

V&V Reference Report

L2 ASCDS Version : 10.6

Observation 20450 - L2 Version 2
Chandra X-Ray Center

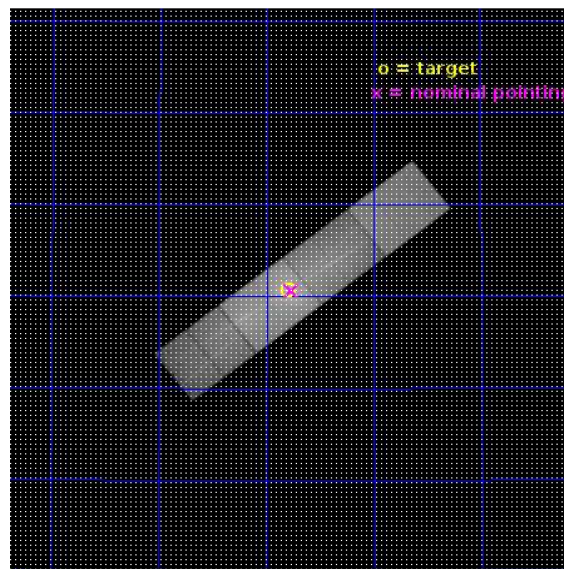
L2 Processing Date : Oct 31 2017

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 |
| 3 | Gratings | 17 |
| 3.1 | HEG Arm | 17 |
| 3.2 | MEG Arm | 19 |
| A | Summary | 21 |
| A.1 | Status | 21 |
| A.2 | Comments | 21 |

1 Front

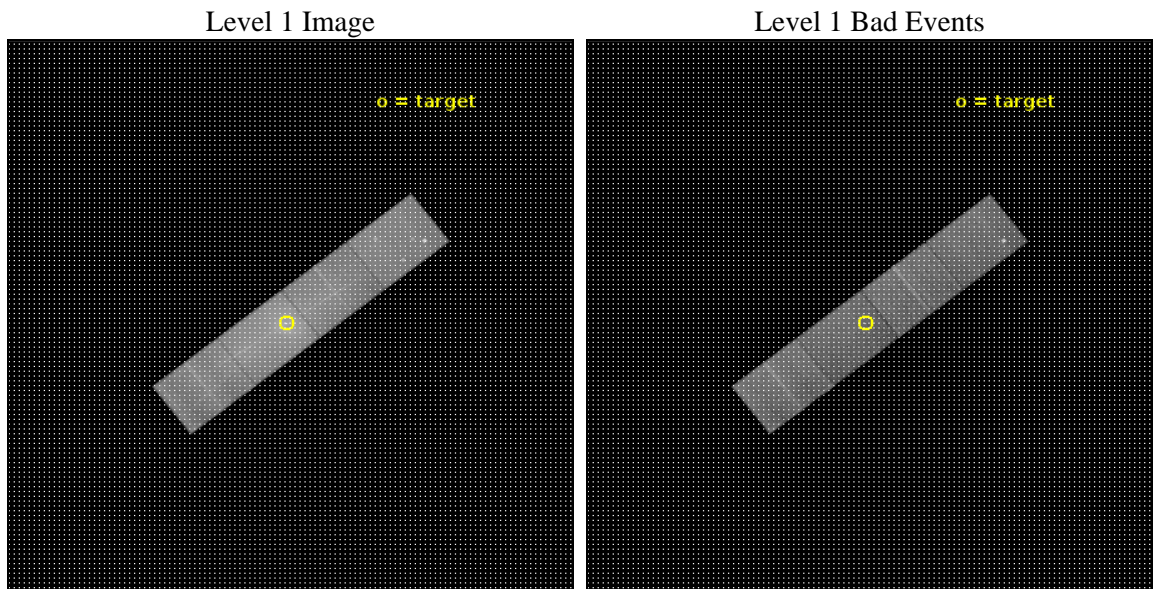
| | | |
|----------|--------------------------------------|---|
| seq_num | 703554 | Sequence number |
| obs_id | 20450 | Observation id |
| title | Chandra/HETG Observations of NGC1275 | Proposal title |
| observer | Christopher Reynolds | Principal investigator |
| object | NGC1275 | Source name |
| dtcycle | 0 | |
| cycle | P | events from which exps? Prim/Second/Both |
| ra_targ | 49.950417 | Observer's specified target RA [deg] |
| dec_targ | 41.511667 | Observer's specified target Dec [deg] |
| ra_nom | 49.941778576742 | Nominal RA [deg] |
| dec_nom | 41.510752954111 | Nominal Dec [deg] |
| roll_nom | 142.16235533143 | Nominal Roll [deg] |
| revision | 2 | Processing version of data |
| ontime | 30090.402078867 | Sum of GTIs [s] |
| livetime | 29584.507009013 | Livetime [s] |
| ontime5 | 30090.361038923 | Sum of GTIs [s] |
| ontime6 | 30090.31999886 | Sum of GTIs [s] |
| ontime7 | 30090.402078867 | Sum of GTIs [s] |
| ontime8 | 30090.278958917 | Sum of GTIs [s] |
| l2events | 831759 | Number of level 2 events |



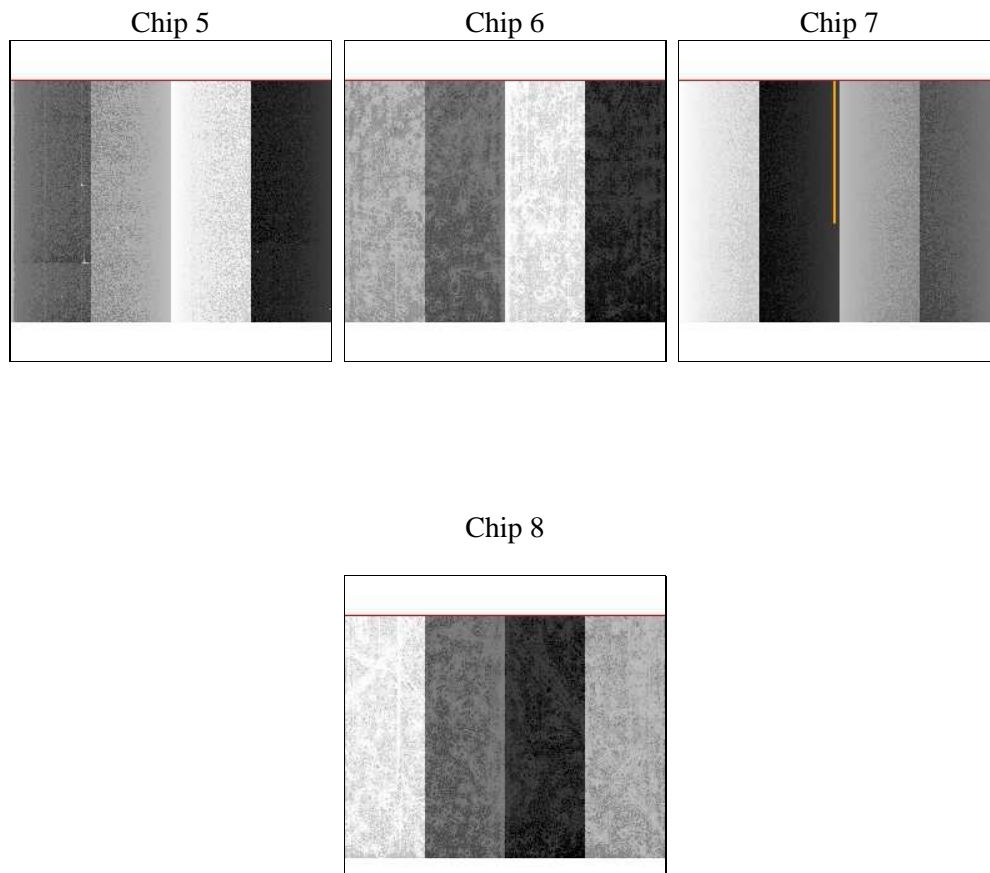
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

| | | | | | |
|----------|---------------------|--------------------------------|----------------|--------------------|---|
| obi_num | 1 | Obi number | sched_exp_time | 30000.000000 | [s] Scheduled observation exposure time |
| ascdsver | 10.6 | Processing system revision | ontime | 30090.402078867 | Sum of GTIs [s] |
| caldbver | 4.7.6 | | ontime5 | 30090.361038923 | Sum of GTIs [s] |
| date | 2017-10-27T19:12:04 | Date and time of file creation | ontime6 | 30090.31999886 | Sum of GTIs [s] |
| revision | 1 | Processing version of data | ontime7 | 30090.402078867 | Sum of GTIs [s] |
| | | | ontime8 | 30090.278958917 | Sum of GTIs [s] |
| | | | l1events | 1464605 | Number of level 1 events |
| | | | tgmethod | MANUAL | Method used to create src1a file |
| | | | zo_pos | (4046.80, 4103.60) | src1a sky pixel position |
| | | | zo_pos_tgd | (4046.82, 4103.67) | src1a sky pixel position via todetect |

2.1.4 Events

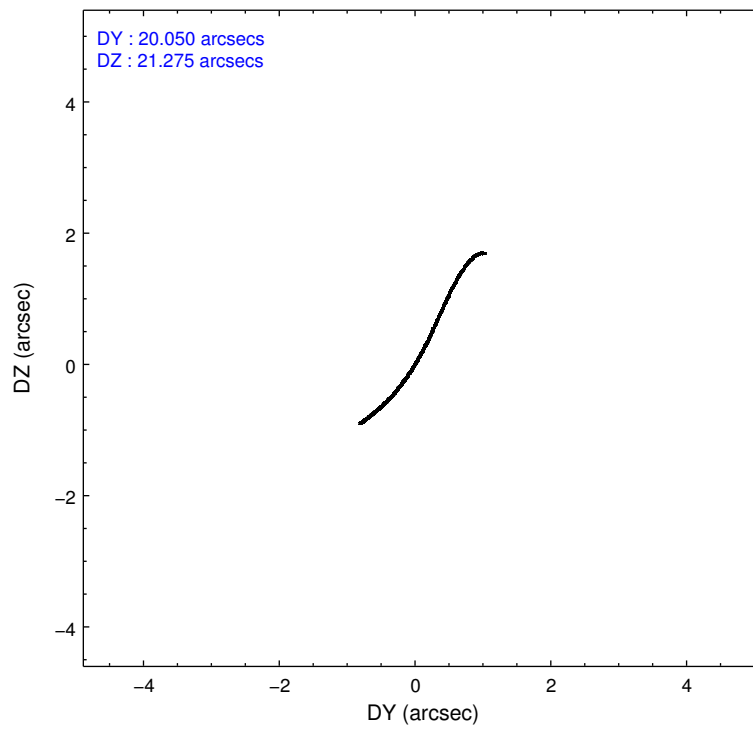
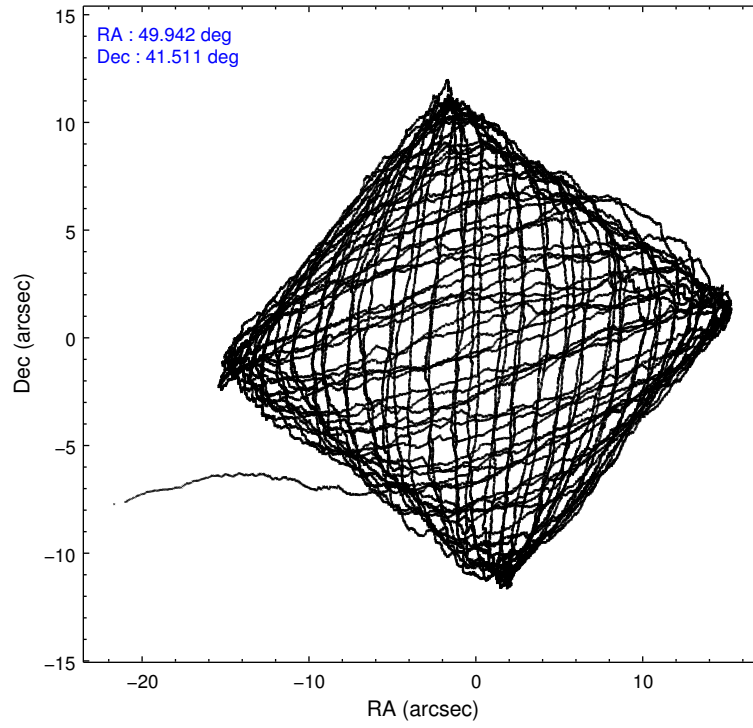
| | ccd 5 | ccd 6 | ccd 7 | ccd 8 |
|-----------------|--------|--------|--------|--------|
| level 1 events | 309153 | 336284 | 529117 | 290051 |
| rejected events | 138017 | 148248 | 118820 | 154879 |
| rejected % | 44% | 44% | 22% | 53% |

