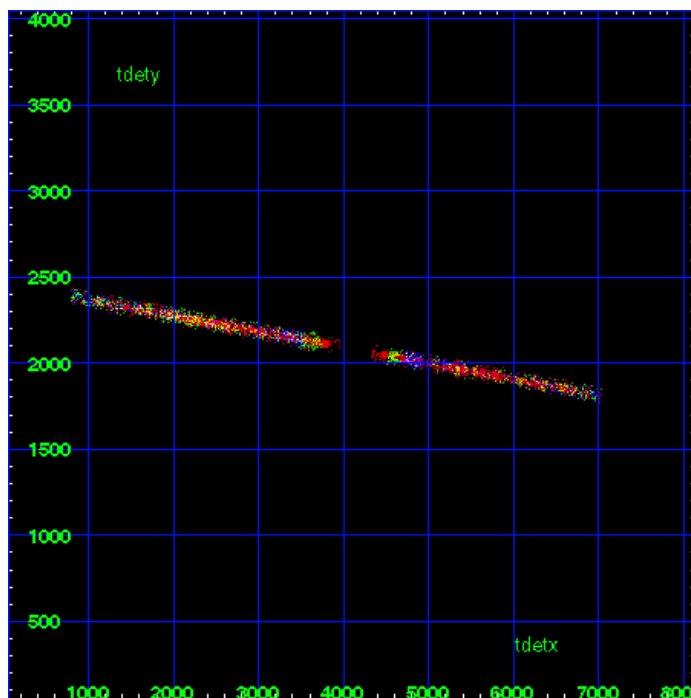
HEG Zero Order



HEG Order Sort ALL

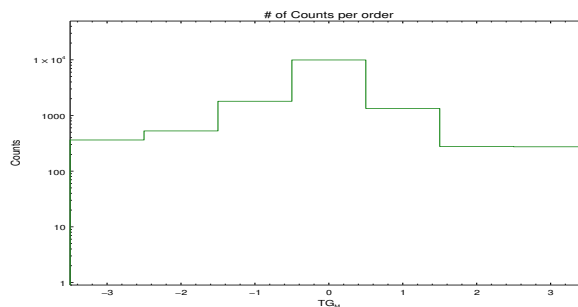


Spot Image HEG

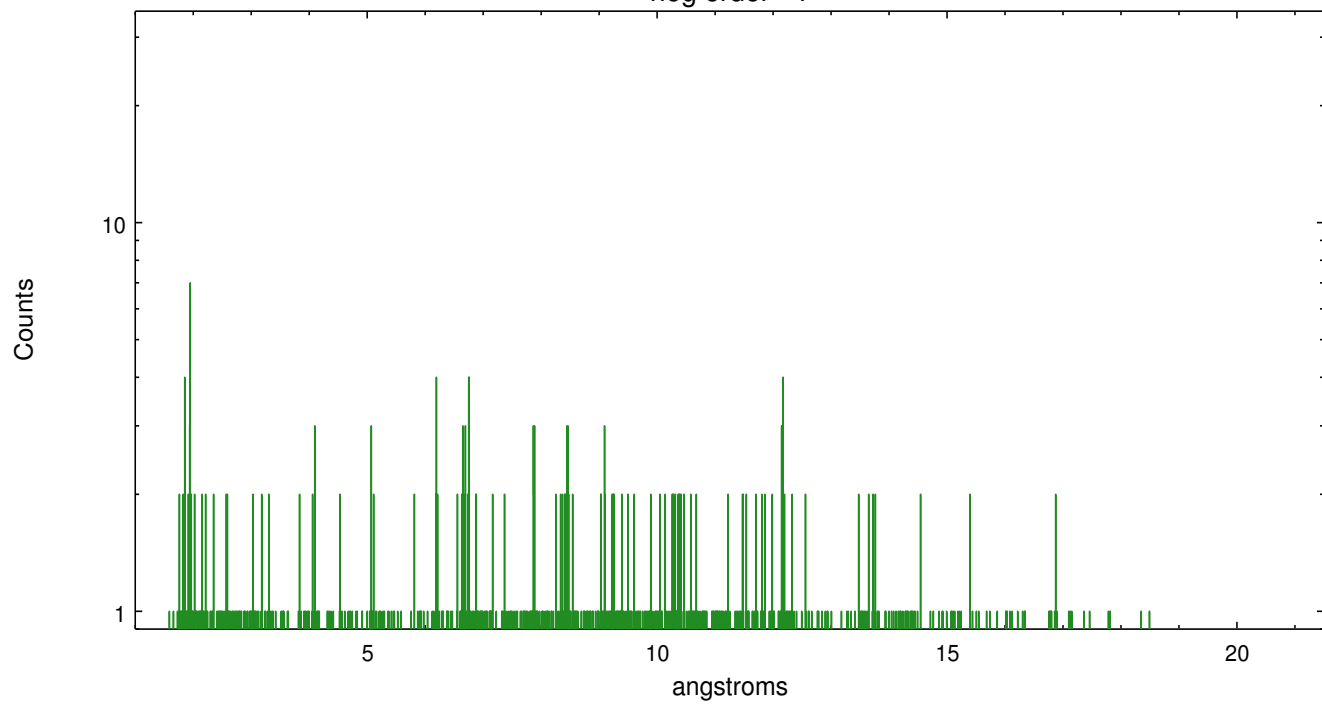