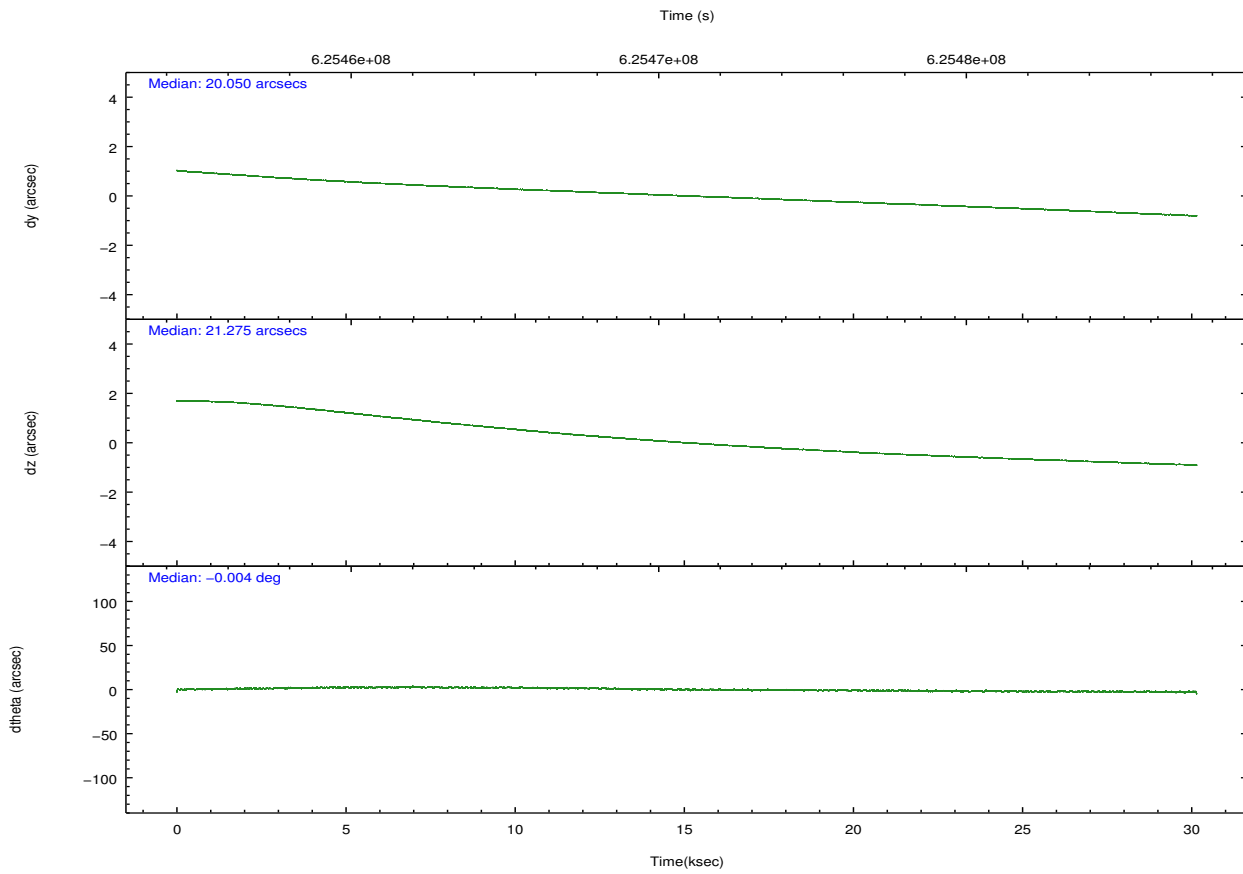
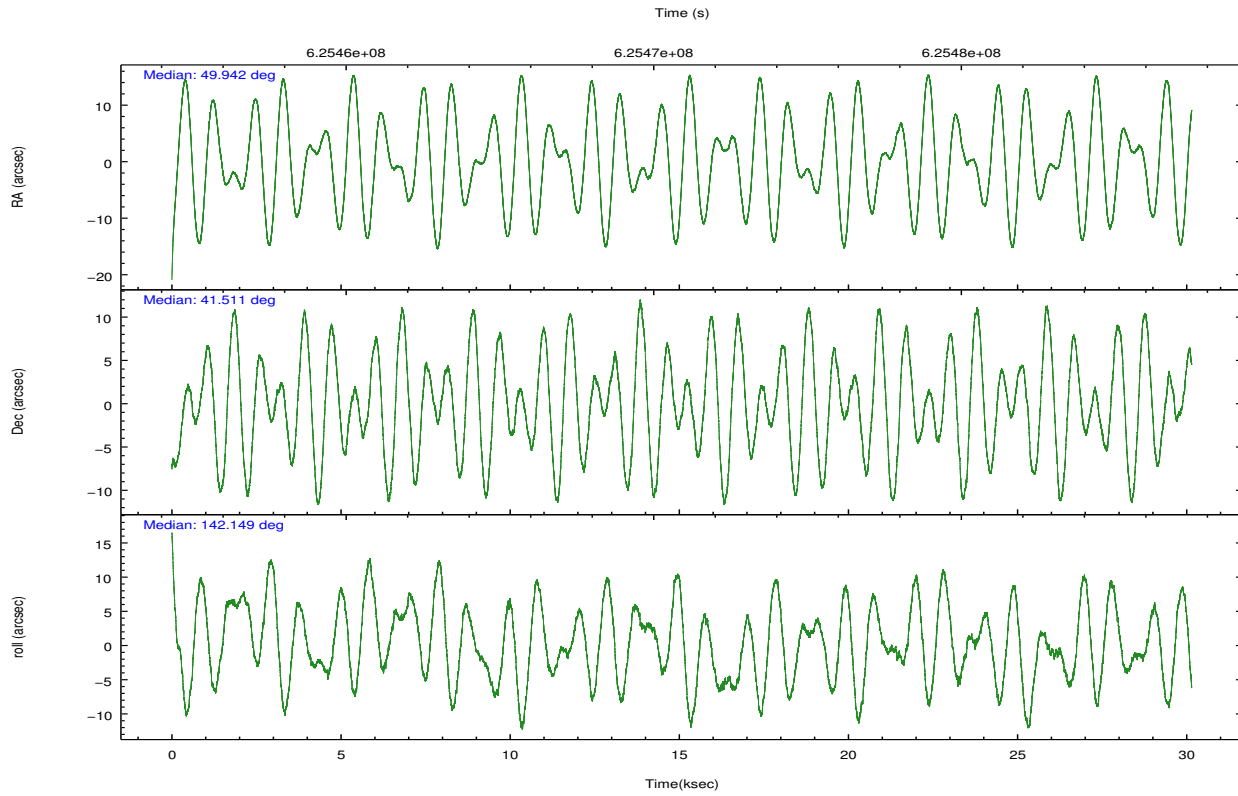
| | ccd 5 | ccd 6 | ccd 7 | ccd 8 |
|----------------|--------|--------|--------|--------|
| grade 0 events | 27645 | 134499 | 82450 | 79820 |
| | 8% | 39% | 15% | 27% |
| grade 1 events | 632 | 525 | 514 | 351 |
| | 0% | 0% | 0% | 0% |
| grade 2 events | 55341 | 25949 | 100840 | 21901 |
| | 17% | 7% | 19% | 7% |
| grade 3 events | 6967 | 8028 | 43417 | 8111 |
| | 2% | 2% | 8% | 2% |
| grade 4 events | 6848 | 7853 | 42634 | 7922 |
| | 2% | 2% | 8% | 2% |
| grade 5 events | 17872 | 7857 | 23640 | 11280 |
| | 5% | 2% | 4% | 3% |
| grade 6 events | 74352 | 11726 | 140980 | 17428 |
| | 24% | 3% | 26% | 6% |
| grade 7 events | 119496 | 139847 | 94642 | 143238 |
| | 38% | 41% | 17% | 49% |

2.2 Compared Parameters

| Parameter | Planned | Actual | Parameter | Planned | Actual |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument | ACIS | ACIS | Obspar format version number | 7 | 7 |
| Detector | ACIS-5678 | ACIS-5678 | Obspar file type | PREDICTED | ACTUAL |
| Grating | HETG | HETG | 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 | 49.978166 | 49.94177857674241 | CCD I2 on | N | N |
| [deg] Pointing Dec | 41.507368 | 41.51075295411118 | CCD I3 on | N | N |
| [deg] Pointing Roll | 141.981611 | 142.1623553314347 | CCD S0 on | O1 | N |
| [mm] SIM focus pos | -0.684267 | -0.6828225247311905 | CCD S1 on | Y | Y |
| [mm] SIM defocus | 0 | 0.001444936568705701 | CCD S2 on | Y | Y |
| [mm] SIM translation stage pos | -190.132523 | -190.1425803651734 | CCD S3 on | Y | Y |
| [mm] SIM translation stage offset | 0 | 0.01005778216563158 | CCD S4 on | Y | Y |
| [s] Observation start time (MET) | 625455967.184000 | 625454796.31756 | CCD S5 on | O2 | N |
| Observation start date | 2017-10-27T01:44:58 | 2017-10-27T01:26:36 | Number of optional ACIS chips dropped | 2 | 2 |
| [s] Observation end time (MET) | 625485967.184000 | 625486216.1569 | On-chip summing requested | N | N |
| Observation end date | 2017-10-27T10:04:58 | 2017-10-27T10:10:16 | Subarray requested | CUSTOM | CUSTOM |
| Read mode | TIMED | TIMED | Subarray start row | 125 | 125 |
| | | | Subarray row count | 774 | 774 |
| | | | Alternating exposures requested | N | N |
| | | | [s] Primary exposure time | 0.000000 | 2.4 |

2.3 Aspect



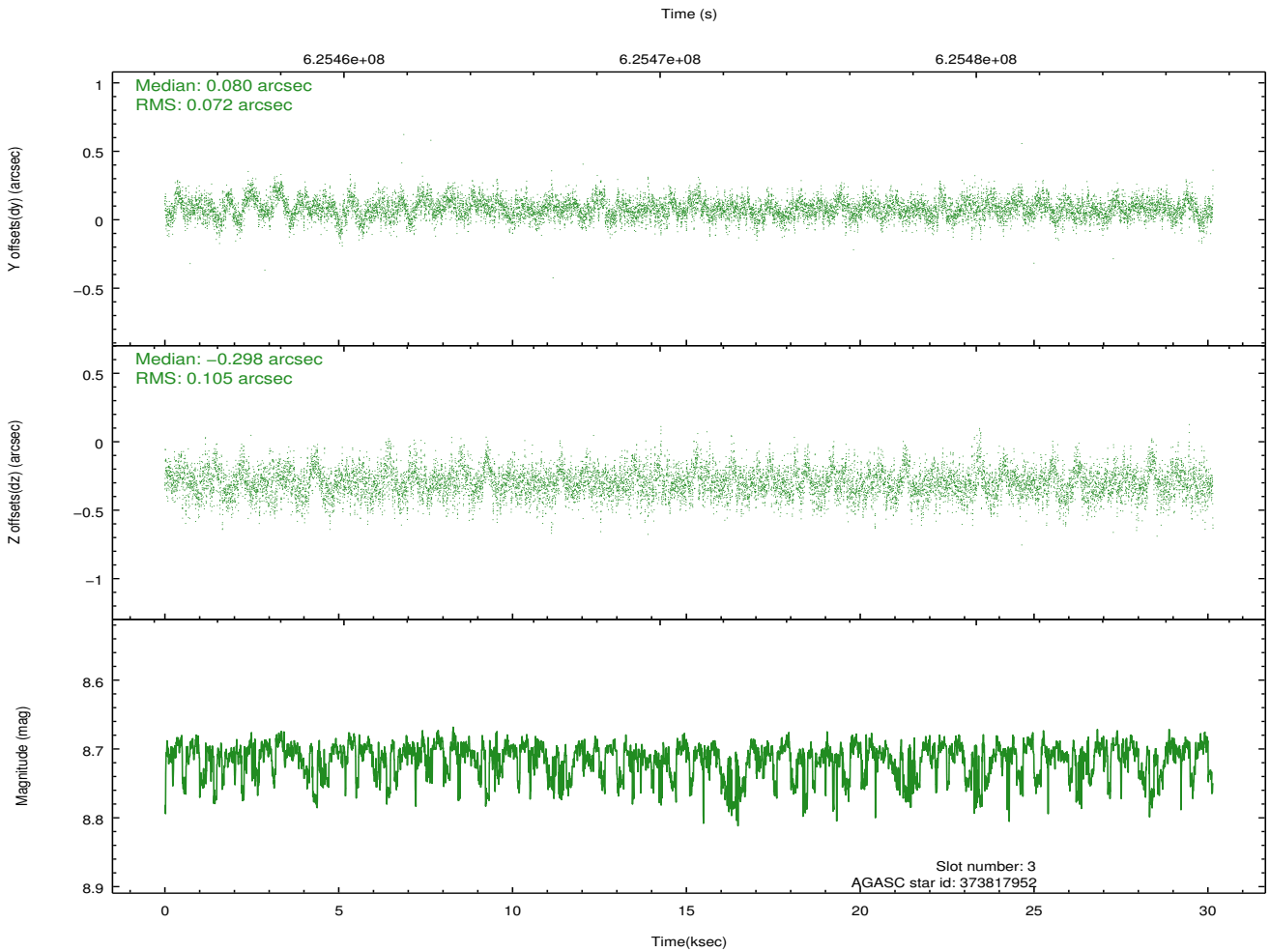
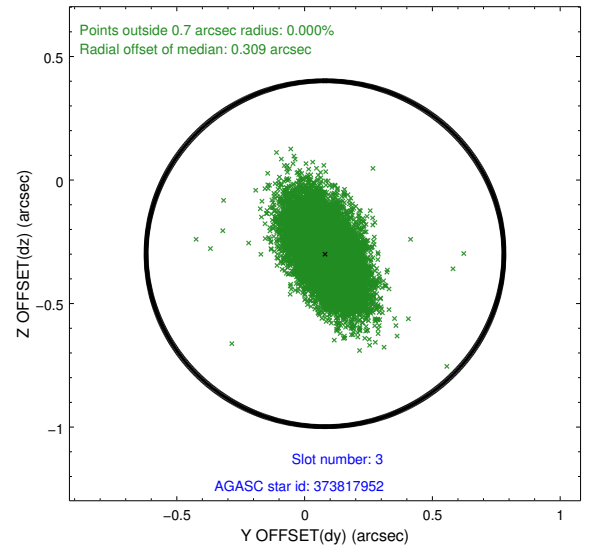
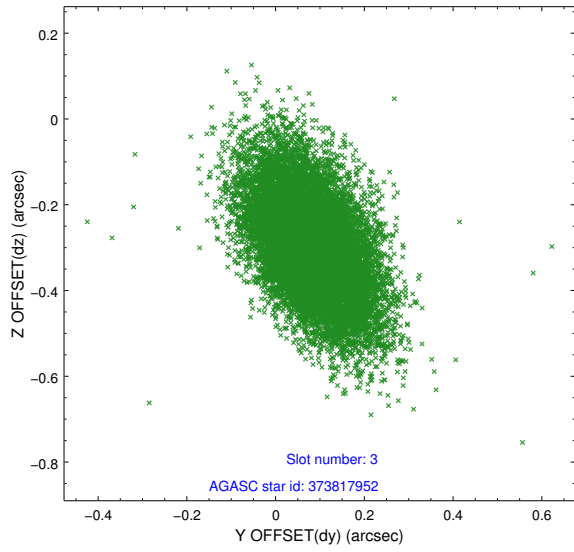


Slot Statistics

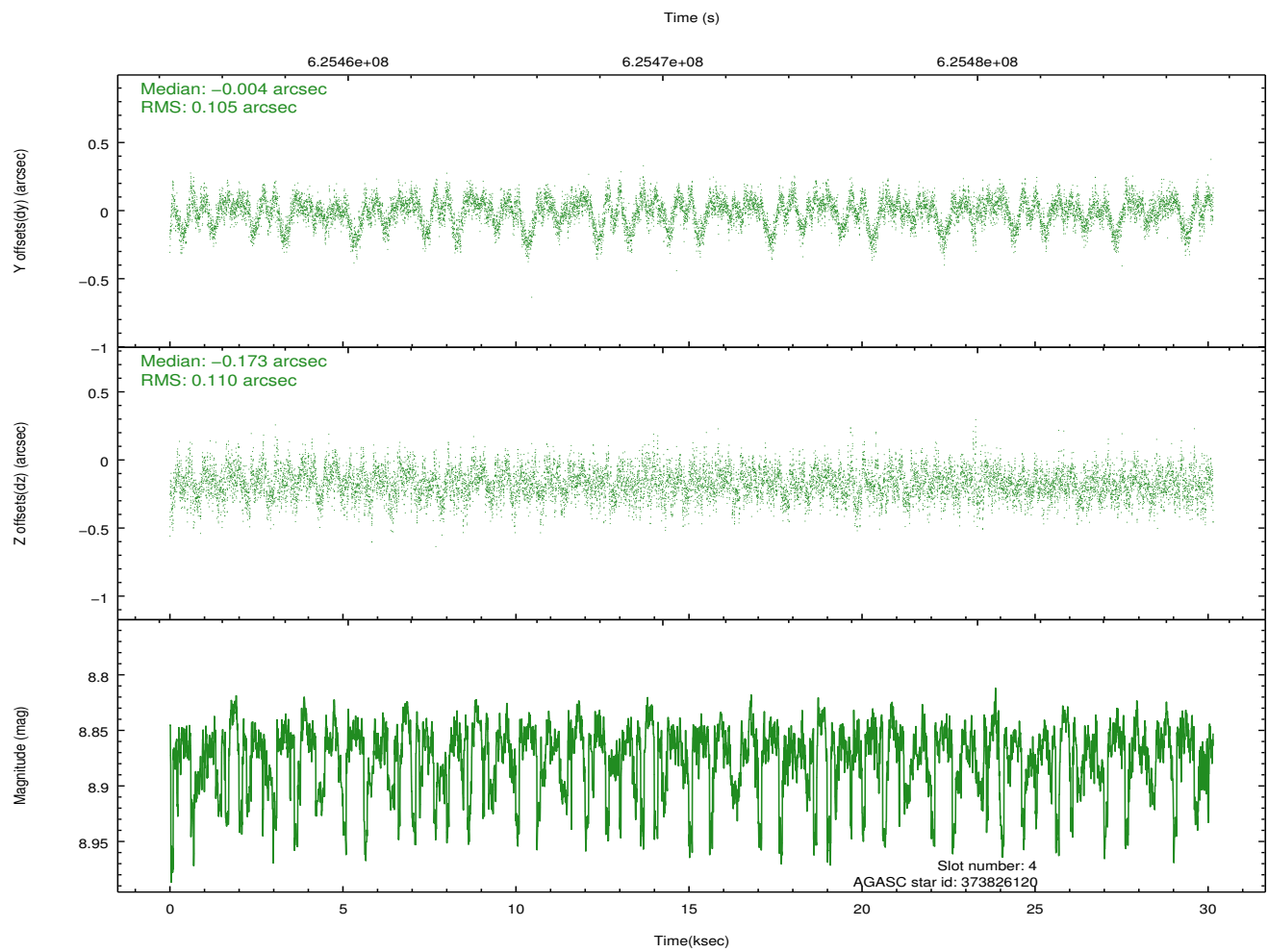
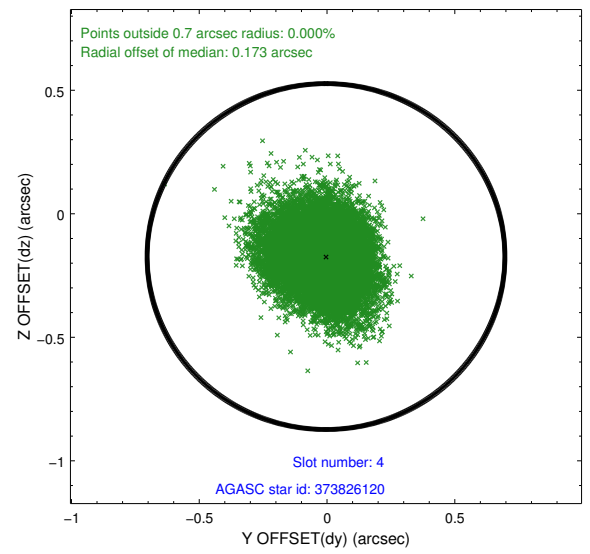
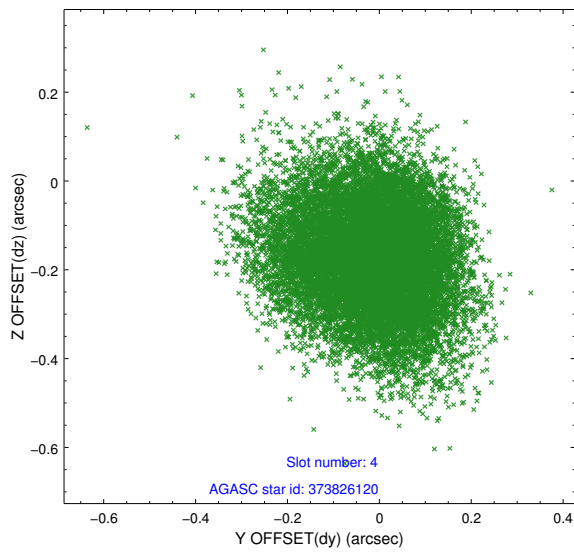
| slot | status | used | id | mag | n_pts | med_dy | med_dz | dr1 | dr2 | ra | dec | mean_y | mean_z |
|------|--------|------|-----------|------|-------|--------|--------|-------|-------|-----------|-----------|----------|----------|
| 0 | FID | | ACIS-S-2 | 7.08 | 7352 | -0.266 | -0.150 | 0.027 | 0.046 | 0.000000 | 0.000000 | -773.44 | -1743.12 |
| 1 | FID | | ACIS-S-4 | 7.20 | 7352 | 0.557 | 0.167 | 0.023 | 0.032 | 0.000000 | 0.000000 | 2140.62 | 165.62 |
| 2 | FID | | ACIS-S-5 | 7.19 | 7353 | -0.328 | -0.010 | 0.027 | 0.041 | 0.000000 | 0.000000 | -1826.26 | 159.19 |
| 3 | GUIDE | used | 373817952 | 8.71 | 14700 | 0.080 | -0.298 | 0.130 | 0.231 | 49.913424 | 40.978510 | -1034.13 | 1607.98 |
| 4 | GUIDE | used | 373826120 | 8.87 | 14697 | -0.004 | -0.173 | 0.162 | 0.263 | 49.738165 | 41.186341 | -199.00 | 1310.33 |
| 5 | GUIDE | used | 374352808 | 8.74 | 14688 | -0.071 | -0.011 | 0.163 | 0.276 | 49.969955 | 42.208621 | 1572.73 | -1974.69 |
| 6 | GUIDE | used | 376057824 | 8.32 | 14697 | 0.242 | 0.467 | 0.133 | 0.235 | 50.665569 | 41.926280 | -516.62 | -2327.19 |
| 7 | GUIDE | used | 374357808 | 8.65 | 14695 | -0.242 | 0.019 | 0.143 | 0.252 | 49.921429 | 42.176083 | 1602.27 | -1803.05 |