Full Detector HEG

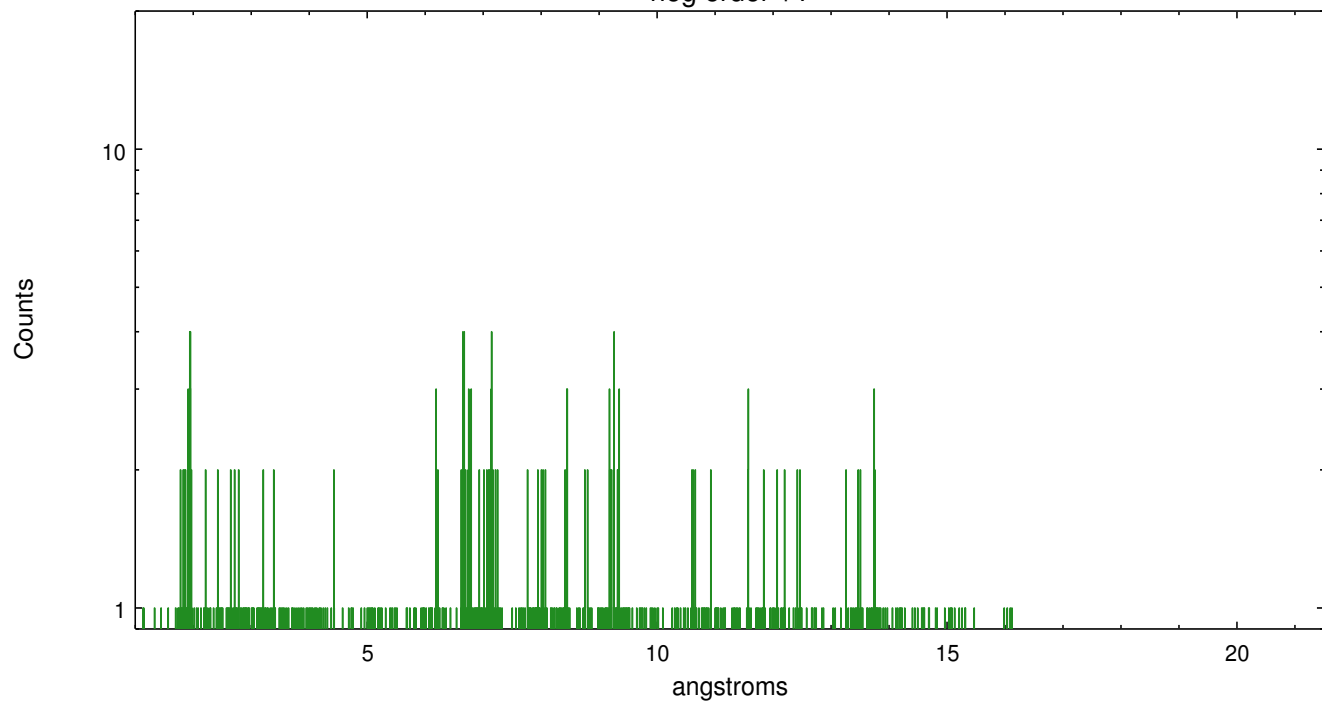
| | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 363 | 528 | 1799 | 9936 | 1337 | 277 | 274 |