2.4 Star Slots

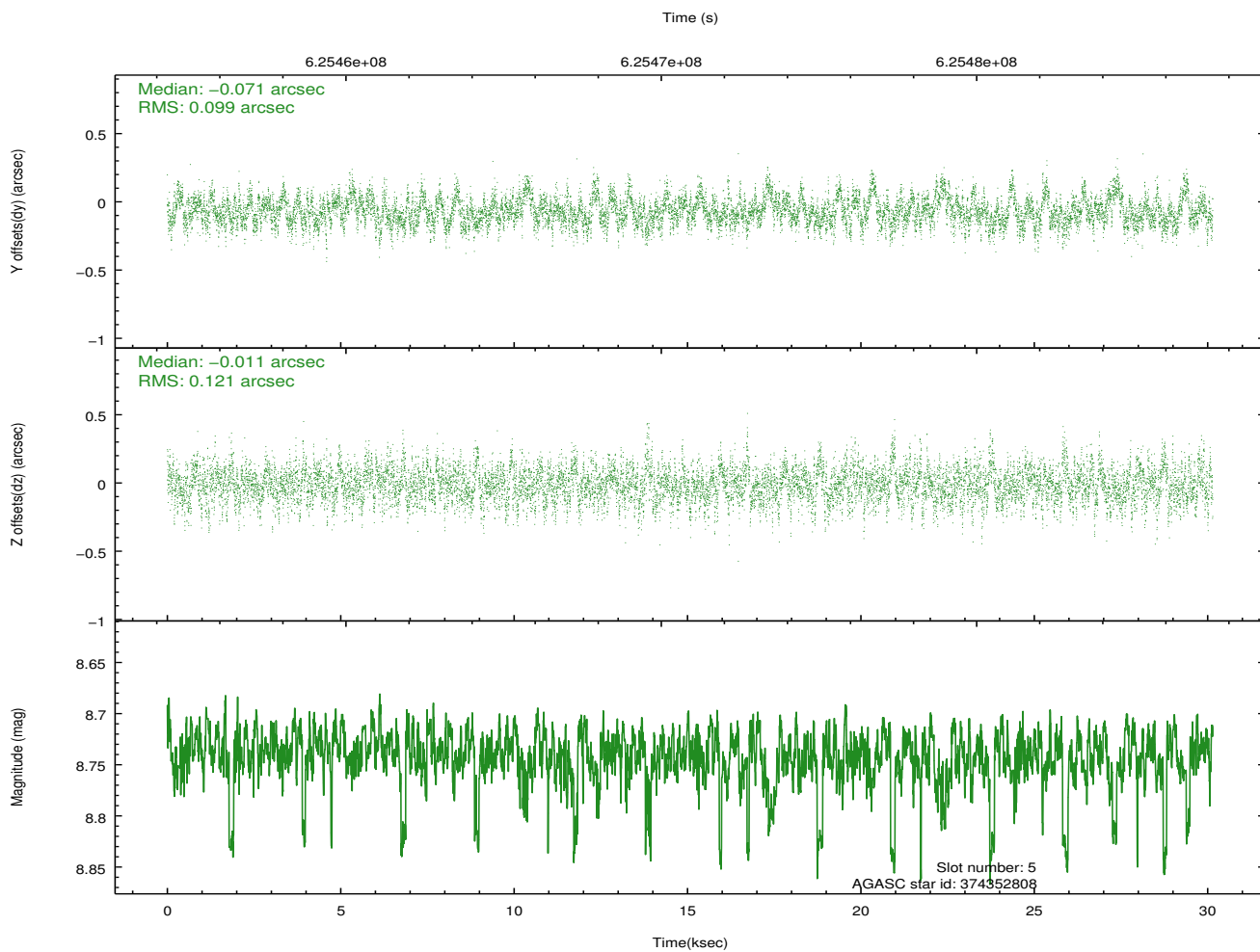
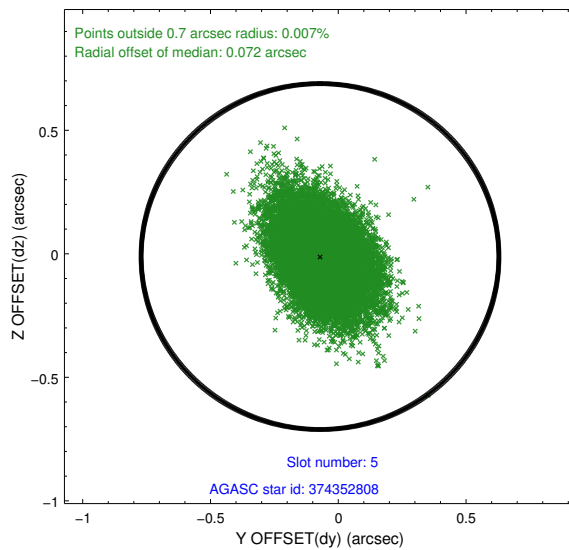
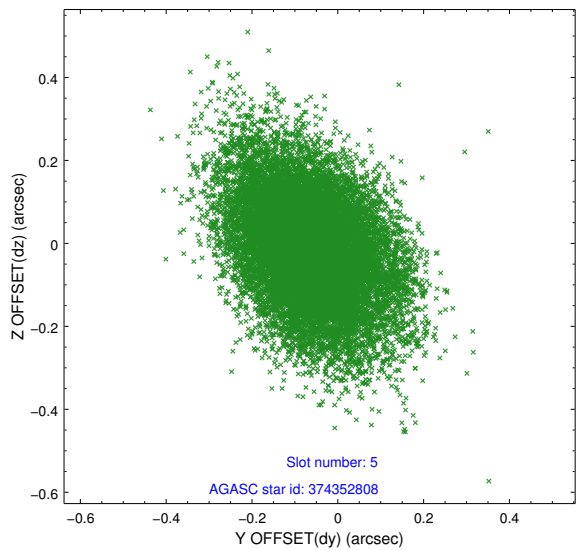
2.4.1 Slot 3



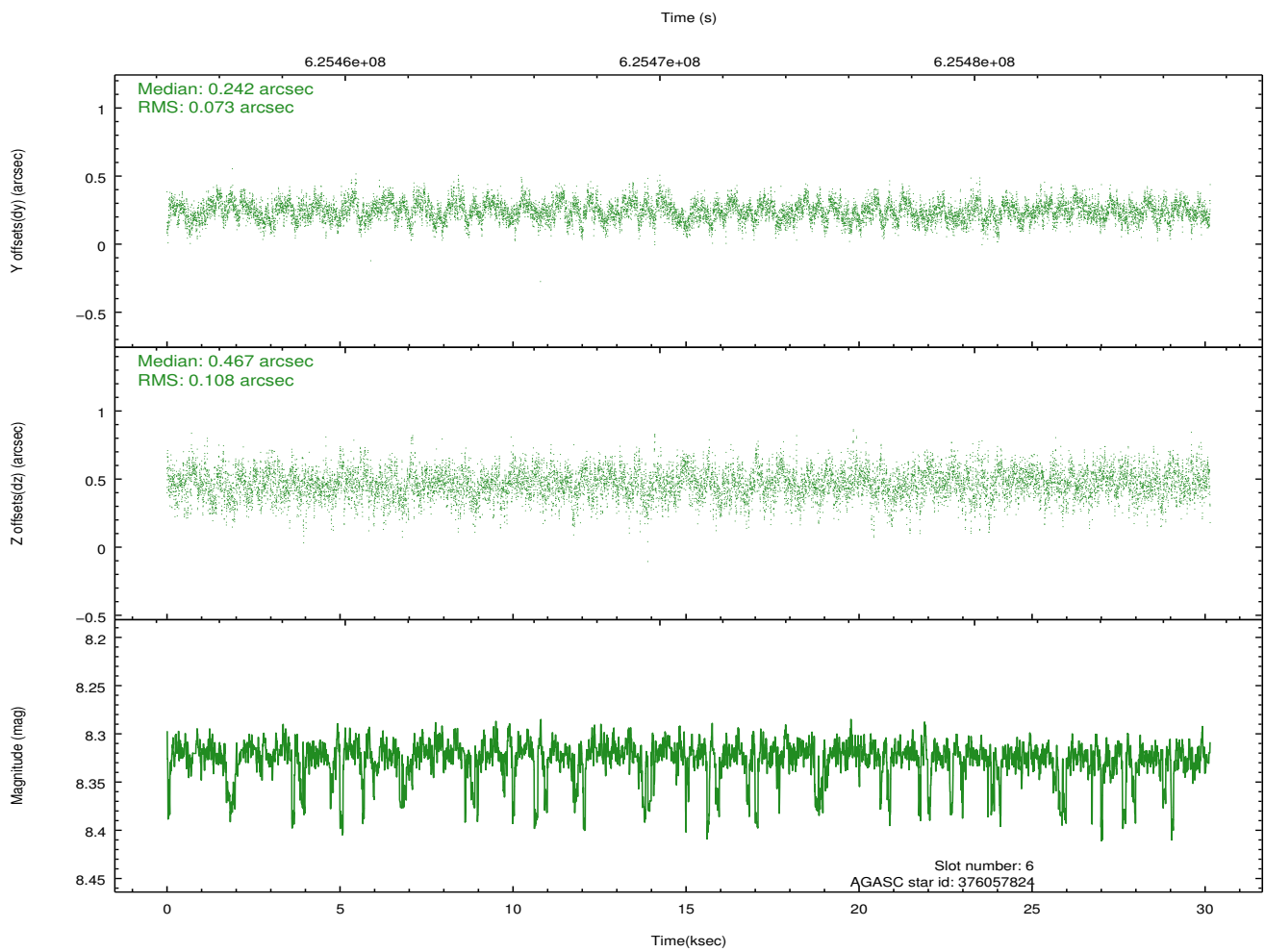
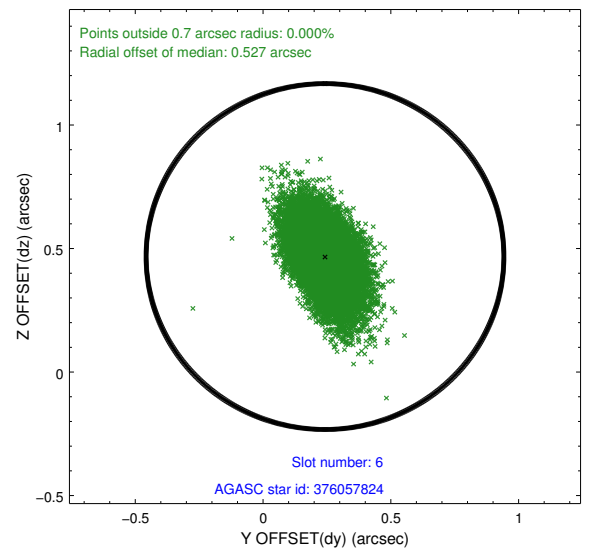
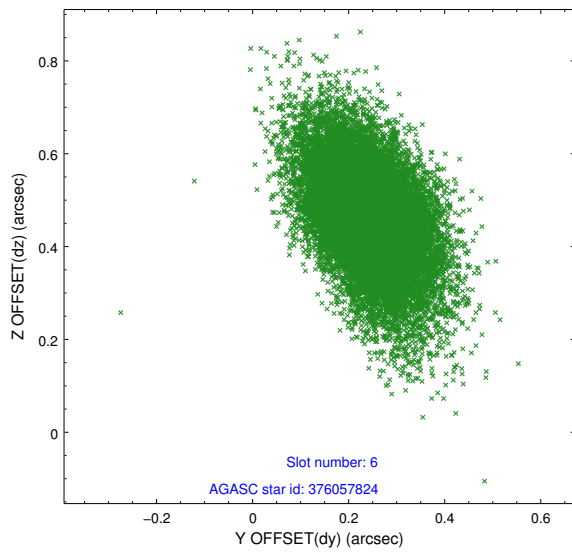
2.4.2 Slot 4



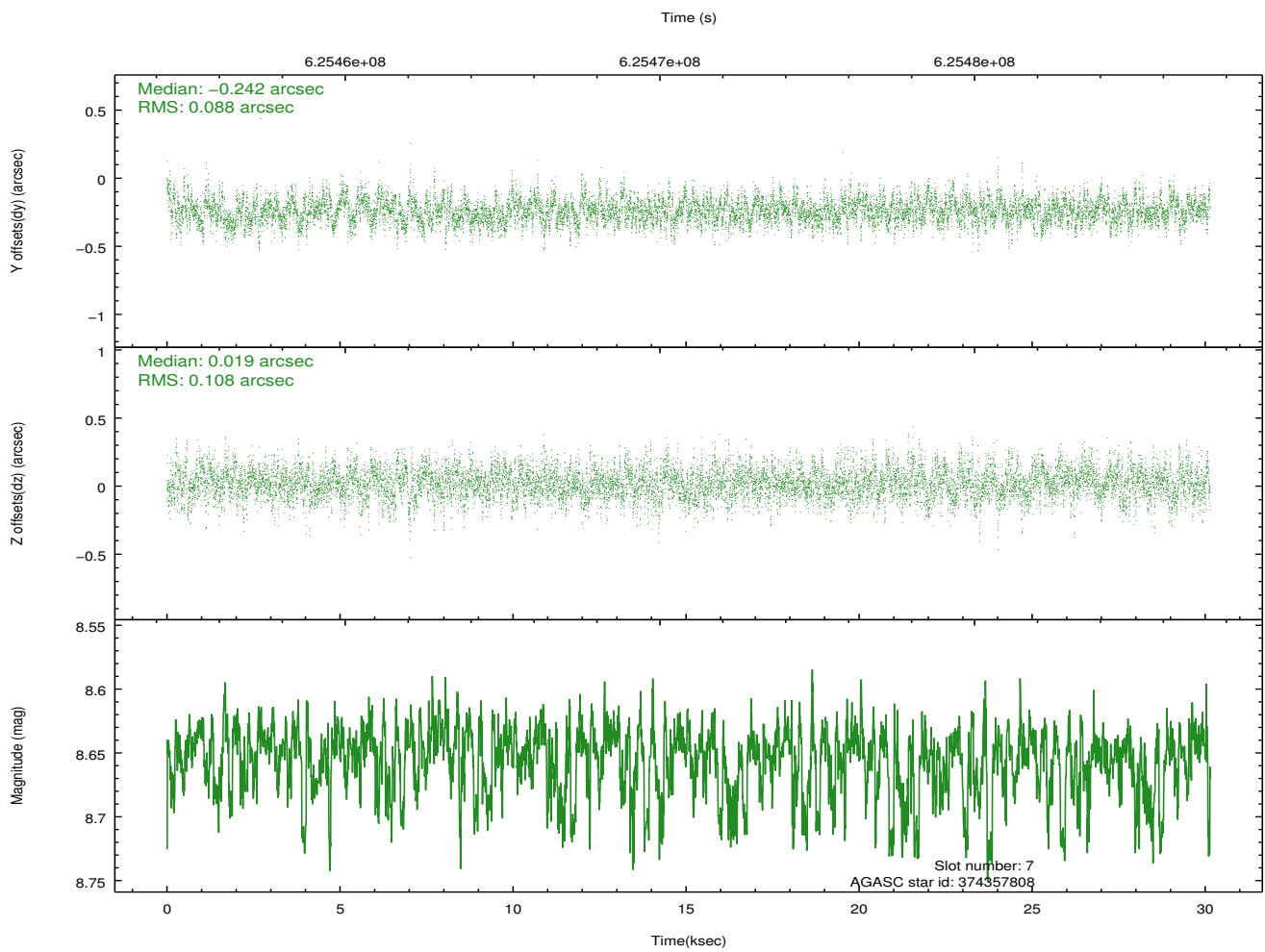
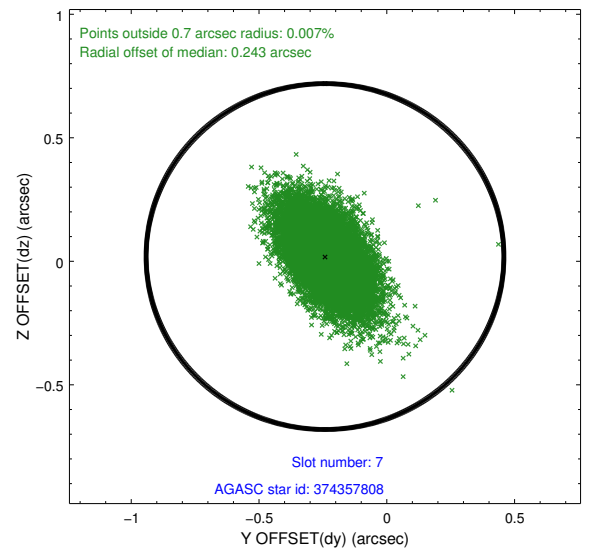
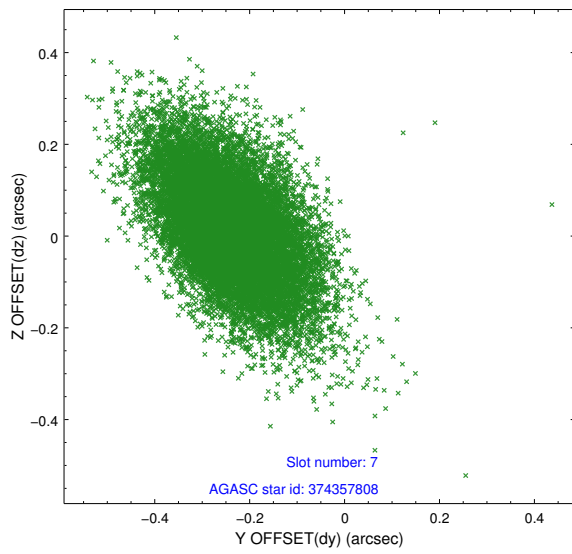
2.4.3 Slot 5