heg order -1



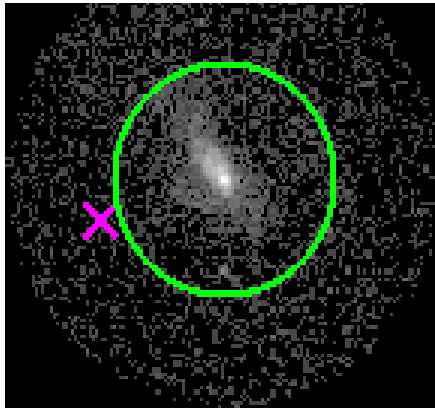
heg order +1



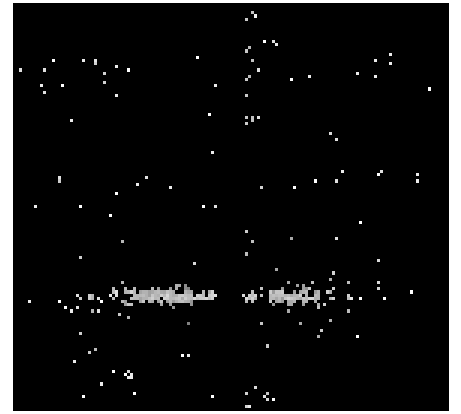
3.2 MEG Arm



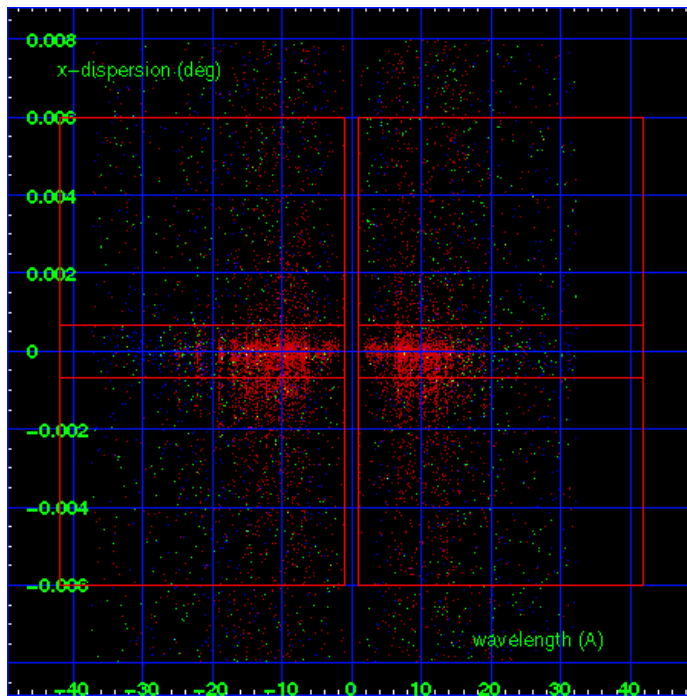
MEG Order Sort 123



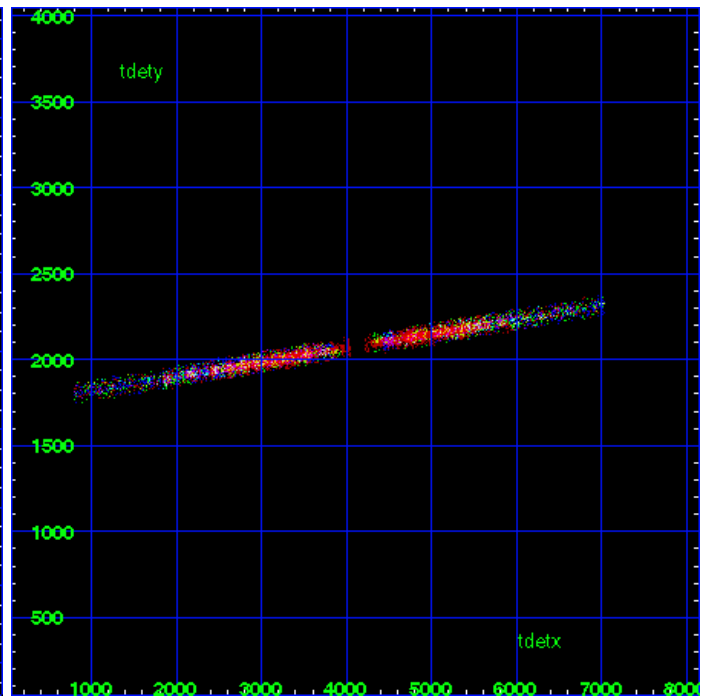
MEG Zero Order



MEG Order Sort ALL

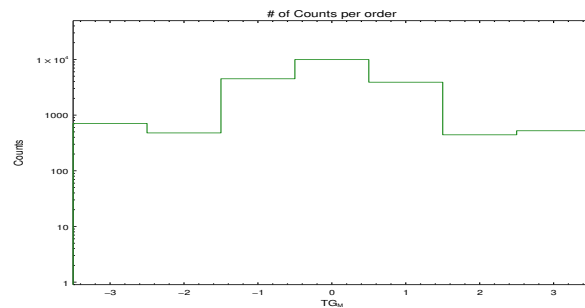


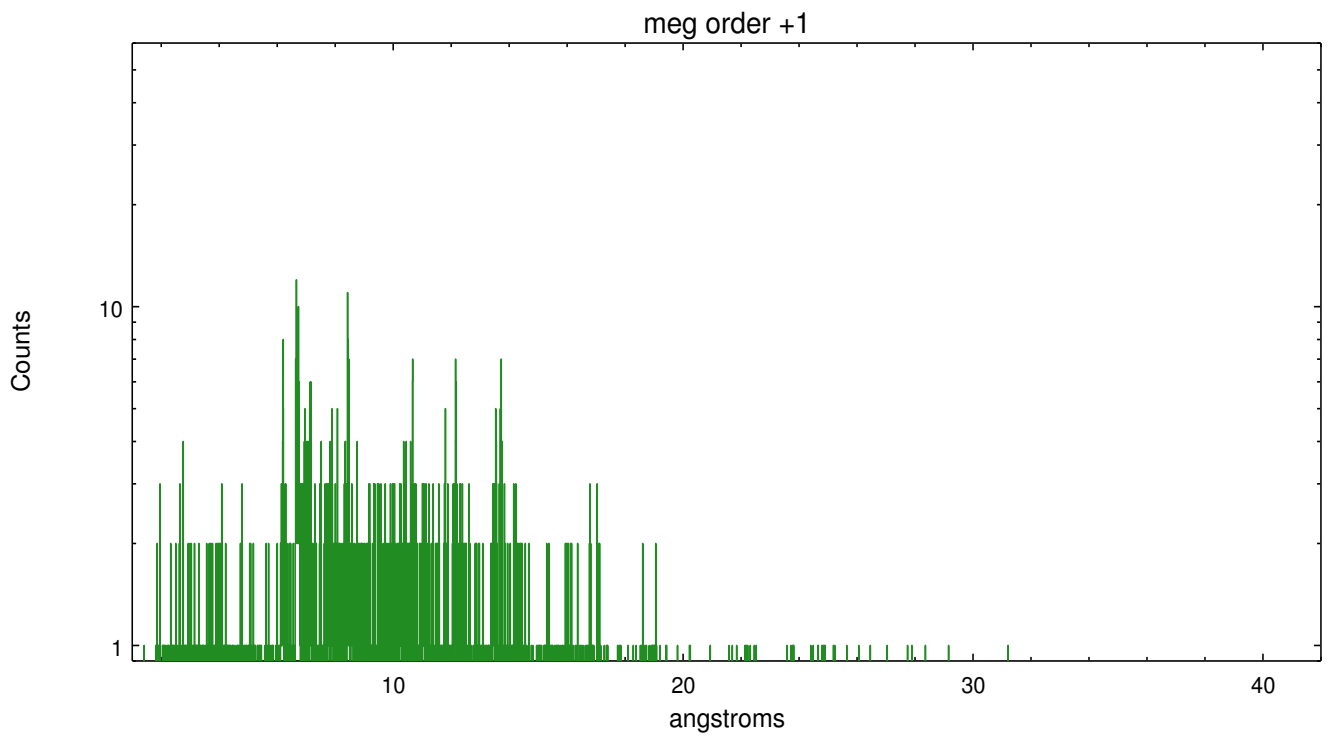
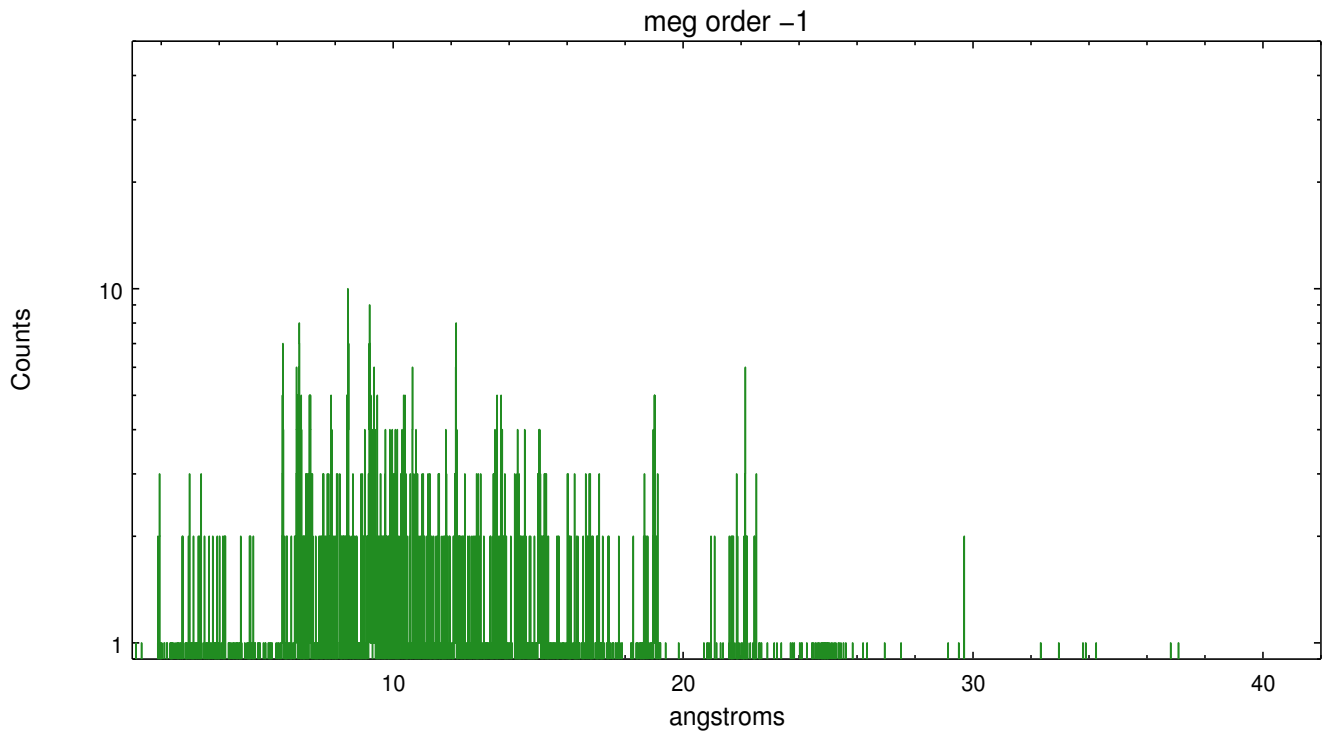
Spot Image MEG



Full Detector MEG

| | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 708 | 479 | 4497 | 9936 | 3899 | 443 | 524 |





A Summary

A.1 Status

| | |
|----------------------------|-------------|
| V&V Scientist | Joy Nichols |
| V&V Date (YYYY-MM-DD) | 2012.06.07 |
| V&V Edition | 1 |
| V&V Disposition and Status | OK |
| V&V Charge Time | 43.605 |

A.2 Comments

Source is extended and asymmetric. Standard software processing technique using the tool `tgdetect` did not give an accurate position for the zeroth order. The zeroth order position used in this processing was manually determined to be the brightest position in the nucleus. The newly determined zeroth order coordinates ($x=4130.25$, $y=4107.25$) have been placed in the `*src1a.fits` file, replacing the coordinates determined by `tgdetect`. Please note that rerunning `tgdetect` for analysis purposes will not give the same zeroth order position as that used in this processing.

===

Roll constraint met.

===

WARNING: there are no standard ciao tools for analysis of grating spectra from extended sources. The shape of an emission 'line' will be the shape of the zero order spatial structure convolved with the instrumental LSF. Grating extractions can be used, but need to be combined with custom spatial-spectral analysis, since wavelength is multi-valued at any particular diffraction angle.