2.4.4 Slot 6

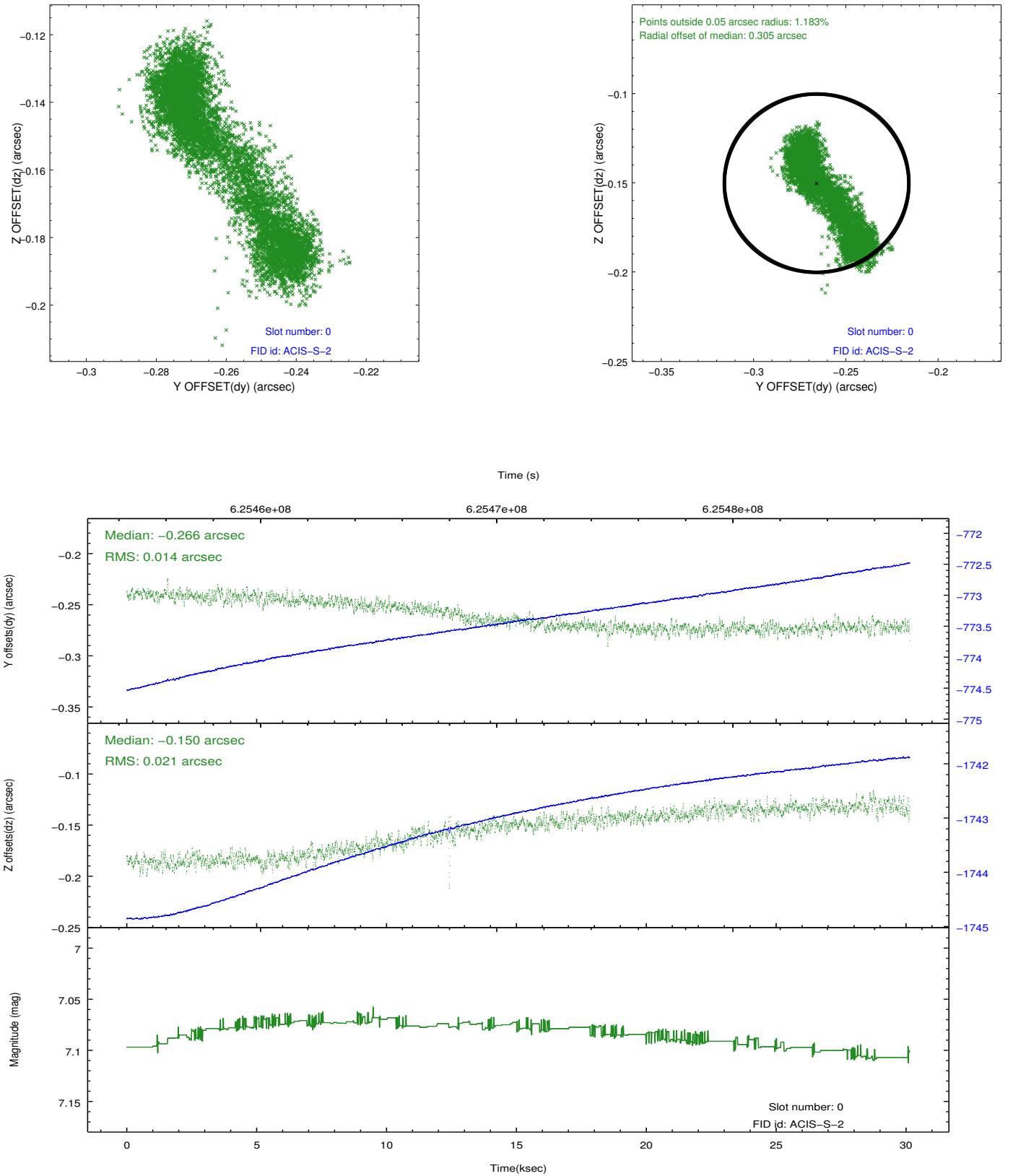


2.4.5 Slot 7

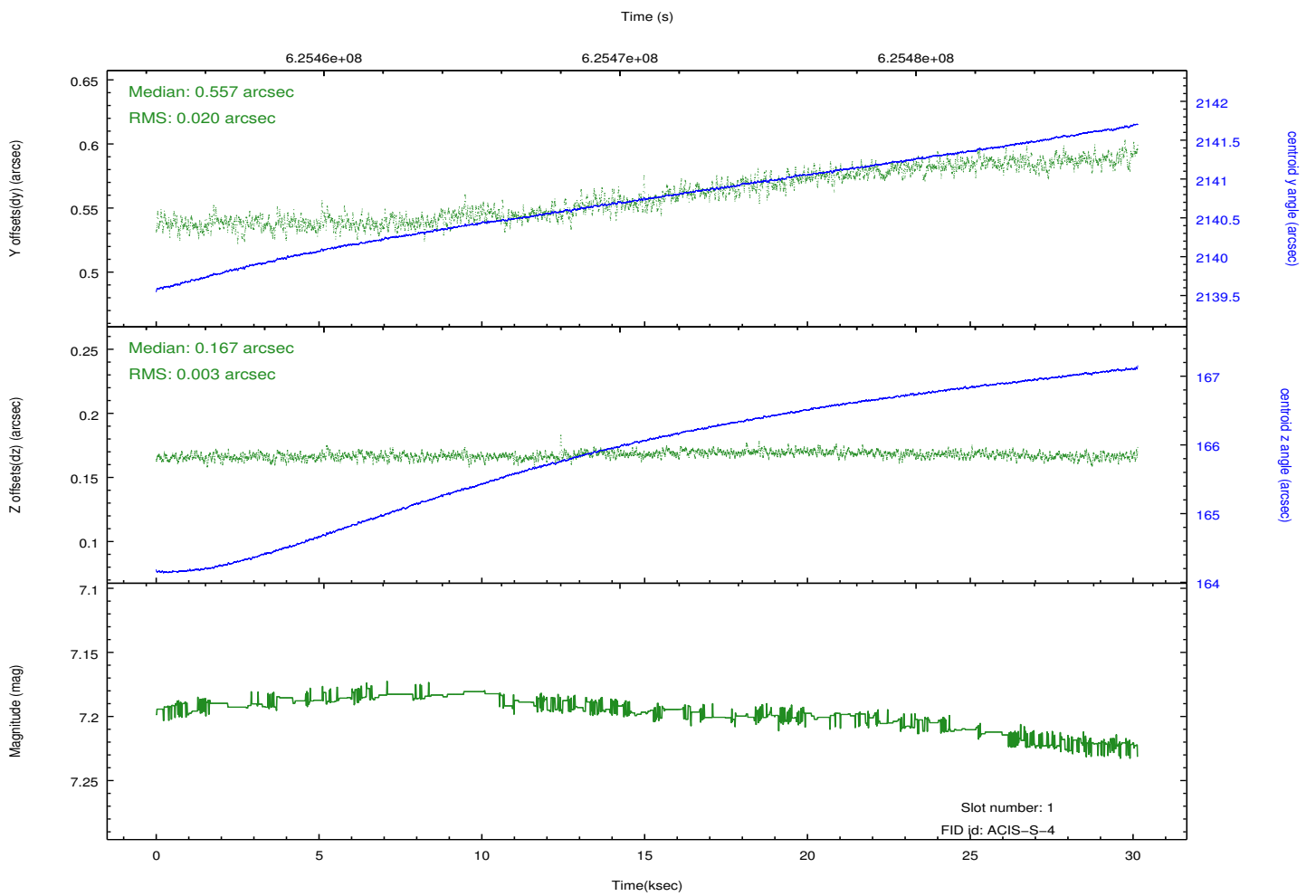
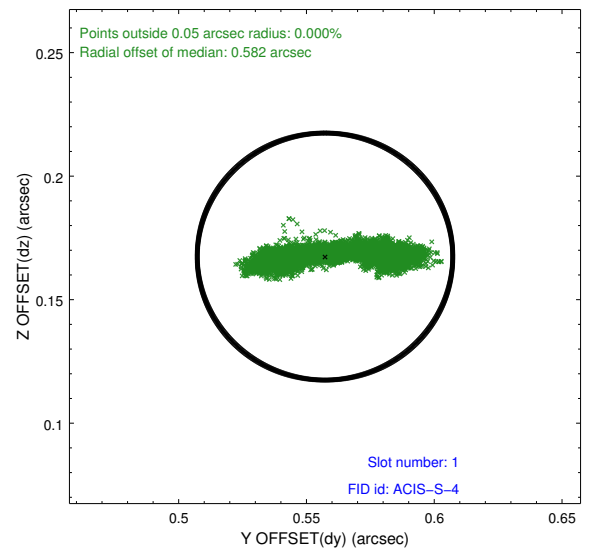
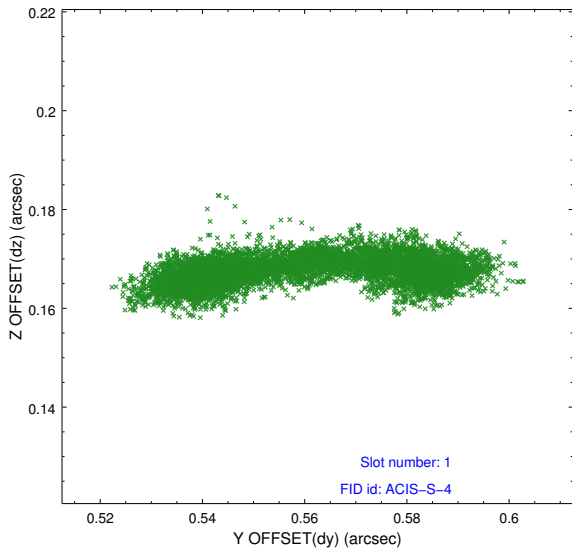


2.5 FID Slots

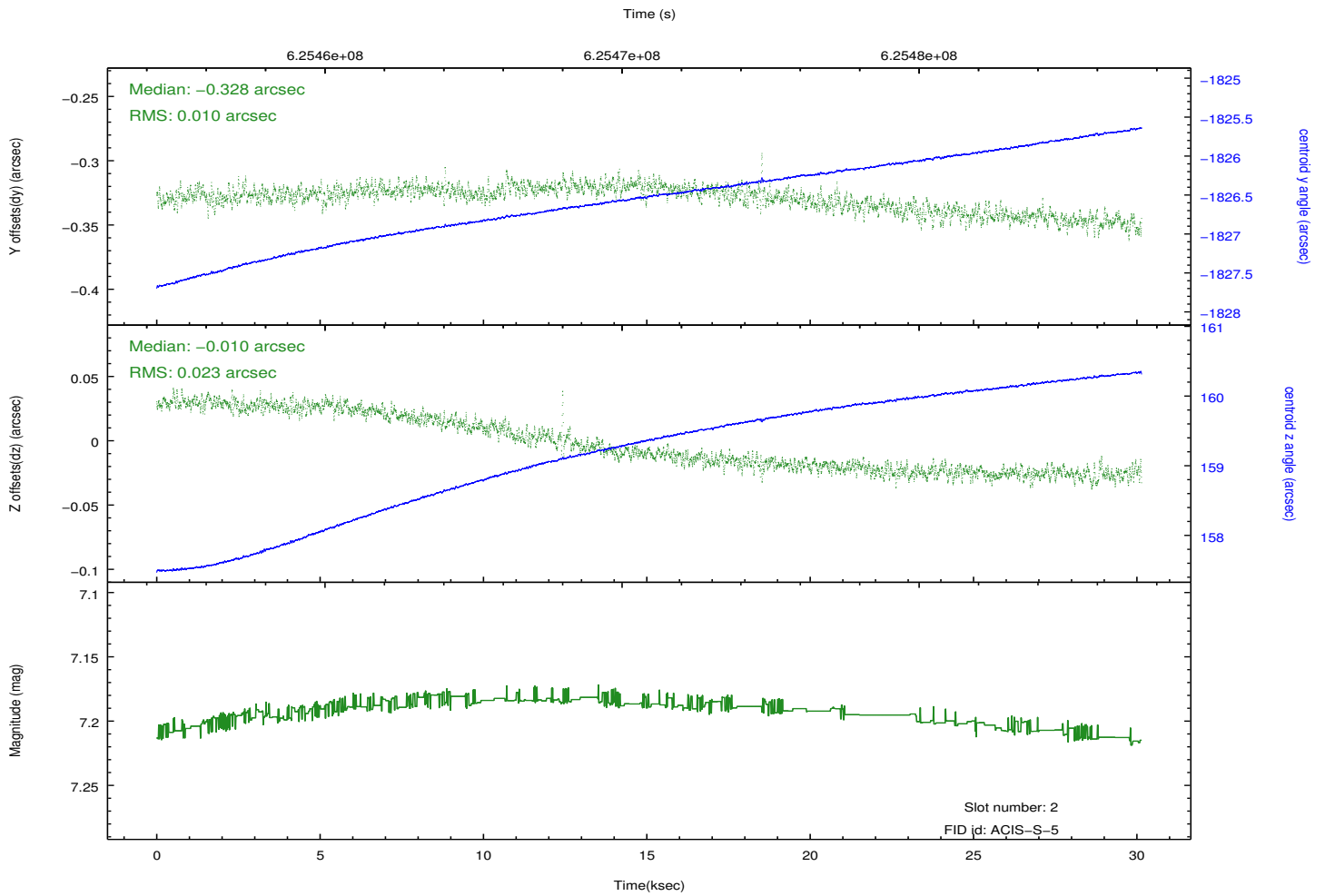
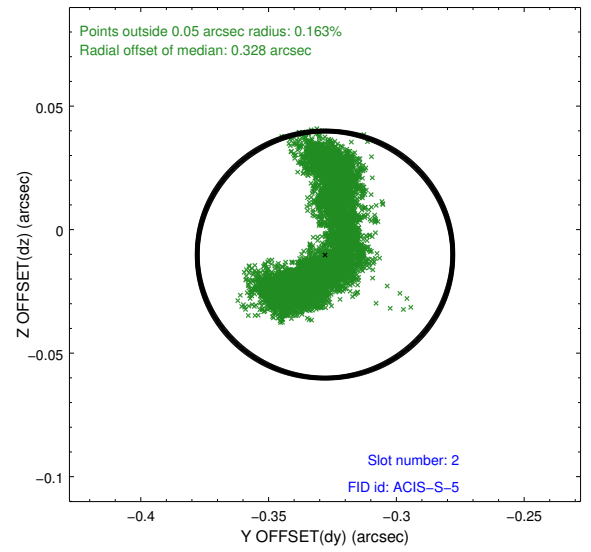
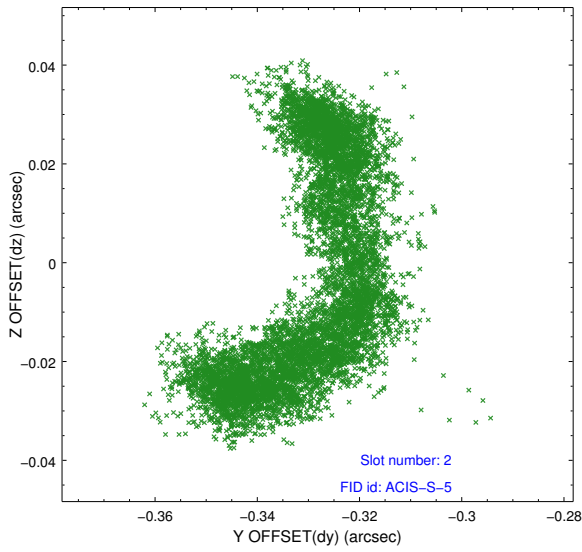
2.5.1 Slot 0



2.5.2 Slot 1

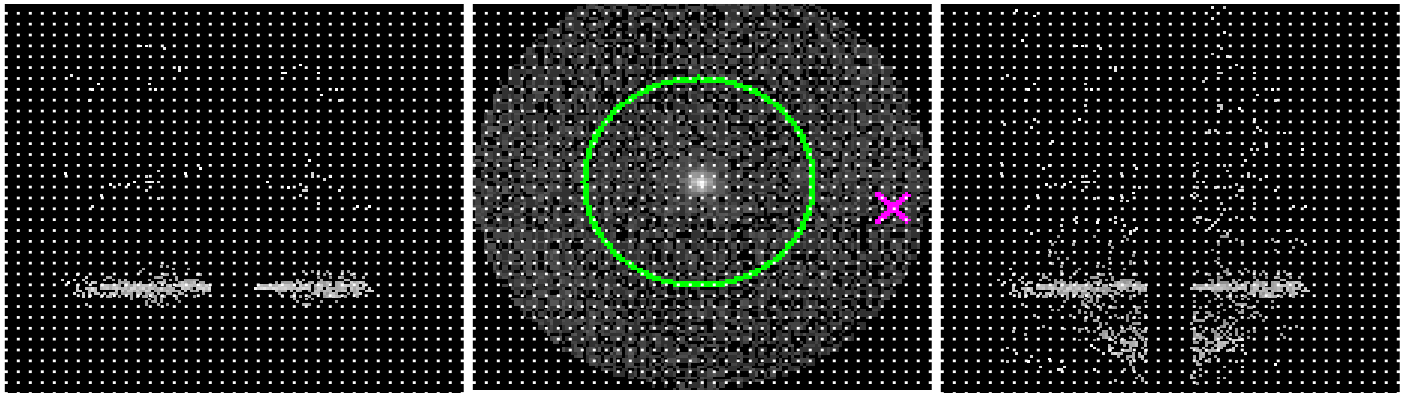


2.5.3 Slot 2



3 Gratings

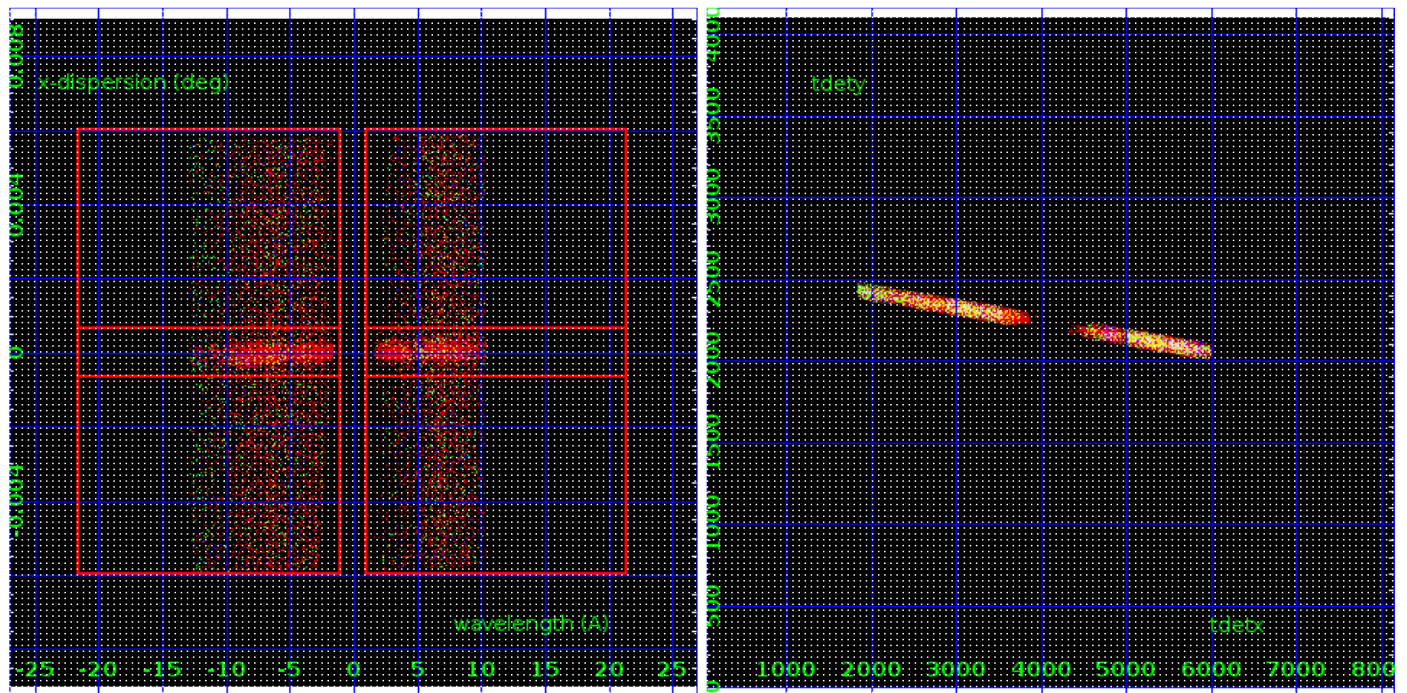
3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

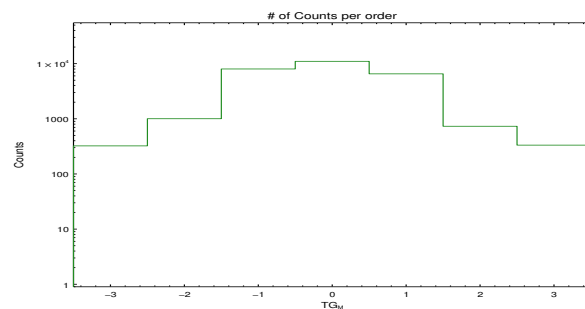
HEG Order Sort ALL

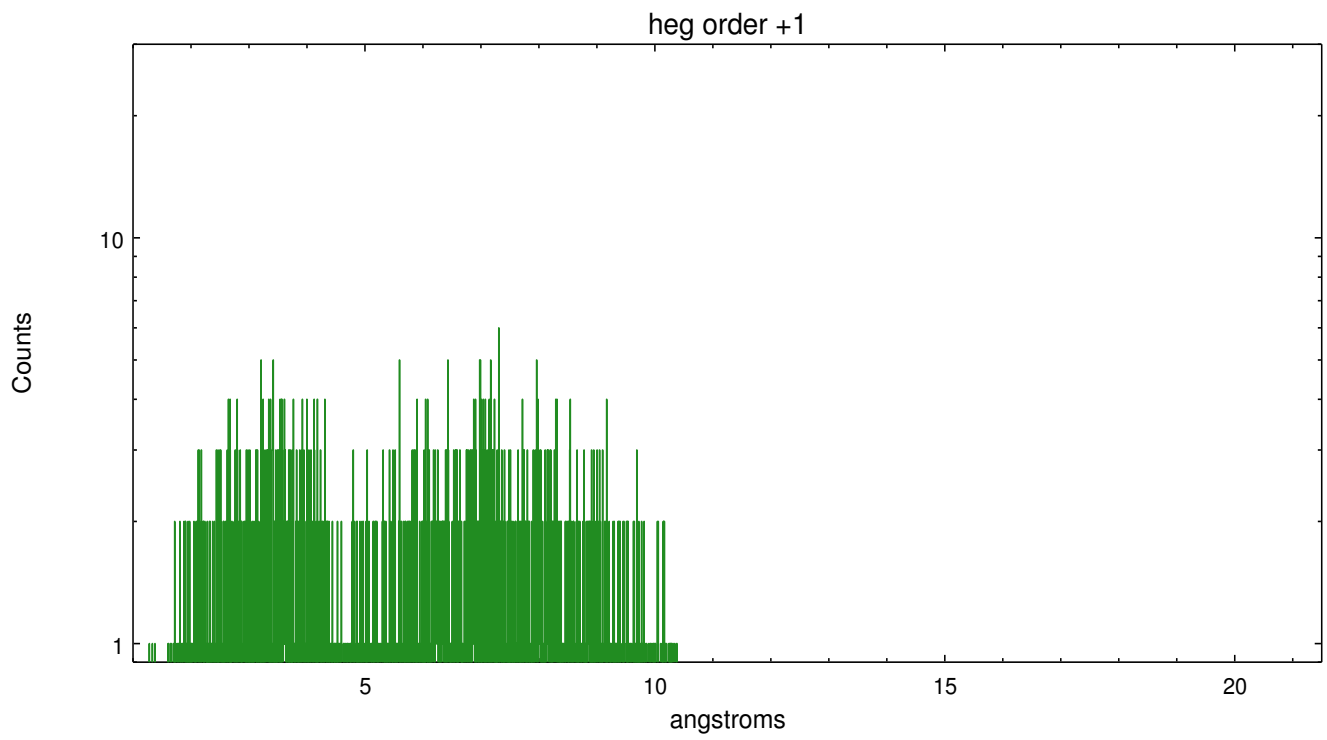
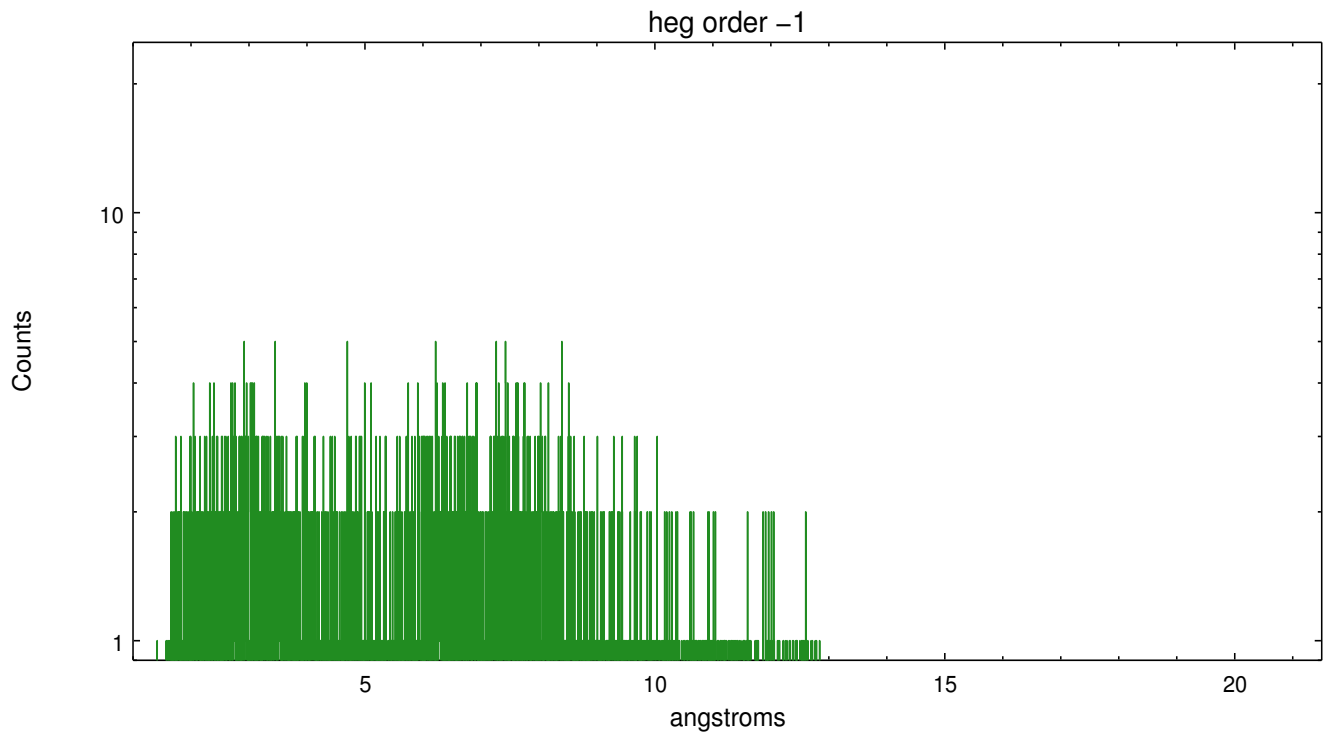


Spot Image HEG

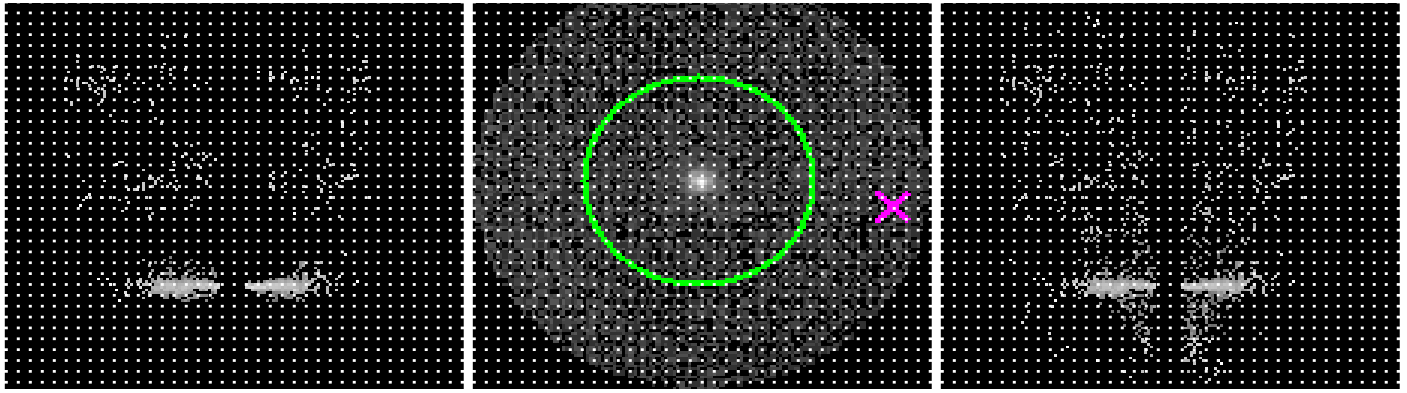
Full Detector HEG

| | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 323 | 1004 | 8011 | 11015 | 6535 | 732 | 333 |





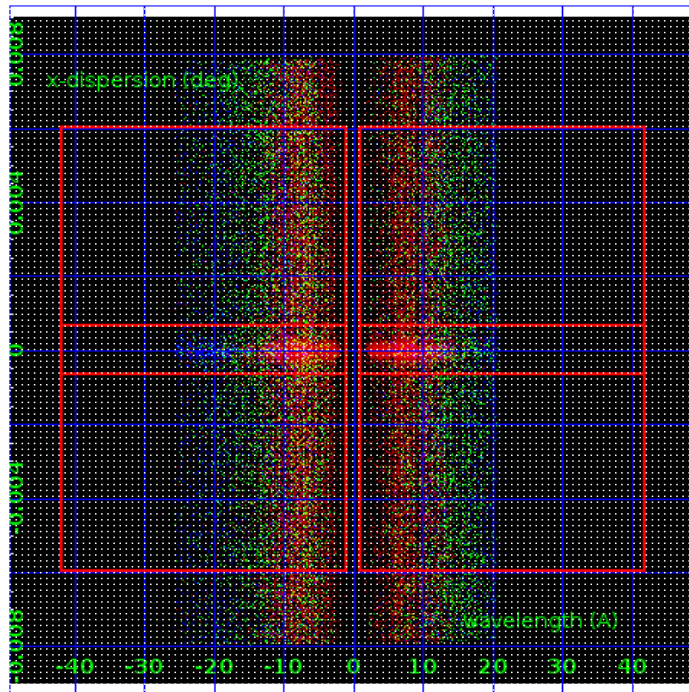
3.2 MEG Arm



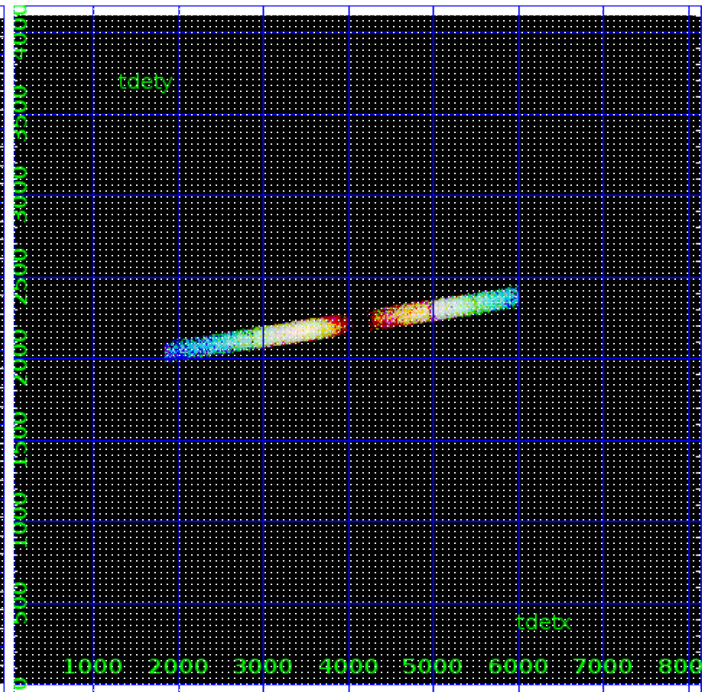
MEG Order Sort 123

MEG Zero Order

MEG Order Sort ALL

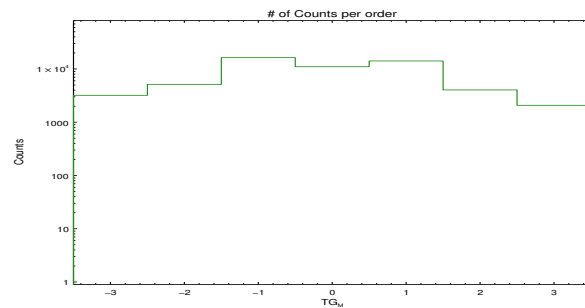


Spot Image MEG

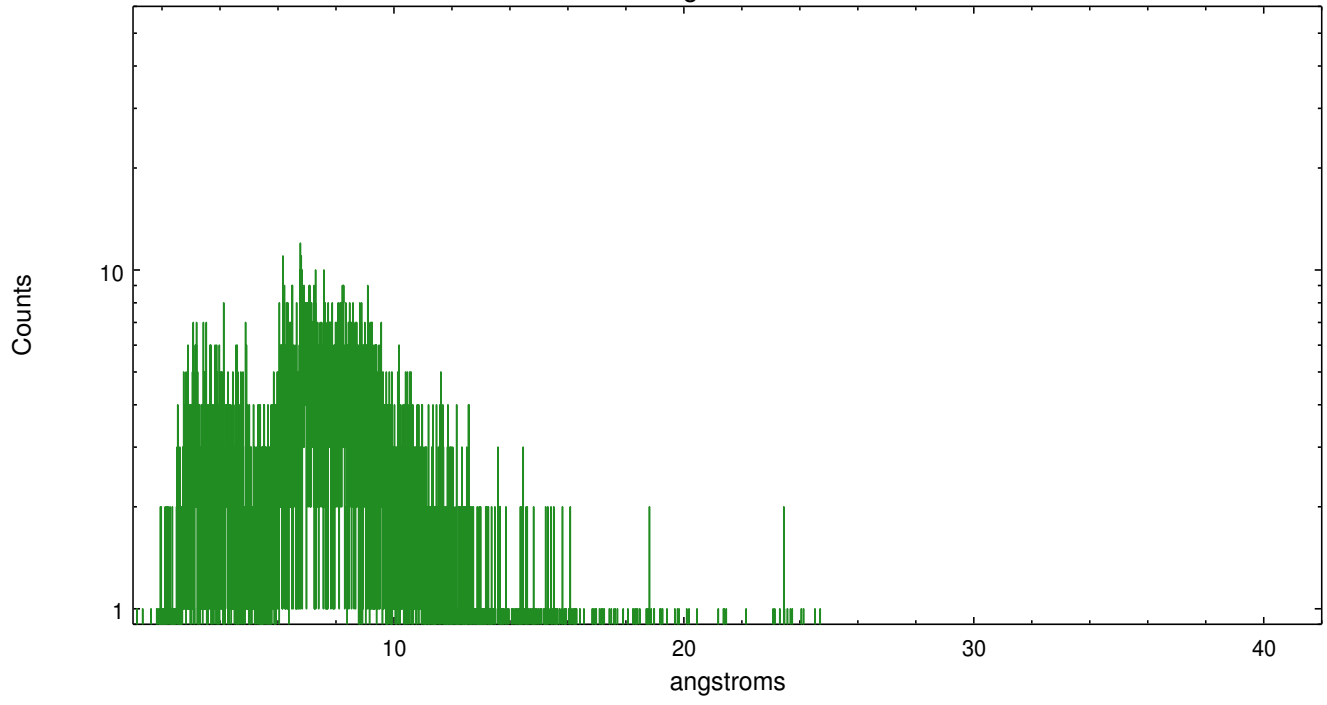


Full Detector MEG

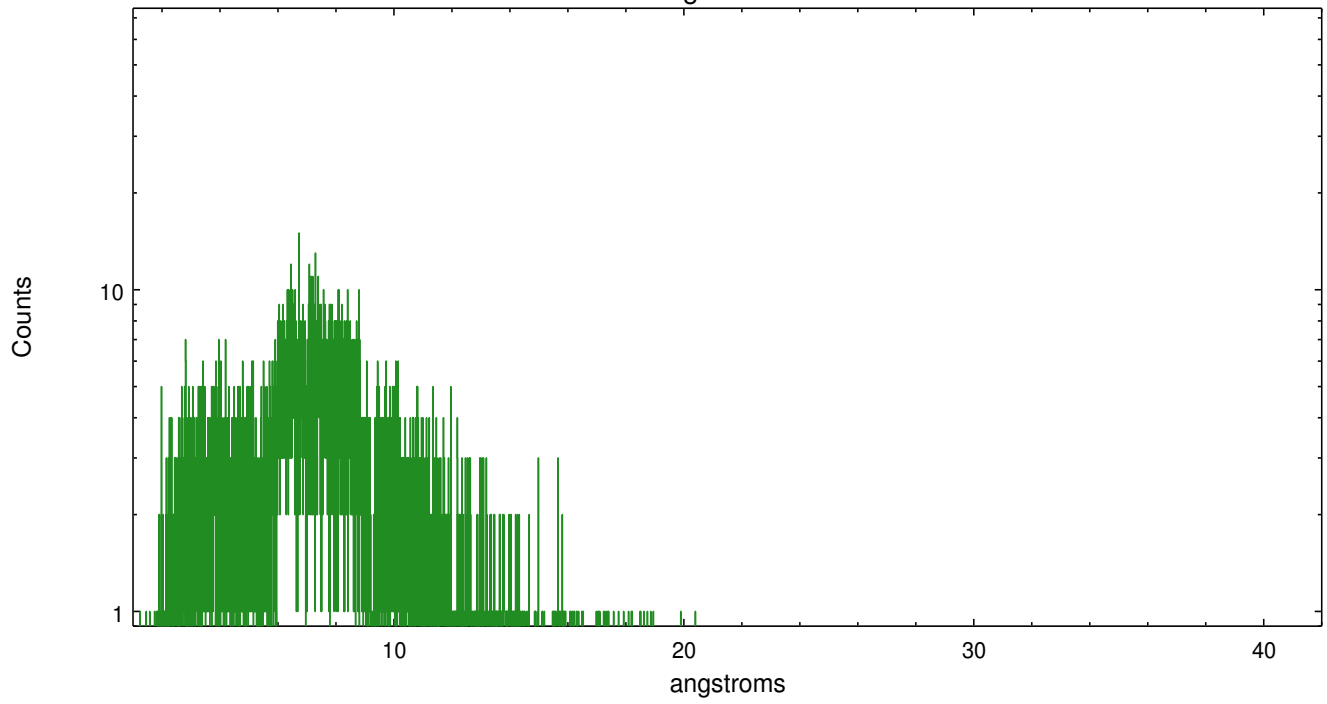
| | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 3201 | 5142 | 16314 | 11015 | 14140 | 4041 | 2078 |



meg order -1



meg order +1



A Summary

A.1 Status

| | |
|----------------------------|--------------------|
| V&V Scientist | David Huenemoerder |
| V&V Date (YYYY-MM-DD) | 2017.11.01 |
| V&V Edition | 1 |
| V&V Disposition and Status | OK |
| V&V Charge Time | 30.090402078867 |

A.2 Comments

Comments for Obi 1

Fid in slot 1 radial offset > 0.550000 arcsec

Aspect review: acceptable.

Note: automatic zeroth order determination via `tgdetect2` was slightly off; used a manually determined centroid.